MOVING TOWARDS A NON-PRESCRIPTIVE APPROACH TO FATIGUE MANAGEMENT IN AUSTRALIAN AVIATION:

A FIELD VALIDATION
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EXECUTIVE SUMMARY

Background

In general aviation, the risks associated with fatigue have been managed primarily through prescriptive regulation of Flight and Duty times under the auspices of Civil Aviation Order (CAO) 48. In recent years, there has been a general consensus that CAO 48 has been inadequate as a means of ensuring safety. In general, the CAO 48 regulations have been seen as overly restrictive given the breadth of flight operations and to be lacking any credible scientific basis. Indeed, as recently as 2000, exemptions to CAO 48 were the dominant form of regulation under CAO 48.

Not surprisingly, a regulatory approach in which exemptions were the principal form of regulation, suggested that a new approach might be of some benefit. In fact, policy initiatives to reform CAO 48 had begun in the early 90’s but had typically stalled over differences in opinion regarding the form of prescriptive regulation to be used and the politics of self-interest. While many operators agreed that reform was essential, few were prepared to embrace regulations that restricted current operating practice. Since many of the current practices were not demonstrably unsafe based on past practice, this belief was both understandable and defensible - if not scientifically credible.

In line with recent shifts in regulatory approach, CASA suggested that it may be appropriate to try an alternative regulatory model in which prescriptive regulation was replaced by a ‘safety case’ approach. From this perspective, CASA would mandate the requirement for organisations to manage risks associated with fatigue without the use of specific prescriptive regulations. In theory, organisations were required to develop and implement a fatigue management system (FMS) comprising policy, training and education, risk management and compliance audit mechanisms.

In essence, each organisation was required to develop a FMS that enabled them to minimise the risk of fatigue-related accident or incident. Under this approach, the regulator was responsible for ensuring that an organisation developed, implemented and maintained a reasonable and scientifically defensible system for managing fatigue. However, CASA would not mandate specific prescriptive guidelines for flight and duty times as per the original CAO 48 system.

This approach was consistent with emerging trends in several areas of aviation safety management and provided a mechanism whereby organisations could develop a safety system specifically tailored for unique operational requirements. By acknowledging that there was unlikely to be a unique set of prescriptive rules that could cover all operational scenarios, CASA believed it would be possible to ensure safety through a performance- or outcome-based model of regulation. In effect, recognising that safety, rather than compliance to an arbitrary rule set, was the underlying goal and most likely to ensure that fatigue-related risk was well managed.

In 2001, many of the exemptions to CAO 48 were cancelled and the mechanism whereby exemptions were granted was centralised to Canberra. In addition, operators were given the option of presenting an alternative safety-case for approval by the regulator. While this approach was eminently sensible from a regulatory perspective, the magnitude of exemptions and the lack of specific resources in Canberra to manage the transitional process resulted in a significant bureaucratic bottleneck and considerable (and legitimate) frustration on the part of the industry.

As part of the CASA response to the new approach, the Centre for Sleep Research, University of South Australia was commissioned to undertake an evaluation of a sample of the first organisations to undertake the development and implementation of a FMS. The major aim of the evaluation was to determine whether the FMS non-prescriptive approach to fatigue management could provide a viable alternative to prescriptive legislation (i.e. CAO 48).
Method

At the time the evaluation started, 21 operations were trialling the FMS. Although all 21 operators were approached to participate, the full evaluation included data from 16 operators. For the organisations that participated, there was a strong commitment to improving both the actual FMS and its implementation process. These represented a mixture of fixed-wing, rotary wing and hot air balloon operations, including passenger charter, freight, emergency medical services, marine piloting operations and operations in support of the electrical industry. The five operators who were unwilling to participate cited various reasons including the cost involved in the exercise and difficulties in scheduling employee availability.

The majority of data was collected during onsite visits, which took approximately one day at each site. This involved both interviews with key stakeholders and collation of all relevant documentation to the FMS. Interviews were conducted with management, chief pilots and flight crew representatives. Open-ended questions addressed the basic understanding of FMS, opinions, attitudes and experiences of the FMS, and future plans and objectives for the FMS. Each interview was taped, and the transcripts were subsequently analysed through a process of content analysis. The documentation was collected and evaluated. Where available, this evaluation included items such as the system policy, any relevant communications, training materials and records, and any audits that had been conducted throughout the process.

Results

Approximately 90% of managers, and 85% of flight crewmembers perceived the FMS had a positive impact on operations. However, a further 10% managers and 15% flight crew perceived the FMS had negatively impacted upon operations.

Reasons supporting these responses were considerably varied across the participating sites. However, several reasons were more prominently stated than others. One of the major reasons provided for the FMS being a positive introduction was that it has increased operational flexibility. A second major strength was an increase in the awareness and understanding of fatigue. This in turn, led to a perception of increased safety in relation to fatigue. The third major strength was that the FMS provided a rational basis for fatigue management. This statement was largely provided in comparison to CAO48, which provided little scientific background to the prescriptive rules.

The most commonly reported weakness of the system was that there was too narrow a focus on fatigue. This was largely stated in relation to the fatigue-modelling software. That is, most other frameworks have emerged to manage other issues as well as fatigue, such as environmental, industrial and psychosocial issues. For example, fatigue computer-modelling software will be effective from a fatigue perspective, however it does not consider other factors. In essence, this is not necessarily a negative perception. Historically, flight and duty time regulations that have been aimed at addressing fatigue have been polluted with other factors such as industrial and psychosocial issues. The current approach to fatigue management separates fatigue from other issues, which may be important, but should not necessarily be a part of a FMS.

Regardless of the optimal focus of a FMS, both operators and flight crew were concerned that such factors would be left out of the fatigue management system. This concern can largely be traced back to misperceptions arising during the FMS implementation stage. In particular, operators perceived an over emphasis on the reliance of computer modelling. However, if the modelling system were coupled with other appropriate risk management strategies, these concerns would be largely addressed.

Operators consistently stated the strengths and weaknesses provided above. However, some operators saw other strengths that were identified by others as weaknesses. For example, some managers perceived that FMS increased productivity, whereas others thought it decreased productivity. Furthermore, some thought the FMS made their jobs easier and was less complex to use than CAO 48; whereas others thought that there was more work involved, and it was harder to understand than CAO
48. The disagreement in these responses could relate to several underlying factors. The most likely explanation again relates to the lack of resources and information provided at the implementation stage. That is, the lack of clarity regarding the FMS often lead to higher levels of workload, and a perceived complexity of the system. It is likely that operators who began the FMS in the later stages of the implementation period received more information and assistance from CASA. Therefore, they would be more likely to have positive perceptions, which may explain the conflicting opinions described above.

One of the major components of the document review was the evaluation of FMS policies for each operation. During the implementation period, it became clear that the information and assistance provided by CASA was not sufficient. Furthermore, operators attempting to set up a FMS required a clearer direction of the requirements CASA had in relation to its regulatory responsibilities. In response to this realisation, a CASA representative released an example policy template, titled Company Sky One, to all general aviation operators who were applying for a FMS. This was well accepted by the majority of operators. However, the release of the template also caused several difficulties. More specifically, instead of using the template as example documentation of what was expected of an ideal FMS, many operators used it as a strict template, and simply cut and pasted their names into the template and used it as their own.

Company Sky One subsequently became the foundation of the majority of FMSs. Indeed, various components of the template were evident in every operation. Furthermore, 11 of the 21 operations had kept 50% or more of their policies to be exactly the same as Company Sky One, inserting their names in the appropriate places. Furthermore, six of the 21 locations had over 90% or their documents relatively unchanged from the Company Sky One template. The geographical and operational diversity of the organisations in the FMS trial was large. Therefore, using a universal template worked against the primary aim of FMS, which was to move away from an “all encompassing” prescriptive legislation to an operationally specific model.

An extensive list of recommendations is provided in chapter 10 of this report. However, some specific recommendations should be highlighted. First, CASA should provide operators with clear guidelines and information about the FMS prior to implementation (Recommendation 2.2). Before starting to implement a FMS, operators should be aware of the nature of FMS, how it will benefit them, and CASA’s expectations should they choose to proceed with the FMS. This will allow a clearer understanding of the FMS goals and aims, and prevent misperceptions from occurring.

There were many misperceptions surrounding the fatigue modelling software and risk management procedures. Therefore, CASA should ensure that each operator fully understands what FAID can and cannot be used for (Recommendation 1.2). Specifically, it should be made clear to all operators that while FAID assists in understanding work-related fatigue associated with hours of work, it does not account for job-specific factors. Such factors can be accounted for using risk management processes.

Furthermore, CASA should ensure that each operator fully understands all of the required risk assessment steps (Recommendation 1.3). This includes the provision of guidance from CASA where required by operators. In most cases however, operators will obtain appropriate understanding from AS4360. This is available from Standards Australia at a minimal/reasonable cost.

Finally, CASA should formulate an industry toolbox, providing operators with several options of templates on which to base their FMS to suit their specific operation (Recommendation 2.3). The need for some form of FMS template became clear. Providing operators with several FMS policy options, which they could tailor to their specific operation, would: effectively communicate CASA’s expectations of an ideal FMS; reduce the stress associated with writing a FMS; and reduce the cost associated with writing a FMS.
**Discussion**

In general the industry response to the new approach was supportive of the concept yet critical of the implementation. There were several reasons for the frustration. Most of these have been documented in the attached report in considerable detail.

First and foremost, FMS was an entirely new approach and there was little understanding of how the process might play out and the resource implications necessitated by the change. As the body of the report will chronicle, the change from a simple prescriptive model to a safety-based approach was to prove challenging for both the industry and regulator.

There were no clear guidelines on what constituted an adequate safety-case. Neither was there a clear understanding of the resources required by the regulator or an industry member in developing and approving a fatigue management system. In many cases all parties were operating in an intellectual vacuum.

This problem was further exacerbated by the regulatory climate and culture surrounding the issue. Both operators and the regulators came from prescriptive cultures where ‘tick and flick’ were the dominant form of regulatory compliance. FMS assumed a basic change in the anthropology of compliance such that operators and regulators were required to develop, resource and implement a safety case from scratch rather than ‘cut and paste’ text as they had in the past. Without pre-existing templates and ‘boiler plate’ the resource requirements were high and guidance was low. For many operators and some regulatory officers the ambiguity in what was demanded along with the time commitment required to ‘wrestle with the beast’ proved difficult if not impossible.

These issues are not unique to FMS. Many regulators and operators in aviation as well as other modalities have long commented on the transitional difficulties associated with performance-based management systems. This difficulty is best summarised by the hoary aphorism that observes ‘culture eats strategy for breakfast’. In a sense, the initial implementation of FMS failed spectacularly to anticipate the socio political context into which it was applied and the resources required to overcome that contextual barrier.

Unfortunately for CASA, the regulatory changes associated with the introduction of FMS occurred midway through a budget cycle and there was insufficient time to plan for the potential resource implications of the change and limited capacity to redirect funds from other projects (given the current funding restrictions for Federal Government agencies).

There was a similar problem for the industry. Exemptions were often cancelled without sufficient notice or budgetary allowance for the ideal development of the novel FMSs. In the past, the compliance costs associated with a simple prescriptive system were relatively small. On the other hand, developing an initial fatigue management system required a significant commitment of time and resources by operators and the regulator. For many small operators in the general aviation sector, difficulties associated with the cultural shift to a safety-case approach and the extra resources required proved a challenge for already tight operating budgets.

While many of the operators acknowledged the theoretical benefits of the new approach, i.e. increased flexibility and improved safety, they indicated that there was a significant ‘up-front’ cost associated with developing and implementing a FMS. From the operator’s perspective, developing and implementing a fatigue risk management system was a substantial undertaking for many of the organisations. While it promised significant operational and safety improvements, timely development, implementation and approval were critical for the success of such an approach. Operators also believed that inadequate ‘up-front’ resource allocation was a significant issue for CASA.

While operators were near universal in their approval of the shift in regulatory perspective, they were frequently critical of the way in which the change process was managed. In their view, given the lack of resources in the operator community and a lack of resources allocated by the regulator, implementation had been significantly compromised.
It is worth noting however, that the majority of operators believed that the new approach was likely to be worthwhile in the long run and should remain. They believe that the new approach would be extremely successful if adequately resourced and targeted to those most likely to benefit from the flexibility and improved safety.

At a global level, most operators felt that the shift from a strict prescriptive approach [eg. CAO48] to a strict safety-case approach may be an over reaction. While the majority of the GA industry was operating to exemptions they believed that many were only relatively minor excursions from CAO48 and fell into a limited number of categorical exemptions.

Many of the operators reasonably believed that the cost of developing a safety case approach to fatigue management would be greater than any operational benefit derived. In these cases, they believed a universal safety-based approach was flawed and provided little additional benefit over the traditional prescriptive approach. Operators believed there were several ways in which this issue could be successfully resolved.

First, they believed that it may be possible to craft a hybrid approach in which the regulator developed a limited number of ‘off-the-shelf’ safety cases that could be developed and implemented at a relatively low cost by those operators for whom the traditional prescriptive approach had been reasonable. On the other hand, for those operators who required a major excursion from the ‘off-the-shelf’ safety case it would be reasonable to expect them to invest in the greater cost of developing and implementing a specific safety-case to suit their unique operational requirements.

Second, it would be important to develop public domain resources that reduced the necessity for each individual operator to ‘re-invent the wheel’. Such an approach would also reduce the resources required for the regulator to ‘re-approve the wheel’ for each individual operator.

What this suggests strategically is an alternate compliance model whereby CAO48 is replaced by a limited set of fatigue management systems that have been developed jointly by the industry, the regulator and the scientific community. These systems could be developed as ‘best-practice’ models to cover a significant proportion of the industry for whom the development of a FMS would be prohibitively expensive [relative to operating budget] and of limited operational or safety benefit.

This approach would typically, although not necessarily, enable the regulator to develop adequate FMSs for many of the small operators working reasonably close to the current CAO48 guidelines at a reasonable cost to the industry. Other operators, for whom there would be significant benefits for working safely, albeit outside a predefined FMS would be required to develop a more comprehensive FMS that ensured safe operations. Given the potential advantage, the additional costs would be economically reasonable.

The advantage of this approach would be the reduction in the initial costs of developing a FMS by those operators for whom there is marginal benefit. It would also reduce the resource requirements for approval by the regulator since many of the operators would fall into pre-defined approval categories. In addition, this would enable the regulator to target regulatory resources most appropriately. That is, spending the resources on determining whether a FMS is acceptable [or not] for those safety operations that pose the greatest potential safety risk to the community.

On the basis of comments by the industry we believe that it would also be appropriate for CASA to develop a public domain FMS toolbox that would enable the industry to reduce the cost of developing and implementing either a predefined or unique FMS.

Such a toolbox should be consistent with the Australian Standard for Risk management [AS/NZ 4360] and include a policy development tool that defines the issues that an operator should, and the regulator will, address in the development, implementation and approval of a FMS. It should also include policy templates for all pre-defined [off-the-shelf] FMSs and examples of other unique approaches developed previously by other operators. A template tool would significantly reduce the cost of developing and approving a FMS policy for both the operator and regulator. It would also provide the opportunity for industry associations to work on common agreed positions and FMS guidelines to shape industry practice over time.
A toolbox should also include public domain training and education materials. These materials should be developed specifically for aviation and cover general issues related to fatigue as well as those unique to the industry. To ensure quality and appropriate delivery, the training and education materials should ideally be competency-based and approved by ANTA (Australian National Training Authority) and portable between employers.

Experience in other industries has shown that the cost of developing FMS training and education materials or outsourcing their supply can be very high for small operators. This is particularly true for those small operators who are situated in remote areas. For these operators there are significant costs associated with getting trainers to staff and the training costs must be amortised over a small number of employees.

We would suggest the development of traditional hard copy and on-line [web-based] resources that enabled the training costs to be kept at a comparable levels across the country. We believe a reasonable goal is to be able to deliver FMS training for around $50 or less per employee across the entire industry.

A toolbox should also include tools and guidelines for the audit process. While audit software [eg FAID] has significant advantages for both operator and regulator, there are no clear guidelines on how it should be used, or appropriate ways to set maximum fatigue risk levels. CASA could play an essential role in facilitating the development of operational guidelines for appropriate use of such tools. It would also be appropriate for CASA to anticipate the introduction of alternate software tools and to develop an accreditation process to determine which tools are acceptable under which conditions.

It may also be appropriate for CASA to support the introduction of simple audit tools that do not require operators to commit to a financial outlay. Public domain audit models should be provided to operators to ensure that small operators are not financially or operationally prohibited from developing appropriate audit technologies.

We also believe that it is appropriate for CASA to develop an ongoing program evaluation mechanism to ensure that FMSs continue to evolve and improve based on current scientific knowledge, industry feedback and current best-practice from around the world on how to best manage fatigue.
INTRODUCTION

Background

In most countries, flight and duty times have been controlled through various forms of prescriptive legislation. Such legislation has typically been based on assumptions of sleep and recovery within breaks of a set duration. For the last 50 years, flight and duty times in Australia have been controlled through a piece of legislation known as Civil Aviation Order (CAO) 48. When implemented, CAO 48 addressed fatigue as well as it could with the knowledge available at the time. However, given more recent research on factors such as time of day effects on work and recovery, it is now known to have certain limitations.

The basic premise of CAO 48 was to prescribe maximum limits on flight and duty times within cumulative periods of a week, a month and a year. These limitations were based on the start time of the shift and the associated flying time within the shift. For many operators, these rules were considered too restrictive. As such, a number of standard exemptions were made available for different types of operation. The 10 standard industry exemptions for operations range from international charter to aerial mustering. While the standard exemptions were effective in providing more flexibility than CAO 48, many operators still found them too operationally restrictive. Consequently, under certain conditions CASA issued operators with individually based, non-standard exemptions from CAO 48.

When first introduced, exemptions to CAO 48 were intended as a 12-month interim measure, in which new flight and duty times could be formulated (House of Representatives, 2000). However, due to lack of industry agreement and attempts to stay in line with international standards, the process of developing new flight and duty times has been delayed considerably (House of Representatives, 2000).

In 2000, the Australian Federal Government conducted an extensive inquiry into fatigue in transportation, Beyond the Midnight Oil. The report focused on all major Australian transport industries including road, aviation, rail and marine operations. The report highlighted deficiencies in each area and made recommendations of action to improve the situation. Many of the recommendations were specifically applicable to aviation flight crew and CAO 48. One of the major recommendations made, was that “the Civil Aviation Safety Authority should implement a Fatigue Risk Management System to regulate flight and duty times for aircrew as soon as it is feasible to do so” (House of Representatives, 2000).

Aviation is an extremely broad and diverse industry. One operator may have completely different operational needs, and hence, different fatigue risk from the next. Fatigue management systems (FMSs) recognise this by offering a less prescriptive alternative to fatigue management. The basic premise of a FMS is that it is individually tailored to each operation, providing the operator with greater flexibility, yet be more scientifically valid and tailored than the previous operating system (i.e. CAO 48). In offering greater flexibility, the FMS approach to fatigue management clearly shifts responsibility from the regulator to the operator. As such, the operator is required to identify all fatigue-related risks within their operation, and present a safety case to the regulator, stating operational needs, and detailing how the risks have been addressed. In an operational environment, the operationally specific nature of FMS has potential to be more efficient for both business management and productivity.
As shown in the figure below, effective FMSs are based on systems theory, and consist of several component parts, including:

![Figure 1. Effective Fatigue Management Systems](image)

Each of these will be discussed in more detail in the following sections.

**Policy Development**

Safety, including the management of fatigue, should be the major factor in the long-term operations of any organisation. For any new safety regime to be effective, employees require a clear set of rules, easily identifiable authority figures and strong leadership to demonstrate the importance of the system (Hayward, 1995). This is largely achieved through policy frameworks. Therefore, the values of safety, and in this case fatigue management, should be inherent in company policy and manuals (Orlady & Orlady, 1999).

For fatigue management, an effective policy is essential for aligning all company efforts towards the goal of safety (Lee & Dale, 1998). First, FMS policy identifies shiftwork and fatigue as workplace hazards that should be managed equally to all other occupational health and safety risks. Furthermore, it creates a clear set of rules and responsibilities for both employers and employees to follow to manage the risk (Newcomb, 1989).

Furthermore, policy establishes an auditable process to assess whether fatigue and shiftwork are being managed appropriately through the specification of auditable outcomes.

Ideally, a FMS policy should be constructed on two levels:

- a corporate level, to underline the commitment from senior management; and
- an operational level, as a working document of how the FRMS will work in practice.

The corporate level policy is one of the first development stages of an effective FRMS. The policy should be a short document that acknowledges fatigue as a significant work hazard, and identify why it is being managed. Furthermore, it should highlight the commitment from senior management for the effective management of fatigue.

The operational level of policy should be more applied and place clear guides and limits on fatigue in the workplace. As such, it should:

- Outline processes to manage the risk of fatigue;
- Provide practical guidance on how to eliminate or minimize fatigue-related risks;
- Review legal and operational responsibilities for fatigue management; and
- Provide guidelines for future development and review.
After outlining the nature of fatigue, and the aim of fatigue management within the organisation, the FMS policy should detail active steps of how to reduce the risk of a fatigue-related incident. That is, it should provide a framework of how fatigue will be managed within the workplace. In doing so, the FMS policy should specify clear responsibilities of both management and employees on a day-to-day basis. For example, management responsibilities would include factors such as ensuring work hours are kept within a certain fatigue threshold, and informing employees of all fatigue-related hazards. Employee responsibilities would include factors such as appropriate use of rest time, and reporting subjective fatigue when they feel it is not safe to continue a job.

Once the responsibilities of the FMS operation have been laid out, the FMS policy should provide administrative guidelines for future development and review. For example, once the FMS has been in operation for a period of time, an evaluation involving all key stakeholders (management, unions, chief pilot, flight crew, etc.) should take place. In this way, the FMS should remain a dynamic document, and be open to discussion of change depending on the current organisational climate. That is, factors such as staff turnover, output demands and hours of operation impact strongly on operations. With such changing demands, policy needs to be permanently open for discussion and input from all levels of the operation (Helmreich and Merritt, 1998). In providing guidelines to ensure the constant review of the FMS policy, management would be displaying a ‘hands-on’, proactive approach towards the on going improvement of fatigue-related safety.

**Fatigue Modelling**

Due to the nature of aviation, FMSs will vary widely between operations. Therefore, it is essential that regulators monitor FMSs to ensure they manage fatigue to a safe standard. Hence, in addition to determining whether it has been implemented appropriately, regulators should have a very clear understanding of what constitutes an acceptable system.

Historically, regulators had clear sets of rules for auditing. As in the case of CAO 48, audits are typically based on compliance to a universally imposed rule as determined by the government or industrial awards. Rules such as these have been very clear-cut, with easily defined boundaries that provide clear definition for audits. However, due to the universal nature of the rules, they tended to be very restrictive and inflexible in actual operations. Specifically, CAO 48 prescribed maximum duty time and shift limitations and minimum break times. By limiting the amount of work hours, these limitations were somewhat effective in providing equity for family and social time. However, they were created independent of time of day factors, making them largely ineffective for the specific control of fatigue.

Guidelines for a FMS audit are far broader. Some of the auditable factors may include effective communication strategies, risk assessment, risk management, policy and training programs. However, one of the major factors involved with a FMS audit is screening rosters for the presence of, or potential for, work-related fatigue.

As shown in the figure below, work-related fatigue is largely dependent on several factors. For example, work-related fatigue can arise from long shifts, shifts that start early in the morning, insufficient breaks in between shifts, and the nature of shifts in the previous week of work. As such, any computer-based fatigue model should consider each of these factors when determining fatigue.

![Figure 2. Assessing work-related fatigue](image-url)
There are several models available for the assessment of rosters in relation to the risk of fatigue. Some require inputs including light exposure and sleep times. However, others only require work time inputs (Folkard & Akerstedt, 1991; Dawson and Fletcher, 2001). It should be noted that while each of the available models are effective in predicting fatigue, they have been developed for different purposes. For example, some models have been developed strictly for military purposes (Hursh, 1998), others for research settings, where factors such as sleep time and light exposure can be controlled (Jewett & Kronauer, 1999), and others for use within an industry setting (Akerstedt & Folkard, 1996; Dawson and Fletcher, 2001).

One example of software that has been developed for industry, is a mathematical model known as Fatigue Audit InterDyne (Fletcher and Dawson, 1998, Dawson and Fletcher, 2001: see appendix A). FAID is a software-based audit system that assesses potential and/or actual hours of work to determine a level of work-related fatigue. Validations of FAID to date, have been conducted through various laboratory and simulator studies, and through comparisons of performance and blood alcohol concentration (BAC). In order to refine the program, future validations have been planned, including:

- Boeing 747 simulator studies with QANTAS, the QANTAS pilot’s association and CASA;
- Further rail simulator studies; and
- Workplace-based fatigue and performance studies.

Furthermore, the Australian Research Council has recently awarded a 3-year grant to the further development and validation of FAID.

Fatigue modelling programs such as FAID can be used effectively in determining work-related fatigue. However, before implementing such a program, several considerations should be noted. The major consideration is that modelling produces a fatigue index based solely on the impact of hours of work on fatigue. Factors such as workload, climate and aircraft type are not considered within such programs. Furthermore, the models provide a guide as to how much recovery sleep an employee will obtain within breaks. Particularly with breaks at work, this is likely to vary substantially between individuals. Therefore, fatigue-modelling programs should be used only as a tool to screen rosters for fatigue.

With the considerations discussed above, it is important that fatigue modelling is appropriately coupled with risk management processes. Risk management (as discussed below) allows organisations to account for local and job-specific factors that can impact on work-related fatigue on top of hours of work. These two processes can work together to manage work-related fatigue from both hours-of-work and job-specific perspectives. As such, when coupled with risk assessment, fatigue modelling can provide a reliable indication of work-related fatigue that can be used to optimise the auditing process.

**Risk Management**

As shown in the figure below, fatigue can result from a variety of sources. More specifically, there are two major themes of contributing factors to workplace fatigue: work-related, and non-work related. Non-work related factors largely stem from lifestyle practices, such as sleep, diet, social behaviour, family commitments and home environment (Baker, 2000). Work-related fatigue on the other hand, generally either stems directly from poor rostering (Fletcher, 1998), or non-hours of work issues such as workload, climate, or noise (Rosekind, 1994). Whether caused from work- or non-work related factors, they are still likely to have negative effects on performance at work. Therefore, the relative risk of each contributing factor needs to be assessed, and then managed appropriately.

Figure 3. Contributing factors to fatigue
Fatigue modelling practices, such as those described in the section above, are useful in managing fatigue resulting directly from rosters. As such, high points of fatigue in the roster are highlighted, and can either be changed, or assigned with lower-risk tasks to compensate. However, risk management for the other contributing factors is likely to be more complex.

Training and education programs are an effective way of raising awareness of employees to the risks associated with fatigue, and alerting them to the contributing factors they should be aware of. As discussed further below, this is one of the major strategies used to manage the risk of lifestyle-related fatigue, as it raises awareness of aspects such as diet and environment that employees may not have previously been aware of. While it is difficult to dictate what employees can or can not do in their non-work time, it is important that the appropriate risk management practices are still put in place. For example, giving employees the right to refuse a shift if they feel that their relative fatigue levels will impact upon safety.

Work related, non-hours of work factors can be controlled more directly. Employers are required to identify any foreseeable hazards that might contribute to fatigue. These might include factors such as workload, weather conditions, noise, aircraft type or instrument ratings. Once identified, each hazard should be assigned a relative level of risk. For example, flying a light aircraft through a turbulent electrical storm is likely to be significantly higher risk than flying a commercial aircraft on a clear day. Decisions such as these should be made with the consultation of employees. Once the appropriate level of risk has been assigned to each factor, risk can be controlled with the fatigue modelling process. That is, higher risk tasks should be assigned a lower maximum fatigue score whereas lower risk tasks can be assigned a higher maximum fatigue score. This will be discussed further in chapter four, benchmarking.

**Training & Education**

Another major component of an effective FMS is training and education for management and employees. Training and education is aimed at creating a shared set of attitudes, values and beliefs. That is, education can create a proactive approach to sharing the responsibility for safety. Indeed, safety training has been shown to be a prominent factor in low accident companies (Cohen et al., 1975, Smith et al., 1978, Zohar, 1980, Cooper, 1995, Cooper and Cotton, 2000).

The context of safety training and education should be clearly documented within the FMS policy. Effective training programs should provide: (1) a basic understanding about the nature of work hours; (2) the nature of fatigue and performance decrements; and (3) fatigue-related coping strategies. Many organisations also include training for lifestyle factors such as sleep, diet, physical exercise, and psychosocial factors to encourage employees to take responsibility in the management of fatigue.

While training and education programs have obvious benefits, they are of little use if supporting company processes, procedures and practices are not in place (Harvey et al., 2001). Indeed, studies have shown that training is of little effect if the work environment does not change, and the old ways of working are still reinforced (McDonald et al., 2002). Thus, education has the potential to be extremely beneficial within FMS if supporting operational procedures are also in place.

**The Present Study**

As recommended by the House of Representatives in Beyond the Midnight Oil (2000), CASA have implemented a trial-FMS within a subsection of Australian general aviation. The purpose of this evaluation was to determine the efficacy of the FMS approach to fatigue management in general aviation, and provide recommendations for future development.
2. METHODOLOGY

At the outset of this evaluation, 21 general aviation operators were participating in a trial FMS as a potential alternative to CAO 48 for managing flight and duty times. These operators represented a wide spread of geographic, aircraft type and operational requirements. The 21 operators represented a relatively even mix of fixed-wing, rotary-wing and balloon operators, as well as a mixture of passenger charter, freight, piloting, emergency medical services (EMS), and operations in support of the electrical industry. At least one operator from every state and territory of Australia, except for Tasmania and the Australian Capital Territory, participated in the trial FMS. The operators also varied widely in size, ranging from only two full-time pilots, to those having large bases, with over one hundred pilots across Australia. Prior to the evaluation occurring, an initial evaluability assessment was conducted with one rural and one urban operation. This was performed to refine the likely process for the full evaluation. That is, availability of documentation, structure of interviews with target groups and possible logistics for visits. Following the evaluability assessment, the template for the evaluation was constructed. Specifically, the template included document checklists, process time lines, contact details and interview templates. The full template is provided in appendices B to D.

Each of the 21 operators trialing the FMS were approached to seek their participation in the evaluation. Initially, management were sent a document via e-mail, detailing the nature of the evaluation, and what to expect of the process should they choose to participate. The e-mail was followed by a phone call to determine their interest in participation and, if they agreed to participate, to organise an appropriate time for a member of the evaluation team to visit their operation. For consistency of process, a single member of the evaluation team was responsible for all site visits.

Some of the data collection was broadly related to all results chapters within the report. However, other information was specifically related to individual chapters. Therefore, general data collection is presented first, and more specific information for individual chapters is presented in the latter part of this chapter.

General Data Collection

The data collection for the actual evaluation consisted of four main requirements, which are detailed in full in the following sections. The requirements were:

1) Onsite Visits
2) Interviews with key stake-holders
3) Questionnaires
4) Document Review

Onsite Visits

The onsite visits were the main process used to collect and collate data, as well as question management and flight crew members. It was intended that a full day visit would be allocated to each site. However, it was foreseeable that for some of the larger organisations, additional time or visits to multiple sites may be necessary.

Each site visit involved:

• taped interviews with key stakeholders;
• completion of questionnaires;
• document collection; and
• personal observations of the evaluator.
Interviews

During each site visit, all relevant employees who could be made available were interviewed. This included members of management, the chief pilot, administrative staff (e.g., rostering and payroll) and flight crew. Prior to the interviews, it was made clear to each participant that all responses would remain confidential both within the operation and from CASA. It was intended that interviews should last as long as necessary to obtain the information that the employees deemed significant.

Each interview was taped using a Sony M-560V micro cassette recorder. The interview contained both broad questions about the FMS as a whole and more specific questions about individual components of the FMS. These questions related to the basic understanding of the FMS; opinions, attitudes and experiences of the FMS; and future plans and objectives for the FMS. A full-copy of the interview templates for both management and flight crew are included in appendices C and D. Following interviews, all records were deidentified.

Quotes from various responses are presented within each chapter of this report. All quotes are referenced, to allow the reader to examine the surrounding content of the quote in the appendices. Quotes from management are indexed with an ‘M’, and pilots, with a ‘P’. For example, 1. Management, is referenced as (M1) and; 4. Flight Crew is referenced as (P4).

Questionnaires

Throughout the interviews, Leichhardt-scale questionnaires were presented to each interviewee. Leichhardt scales are known to be both reliable and valid for the collection of interview data. Furthermore, there is little room for misinterpretation of response requirements, particularly when a researcher is present to answer any questions.

An example of a Leichhardt scale is provided below. This particular example requires the interviewee to select a response on the scale from “very good” to “very poor”.

How would you rate your overall satisfaction of the FMS? Please circle one:

| Very Good | Good | Average | Poor | Very poor |

The proformas of questions were presented one at a time as they related to individual questions discussed during the interview. The questionnaires for both management and flight crew are included within the interview templates. These subjective questionnaires were used to bolster objective data obtained from other parts of the evaluation. Specifically, the questionnaires were elaborated on with the extended interview responses.

Document Review

The document review consisted of the collection and content analysis of all relevant documentation related to the FMS of each individual operation. Some of the key documents for this process were provided by CASA. These documents included:

- FMS policies of each of the 21 operators;
- Any CASA audit reports that had been generated across the trial FMS period;
- Any prior exemptions issued to each operation for flight and duty times required by CAO 48; and
- All documented communications between the operator and CASA during and after FMS set up.
The majority of documents however, were collected during the on-site visits with each of the individual operators. The documents requested from each operator included:

- Precursors to the final FMS policy
- Communications (eg. Memos, e-mails, faxes, etc.) between management and employees regarding the FMS
- Internal audit reports relating to FMS
- Expenses accrued relating to FMS
- Training register and materials
- Employee actual work hours
- Grievance records
- Incident / hazard / occurrence reports
- Pre / post FMS duty rosters
- Annual report

The aim of collecting these documents was twofold. First, to examine the content of the FMS and all related material. Second, the documentation enabled access to the communications by management with both CASA and employees, allowing an examination of the FMS implementation.

**Specific Data Collection**

**Chapter 1 - Attitudes and Opinions towards the FMS**

This section outlines a broad summary of specific parts of the interviews conducted at each site visit. The specific topics covered here pertain to the attitudes and opinions of both management and flight crew of each operation visited. Questions were framed in order to investigate the positive and negative viewpoints of the FMS. As such, there were four specific questions asked:

- How would you rate your overall satisfaction with the FMS in addressing fatigue-related issues?
- How would you rate the overall usefulness of the FMS in addressing fatigue-related issues?
- What are the major strengths of the FMS?
- What are the major weaknesses of the FMS?

For the first two questions, interviewees were first asked to circle a response of either: very good, good, average, poor or very poor. They were then asked to comment on their response. The latter two questions were descriptive answers only. Actual interview responses for both management and flight crew are included in appendices F and G. For the purpose of confidentiality, the interview sections are presented in random order, and de-identified in terms of operation and individual.

**Chapter 2 - Operators’ Set-up Requirements**

The interviews that were completed with management investigated experiences of operators’ FMS set ups. Management representatives were asked to briefly describe the major steps taken to set up their current FMS. This was phrased as an open question, and conversation flowed according to the response. Depending on what arose in these discussions, information was provided regarding:

- budget for FMS;
- frustrations experienced throughout the setup period;
- assistance provided by CASA;
- the role of the consultant; and
- suggestions for future development.

Each of these points are explored within the results of this chapter. The relevant transcripts for each of these interview sections are included in appendix H.
Chapter 3 - Policy Statements

Each of the 21 operators currently trialing the FMS had their policy document provided to the researchers by CASA. Initially, the specific process that each organisation followed to write their FMS policy was documented. The evaluation also required a review of the content of each document for specific components of each FMS. An additional process was to compare each policy against all 73 sections and subsections of the template, Company Sky One (appendix I), which had been provided to all operators by a CASA representative. The third step of policy evaluation was to identify the desired elements of a policy and provide recommendations for future policy development.

Chapter 4 - Benchmarking

This chapter describes the limitations of fatigue modelling programs, and applies the Australian/New Zealand Standard for risk assessment, the AS4360, within the scope of effective fatigue management.

Chapter 5 - FMS Audits on Rosters

During the site visits, each operator was asked to provide copies of rosters prior to the implementation of FMS, and also after the implementation of FMS. Each roster collected was one month in duration, and corresponded with the corresponding roster for the previous year. For example, 2 rosters were collected for employee x: January 2002 and January 2001. This was done to allow for seasonal variation within work patterns.

The organisations that provided rosters represented a variety of different operation types, including:

- Emergency medical services (EMS)
- Passenger charter; and
- Rotary wing.

The data received from the various operations were in a variety of forms. Some were handwritten on duty entry forms; others were entered into Microsoft Excel worksheets; and the remainder had already been formulated for fatigue analysis as .rtr files, which are compatible with the audit software. The handwritten duty entry forms were entered into a Microsoft Excel worksheet. The Microsoft Excel shift data were then extracted from the rosters, into a format suitable for analysis, as .rtr files. The data was subsequently entered into a program that assesses rosters for work-related fatigue. That is, the roster data was entered and analysed using the Fatigue Audit InterDyne (FAID) software.

A theoretical maximum threshold of a FAID fatigue score of 80 was employed for the analyses within this report. This threshold level (approximately 200% of the standard work week maximum fatigue score) is a theoretical threshold based on general validations. It should not be considered to be a general recommended threshold for all general aviation operations. That is, as discussed in chapter four, benchmarking, all fatigue scores should be interpreted in conjunction with effective risk management strategies.

Chapter 6 - Standby Rostering and Commuting

To determine beliefs and perceptions of both management and flight crew of standby rostering and commuting, four specific questions asked:

- Do you have standby rostering within your operation?
- In your opinion what are the effects of standby rostering on fatigue?
- Approximately how far do you have to commute to and from work?
- Do you feel that fatigue affects your safety/driving performance commuting to and from work?

Interviewees were only asked to provide opinions on the effects of standby rostering if their operation had a standby system in place. Similarly, the last two questions did not apply to touring pilots, who lived on base during their employment period and had no commute time. Interview responses for both management and flight crew are included in appendices J and K.
Chapter 7 – Training and Education

Within each site visit, details were collected regarding the nature of communications pre-FMS, upon implementation of the FMS, and post-FMS between both CASA and the operator, and the operator and flight crew. These took the form of e-mails, memos, fax's, meeting minutes, notes from phone conversations, and personal recollection. Individual training programs were also examined to determine first, whether formal training and education was taking place, and second, the efficacy of individual programs. Details of training program elements are included in appendix L. Within each interview, both management and flight crew were also asked questions regarding the nature of the training and education program and their attitudes and opinions thereof. Specific questions relating to communications, training and education include:

- What sort of communications did you give to flight crew about the FMS when it first started?
- Have you ever received any training/education about fatigue and the FMS?
- How would you rate the overall usefulness and effectiveness of that training program?
- Is there anything not covered that you would’ve liked to have been included?
- Was there anything covered that you don’t think was necessary?
- Do you see training, this sort of training, as an essential part of FMS?

The first question was directed to management, and the second to flight crew. The final four questions were posed to both management and flight crew. The interview responses for each of these questions are included in appendices M and N.

Chapter 8 – Personal Responsibility

Questions were framed in order to determine how responsible pilots feel towards preventing workplace fatigue. As such, three main questions were framed:

- In approaching management about fatigue, FMS or just general safety concerns, how comfortable do you feel?
- How much sleep do you try to get per 24 hour period?
- Do you feel personally responsible to ensure you are sleeping in the times you are supposed to?

The first two questions aimed to determine behaviour choices of individuals. That is, one was framed at determining the willingness to report as unfit for work due to fatigue and the other at personal sleeping habits. The third question was more specific, and directly asked flight crew about personal responsibility for obtaining sufficient sleep. The interview responses for each of these questions are included in appendix O.

In addition to the interviews, flight crew were also asked to complete sleep and duty diaries for a period of two weeks. The purpose of the diaries was to determine first, how much sleep pilots are achieving on average before a shift, and second, to determine how sleep correlates with duty. However, due to the poor response rate with the diaries, they will not be discussed within the scope of this report.

Chapter 9 – Effects on Operation

Participants were asked to describe how the FMS had impacted upon their operation and individual workload. As such, two major questions were asked as a part of the interviews. The questions included:

- In your opinion, does the FMS have a positive or negative impact on general work life?
- Has the FMS lead to any major company changes in operations?

The interviewees generally gave a one-word answer for the first question, but were then asked to comment on their response if they wished. Actual interview responses for both management and flight crew are included in appendices P and Q.
General Results

The majority of the analyses, results and conclusions of each evaluation component are included in the relevant chapters. However, there are general results that relate to all chapters; these details are provided below.

Although 21 operators were approached to participate, the full evaluation included data from 16 operators. For the organisations that participated, there was a strong commitment to improving both the actual FMS and its set up process. The five operators who were unwilling to participate cited various reasons including the cost involved in the exercise and difficulties in scheduling employee availability.

As indicated in the interview section above, there was no time limit for employee interviews. The range of interview durations was from 20 minutes to an hour in length. Similarly, it was intended that each site visit could be completed within a day. However, due to the variability of the size of operations, availability of staff to assist, the time required ranged from two hours to two days (average, 6.31 hours; SD = 2.96 hours).

As expected, a number of organisations required site visits at more than one base. Specifically, three operators required visits that involved two sites.
CHAPTER 1: ATTITUDES & OPINIONS TOWARDS FMS

As outlined in the methodology chapter, the attitudes and opinions of management and flight crew in each organisation toward FMS were investigated using interview techniques. Specifically, interviewees were required to comment on their beliefs relating to: the trial FMS; CAO 48 as a predecessor; and any comparisons between the two. There were also attitudes and opinions that were reported for specific components of the trial FMS. However, the results for these specific FMS components are provided in the relevant chapters. For example, attitudes and opinions related to specific training and education packages are not reported in this chapter, but can be found in chapter seven, training and education.

The overall consensus was that the trial FMS provided significant benefits over CAO 48 for each of the 18 operations. Of the 41 employees interviewed, 36 stated that they favoured the FMS concept over CAO 48, and could see its potential for effective fatigue management in the future. This was particularly highlighted by the following quotes:

"It's definitely a substantial improvement over CAO 48 - that's no question whatsoever" (M8)
"I think it's much better than CAO48. It's like chalk and cheese" (M10)
"Most people realise that it's in the immature stages, but see its potential" (P3)
"FMS is very good if people have got the right attitude about it" (P9)

Although the overall consensus was positive, there were specific suggestions as to how the FMS could be further improved. These suggestions were provided in response to the questions relating to strengths and weaknesses of the FMS. While the responses of participants were varied, and in some cases conflicting, several themes emerged. Interestingly, both management and flight crew highlighted similar strengths and weaknesses. The six most common strengths and weaknesses are shown in the table below. Each of these will subsequently be discussed in more detail.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weakness</th>
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</thead>
<tbody>
<tr>
<td>Increased awareness and understanding of fatigue</td>
<td>The current method of applying FAID</td>
</tr>
<tr>
<td>Operational flexibility</td>
<td>Potential for abuse</td>
</tr>
<tr>
<td>Increased productivity</td>
<td>Decreased productivity</td>
</tr>
<tr>
<td>Less complex and easier to use than CAO 48</td>
<td>Extra work-load in setting up and maintaining the FMS</td>
</tr>
<tr>
<td>Clearer sharing of responsibility relating to fatigue</td>
<td>Increased potential for legal liability</td>
</tr>
<tr>
<td>Scientific basis for fatigue management</td>
<td>Absence of risk assessment</td>
</tr>
</tbody>
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Table 1. Perceived Strengths and Weaknesses of the FMS
Strengths

Increased Awareness and understanding of fatigue

One of the strengths identified of the FMS was that it provided an increased awareness and understanding of fatigue. Specifically, this strength related to improvement of occupational health and safety concerning fatigue. The reported increase in awareness and understanding resulted in significant benefits for safety, including:

1) A realisation that the rules underlying FMS were based on scientific evidence, whereas CAO 48 was less grounded;

"the guys actually learning and understanding a lot more of why they're doing it instead of just being told yet again this is it" (M15)

"it gives a lot of guidance, whereas beforehand we were purely operating on 'you cannot do this, you cannot do that'" (P17)

2) Having a FMS as a safety system, in place of flight and duty legislation, has helped to set fatigue as a hazard equal to those such as drugs and blood alcohol concentration levels;

"people, within whatever limit it sets, reach that point where they become impaired like they seem to be 0.05 alcohol, where we have a zero alcohol tolerance. From that point of view, it should point out to them that there's a danger" (M2)

3) It has made both management and flight crew more conscious of fatigue as an issue, which helped individuals to recognise their personal limitations, and thereby creates a safer operation;

"the whole issue of raising the awareness of fatigue rather than the awareness of work limits has had the effect of people being somewhat more conscious of it and so I think it will lead to a truly safer operation" (M13)

"it allows the pilot to know what his working conditions are, knows his limits, and secondly, I know what the limits are as well" (M11)

4) Education on the effects of shiftwork on health and lifestyle, with pro-active countermeasures.

"I think it's just increased the knowledge of all the pilots tenfold" (P14)

"Gives pilots a clear understanding of fatigue and presents them with solutions as to how they can avoid fatigue-related risk" (M4)

"the course we did with the booklet and all the rest of it gave us clues about how to control fatigue" (P10)

Operational Flexibility

Another major strength highlighted by both management and flight crew was the increased flexibility of the FMS over CAO 48. Instead of providing black and white limits on maximum flight and duty hours, and minimum break periods, the FMS allowed people to work for longer hours when biologically appropriate (day time), and shorter hours when biologically difficult (night time). That is, individuals could work different roster patterns, with either a reduction or increase in actual work hours, so long as they felt fit to do so, and the fatigue audit system supported their judgment. Several statements were made to this degree, including:

"provided we manage the fatigue, provided you’re fit to work, that’s really the only requirement, and that’s really how the system works" (M6)

"Safety is a big one, but flexibility is the better one, because under CAO48 if a guy went out into the bush and through no fault of his own he got delayed or something then he was over his limit. That was after he’d put in 15 or 16 hours, so technically and legally we couldn’t even get him home. Now you can." (M14)
"we can look at a guy's fatigue score and see how he feels and then we can send him back out again whereas CAO48 he might have had one hour today, and one hour the next day and six consecutive days having one hour and he's limited, he can't fly the next day purely because CAO48 says he can't. we have got the flexibility in this to put him on" (M5)

"The ability to work any time, without restriction, or very little restriction" (P5)

"The great flexibility. At the end of the day, as a pilot, it allows me to get out and do my job, and not be inhibited, and not be restricted. But, it still pulls me up as far as safety wise goes" (P9)

**Increased Productivity**

With the increased flexibility associated with FMS, a number of operators also reported an improvement in productivity. That is, more effective scheduling of pilots had lead to more efficient business operations, allowing better competition, acceptance of more contracts, and consequently, substantial economic benefits. One operator in particular made specific comments in support of such benefits:

Manager: "It's allowed pilots to work every day, because under the old system, it really was unworkable in some areas... paying two pilots - that made the job too expensive so people wouldn't do it...

Interviewer: "So there are economic benefits as well?"

Manager: "From all three parties. If you apply the disadvantage rule there's always three parties to consider, and each of those three parties has been advantaged by it." (M7)

**Less complex and easier to use than CAO 48**

Adding to increased levels of productivity, some operators have found the FMS easier to administer than CAO 48. Such operators experienced timesavings in data entry, and less-complex calculations for rostering practices. Specifically, examples include:

"it cuts down on the paperwork and it cuts down on the accounting at the end of it when you can just present the graph and just say 'there we are that was my score all the way through'. Trying to write down the CAO48 tables and things was just a nightmare." (M6)

"the majority of the rules pertaining to its use are quite simple to use, it wasn't difficult, because I had to basically instruct my people how to use it and it was very simple, unlike 48" (P13)

**Clearer Sharing of Responsibility Relating to Fatigue**

Many operators experienced a greater sense of responsibility in the management of fatigue with the FMS. Historically, the regulator has been perceived as the responsible body for regulating and ensuring safety for flight and duty times. Under the FMS however, both management and flight crew felt it was now a shared responsibility between all three parties: management, flight crew and CASA. That is, it is the responsibility of management to ensure rosters did not violate the fatigue audit system, and to respect any statements of flight crew who reported they were unfit for duty due to fatigue. Assuming adequate opportunity for recovery is provided, it was the responsibility of flight crew to present fit for work, and to notify management if they felt that fatigue could compromise their performance. At the same time, it was CASAs responsibility to conduct audits, and ensure that individual fatigue management systems were appropriate. While not all have seen this as a positive development, others have welcomed it. This is particularly highlighted by the following quotes:

"it has actually put the responsibility back on the employees as far as being fit for work is a very useful thing" (M12)

"CASA has great difficulty managing fatigue, so the shift in responsibility is such that now it's shared equally between the operator and the pilot." (M17)
Scientific Basis for Fatigue Management

Both management and flight crew felt confident that the FMS was effective due to the scientific background of the FAID system. FAID has been reviewed in several scientific journals (see appendix A). Due to the strong scientific basis in which FAID was developed, many operators felt that it would appropriately control fatigue, by highlighting any ‘problem’ shifts. This was particularly reflected in the following quotes:

“flying in the middle of the night is more tiring than flying around in the middle of the day, and 48 never addressed that” (P2)

“It takes the decision making out of management’s hands I suppose” (M3)

“So instead of going to management and saying ‘you know, I don’t think he should work tomorrow because he’s done this many days and he shouldn’t’, you can now simply whack it in the computer and it flags him as ‘yes’ or ‘no’. It’s given you a benchmark to work on” (M3)

While this viewpoint was held by a number of operators, it should also be noted that a range of improvements to the use of FAID were flagged. These will be discussed in the next section of this chapter.

Weaknesses

While there are many reported benefits of the FMS, most operators recognised that it is still in the early stages of development. Therefore, a number of perceived weaknesses were also reported. The six main identified weaknesses are discussed below.

The Current Method of Applying FAID

One of the most commonly reported concerns with the FMS was the FAID system. There were a number of specific concerns raised in this area, including:

1) The validity and reliability of the system. As discussed in the background, FAID is a software package that predicts work related fatigue associated with hours of work (based on start and end times of shifts). It is well understood that factors in addition to hours of work can influence fatigue. For example, aircraft type, operating altitude, number of sectors and environmental conditions can all contribute to increased fatigue levels. FAID does not attempt to account for such factors. Rather, risk management can be employed to address these and any other concerns relating to fatigue risk. Clearly this level of detail was not fully understood by operators, because a major weakness identified was that FAID did not account for factors other than work hours. One example provided was that four hours of low level flying in difficult weather conditions was allocated the same score as four hours of standby conditions.

On the basis of the above concern, many participants felt insecure about using FAID as a ‘stand-alone’ safeguard against fatigue, and favoured having limitations, or work practices working behind FAID to prevent unreasonable shifts from occurring. Many statements were made in support of this issue. A few specific quotes that highlighted the major issues were as follows.

“there are a number of anomalies in it in terms of not being able to recognise if certain activities are far more fatiguing than others” (M5)

“The score itself, I mean it doesn’t capture the true fatigue levels. It’s not a real reflector of fatigue, it’s a reflector of the hours of the day you work, two different things” (M9)

“the fatigue score can be misleading. FAID, used without any other measures and safeguards can lead to an inaccurate perception of fatigue, which can be just as dangerous as having no limit in place” (M4)

“the FAID program specifically, I don’t think, gives you any support, assistance, in helping you make that decision. Out of a score of 80, we’ll be sitting at 35 or something. Whereas you’ll think it’s much higher” (P14)

There were a number of other concerns reported in addition to that mentioned above. For example, if a shift was worked across a time of day that does not overlap with a time normally chosen for sleep, the maximum allowable duration of the shift would be much longer than allowed under CAO 48.
"By its own admission you can work two 19-hour shifts back to back and that defies common sense and logic doesn’t it?" (M7)

One operator also aired a concern that one-minute difference changed the FAID score significantly. That is:

"if you record your work time as finishing one minute after the hour rather than one minute before the hour you can have a blow out of a significant fatigue score, which is a nonsense... people will start to manipulate the software to produce the desired result, either to the company's benefit or the individual benefit" (M13)

When this was investigated, it was realised that this single operator must have been using a precursor to FAID that was programmed using the Visual Basic language in Microsoft Excel. This was a problem with the precursor to FAID but was subsequently addressed prior to the release of the first version of FAID.

2) No consideration for individual variation. Another weakness reported about FAID was that it used a generic formula to measure the fatigue of everyone. That is, there was no provision for individual differences. It was reported that some individuals were more resilient to fatigue in the morning, whereas others may be more resilient in the evening. As indicated by the following quote, this was one aspect that operators thought was particularly pertinent to the successful operating of the FMS.

"The other thing it misses out on whilst it takes in some circadian rhythm stuff there's people that are morning people and people that are afternoon people...

(M9)

It should be clearly noted that the concern outlined was also not addressed by specifics of CAO 48.

3) User friendliness of FAID. Numerous reports suggested that FAID should be easier to use, particularly given that not all operators were highly computer literate. Several statements were made to suggest that operators found FAID difficult and tedious to use. For example, operators thought that ideally, FAID should be Microsoft Office compatible to allow ease of importing and exporting data from FAID without wasting a lot of time. In line with these points, the following quotes were made.

"I believe the FAID system is completely not user friendly at all. It's difficult." (M5)

"unless you have a database like ours where it does it for you automatically, it'd be a nightmare, you just about have to employ a secretary to sit there and do nothing for a few days a week to sit there and put it in for you" (M16)

4) Misperceptions of FAID. Many operators expressed concern that FAID was being used as the major thrust of the FMS. That is, instead of using a systems approach to fatigue management, as is required for an effective FMS, some operators were using FAID as a sole point of control. An effective FMS would also include active procedures and policy, training and education and risk management. One manager in particular, stated:

"They were basically putting out this FAID scoring system as being managing fatigue, which it isn’t" (M9)

The actual implications of these statements are discussed in more detail in chapter four, benchmarking.

Potential for abuse

Whereas most operators enjoyed the increased flexibility associated with the FMS, many also associated that flexibility with increasing the likelihood of abusing the system. The shift from a prescriptive approach such as CAO 48 meant that the responsibilities for fatigue management were shared between the regulator, the organisation and its employees. Given that more responsibility sits outside of the regulator, it was considered that the FMS could therefore allow for greater abuse on behalf of the operator or its employees. For example, pilots reported concern over operators could potentially use the FMS to their advantage, by overworking flight crew, which would not be identified by CASA for some time. Management reported concerns over pilots who wished to accumulate large numbers of hours over short periods of time, which would similarly use the FMS to their advantage. Furthermore, management reported concern that other organisations that used the system in such a way may gain a commercial advantage at the expense of safety. Many statements were made to this effect. A few of them, include:
Management:
"you get people who will abuse the system and people who will do it right" (M2)
"it could be abused by people who don’t take the rest effectively" (M6)
"We have a traditional problem with pilots, there’s two things, they want to fly, and they want to get paid" (M17)
"it would allow an unscrupulous operator to drive people fairly hard" (M6)
"It allows some commercial operators who might be a bit callous perhaps to just work people to death" (M7)
"In actual fact, it’s better than most concessions because if you’re just working daylight hours you could fly all day long and it depends what limits you set as a company" (M2)

Flight Crew:
"they can work you more" (P7)
"if you get operators or employers, they can, yeah push people right to the limit" (P9)
"I believe that an unscrupulous operator, which we don’t have here, could take advantage of that flexibility" (P15)
"you can get the people who are trying to make their operation more efficient and pushing people to the limit" (P4)
"There are some areas where technically with the system, we can legally do the work but it may be a very, very long day" (P1)

Decreased productivity
While a few operators experienced increased productivity, others experienced differently. Indeed, in some cases, the FMS was found to be more restrictive on hours than the CAO 48 exemptions. Therefore, under certain circumstances, fewer hours could be worked by existing pilots, which had significant effects on productivity. For these operators, this equated to a commercial disadvantage relative to the schedules allowed under CAO 48 exemptions. One manager made the specific quote that the only weakness of the system was:
"limiting being able to work and productivity" (M11)

Extra work-load in setting up and maintaining the FMS
Another weakness and frustration expressed by the operators was the work-load associated with both setting up and maintaining the FMS. This was mostly in relation to the set-up and policy writing of the system, which was reported by many as unreasonable. However, a few flight crewmembers also experienced a greater workload on a day-to-day basis, with more paperwork to complete during each shift.
"...once it’s set up its fine, the actual writing of the manual and the setting up of it took me hours and hours and hours" (M3)
"the thing that I probably find most fatiguing about all this is all the paperwork" (P15)
**Increased potential for legal liability**

The shift in responsibility for fatigue management from the regulator to the operator was again noted. However, some described this as a weakness rather than strength. Indeed, several operators maintained that CASA were placing the legal liability back on the operation for ensuring safety through the prevention of fatigue. More specifically, it was thought that if the company were required to write its own rules, then CASA would be less legally liable for any fatigue-related incidents that occur as a result of those rules.

"if you have an accident while you are working inside of that thing that they said you could be, leaves them liable for litigation, by taking away CAO48 and putting it back on the company, and that's what they're doing" (M2)

**Absence of risk assessment**

The lack of consideration for task variation was mentioned as a specific weakness of FAID. However, it was also mentioned in broader terms, as a weakness of the entire FMS. Operators made statements that the FMS failed to recognise the different risks associated with different tasks. For example:

"it doesn’t take into account risk, task associated risk, which I think it should be doing" (P2)

"It didn’t really differentiate between pilots flying light aircraft, or airline category aircraft – risk assessment needs to be put in place" (P3)

**Discussion**

The overall consensus was that the trial FMS provided significant benefits above CAO 48 for each of the 16 participating operations. However, the attitudes and opinions of both management and flight crew towards the FMS varied widely. The methodology provided results in the form of six main strengths as well as six main weaknesses of the FMS. A number of the strengths and weaknesses related to similar processes and where appropriate, have been discussed together.

There were a number of strengths identified that did not have conflicting weaknesses. In particular, operators appreciated the increased awareness of the hazards of fatigue that the FMS has brought about. Due to the requirements of training and education, operators felt that both management and flight crew had a better understanding of the risks and countermeasures of fatigue in the workplace. It was believed that this in turn helped to create a safer working environment.

One of the main likely reasons that FMS was considered to increase awareness of fatigue was because of the scientific basis from which it was derived. That is, the components of FMS were formed around scientific principles wherever data were available to do so. Given that CAO 48 was developed at a time when much of this data was unavailable, this was not a surprising result.

A significant advantage of an evidenced based system was that over time, it was likely to provide significant improvements to safety risks; in this case, fatigue related risks. Potentially, having an evidence based system resulted in less opportunity for legal action to be taken on parties using or regulating such a system. This provided a double benefit to both organisations and CASA.

While it could be argued that less legal risks exist for all parties, one perceived weakness that was identified by the operator was an increased potential for legal liability. The evidence provided for this perception was that the regulator had less responsibility for managing fatigue, which meant that the operations had more responsibility, and therefore, increased legal liability. Given the detail in the above paragraph, this weakness may not be founded.

Some operators reported the FMS to be less complex and easier to use than CAO 48. For example, under CAO 48, there were considerable calculations that needed to be performed in order to know if a flight was acceptable or not. Under FMS, the requirement for such calculations is reduced.
In contrast to the strength of reduced complexity and improved ease of use, it was reported that the workload increased from CAO 48 to FMS. Specifically, responsibilities that did not previously exist or sat with CASA, needed to be fulfilled by the operators. Both managers and pilots reported this increase in workload. One area where this increase was particularly noted was in the input of work hours and output of FAID reports.

Many operators also saw the fatigue modelling software (FAID) as an overall weakness of the FMS. Concerns were largely related to the user-friendliness of the system in terms of data-entry, and compatibility with other programs (particularly Microsoft Office programs). Some operators countered this by having the FAID system programmed to feed directly into their rostering systems, to produce an automatic peak fatigue score. However, this option may not be considered affordable for the smaller general aviation operators.

Other concerns related to the perceived reliance on FAID as the major component of FMS and the subsequent exclusion of other factors that were considered important. The most significant concern relating to this weakness was that FMS as initially implemented did not account for the specific tasks that pilots were required to perform. To a degree, this result reflected a misunderstanding over what FAID should and should not be used for. This concern has been acknowledged by CASA subsequent to the trial FMS beginning and will be more fully addressed in future fatigue management development. Furthermore, additional implications of this weakness have been discussed in chapter five, roster audits.

The most practical method discussed in the scientific literature to account for the above concern would be the use of risk management processes (Reason, 1997). This is particularly true given that the vast majority of organisations already utilise risk management in day-to-day operations. From a theoretical perspective, utilizing risk management for fatigue is identical as dealing with other risks. However, very few organisations are experienced in fatigue risk management, and may need support in determining appropriate operational limits.

A useful example of a risk management system is the Australian/New Zealand Standard, AS4360. In AS4360 there are a number of steps that are required to fully account for operational risks. That is:

- Establishment of the context of fatigue in the organisation;
- Identification of all relevant risks;
- Analysis and evaluation of risks against defined criteria;
- Treatment of risks; and
- Periodical or continuous communication, consultation, monitoring and review throughout the process.

The integration of the above steps is discussed more fully in chapter four, benchmarking.

Although practical, any risk management strategy is liable to be misinterpreted. From an organisational perspective it is possible to simply assess and treat risks without understanding the full context impact of communications (or lack) and the need for continuous improvement. Indeed, the data collected in this evaluation illustrated a fear that this could or had occurred in some organisations.

This concern arose both from management and flight crew, which suggests that the full requirement of steps for risk management were not fulfilled. The reasons for this may include an incomplete understanding of the risk management process. The evidence for this from the management perspective is that some were not aware at all that risk management was going to add operational meaning to the FMS. Of those managers that were aware, more again were not familiar with the step-by-step process presented above. From the flight crews’ perspective, it was reported that their opportunity for input was limited in a number of cases. The biggest fear however, was that management recruited in the future or management in other organisations could decide on the outcome of the risk assessments to suit the company; at a cost to the pilot’s safety and well-being.

As can be understood from the above paragraph, the comprehension of risk management principles was reasonably similar across the organisations. That is, some were unaware of its value and those that were did not fully realise the benefits that were available. Another area where consensus was high, was the question of flexibility. The majority of operators highlighted an increased flexibility as a major strength of the FMS. The FMS allowed the provision for longer hours if required, and different shift structures, to maximize the utilization of company and staff resources. While this was certainly seen as a benefit to some company operations, for others it did not. In fact, the reports from the 18 operators split the belief over productivity changes equally into three groups.
One third of the operators stated that FMS had no measurable impact on productivity whatsoever. Indeed, the rosters and other operational drivers had not been significantly changed as a result of the FMS. The second third of operators stated that the implementation of FMS had considerably improved both operational flexibility and productivity. This was evidenced by increased staff availability due to the reduced prescription of FMS over CAO48. The final third of operators felt the FMS had affected productivity in a negative way. For example, operators with large numbers of very early morning starts reported having to increase access to additional staff to fulfil the requirements of FMS.

It is imperative that risk management processes are used in conjunction with fatigue modelling software packages. However, the perceived ‘over reliance on fatigue modelling’ is not necessarily a negative response. The main purpose of a FMS was to manage fatigue. Historically, legislation directed at flight and duty times to control fatigue was polluted by other factors such as industrial and psychosocial issues. An effective FMS separates fatigue management from being polluted by other factors such as these. In this way, fatigue can be more realistically managed in isolation from factors such as these. While industrial and psychosocial factors may be important, they should not necessarily be a part of a FMS. Where factors such as these have an indirect contribution on fatigue, they should be noted, and possibly covered within the training and education to raise awareness of their contribution.

The above sections of this discussion have outlined the reported strengths and weaknesses of the trial FMS. These strengths and weaknesses have been put in context and detailed and supported by evidence from the evaluation. Some areas of discussion have been consistently reported by the operators, whilst others have not.

In summary, the discussion points where general consensus did occur across the organisations were:

- Increased awareness and understanding of fatigue
- Operational flexibility
- Clearer sharing of responsibility relating to fatigue
- Scientific basis for fatigue management (if accompanied by risk management)
- Potential for abuse
- Increased potential for legal liability

The discussion points where consensus was not met were:

- The effect of FMS on productivity
- The workload impacts and complexity of FMS
- The effectiveness of how FAID is currently being applied

**Recommendations**

Prior to the trial FMS process, it was clear to both CASA and general aviation operators that there was need for regulation change. This was particularly important given the realisations relating to CAO 48, which meant that there was little scientific basis for some of its requirements. It is apparent from the investigations in this evaluation that there were considerable improvements made by implementing FMS. This was apparent in the levels of understanding and awareness in the participant organisations as well as a clearer sharing of responsibility and scientific basis. To further fortify future versions of FMS (or other non-prescriptive approaches to regulation), there are areas that were identified for improvement.

Not surprisingly, these recommendations largely cover the weaknesses identified in the evaluation. That is, there are recommendations relating to the appropriate use of the FAID system and risk assessment, the perceived potential for abuse, as well as the possible impact on workload and productivity. These are detailed below.

1.1 Each operator should obtain the most recent version of FAID. This would allow operators to use a version of FAID where the majority of the concerns outlined have been addressed. For the organisations who have purchased the FAID system, this upgrade should be available either free or for a minimal charge. For those organisations that have not previously purchased FAID, licensing fees would apply.
1.2 Each operator should fully understand what FAID can and cannot be used for. Specifically, it should be made clear to all operators that while FAID assists in understanding work-related fatigue associated with hours of work, it does not account for job-specific factors. Such factors can be accounted for using risk management processes.

1.3 Each operator should fully understand all of the required risk assessment steps. This includes the provision of guidance from CASA where required by operators. In most cases however, operators will obtain appropriate understanding from AS4360. This is available from Standards Australia at a minimal/reasonable cost.

1.4 Both operators and CASA should ensure that their audit procedures detect excursions from documented procedures. Because of the inevitable intentional and unintentional excursions from procedures when a new system is introduced, it is imperative that sound audit procedures are in place to identify and address such excursions.

1.5 CASA should further investigate the reasons for increased workload and decreased productivity in specific organisations. This would be done most practically by creating a case study of those organisations that have reported reduced workload and increased productivity. This case study would be an informative document that would then assist and guide other organisations where appropriate.
CHAPTER 2: OPERATORS’ ‘SET UP’ REQUIREMENTS

As indicated in the methodology chapter, interviews with management allowed for discussion about the major steps in setting up each operator's FMS. These discussions were informal in the sense that there were no lists of questions presented to the interviewee. Rather, open discussion was allowed to occur following a single question about FMS ‘set up’ experiences.

Throughout most of the interviews, operators provided details of expenditure throughout the FMS ‘set up’. If the expenditure associated with the FMS ‘set up’ was not clear, an estimate on the dollar figure was asked for. Operators estimated spending between $10,000 and $50,000+ on the FMS ‘set up’. These figures accounted for factors such as personal time to write the document, or hiring a consultant to do so, purchasing the FAID program and education booklets. However, no operator was able to present documented details of expenditure; they simply stated it had been an expensive exercise.

In addition to the factors considered in these costings, one of the major concerns expressed by management representatives about the FMS ‘set up’ was the amount of time it took to get the policy document approved by CASA. That is, operators reported that from beginning work on the FMS policy document, to gaining approval from CASA, took from anywhere in the order of three months to over a year. In some cases there were delays between correspondence. In other cases there were a very large number of communications between CASA and the operator. In both cases, this was an extremely stressful period, as operators were uncertain whether their current exemptions to CAO48 would be renewed pending the acceptance of their FMS.

When asked why the FMS approval process took so long, it was assumed by most operators that CASA were not fully organised. It was additionally reported that such delays for feedback and disorganisation were also common on non-FMS matters when it came to CASA. The strength of the responses during this phase of the interview process highlighted the level of frustration experienced by some operators throughout the ‘set up’ process.

“the process was quite tiresome, drawn out unnecessarily, but as I say I felt that that was because they didn’t really know what they wanted.” (M9)

“think it was protracted because I don’t think CASA knew what they wanted. It was sort of like that draconian rule that ‘Well what do you want?’; ‘Well, we’re not really sure what we want, but you tell us what you’re going to give us and then we’ll tell you if it’s what we want’” (M4)

“Initially, I would suggest – when they told us we had to do this, the cooperation from CASA was in the negative – you wouldn’t even get on to scale. What they were telling us was that all our exemptions were being withdrawn, and by the way, you have to produce something that we are not even going to tell you what it is.” (M14)

“There wasn’t much [materials] from CASA, all that CASA really had if you looked at the development proposals were rules, was that you would have to have a fatigue management system, end of story, and what the devil is an FMS?” (M1)

Interviewee: “What sort of assistance did you get from CASA?”
Manager: "Fuck all!" (M3)

The frustrations detailed above were further strengthened by the staff turnover within the FMS project group throughout the trial. It was specifically reported that maintaining a single contact person at CASA was difficult. Furthermore, operators reported that each CASA representative they spoke to had different ideas of what was and what was not acceptable for a FMS. This was particularly highlighted by the following quotes:

“The other problem with CASA is they had quite a few personality changes, or personnel changes, during the process, that made it a bit hard, you didn’t know exactly who you’d be dealing with next week, and that caused problems, it would have been nicer if there had been a bit more continuity of personnel” (M6)
“[the CASA representative] was there and then s/he wasn’t there and s/he was there and then s/he wasn’t there and taking sabbaticals here and I got quite cranky with CASA, just a bit of consistency... And then [another CASA representative] came on the scene, and it became much easier then because you had one point, whether or not s/he was doing it all, but at least s/he was a contact point and maintained continuity, and we talked about the do’s and don’ts and the wherefores and...” (M1)

“Certainly [the CASA representative] was right up there with “let’s get out there and get it done” but I think [the other CASA representative] was put there because s/he might have had the qualifications but s/he didn’t have the understanding of exactly what s/he was doing.” (M2)

The initial confusion surrounding the FMS led to further frustration with respect to submitting the documents for approval by CASA. Understandably, because of the lack of knowledge of what was expected of a FMS document, the majority of first submissions to CASA were rejected. For many operators, this meant a complete re-write of the document, some of which had taken consultants or hours of personal duty time to design. Perceived value of such consultants is discussed further below.

Operators reported submitting up to 10+ different drafts of the policy before being accepted for a trial period. Throughout the ‘set up’ period, this was by far, the most reported frustration of the FMS by operators. Several specific quotes are included below, which further highlight the frustration.

“It was such a new thing for CASA and us and everybody else, so there was a lot of goalpost shifting for a while, you’d submit something... sounded like it was going to be OK and then the answer would come back ‘No, we want this changed, we want that changed’ and then it went on for weeks and weeks and we submitted maybe 10, maybe more FMSs, till eventually perhaps through attrition we just wore them down, eventually they gave it to us for attendance” (M6)

“They have this rule to say you have to satisfy this, but the specifics are not detailed. So you just keep sending up stuff until one day ‘BING’ you’ve actually been accepted. And how did I do that, well I don’t know, so I don’t care.” (M14)

“For goodness sake tell us everything you want, we’ll do all that, and then we’ll give it back to you and its all over. Why do we have to keep on this rebounding stuff, which unfortunately is a common CASA problem.” (M1)

As mentioned above, a number of operators commissioned consultants to assist in developing their individual FMS policies. Many operators contacted the research group responsible for this evaluation; the Centre for Sleep Research at the University of South Australia. Others found consultants elsewhere who had backgrounds in various specialties including human factors. While this was invariably an additional cost, in most cases it was successful in alleviating frustrations.

“I would never have done it without the assistance of a consultant, it was just too big for my level, for my experience” (M7)

“We had to hunt around for someone that knew something about it, and came across [a consultant]. We then commissioned [the consultant] to actually write the program” (M3)

“I wrote an introductory letter to [the consultant], outlining our work, company and our operation, and then [the consultant] wrote up a FMS for us, and sent it to me, and then I looked through it and changed what needed to be changed to make it fit our operation” (M15)

As the difficulties of developing an appropriate FMS became clear, a CASA representative released an example FMS document to all operators. The document was called Company Sky One, which became used as a generic template. Having an idea of what was interpreted as CASAs expectations, the majority of operators welcomed the template, and soon experienced acceptance of their own policies.

While Company Sky One was certainly welcomed by the majority of operators, it resulted in further complications of the FMS process. However, the need to provide examples, or templates of the FMS became clear. This will be discussed further in chapter three, policy statements, of this report.
Discussion

The majority of operators reported the FMS ‘set up’ as an expensive, negative experience. This was due to a variety of reasons, which were largely related to poor communication.

Initially, operators felt they were provided with insufficient basic information to begin designing their own FMS. That is, they had little idea of the background of an appropriate FMS or the foundation on which it should be constructed. The confusion associated with this was intensified by the lack of consistency demonstrated by CASA staff in the FMS team. Operators were frustrated with the high turn over of staff within the CASA FMS team. It was reported that each team member had different expectations of the FMS, and provided operators with different, and often conflicting information in relation to both FMS content, and having their FMS approved.

The inconsistency of information provided to operators led to many different ideas and perceptions of CASA's expectations of an ideal FMS. Not surprisingly, initial FMS submissions were not accepted, and re-writing and re-submission were required. Operators reported submitting up to ten submissions before being approved by CASA, which again led to increased frustration with the set-up process. A number of operators relieved this frustration by hiring a consultant to write the FMS, who often dealt directly with CASA until the document was approved. While hiring a consultant was generally expressed as a positive experience, it further added to costs, making the process even more expensive.

With the growing discontent of operators, a CASA representative released the Company Sky One example FMS policy document, which was subsequently used by operators as a FMS template. As discussed further in chapter three, there were many issues associated with this. Having one generic template, meant that all FMSs became very similar rather than being individually tailored to each operation. While the implementation of the single template lead to complications of the FMS process, it became clear that all operators would welcome a policy template.

Recommendations

2.1 The FMS should be thoroughly planned out by CASA and market surveys completed prior to implementation. This would help CASA to define clear guides and definitions as well as provide greater organisation throughout the implementation period.

2.2 CASA should provide operators with clear guidelines and information about the FMS prior to implementation. Before starting to implement a FMS, operators should be aware of the nature of FMS, how it will benefit them, and CASA's expectations should they choose to proceed with the FMS. This will allow a clearer understanding of the FMS goals and aims, and prevent misperceptions from occurring.

2.3 CASA should formulate an industry toolbox, providing operators with several options of templates on which to base their FMS to suit their specific operation. The need for some form of FMS template became clear. Providing operators with several FMS policy options, which they could tailor to their specific operation, would:

• communicate CASA's expectations of an ideal FMS;
• reduce the stress associated with writing a FMS; and
• reduce the cost associated with writing a FMS.
CHAPTER 3: FMS POLICY STATEMENTS

As outlined in the methodology chapter, the policy documentation of each of the 21 operators currently trialing the FMS was provided to the researchers by CASA. The content of each policy was evaluated for specific content and against a template provided by a CASA representative. Furthermore, the desired elements of a policy were clarified and specific recommendations were made for future development.

As introduced in chapter two, Operators’ Set-up Requirements, operators attempted to construct their own policy documents based on previous CAO 48 exemptions. They also accessed other relevant information from colleagues, the internet and consultants. Some of the larger companies hired consultants to write the documents on their behalf. Following one or more draft submissions to CASA, it became clear that the content being provided by operators was not sufficient to meet CASA’s requirements. It therefore became evident that operators attempting to set up a FMS required a clearer indication of CASA’s requirements in relation to their regulatory responsibilities.

This realisation prompted a CASA representative to release an example policy template, titled Company Sky One (see appendix I). Company Sky One was distributed to all general aviation operators who were seeking to apply for a FMS. This included operations varying widely, from airfreight to emergency helicopter rescue, passenger charter, and hot air ballooning. The intention of this document was to provide operators with a clear idea of CASA’s expectation of an appropriate FMS policy. The example policy was well accepted by the majority of the trial general aviation population. Indeed, all welcomed having guidance in the form of a template to reduce what they saw as replication of effort across the industry.

The intention of providing Company Sky One was appropriate given the frustrations of operators who had not met CASA’s expectations. However, a number of difficulties were faced by organisations trying to use this template. These difficulties were only somewhat foreseeable by either CASA or the individual operators. The Company Sky One document was extremely well received by the operators. It was seen as a template that could be used to explicitly meet the requirements of CASA. The following quotes come from the transcripts relating to chapter two; however are relevant to this discussion.

“we got on with [the CASA representative], and s/he produced a generic document, a master if you like” (M1)

“basically we were given an outline of what an FMS document should look like... we’ve got to produce an equivalent sort of document written around the company” (M5)

“the Sky One document, I think that made things a lot clearer, because we could see exactly what he wants, so we’ll write along those lines then. And I think that was probably the turning point” (M6)

“It wasn’t really until [the CASA representative] produced the template document that we were really able to get our teeth into it and say OK if this is what CASA wants... and that was really the biggest determining factor, what does CASA want.” (M13)

An assumption made by most operators however, was that a document provided by the CASA representative responsible would be fully inclusive of all CASA requirements. This assumption however, ultimately caused many of the difficulties that were faced by the operators. A further assumption that was made by the operators was that there were not additional processes in addition to using Company Sky One as a template.

Essential to a successful policy implementation is the integration of specific factors that relate to the particular organisation, operational area and local conditions. Furthermore, successful policy implementations should also include considerable consultation, feedback from stakeholders and formal revisions. The use of the Company Sky One document as a strict template did not target any of these additional requirements as considerations. For example, many operators simply cut and pasted their names into the template, and used it as their own.
The geographical and operational diversity of the organisations in the FMS trial was large. It is therefore not surprising that a single document could not address all of the specific factors that were relevant in all of these operations. In effect, this worked against the primary aim of FMS, which was to move away from an "all encompassing" prescriptive legislation, to a more operationally specific model.

To objectively determine the degree to which operators used the Company Sky One policy as their own, a comparison was performed. This comparison matched each of the 21 operators policy with the 73 sections and subsections of Company Sky One. The results of this comparison are shown below in Figure 4 and all data is provided in full-tabulated view as they relate to each section of the policy template, in appendix R.

![Figure 4. Percentage frequency comparisons of the 21 organisational policies with the Company Sky One template. The numbers along the horizontal axis represent individual operations. The percentage along the vertical axis indicates the percentage overlap between the policy and the Company Sky One template. The red bars represent the percentage of identical sections and subsections; the green bars represent the percentage of sections and subsections with more than 50% identical; the yellow bars represent sections and subsections that were completely different to the Company Sky One template; and the blue bars represent sections or subsections that were not present.](image)

As can be seen in the figure above, various components of the Company Sky One policy template were evident in every operation. That is, no single operation had written a FMS policy independently of the template provided by CASA. Furthermore, 11 of the 21 operations had left 50% or more of their policies to be exactly the same as Company Sky One, inserting their names in the appropriate places. When combining the same and similar statistics, 6 of the 21 locations have over 90% of their documents relatively unchanged from the Company Sky One template.
Discussion

As the results show, the Company Sky One policy template was copied or paraphrased to some degree by every operator. One possible reason for this was that individual operators accepted the Company Sky One template as an easy method to obtain FMS approval after numerous unsuccessful attempts. As outlined in chapter two, the evidence for this is that the operators had developed between two and 10+ iterations before finally receiving approval from CASA. Particularly for those in the latter part of this range, it would not be at all surprising if they would have submitted anything to gain approval.

Another possibility is that the CASA representative did not sufficiently clarify what an appropriate policy consists of, and how to most effectively use the policy template provided (i.e. Company Sky One). If this was the case, then the operators may have felt like they had no other option but to utilise the template provided as a guide.

Acknowledging the shortcomings, having a policy was considered desirable by most operators. This is best illustrated by the following quotes, which are taken from transcripts relating to chapter two. Although they are from a previous chapter, they are highly relevant to this discussion.

"I think the template is an absolute essential is you’re going to have any success in operators, because we go back to this sophistication issue, otherwise you’re asking helicopter or aviation operators to become fatigue experts and able to craft their own fatigue management systems, and that’s just not possible." (M13)

"should just be a pro forma, this is the structure the FMS has to have, these what you have to have in place, the training you have to have in place, blah, blah, blah, checklist, tick, tick, tick, really shouldn’t be any more than that I wouldn’t have thought" (M6)

"one of the things I think needs changing – that CASA could make it much easier by putting out a generic program - that all you do is tailor in the required tasks" (M3)

The Company Sky One document did address a range of relevant issues relating to fatigue management. On further reflection however, it is clear that the definitions, wording and content of the template provided could be further improved. In addition, there are additional processes that would add considerable value and meaning to the organisations. As the third part of the policy evaluation, the broad details of an ideal FMS policy have been collated.

An ideal FMS policy should be a short, concise document that outlines the commitment of management to managing fatigue, and the operational impact thereof. As such, there are several essential factors that should be clearly outlined, including:

- a statement of commitment from senior management;
- practical guidance on how to eliminate or minimize fatigue-related risks, such as:
  - underlying work practices (e.g. hours of work, double-check systems); or
  - lifestyle factors (e.g. family & social life, diet, exercise)
- a review of legal and operational responsibilities for fatigue management;
- clarification of employer and employee responsibilities; and
- guidelines for future development and review.

It may be prohibitively difficult to develop a single policy that is relevant for all general aviation operators. Indeed, it is widely understood that, as far as governing flight and duty times are concerned, there is no ‘one size fits all’. From CASA’s perspective, this may be ideal to creating multiple templates; for example, small, medium and large operations and/or commercial, mustering, ballooning, etc.

It should also be noted that a small number of operators had taken the general FMS principles from Company Sky One, and successfully applied them to their own operation. These operators are represented by organisations 16 to 21 on figure 4 above. These organisations individually tailored their policy statements to create documents that were relevant to the operation and conditions. This example highlights an additional element of an ideal FMS policy. It is implicit in such a process that these organisations coordinated the collection and/or development within a context that was meaningful. It could not be determined from the results whether this context was meaningful to both management and flight crew; however, ideally it should do both.
Recommendations

3.1 CASA should provide one or more policy examples to all operators as a guide. Policy examples are a way in which CASA can provide guidance as to the relevant considerations and structure for all operators. Examples are considered highly meaningful from the operators’ point of view because they reduce the degree of guesswork and assumption to a minimum. However, guides should be created and delivered with caution and include detail of all appropriate steps and cycles. From CASA's perspective, this may most easily be achieved by creating multiple templates; for example, small, medium and large operations and/or commercial, mustering, ballooning, etc.

3.2 Where operators are unsuccessful in meeting CASA’s FMS policy requirements, content coaching should be provided by CASA. This is particularly important to avoid operators having to submit a large number of drafts for consideration. It is therefore likely to reduce workload for both CASA and operators. The content coach from CASA should be technically and experientially qualified in fatigue management.

3.3 CASA should ensure that the responsibility for document release and approval of FMS components does not sit with one individual. At least some of the frustrations reported by operators may have been averted if the appropriate uses of Company Sky One had been communicated. It is unlikely that a communication that had been double-checked by two or more FMS team members would not fulfil operators’ needs. Similarly, if approval of FMS components were double-checked, the outcome would be likely to have more consistency across CASA. Furthermore, CASA staff involved must be trained with a view to achieving maximum consistency when dealing with the industry.
CHAPTER 4. BENCHMARKING

Throughout the interviews, operators were asked to describe the process through which they established the fatigue benchmark scores. That is, the process through which operational risk was assigned to and managed by the computer-based fatigue modelling output scores. At the time of this evaluation, operators had invariably reported that they had based their fatigue benchmark score solely on information provided to them by CASA. That is, in line with Company Sky One (see Chapter 3), a CASA representative recommended a certain fatigue benchmark score to all operators. This was done with little or no attention to individual operational risk management processes. As such, when asked how operational fatigue benchmark levels were set, the typical answer was to use the figure provided by CASA.

Initially, FMSs were named ‘Fatigue Risk Management Systems’. However, the risk component did not appear as an evident or strong component within any of the operators’ systems. As such, fatigue management systems became largely based upon the computer fatigue modelling scores. As discussed in chapter 1, attitudes and opinions, this over-reliance on fatigue modelling became a major concern of operators in relation to the overall efficacy of the FMS.

While computer-based fatigue modelling is effective in determining fatigue as a consequence of hours of work, it does not take into account job specific factors such as environment, time on task and workload. Therefore, modelling should always be used in conjunction with risk management procedures to account for factors such as these.

The remainder of this chapter is split into two sections. The first section details exactly what an example computer based modelling program, the Fatigue Audit InterDyne (FAID), can be used for. The second section describes a risk management process, adopted from the Australian/New Zealand Risk Management Standard AS4360, as it applies to the management of fatigue.

Computer based fatigue modelling (FAID)

By analysing a theoretical or actual set of work hours using the FAID system, a score is produced. The algorithms used to produce the score are based on the following factors:

- Length of shifts and breaks. How the shift length relates to the work-related fatigue associated with that shift. Similarly, how the break length relates to the opportunity to obtain recovery sleep to reverse the effects of fatigue;
- Time of day. Fatigue accumulates faster at certain times of the day than others. As a general rule, fatigue accumulates fastest at the times that we would naturally choose to sleep and fastest in the hours of 0300 to 0500h. Similarly, breaks from work have greater potential fatigue recovery value at certain times of day. This is because of both biological and societal reasons. As a general rule, sleep is easiest to obtain in the hours between 2200h and 0800h;
- Prior seven-day work history. The hours that an individual has worked in the past seven days will contribute to their current fatigue state. The most recent days will obviously have the greatest impact. That is, what an individual worked yesterday has a large impact on their fatigue state today. What they worked two days ago has a fairly high impact but not as much as yesterday. What they worked six or seven days ago has a little impact but very little compared to yesterday. Days back further than seven days do not have any measurable impact; and
- Biological Limitations on Sleep and Recovery. Humans cannot bank sleep up. For example, if a person has a week of night shifts coming up they cannot decide to sleep for 30 hours straight to offset the sleep they feel they will lose during the week ahead. Similarly, if an individual has just worked a week of night shifts they can generally not catch up on all of the sleep they missed out of in a single 30-hour sleep.
The score produced is not a percentage but a number and can range from zero up to more than 140. The results of a range of theoretical, laboratory and simulator studies indicate that regardless of the test used, an individual with a score in the 80 to 100 range will be as impaired at a similar level as if they were intoxicated with alcohol to a level of 0.05% Blood Alcohol Concentration (BAC) or greater. The exact score that equates to 0.05% BAC does differ depending on how sensitive a particular test is to impairment to fatigue and alcohol. However, as mentioned, a score of 80 to 100 has been consistently shown to be comparable to impairment equivalent to 0.05% BAC or greater.

A practical method for accounting for such differences is by using a risk management approach such as such as the Australian Standard for Risk Management (AS4360) - www.standards.com.au/catalogue/

**Risk management using the Australian Standard AS4360**

As discussed above, the FAID model helps manage the work-related fatigue associated with hours of work. At a functional level, FAID is more powerful when coupled with tailored maximum fatigue thresholds for specific tasks or jobs within a particular operation. A framework such as AS4360 can be used to perform this tailoring. Theoretically, the impact of any job-specific factors can be accounted for using such a process. It would be difficult for the regulator to perform this level of risk management because there are often unique local factors, procedures, equipment, requirements, training and experience within every organisation. Therefore, the responsibility for conducting and justifying this process would largely lie on individual operators.

Relevant factors are taken into consideration by determining their relative importance using a step-by-step procedure. In very simplistic terms, this procedure involves a group of employees assigning a score from one to five to: 1) the likelihood, and 2) the consequence of all possible incidents and accidents. The one-to-five scale uses very specific definitions of likelihood and consequence that are provided within AS4360.

Once likelihood and consequence scores have been assigned then a risk group is assigned according to a table in AS4360. The risk groups are ‘low’, ‘moderate’, ‘high’ and ‘extreme’. Therefore, at the end of the risk management assessment each task or job that an employee may be required to do will have been assigned as being either ‘low’, ‘moderate’, ‘high’ and ‘extreme’. This process is summarized by the table 2, which reflects the risk classification matrix from AS4360.

<table>
<thead>
<tr>
<th>Consequences</th>
<th>Insignificant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>A (almost certain)</td>
<td>H</td>
<td>H</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>B (likely)</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>C (moderate)</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>D (unlikely)</td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>E</td>
</tr>
<tr>
<td>E (rare)</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

**Legend**

E: Extreme Risk; immediate action required
H: High Risk; senior management attention needed
M: Moderate Risk; management responsibility must be specified
L: Low Risk; manage by routine procedures

Note: The number of categories should reflect the needs of the study

Table 2: Qualitative Risk Analysis Matrix - level of risk (from AS4360)
The definition of a job or task does not effect the accumulation of fatigue points within FAID. However, it is likely that the maximum level of fatigue that you would accept for a task assigned as ‘high’ risk would be lower than for a task assigned as a ‘low’ risk. For example, if someone were required to be in the office photocopying training manuals, a ‘low’ risk task, then a maximum fatigue score of 80 points might be determined to be acceptable. However, if a person were required to be flying a surveillance aircraft at low altitude then a lower maximum threshold of fatigue such as 65 might be considered appropriate.

In summary, this is the goal of the risk management process with regards to fatigue management; to determine acceptable thresholds of maximum fatigue score by taking into account all of the work tasks and factors that might impact on a person’s capacity to do a job safely.

**Recommendations**

4.1 Future iterations of the FMS should include requirements that relate to risk management. Specifically, operators should be made acutely aware that managing the work-related fatigue does not just require assessment of hours of work. That is, at a minimum, other significant factors should be considered.

4.2 Operators should initially determine which significant factors exist in addition to hours of work. This process would need to consider factors including legal requirements, environmental conditions, aircraft type, experience, as well as occupational health and safety (OH&S). This should be considered a high priority in any future amendments or system developments.
CHAPTER 5: FMS ROSTER AUDITS

One of the evaluation aims was to determine the FMS effect on operations. One obvious facet of this was whether the FMS impacted upon rosters. That is, to determine whether the pre-FMS rosters differed from the post-FMS rosters.

As outlined in the methodology section, each operator was asked to provide both pre- and post-FMS rosters. Where available, it was requested that these rosters were provided for corresponding months of the year to allow for seasonal variation. For example, rosters were collected for a sample of employee records for both January 2001 and January 2002. The rosters were then analysed with the computer-based fatigue modelling program called Fatigue Audit InterDyne (FAID).

While all operators could offer post-FMS rosters, very few had records available for the previous year. Indeed, only three operators could provide both pre- and post-FMS rosters. This was a surprising outcome, given that it has always been a clear requirement for operators to keep accurate records of all flight crew flight and duty hours under CAO 48. Other operators either did not have the records to provide the evaluation team, or the definitions of rostering had changed so much that any comparison would be meaningless. For example, before FMS, many operators only recorded flight time as duty. Under the FMS, rosters account for all forms of duty. Therefore, rostered hours in some cases had increased dramatically.

The present analysis compared rosters from before and after the implementation of FMS for only a very small proportion of the operators: three of 21. The analysis included a total of 23 employees, and consisted of 643 work episodes and 2750 work hours. Such a small sample size could not be considered to be generalisable across the operator group, let alone the industry.

Within the rosters analysed, an average of 7.1 (SD = 1.9) work episodes were worked per employee per week. This figure ranged from an average of 4.7 work episodes per employee per week to an average of 8.7 work episodes per employee per week across the operations. The variability in the number of work episodes per employee was an artefact of the specific operations that provided data. That is, certain operators had the potential for multiple shifts per 24 hours due to the nature of work.

When analysing rosters, there were a number of points to consider. One of the simplest and most meaningful measures to examine was the maximum fatigue score. This provided an indication of the absolute highest point of fatigue within any individual shift. Six rosters were analysed in total, which represented three operations pre-FMS, and the same three following FMS implementation. Due to the nature of the operations assessed, the contribution of hours of work to fatigue in these analyses was considered low to moderate. Specifically, due to a low-level of night time work, the opportunities for sleep were quite regular throughout the rosters. This had the effect of regular opportunity for sleep recovery, which therefore minimized high levels of fatigue.

In the rosters analysed, only one employee in pre-FMS C reached a score above 80. The maximum fatigue scores for each operation are shown below in table 3.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Max FS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre FMS A</td>
<td>34.9</td>
</tr>
<tr>
<td>Post FMS A</td>
<td>31.4</td>
</tr>
<tr>
<td>Pre FMS B</td>
<td>56.8</td>
</tr>
<tr>
<td>Post FMS B</td>
<td>61.5</td>
</tr>
<tr>
<td>Pre FMS C</td>
<td>81.3</td>
</tr>
<tr>
<td>Post FMS C</td>
<td>73.4</td>
</tr>
</tbody>
</table>

Table 3. Maximum fatigue scores for each operation included in the analysis.
The assessments do not make any judgments regarding factors that may or may not be important in individual operations. This includes job specific factors as discussed in the previous chapter on benchmarking (Chapter 4). This may also include the appropriateness of individual rosters for specific operations based on coverage requirements, employee availability and organisational policies/procedures. Furthermore, the method for defining standby work will also influence the results obtained from such assessments. This inconsistency is discussed further in the next chapter, standby rostering and commuting (chapter 6).

FAID analyses indicated several reasons for the increased fatigue scores experienced by the employee that scored over 80 in the pre-FMS C roster. In this case, shifts up to 16 hours in duration were a major contributor to increased fatigue levels. This was particularly so because each of the shifts began in the early hours of the morning at times that would normally be used for sleep. A compounding factor to shift length, which contributed to the score above 80 in the pre-FMS C roster, was the compression of work hours into blocks. Practically speaking, this meant that the roster with elevated fatigue scores had many work hours compressed closely together. When shifts in excess of 8 hours were combined with shift compression, fatigue scores became high. For example, the pre-FMS C roster scheduled five long, consecutive shifts, each beginning early in the morning. The roster for that period is shown below in Table 4.

<table>
<thead>
<tr>
<th>Shift</th>
<th>Start Time</th>
<th>Finish Time</th>
<th>Max FS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0300</td>
<td>1900</td>
<td>49.6</td>
</tr>
<tr>
<td>2</td>
<td>0600</td>
<td>2000</td>
<td>62.6</td>
</tr>
<tr>
<td>3</td>
<td>0600</td>
<td>1900</td>
<td>73.5</td>
</tr>
<tr>
<td>4</td>
<td>0600</td>
<td>1800</td>
<td>81.3</td>
</tr>
<tr>
<td>5</td>
<td>0700</td>
<td>1600</td>
<td>76.8</td>
</tr>
</tbody>
</table>

Table 4. High fatigue shifts from Roster preFMS C. High fatigue scores were attributed to long shifts, early starts, and shift compression.

While one individual did reach a maximum fatigue score over 80, it should be noted that this individual was a chief pilot, and the majority of this period was spent working on administrative duties. Therefore, the risk associated with the elevated fatigue score may not have been as great as general flying duties.

To determine whether there was any effect of the FMS on rosters, pre FMS rosters were compared with post FMS rosters. The results are presented in figures 5, 6, and 7. As can be seen, there was no significant difference between pre- and post-FMS rosters in any of the operations. That is, maximum fatigue scores remained relatively similar after the implementation of the FMS, compared to beforehand. The full statistics of these results are shown in appendix S.

Figure 5. Shift maximum fatigue scores for pre- and post- Operation A rosters. The maximum fatigue score is recorded along the horizontal axis. The percentage frequency of shifts reaching the maximum fatigue score is shown along the vertical axis.
Discussion

While the data was provided by only three operations, and was thus by no means representative of the entire population of Australian general aviation, the following conclusions can be drawn. Based on the data that was made available for the assessments, there were no major concerns that could be generalised. However, of considerable concern, was the absence of records that could arguably be considered essential. While the duties undertaken throughout the elevated fatigue levels of the employee in the pre FMS C roster could have been considered low risk (i.e. administrative duties), such levels should still be avoided. Not only would this avoid fatigue-related risk when driving home from work, but it would also ensure that the pilot is fit to fly should an unexpected flight arise.

In examining the operational effect of fatigue, rosters were directly compared from both before and after the FMS implementation. As shown in the results, no significant impact was observed. That is, rosters stayed relatively the same across the implementation of the FMS. This was not surprising, considering the statements discussed later in Chapter nine, Effects on Operation. That is, operators reported that the FMS had no real effects on the operation. Rather, it had served to increase awareness about the FMS and improved the level of communication between management and flight crew members.
The results discussed above indicate that rather than modelling operational factors around the FMS concepts, operators were using the FMS more so to validate what they were already doing. This may have occurred for one of two reasons. First, operators may not have had the knowledge to specifically apply the FMS to make their operation more efficient through the re-modelling of rosters. That is, employees could potentially be rostered more effectively under the FMS, compared to the previous CAO 48 concession, to produce greater operational flexibility and productivity. Another explanation is that the operators had already maximized their rosters to the full potential prior to the FMS, and would receive no benefit from altering them further. However, a considerable amount of additional data would be needed for analysis in order to determine which of these is more likely.

Recommendations

5.1 CASA should determine the preferred format for collection of planned and actual rostered hours for future hours of work assessments. This would allow for a clearer understanding by the operators of what CASA’s expectations are. This could clearly improve compliance with future assessments and ensure consistency within and across the operations.

5.2 Operators should make a formal commitment to store planned and actual rostered hours for all employees. This is particularly true for shiftworking employees and those affected by flight and duty time regulations. These hours should be maintained in a continuous or periodical manner. Furthermore, it should be expected that these hours would be requested by CASA for future evaluations.

5.3 CASA should provide guidelines as to how operators can optimise flexibility and safety with regards to structuring hours of work. That is, successful implementations by operators should be celebrated and communicated to other operators in order to assist in the tailoring of the system.
CHAPTER 6: THE EFFECT OF STANDBY ROSTERING AND COMMUTING ON FATIGUE

The Parliamentary Inquiry into Fatigue in Transportation (House of Representatives, 2000) highlighted standby rostering as a factor that should be considered in fatigue management. More specifically, it stated that:

"Workers who are 'on-call' during off-duty times can find that their opportunities for rest are disrupted significantly. Evidence indicates, for example, cases where on-call marine pilots have been called up to six times with revised ship arrival times while at home resting. As a consequence they begin their next shift already suffering from the cumulative effects of fatigue" (1.46)

Therefore, the first section of this chapter reports interviewee opinions about the effect of standby rostering on fatigue. The contribution of commuting to and from work has also been raised as an additional potential source of fatigue. Therefore, the second section of this chapter describes perceptions of interviewees regarding the effect of fatigue on their driving performance to or from work.

Standby Rostering

The only study participants that were regularly rostered on standby at work conditions were the emergency medical service (EMS) operations. When other operators used standby rostering, it was generally standby at home conditions.

The data collected indicated there was no uniform method of classifying standby rostering. That is, depending on the type of operation, some counted standby strictly as duty time, while others counted it as normal time off. This was true for the contexts of both payroll and duty time concerning fatigue auditing.

When asked whether standby should be counted as duty, opinions varied widely. From a payroll point of view, many operators argued strongly that it should not be counted as duty. That is, paying flight crew members to sit around 'waiting for work' would not represent sound financial practice. An additional reason against standby rostering being counted as duty from the organisations' perspective was related to the resultant elevation of scores on FAID. That is, according to FAID, flight crew members would be accumulating fatigue when they were performing no work and potentially resting. As such, counting standby shifts as duty was perceived to be operationally restrictive. This was summed up by the following quotes:

"It's duty time. So, it automatically goes in as duty" (M1)

"Standby under the current concessions is not considered at work." (M12)

"The reason we don't include it is because, in effect, you're not doing any duty hours. And if they start, if CASA, or if you suggest, or I'll talk about CASA – if they want to include that in the fatigue score, it will be very limiting to the point where companies will go broke to the point where companies will have to employ more pilots to sit around and do nothing" (P9)

While there was much debate against counting standby as duty, some operators were in favour of it. Indeed, depending on the operation, some interviewees stated that standby should definitely be counted as duty.

"It's not currently, but it definitely should be" (P13)

One alternative solution was that standby shifts should be attributed a lower risk than actual duty, and therefore a higher threshold of fatigue score would be permissible. Therefore, as can be seen in the following statement, standby conditions would be classed as lower risk than duty, but higher than off duty.

"whether it should be counted as duty, no, but as a form of duty, yes" (P6)

Interviewees were also asked to comment on how standby rostering affected their personal perception of fatigue. The majority of participants (80%) stated that standby rostering did not feel like a significant issue because they had been a part of normal operations for quite some time. Therefore, comprehending what life (and resultant fatigue levels) would be like without them was difficult, if not impossible. That is, flight crew
members had become accustomed to standby rostering over time, and learnt to live around it with minimal perceived effects on fatigue. In doing so, individuals had learned various strategies that ensure they are prepared to leave immediately if called, thereby reducing stress levels.

“no, because the guys have been here long enough now, it doesn’t really effect them” (M3)

“no. If you’re sensible about it, you just – everyone’s different, but you eat your normal meals at your normal times. You go to bed when you normally would, but you have a bag packed, and you’re ready to go. Most of the time here, we give each other plenty of notice” (P9)

While there were certainly individuals who experienced no subjective fatigue effects of standby rostering, others, particularly those that stated fatigue should be counted as duty, stated otherwise. These individuals maintained that they were unable to rest from normal work when they were on standby, and therefore, obtained a reduced quality of rest time.

“For sure, you can never get quality time and switch off and just be yourself at home, you’ve always got to orientate what you’re going to do and how you’re going to do it around the phone call.” (P12)

**Commuting**

As described in the methodology chapter, to determine the average commute distance and time, flight crew members were asked to provide an approximate value for commute time in terms of both distance and time from home to work. The average distance was 23.3km (SD = 16.3km) and ranged from 3km to 60km. The average time was 23 minutes (SD = 17.4 mins), and ranged from 3 minutes to 60 minutes. The results are shown below in table 5.

<table>
<thead>
<tr>
<th>Kms</th>
<th>Mins</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
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</tr>
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<td>7</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
</tr>
<tr>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>11</td>
<td>50</td>
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<tr>
<td>12</td>
<td>55</td>
</tr>
<tr>
<td>13</td>
<td>60</td>
</tr>
<tr>
<td>14</td>
<td>65</td>
</tr>
<tr>
<td>15</td>
<td>70</td>
</tr>
<tr>
<td>16</td>
<td>75</td>
</tr>
</tbody>
</table>

Table 5. Average commute distances and times for participating operators' employees between home and work

The majority of flight crew members recognised that fatigue had the potential to affect driving performance when commuting to and from work. However, very few thought that fatigue specifically affected their driving performance. Reasons supplied were that increased awareness reduced the risk, and that if they felt too tired to drive, they would take the responsibility to have a sleep before driving home.

“I always have a sleep before I go home, because it takes me over an hour” (P2)

“if I’ve been out all night and I feel very tired, and then I’d go and have a lie down and then drive home.” (P5)
Discussion

The treatment of both standby hours and commuting was widely varied across the operations investigated. One major distinction for discussion would be standby hours spent at work versus standby hours spent at home. Given the use of tools such as FAID and risk management, the need for consistency is essential.

Judging by the feedback provided, there appeared to be no uniform method of defining, applying or recording standby duty. Considering the operational variation within general aviation, this is not particularly surprising. From an operational perspective, there is clear logic for standby not being considered duty time for payroll or flight and duty times. From the employees’ perspective however, standby is clearly not free time that is available for certain social pursuits. As examples, employees can not generally travel further than a one hour radius from base, or be engaged in the consumption of alcohol. Therefore, standby hours can not strictly be defined as non-work time either.

Depending on the type of operation, standby at home was not always considered work. This was largely due to the wide variation of standby conditions. For example, in one operation, a flight crew member on standby at home could be expected to respond to a work call with five minutes notice; whereas in another operation, they could receive 24 hours notice or more. Similarly, some operations used standby rostering as a backup to cover emergency shifts such as sick leave. In these cases, flight crew members’ standby conditions were rarely used. Other operations however, had standby conditions in which flight crew members could count on being called upon regularly.

While standby at home conditions, and to some degree standby at work conditions, are less fatiguing than actual work, they are undoubtedly more fatiguing than actual time off. That is, under standby conditions, an individual is unlikely to accrue the same level and quality of rest as when they are on a break period from work. For example, the individual is required to remain available to respond to the phone or beeper, in case they are required to work. Therefore, the individual would generally be unable to gain as much rest as they would if they were not on standby.

As reported in the results, the lower quality of rest associated with standby conditions was evident in some of the interviewees responses. However, many individuals perceived that standby rostering has no effect on fatigue. This was particularly so for those who had worked standby rosters for a significant period of time. That is, interviewees perceived that while at first standby rostering reduced the quality of rest time, it became easier as they developed time management strategies.

As with standby rostering, there was also a need for consistent management of commuting time. The average commute time in this sample was relatively small, i.e. 23 minutes each way. However, the range included commutes from three to 60 minutes each way. While this does not seem excessive compared to commute times in large cities, it must be acknowledged that this is time not available for rest or other activities. In the case where the commute was one hour each way, the time available for sleep was reduced by two hours. This therefore, allowed for a greater accumulation of fatigue risk.

Furthermore, many participants drove to work in the early hours of the morning. Such early start times are known to require individuals to shorten their sleep compared to what they would self-select if it were a rest day (Kecklund et al., 1997). In addition, the scientific literature has indicated that performance is particularly impaired within the hours of 2-7am (Knauth et al., 1980; Folkard & Barton, 1993; Kecklund et al., 1997). Therefore, when driving to work at such hours, drivers are more at risk of an accident than normal. Similarly, when a flight crew member is worked to their maximum fatigue limit during a shift, it is likely they will exceed that threshold on the drive home, and again be at higher accident risk.

While the scientific community believes the risk of fatigue and commuting is significant, the majority of interviewees perceived that their driving performance was not impaired by fatigue. However, many also indicated that if they did feel fatigue prior to driving home from a shift, they would take the responsibility to have a nap before driving home to reduce the risk. If this is truly put into practice, it demonstrates a good sense of personal responsibility in fatigue management.
Recommendations

6.1 CASA should clearly define standby rostering and what it means for specific operations. Depending on the type of operation, it may be that standby should be counted as a form of duty, but in some cases, perhaps not strictly as work. These definitions will impact on the hours counted for fatigue modelling.

6.2 Flight crew members should be provided with practical training and education relating to sleep and fatigue. Specifically, the dangers of fatigue in relation to standby rostering and commuting should be explained and potential countermeasures such as napping and strategic caffeine use should be provided. Other recommendations for training and education are made in chapter seven.

6.3 Ideally, flight crew members should be provided with suitable sleeping accommodation to enable napping upon completion of shift should they wish, before they drive home. At the very minimum however, management and flight crew at each operation should consider the available options for employees to nap. This will encourage a dual responsibility relating to the risks associated with fatigue, standby rostering and commuting.

6.4 During the risk management assessments in each operation, commute times greater than an hour should be identified. The intention of such identifications is not to single out individuals, but rather to create transparency of another potential factor that could increase fatigue within the operation.
CHAPTER 7: FMS TRAINING & EDUCATION

Individual learning has the ability to produce a positive impact upon the safety culture of an organisation (Reason, 1997; Clarke, 2002). To strengthen such an effect, learning processes should stress the importance of both the operation at large as well as all of the essential components that can ensure high safety standards (Wang & Ahmed, 2003). One major area of individual learning is achieved through training and education programs. Training and education can be either formal or informal. Informal training comes in many forms, including communications between stakeholders, whereas formal training and education is generally defined by the implementation of a targeted package.

There are various factors that contribute to the success of such programs, including:

- Individual learning (Argyris & Schon, 1996) - attitudes and opinions towards the training process;
- Communication Styles (Wickens et al., 1997) - the processes of delivering the training and education;
- Organisational culture (Drew & Smith, 1995) - communication styles within the organisation;
- Knowledge management (Fiol, 1994; Fiol & Lyles, 1985) - record keeping, and access to information and;
- Continuous improvement (Pedler et al, 1991) - feedback processes in place to further improve the processes in the future.

The general aim of this chapter was to review the nature of existing training and education frameworks within each of the participating operations. The specific aim was to examine each of the contributing factors to successful training and education programs and provide recommendations for future improvement. As outlined in the methodology, this was achieved through the examination of:

- all documented pre- and post-FMS communications between the operator and CASA (e.g. letters, emails, documented phone conversations)
- all documented pre- and post-FMS communications between the operator and flight crew (e.g. memo's, safety meeting minutes)
- training program elements (e.g. handouts, workbooks, presentations)
- training records (e.g. name, employee, frequency); and
- interview questions relating to experiences, attitudes and opinions of FMS training programs.

Communication is an informal method of training and education. This includes education of the industry by CASA, of employees by operators, and of CASA by the industry. In terms of the FMS, communication should establish the context of the system, and outline requirements of both CASA to the operator, and the operator to flight crew. Therefore, all documented communication was collected from both CASA and participating operators.

As indicated from the CASA- and operator-supplied data as well as specific comments made by operators during interviews, it appeared there was little communication between CASA and operators. More specifically, operators were provided with limited information regarding CASA's expectations of minimum requirements of the FMS. This was noted specifically in terms of training and education components.

"it wasn't specified what it was supposed to be" (M6)

While operators were dissatisfied with the level of information provided for training and education in FMS, a notable exception was the recommendation of a training & education booklet. This booklet was called Practical Living for Shiftworkers, and was produced by the Centre for Sleep Research, University of South Australia. It was also reported that several internet links may be useful for any operators' wishing to conduct further research in the area of fatigue.

Although these materials were appreciated, operators could not decipher the specific training and education topics that CASA deemed as useful or to what extent the materials should be used as templates. This was particularly the case given that the recommended materials were created for shiftworking industries in general rather than being specific to aviation. In general, shiftwork impacts on individuals in a similar manner. Therefore, it could be argued that a generic package was appropriate. However, it could also be argued that there are aviation-specific issues that may be unique and provide additional benefit to recipients of training.
Communications between the operator and flight crew varied significantly from site to site. Formality of communication was largely dependent on the operation size. That is, large operations tended to have detailed records of every memo, e-mail or meeting minutes that were posted in relation to the FMS.

"we got memos, you’ve got a copy of that email there, we subsequently had a meeting about it all, they were all given copies of the ‘Practical Living’ and asked to complete the questionnaires“ (M1)

"We gave out a memo, told them what we were doing, gave them all a copy of the handbook, we then gave them more training at their training week, where we had people from Inter Dynamics come and gave a spiel." (M5)

Smaller operations on the other hand, often could not provide any paper-evidence of communications with employees regarding the FMS. However, both management and flight crew of these operations reported that all communications had occurred informally, as part of normal conversation within shifts.

"Because we’re a fairly small company, we find a lot of credit in just talking to our guys" (M9)

However, with little exception, flight crew members were informed of the FMS when it was first introduced, and kept informed throughout the implementation process.

Most organisations also used excerpts of the policy template provided by CASA, Company Sky One, as an additional informal training and education document. Specifically, 19 of 21 operators included this educational information in various forms within their FMS the policy template. It was reported to be useful because it contained a significant amount of information describing the nature of fatigue. This was used as a simple way of increasing crew awareness about the nature of fatigue; mitigation of short-term stress and conditions associated with fatigue; and fatigue management strategies.

In terms of formal training and education strategies, the majority of operators utilized the Practical Living for Shiftworkers booklet. The booklet is a competency based, self-paced course for on-the-job training in shiftwork and fatigue management, and has been formally acknowledged for use within the Australian National Training Authority (ANTA) framework. After reading each topic, users are asked to complete a small number of activities. The activities sections are tools to help cement the learning process. An assessors’ guide discusses the range of appropriate answers for each of these exercises. Using this guide, trainees are provided with feedback in the form of suggested answers that they can compare to their own responses.

All operators owned at least one copy of the Practical Living for Shiftworkers booklet, which they used for reference material. Furthermore, 15 of 21 (71%) operators used the booklet as the examination that is supplied as a part of the Practical Living for Shiftworkers package. This was performed either in a workshop situation, where discussion was encouraged for each of the topics, or on a solitary basis, where flight crew members took the booklets away and completed the exercises in their own time. Attitudes and opinions towards the booklet are discussed later in this chapter.

While Practical Living for Shiftworkers was by far the most common training tool used within the FMS, some operations used other training strategies. Some operators hired consultants to present workshops to groups of flight crew. Others put together their own Microsoft PowerPoint presentations, and had an internal staff member deliver presentations. Regardless of the tools, or method of delivery, the training content broadly covered the nature of fatigue, and fatigue management strategies.

Many operators required flight crew to enter their own data into the fatigue audit system (FAID). This in itself required additional training to that described above. That is, flight crew had to be educated about FAID, the meaning of scores produced, and how to use it to a competent level. Again, this was either done through the commission of consultants, or through in-house training.

To determine the level of knowledge management, both records of training and flight crew access to fatigue-related information were examined. All operators had kept a training register. That is, management were aware of who had completed the FMS training and education and when. Where they had been completed, similar records were kept for the completion of competency-based assessments. Furthermore, all operators had a library, containing documents such as reports, papers and web-links to fatigue-related information. These were in place to ensure that any flight crew who wished to further investigate the nature of fatigue or the FMS itself, could do so easily.
In addition to determining the content of training and education programs, it is also important to consider the culture in which they are implemented. Therefore, interview techniques were used to determine the attitudes and opinions of both management and flight crew towards training and education in fatigue management. More specifically, management and flight crew representatives were asked to rate the effectiveness of current training and education strategies in fatigue management.

While many operators expressed concern that they had not received enough guidance for minimum expectations of training and education in FMS, the majority of management perceived their particular program as above average. This was largely attributed to an increase of awareness amongst flight crew about fatigue as a safety hazard, and was highlighted by the following quote:

"it's been basic, it's been practical and it's been effective. It's been effective because people have recognised the fact there is fatigue, because the system is working therefore the training system must be working" (M1)

However, a few operators rated the training as only average. As will be noted again later in this chapter, these operators recognised that the initial training provided was only effective as an introduction, and needed to be followed by more detailed information.

"I'd only rate it as average. Because, it's such a big concept I think it really needs perhaps a more – an introduction where it's more progressive" (M9)

As described above, one of the main components of training and education programs for the majority of operators was Practical Living for Shiftworkers booklet. While no formal questions were framed around attitudes and opinions to this material, some operators offered their opinions without prompt. The majority of operators were in favour of booklet as a useful guide to general fatigue.

"I thought the books were actually very good. Very practical... They certainly give people a better insight into why they are tired" (M7)

While this was true, many operators also reported that the booklet is not specific enough to aviation to be used on its own. That is, operators thought the book did not provide sufficient information to ensure flight crew understanding of the FMS and specific fatigue-related issues within aviation.

Various reasons were provided for this opinion. Some operators were discontent with the incomplete nature of the booklet for FMS training, and maintained that a more comprehensive training package should be produced or provided by CASA. Discontent was also expressed with the price of the booklets, in that it could easily become too expensive for small GA operators to buy booklets for all flight crew. These issues were particularly highlighted by the following quotes:

"I think it was more in line with shift workers in like a mining situation, not specifically to aviation." (P6)

"if CASA prefers to have said that completing that workbook is enough to say that you’re fatigue aware, there is another flaw in the system." (M13)

"Absolutely ridiculous. That’s one thing they [CASA] asked us is “have we sent out one of these books to each one of our pilots”. We said, “No, because (a) these books are very expensive and (b) half those questions don’t even apply to us” (M2)

To further determine the attitudes and opinions, as well as the level of organisational commitment towards FMS-related training and education, interviewees were asked whether they considered training and education as an essential part of an effective FMS. An overwhelming majority of both management and flight crew responded positively. Some interviewees simply stated that it was definitely essential. Others however, offered more detailed reasons for stating so. Some of the reasons for stating that training and education was essential for an effective FMS included:

- Justification for implementing the FMS;
  "Yeah it has to be, you can’t just say, we’ve got a FMS now and… get used to it" (M10)
  "Yeah. I think so. People need to understand what it’s all about. It wouldn’t be a good thing to put it in place without explaining it, what the scores meant and what sort of things influenced it." (P14)
Increased awareness of the risks of fatigue for both management and flight crew; and

"... what the education does, is alert people to factors that they probably never thought of before... not only does it identify symptoms of fatigue, and actually spell it out, it has various countermeasures that you can take to help minimise it, and some lifestyle guidelines as well, so that possibly you won’t end up in that state. So yeah, the education is good.“ (M6)

Increased personal responsibility for managing fatigue.

"Oh yes. You’ve got to understand how it works, because its not just press the buttons and its okay, you’ve got to know how to apply the rest periods and how to apply yourself to it and how to get the best out of it.“ (M13)

Within their justification of including training and education as an essential FMS component, some operators went further to state that training and education in fatigue should be recurrent in a similar way to regular Crew Resource Management (CRM) training programs. This should be done both to maintain focus, and prevent flight crew from forgetting information, and to expand on existing knowledge.

"I thought it was good. But much of it has been forgotten“ (P1)

"I think the big thing that’s come through is that in December, they’d forgotten about stuff we talked about in July” (M3)

"Oh yeah. I think you have to – and I think it has to be followed up“ (M9)

While all interviewees responded that training and education was essential within the FMS to a degree, a few operators considered it as more essential for different operational roles than others. That is, it is not necessary to educate flight crew on the FMS, because it is the responsibility of management to ensure they are not fatigued. As such, the view was that so long as management is well educated in fatigue management, there is no need to educate flight crew.

"For management, yes, for people in the field, no“ (M2)

"Not essential from the point of view of the FMS can operate without all the pilots knowing how to do it“ (M12)

"I’d say yes but that’s a qualified yes because I think there are some situations where a FMS system could be introduced and implemented but didn’t require understanding of the employee, as long as it could be demonstrated that the employees interests and safety were enhanced by the result it really doesn’t matter whether they understand it all.“ (M14)

Discussion

As outlined above, learning processes should stress the importance of both the operation at large as well as all of the essential components that can ensure high safety standards. That is, effective FMSs are dependent upon actual training and education programs, as well as various contributing factors, including knowledge management, communication, organisational culture and improvement processes. All of these factors work together to produce the effect of individual learning and thus, the overall impact of the FMS within the organisation.

There were a number of general positive training and education inclusions by most operators. First, all participating operations had a training and education program in place. Second, all organisations maintained a training register, detailing which flight crew had completed training and, where applicable, passed a competency-based assessment in fatigue. Third, each of the participating operators had also developed a fatigue library, containing several references and web links to fatigue and fatigue management. These were developed to allow employees who demonstrated interest in the concept of fatigue management to easily research it further. Management reported that the libraries were not utilized frequently, but were available to employees at any time.
Although there were a number of general positive inclusions, the depth and quality of the programs were widely varied. Across the board, the programs could be commended for their overall level of information provided on sleep, shiftwork, napping, caffeine, commuting and family/social issues. However, given that some operators stated the need for aviation-specific information, it was surprising that very few actually included relevant additions. For example, the additions to training and educational material could have included information about:

- the specific performance decrements of fatigue on flying;
- reasons for the change away from CAO 48;
- background and purpose of the FMS;
- individual responsibility for the management of fatigue; and
- the potential effects of the FMS on operations.

Some operators covered these points to a degree, with tailored Microsoft PowerPoint presentations that were either delivered by consultants or by a trained staff member. While these presentations provided some expansion in content over Practical Living for Shiftworkers, only one training package covered each of the above-mentioned points. However, presenting FMS training in a workshop or formal presentation such as this, as well as reading material would help to increase the absorption rate of information. That is, the scientific literature shows that information presented in multiple ways (e.g., visual and aural) will have a greater impact on the audience (Fatt, 2000).

Regardless of the tools, or method of delivery, the training content within the current sample typically only covered the nature of fatigue, and fatigue management strategies. Approximately half of the participating operators provided additional training on the fatigue audit system (FAID). However, very little information was provided by CASA to the operators or by the operators to flight crew members about the background or intentions of the FMS, or how it specifically related to individual operations. Many of the misperceptions associated with the FMS, as outlined in Chapter one, Attitudes and Opinions, could well have originated from this lack of information provided by CASA.

As outlined in the results, most organisations also used excerpts of the policy template provided by CASA, Company Sky One, as an additional informal training and education document. That is, an entire section of the policy was given to describing the nature of fatigue, and providing flight crew with fatigue management strategies. While this information is important, the FMS policy is probably not the most appropriate position for it to appear. That is, a policy should outline the definition, purpose and scope of the FMS, as well as individual responsibilities. If it was considered that this information was important, there is no reason why it could not be incorporated into the Practical Living for Shiftworkers booklet, or another training program.

The majority of discussions relating to training and education have related to the formal components. However, there are many informal components that should be considered essential. Specifically, the communication and consultation associated with training and education content and process will significantly impact on how well it is received. It is for this reason that communication between CASA and operators, as well as management and flight crew members was examined.

The results showed very little documented communication between CASA and operators. This was discussed in detail within chapter two, operators’ set up requirements. In summary however, it was clear that many important details were not communicated by CASA to operators. With specific reference to training and education, this lead to dissatisfaction and inconsistency between various training programs embedded within operations. As such, some general aviation flight crew may be more competent than others in fatigue management.

The regularity and availability of documented communication between management and flight crew members varied between sites. Specifically, there was a greater amount, and more detailed communication documented for the larger operators compared to the smaller operators. It appears as though larger operators preferred formal communication systems, whereas smaller operators preferred to communicate through informal discussions. While informal discussions are effective in communicating important details about concepts such as FMS, it is also important to maintain a degree of documented communication. This is particularly the case for formal audit reasons as well as the potential benefits that can be gained from evaluations such as this. In addition, there may be legal requirements for maintaining records of communication similarly to most occupational health and safety related factors.
The results indicated that the majority of operators approached the training and education of employees with a positive attitude. That is, most operators stated that training and education was an essential part of an effective FMS. This may reflect the fact that the training and education process allowed communications on broader issues including the background and potential of the FMS, potential operational changes, management and individual responsibilities as well as the content of the package. That is, the operation obtained indirect benefit that assisted in the implementation of FMS in general by the use of training and education sessions.

Due to the perceived benefits of training and education, many operators recognised the need for an ongoing program and periodic refresher courses. They believed this was necessary both to reinforce what was previously presented, as well as expand on existing knowledge. This would also help to maintain an active focus on fatigue as a significant occupational health and safety hazard.

**Recommendations**

7.1 Operators should be encouraged to continue the use of training and education packages as well as training registers. This would ensure that inductees, ongoing employees and managers have an appropriate exposure to shiftwork and fatigue and any latest research or developments in the field.

7.2 Training and education should be presented in a variety of mediums to maximize absorption. For example, as well as providing reading material, either formal presentations, or group workshops should be organised to help generate discussion and deeper thinking on behalf of both management and flight crew.

7.3 Electronic copies of Practical Living for Shiftworkers, or other appropriate packages, should be made available to organisations. This would reduce the cost compared to purchasing printed booklets and would also assist in delivery of training in remote sites.

7.4 An investigation into the viability of an aviation-specific version of Practical Living for Shiftworkers should be undertaken. If this investigation determines such development to be viable and of value, it would not be a complex or expensive task to undertake.

7.5 All FMS users should be educated in FAID, or whichever computer-based package is being used. It is critical that management and flight crew understand what packages such as FAID should and should not be used for. Although discussed elsewhere, the use of risk management processes in conjunction with roster assessment is the most appropriate approach for managing work related fatigue.

7.6 If the training and education section such as that currently embedded within the Company Sky One template is considered valuable, then it should be incorporated into the overall training package. That is, it should not form a separate document or form a part of the policy for the organisation.

7.7 As a minimum, CASA should provide operators with a list of the topics that are considered relevant for flight crew fatigue training and education. Ideally, a training and education template would be provided by CASA as a part of an industry FMS toolbox. This would ensure that a minimum content is provided and that accurate, practical information is supplied by all operators to employees and their families.
CHAPTER 8: PERSONAL RESPONSIBILITY FOR FATIGUE MANAGEMENT

The scientific literature indicates that for safety systems to be effective, a positive attitude is required, and individuals must take personal responsibility to maximize safety (e.g. Reason, 1997; Earnest, 1997). In addition to being desirable, the appropriate attitude to personal responsibility also has a legal basis. For example, duty-of-care provisions and state-based occupational health and safety legislation requires individuals to fulfill responsibilities with regards to the safety of themselves as well as their work colleagues. Therefore, this chapter reports the attitudes of flight crew towards the management of fatigue. As outlined in the methodology chapter, questions were framed in order to determine how responsible flight crew members felt towards preventing workplace fatigue.

Not surprisingly, the most important contributing factor to fatigue is the amount of sleep an individual obtains. Therefore, flight crew members were asked how long they slept on a typical night. This was a subjective process given that people generally report obtaining adequate sleep. On average, interviewees reported obtaining 7 hours sleep per night. This figure ranged from 5 hours (P13), to 9 hours (P1). Over half of the flight crew interviewed stated they attempt to obtain 8 hours sleep or more within any 24-hour period.

As stated above, a personal sense of responsibility is a large factor in effective safety management. Therefore, flight crew members were asked if they felt personally responsible to sleep in the allocated times. All interviewees responded positively to this question. Moreover, everyone appreciated the importance of gaining adequate sleep prior to work. Two quotes that highlight this include:

"you have to be really disciplined with yourself, you really do" (P7)

"I'm pretty strict with my sleep, I generally get to bed about 8:30 or 9 o'clock, and I'll be getting up at 4 o'clock" (P7)

In line with establishing flight crew members’ sense of personal responsibility for fatigue management, interviewees were also asked about their level of comfort in approaching management about safety concerns. The majority of responses indicated that individuals were very comfortable approaching management. In particular, some statements recognised communication with management as necessary for maintaining safe systems of work. Many statements demonstrating this commitment to communication were made, including:

"If you’re not honest about safety, then – I mean, it’s detrimental to everyone." (P13)

"If I don’t think I’m physically in a position to fly the shift then its up to me to do something about it. No I wouldn’t have a problem doing that with these guys" (P10)

While most participants indicated a positive response about approaching management, there were others who were more skeptical. One participant indicated they would be reluctant to report feelings of fatigue, because of consideration to colleagues. More specifically:

"I think the mentality that you don’t want to let your mates down" (P1)

Another participant responded that because fatigue management was still a relatively new concept, management were still in ‘the learning stages’ of how to approach fatigue reports. Therefore, it was perceived that management would be unlikely to react positively to a fatigue-related report. In this case, approaching management with fatigue-related safety concerns was not perceived as a comfortable task.

"for fatigue specifically, they are still learning, and management are still very military in their approach" (P16)
The most common reason for feelings of discomfort approaching management with safety concerns however was that of prior experience. That is, when safety concerns had been raised in the past, no response was made.

"no, not necessarily... I've already approached management on one matter, and received communication. And I guess, nothing changed as a result" (P9)

"they didn’t get what they wanted and it wasn’t as per the book so I guess they wouldn’t be comfortable anymore" (P12)

In cases such as these, the lack of management response led flight crew to feel uneasy in reporting safety concerns.

Discussion

The general responsibilities of individuals relate to being fit for duty whilst at work, which includes having obtained adequate sleep prior to work. In addition, when an individual does not feel fit to continue work, there is a responsibility for them to report this situation to an appropriate officer.

The statements regarding amount of sleep made by this sample of flight crew members were reassuring. Each of the flight crew members that responded to a question about sleep length, aimed to get a minimum of 5 hours sleep per night. However, the majority was greater than this. More specifically, over 50% of flight crew stated that they try to obtain a minimum of 8 hours sleep, which is a good safeguard against fatigue-related incidents. Even more reassuring, is that all flight crew stated that they felt personally responsible to sleep in the times allocated to do so. That is, pilots were aware of the need for sleep, and tried to routinely obtain 5 hours or more per 24-hour period. This is consistent with the minimum safe amount of sleep recommended within the scientific literature (eg. Ferrara & De Gennaro, 2001).

Another significant contributor to an effective safety culture is the ability to confront management if safety is potentially compromised (Reason, 1997; Orlady, 1999). For example, if flight crew, for a legitimate reason, failed to obtain enough sleep the night before duty, or for other reasons feel too fatigued and unfit to fly, it is important they feel comfortable enough to approach management without fear of retribution. In this sample, the majority of participants felt comfortable in approaching management. However, there were some who expressed reservations.

Reasons for negative responses were generally because of a perceived lack of action regarding previously reported difficulties by management. Furthermore, where action had been taken, no communications had occurred to update the employees of the results. The resulting frustration is likely to have produced a degree of complacency in reporting issues. Flight crew need to feel secure in reporting safety concerns to management without fear of retribution, and receive information of action after reporting the concern (Barach, 2000).

Recommendations

8.1 The specific legal requirements of both individuals and managers should be distilled from the relevant legislation. This should then be incorporated into the training and education package.

8.2 Formal procedures for self-reporting of fatigue-related issues should be implemented. This should include a no-blame response from management at the time of the report. However, it is appropriate to include follow up interviews to determine the nature of the incident. This determination should conclude that the reasons are appropriate or not. In the cases where an individual, regardless of the nature of the difficulty, requires support, it should be made available by the organisation. If it subsequently determined that an individual is inappropriately using the self-report system, performance management processes may be appropriate.
CHAPTER 9: EFFECTS OF FMS ON OPERATIONS

This chapter aimed to determine the operational effects of FMS compared to CAO 48 and its associated exemptions. As outlined in the methodology chapter, this was investigated as a part of the interviews with both management and flight crew. Specifically, interviewees were asked questions that generated discussion about perceived impact of the FMS on company operations. It is important to note that the vast majority of comments cited in this chapter are from managers. This was because a significant proportion of flight crew did not feel a strong understanding of the day-to-day impacts on the operation but only their own circumstances.

The overall consensus was that the FMS had a positive impact on operations. More specifically, 19 out of 21 managers (90.5%) and 17 out of 20 flight crew (85%) considered the FMS to have had a positive impact on operations.

"Positive all round. Absolutely all round." (M10)

"I think it’s had a positive impact and that’s from both sides of the equation, in terms of the employer and employee" (M3)

When asked to explain why the FMS had been so positive, a variety of responses were provided. The most common reason was that participants appreciated the scientific basis behind the fatigue figures, and were confident that it controlled maximum fatigue levels. As such, it was perceived that FAID provided clear justification for not working in a fatigued state.

“So in terms of introducing a positive, practical effect on what’s happening at work, Yeah, very, very positive.” (M3)

“I think it’s definitely a positive impact. Because it’s controlling whether I’m on a fatigue maximum" (M5)

“I’d have to say positive. I think we’re doing it in a bit more scientific way, you know, at least we’ve got some benchmarks. Whereas these were figures plucked out of the air, that’s all they were.” (M12)

A few participants however, responded negatively to the impact of the FMS. For example, one pilot viewed the system as negative, because it gave management an avenue in which to exploit employees. A manager viewed the system as negative because of the inappropriateness of stipulating activities employees can and cannot do outside of work hours. That is, there is no way of monitoring or controlling out-of-work activities performed by employees. These points were highlighted by the following quotes:

"Negative. And that’s because of both lack of understanding, and poor implementation" (P14)

“I think some people out there would view FMS as a way that management can screw them around, but when the FMS was first on the cards there were a lot of people who thought that FMS was a way that management are going to get to us, and I think that a lot of those hard-liners have started to come around and see that its not quite as bad as they first thought.” (P7)

“If you start asking our workforce what they’re doing in their time off, it has a very negative impact. Very strong reaction. Very strong resentment.” (M16)

After commenting on the positive or negative effects of the FMS on operation, participants were asked to comment specifically on what has changed operationally as a result of the FMS. Over half of participants stated that the FMS has not significantly changed operations at all. As such, the FMS has served only to validate the rosters and operational procedures that were already in place.

“It hasn’t really changed what we do in our operation at all, it just legalised what we do in our operation.” (M15)
However, several significant changes were mentioned, the majority of which were considered positive. More specifically, the major operational changes that were reported included:

• Extended duty times;
  "Well, extending the duty time or whatever, the nominated duty time... they want to get out there and fly. That's the nature of pilots." (M1)
  "In terms of being able to give the guys a better run for what they do... they're still doing basically the same job. They're just a little more certain and a little more happy with what they're doing." (M5)

• Reduced requirement of staffing; and
  "we employ less people more effectively. So overall efficiency gain." (M10)
  "So the roster structure's changed, as I said to you earlier, under CAO 48 we required 11 pilots to do one of our contracts, we can now do with six. You still have fill in pilots but you can quite comfortably roster six pilots to do it." (M9)

• Increased communication about fatigue-related matters.
  "...communication across the company is much better... that awareness of communication, uninhibited ability to speak" (M10)

Within this section of the interview, the only negative impact on operations that was reported by three flight crew members was an increased amount of paperwork. That is, the FMS required more administration time and effort than previous concessions to CAO 48. This was particularly highlighted by the following quote:

  "I guess 48 versus FMS, probably double the amount of administration" (P15)

Discussion

By and large, the impact of the FMS has been viewed as positive by both management and flight crew. However, there were more comments available from the managers because of their operational roles. Participants enjoyed the increased flexibility it gave to operations, and also the safeguard against reaching unsafe fatigue levels. Only 12% viewed the FMS as having a negative impact. Reasons for negative responses were largely related to a lack of understanding of the FMS, and fears about how it could potentially be abused, rather than actual impact on operations.

Participants reported the FMS as having four main effects on operations. These included:

• Extended duty times;
• Reduced requirement on staffing;
• Increased communication about fatigue-related matters; and
• Increased paperwork.

In this case, extended duty times were generally seen as a positive impact, allowing greater flexibility, and the ability of pilots to work more desirable hours. In some cases this significantly increased earning capacity. The opportunity for extended duty times also allowed operations to better utilise existing staff. Therefore, operations required fewer flight crew members to complete the same amount of work. This is likely to relate to significant economic effects for each operation.

Another positive impact reported by participants was that the FMS increased the level of communication within the operation regarding fatigue-related matters. That is, the structured flight safety meetings that involved the FMS as a regular item, were seen as a positive impact on operations, and substantially improved the safety environment.

Three flight crew members viewed increased paperwork as a negative impact. Compared to CAO 48, the participants perceived that their paperwork had significantly increased. While this is a valid point, it is likely that once flight crew become more familiar with the FMS, administration and paperwork will become more streamlined, and take less time.
The majority of operators reported no change in operations as a result of the FMS. That is, rather than change operations to accommodate the FMS, instead, they used the FMS to validate what they were already doing. While operations remain within safe fatigue levels, there is no reason why this is an issue. However, with extra education, these operators could be taught how the FMS could help to benefit them, and perhaps increase the efficiency of operations.

Many operators reported no major operational impact of the FMS. However, as described above, others experienced differently. While extended working hours were seen as a positive impact of the FMS, it must be ensured that they are not abused by unscrupulous operators, and remain within safe levels of fatigue. Under these conditions, the FMS has the potential to produce positive operational impact for all operators.

**Recommendations**

9.1 CASA should create case studies of effects on operations as reported following FMS implementation. This is likely to include both positive and negative observations and experiences and should provide an honest and practical way for other operators to optimise their own FMSs. Ideally, these would be provided early in the development stage.
CHAPTER 10: FMS DISCUSSION & RECOMMENDATIONS

General Recommendations

In general the industry response to the new approach was supportive of the concept yet critical of the implementation. As outlined in the report, there were several reasons for the frustration. These are addressed within the recommendations of this chapter.

First and foremost, FMS was an entirely new approach and there was little understanding of how the process might play out and the resource implications necessitated by the change. As the body of the report chronicles, the change from a simple prescriptive model to a safety-based approach was to prove challenging for both the industry and regulator.

There were no clear guidelines on what constituted an adequate safety-case. Neither was there a clear understanding of the resources required by the regulator or an industry member in developing and approving a fatigue management system. In many cases all parties were operating in an intellectual vacuum.

This problem was further exacerbated by the regulatory climate and culture surrounding the issue. Both operators and the regulators came from prescriptive cultures where ‘tick and flick’ were the dominant form of regulatory compliance. FMS assumed a basic change in the anthropology of compliance such that operators and regulators were required to develop, resource and implement a safety case from nothing rather than ‘cut and paste’ text as they had in the past. Without pre-existing templates the resource requirements were high and guidance was low. For many operators and some regulatory officers the ambiguity in what was demanded along with the time commitment required to ‘wrestle with the beast’ proved difficult if not impossible.

These issues were not unique to FMS. Many regulators and operators in aviation as well as other modalities have long commented on the transitional difficulties associated with performance-based management systems. This difficulty is best summarised by the hoary aphorism that observes ‘culture eats strategy for breakfast’. In a sense, the initial implementation of FMS failed spectacularly to anticipate the socio political context into which it was applied and the resources required to overcome that contextual barrier.

Unfortunately for CASA, the regulatory changes associated with the introduction of FMS occurred midway through a budget cycle and there was insufficient time to plan for the potential resource implications of the change and limited capacity to redirect funds from other projects (given the current funding restrictions for Federal Government agencies).

There was a similar problem for the industry. Exemptions were often cancelled without sufficient notice or budgetary allowance for the ideal development of the novel FMSs. In the past, the compliance costs associated with a simple prescriptive system were relatively small. On the other hand, developing an initial fatigue management system required a significant commitment of time and resources by operators and the regulator. For many small operators in the general aviation sector, difficulties associated with the cultural shift to a safety-case approach and the extra resources required proved a challenge for already tight operating budgets.

While many of the operators acknowledged the theoretical benefits of the new approach, i.e. increased flexibility and improved safety, they indicated that there was a significant ‘up-front’ cost associated with developing and implementing a FMS. From the operator’s perspective, developing and implementing a fatigue risk management system was a substantial undertaking for many of the organisations. While it promised significant operational and safety improvements, timely development, implementation and approval were critical for the success of such an approach. Operators also believed that inadequate ‘up-front’ resource allocation was a significant issue for CASA.

While operators were near universal in their approval of the shift in regulatory perspective, they were frequently critical of the way in which the change process was managed. In their view, given the lack of resources in the operator community and a lack of resources allocated by the regulator, implementation had been significantly compromised.
It is worth noting however, that the majority of operators believed that the new approach was likely to be worthwhile in the long run and should remain. They believe that the new approach would be extremely successful if adequately resourced and targeted to those most likely to benefit from the flexibility and improved safety.

At a global level, most operators felt that the shift from a strict prescriptive approach [eg. CAO48] to a strict safety-case approach may be an over reaction. While the majority of the GA industry was operating to exemptions they believed that many were only relatively minor excursions from CAO48 and fell into a limited number of categorical exemptions.

Many of the operators reasonably believed that the cost of developing a safety case approach to fatigue management would be greater than any operational benefit derived. In these cases, they believed a universal safety-based approach was flawed and provided little additional benefit over the traditional prescriptive approach. Operators believed there were several ways in which this issue could be successfully resolved.

First, they believed that it might be possible to craft a hybrid approach in which the regulator developed a limited number of ‘off-the-shelf’ safety cases that could be developed and implemented at a relatively low cost by those operators for whom the traditional prescriptive approach had been reasonable. On the other hand, for those operators who required a major excursion from the ‘off-the-shelf’ safety case it would be reasonable to expect them to invest in the greater cost of developing and implementing a specific safety-case to suit their unique operational requirements.

Second, it would be important to develop public domain resources that reduced the necessity for each individual operator to ‘re-invent the wheel’. Such an approach would also reduce the resources required for the regulator to ‘re-approve the wheel’ for each individual operator.

What this suggests strategically is an alternate compliance model whereby CAO48 is replaced by a limited set of fatigue management systems that have been developed jointly by the industry, the regulator and the scientific community. These systems could be developed as ‘best-practice’ models to cover a significant proportion of the industry for whom the development of a FMS would be prohibitively expensive [relative to operating budget] and of limited operational or safety benefit.

This approach would typically, although not necessarily, enable the regulator to develop adequate FMSs for many of the small operators working reasonably close to the current CAO48 guidelines at a reasonable cost to the industry. Other operators, for whom there would be significant benefits for working safely, albeit outside a predefined FMS would be required to develop a more comprehensive FMS that ensured safe operations. Given the potential advantage, the additional costs would be economically reasonable.

The advantage of this approach would be the reduction in the initial costs of developing a FMS by those operators for whom there is marginal benefit. It would also reduce the resource requirements for approval by the regulator since many of the operators would fall into pre-defined approval categories. In addition, this would enable the regulator to target regulatory resources most appropriately. That is, spend the resources on determining whether a FMS is acceptable [or not] for those safety operations that pose the greatest potential safety risk to the community.

On the basis of comments by the industry we believe that it would also be appropriate for CASA to develop a public domain FMS toolbox that would enable the industry to reduce the cost of developing and implementing either a predefined or unique FMS.

Such a toolbox should be consistent with the Australian Standard for Risk management [AS/NZ 4360] and include a policy development tool that defines the issues that an operator should, and the regulator will, address in the development, implementation and approval of a FMS. It should also include policy templates for all pre-defined [off-the-shelf] FMSs and examples of other unique approaches developed previously by other operators. A template tool would significantly reduce the cost of developing and approving a FMS policy for both the operator and regulator. It would also provide the opportunity for industry associations to work on common agreed positions and FMS guidelines to shape industry practice over time.

A toolbox should also include public domain training and education materials. These materials should be developed specifically for aviation and cover general issues related to fatigue as well as those unique to the industry. To ensure quality and appropriate delivery, the training and education materials should ideally be competency-based and approved by ANTA [Australian National Training Authority] and portable between employers.
Experience in other industries has shown that the cost of developing FMS training and education materials or outsourcing their supply can be very high for small operators. This is particularly true for those small operators who are situated in remote areas. For these operators there are significant costs associated with getting trainers to staff and the training costs must be amortised over a small number of employees.

We would suggest the development of traditional hard copy and on-line [web-based] resources that enabled the training costs to be kept at comparable levels across the country. We believe a reasonable goal is to be able to deliver FMS training for around $50 or less per employee across the entire industry.

A toolbox should also include tools and guidelines for the audit process. While audit software [eg FAID] has significant advantages for both operator and regulator, there are no clear guidelines on how it should be used, or appropriate ways to set maximum fatigue risk levels. CASA could play an essential role in facilitating the development of operational guidelines for appropriate use of such tools. It would also be appropriate for CASA to anticipate the introduction of alternate software tools and to develop an accreditation process to determine which tools are acceptable under which conditions.

It may also be appropriate for CASA to support the introduction of simple audit tools that do not require operators to commit to a financial outlay. Public domain audit models should be provided to operators to ensure that small operators are not financially or operationally prohibited from developing appropriate audit technologies.

We also believe that it is appropriate for CASA to develop an ongoing program evaluation mechanism to ensure that FMSs continue to evolve and improve based on current scientific knowledge, industry feedback and current best-practice from around the world on how to best manage fatigue.

The recommendations detailed below appear in the order presented in the specific report chapters. They are not presented in order of priority as this is likely to depend on the specific operator.

Chapter 1: Attitudes and Opinions

Prior to the trial FMS process, it was clear to both CASA and general aviation operators that there was need for regulation change. This was particularly important given the realisations relating to CAO 48, which meant that there was little scientific basis for some of its requirements. It is apparent from the investigations in this evaluation that there were considerable improvements made by implementing FMS. This was apparent in the levels of understanding and awareness in the participant organisations as well as a clearer sharing of responsibility and scientific basis. To further fortify future versions of FMS (or other non-prescriptive approaches to regulation), there are areas that were identified for improvement.

Not surprisingly, these recommendations largely cover the weaknesses identified in the evaluation. That is, there are recommendations relating to the appropriate use of the FAID system and risk assessment, the perceived potential for abuse, as well as the possible impact on workload and productivity. These are detailed below.

1.1 Each operator should obtain the most recent version of FAID. This would allow operators to use a version of FAID where the majority of the concerns outlined have been addressed. For the organisations who have purchased the FAID system, this upgrade should be available either free or for a minimal charge. For those organisations that have not previously purchased FAID, licensing fees would apply.

1.2 Each operator should fully understand what FAID can and cannot be used for. Specifically, it should be made clear to all operators that while FAID assists in understanding work-related fatigue associated with hours of work, it does not account for job-specific factors. Such factors can be accounted for using risk management processes.

1.3 Each operator should fully understand all of the required risk assessment steps. This includes the provision of guidance from CASA where required by operators. In most cases however, operators will obtain appropriate understanding from AS4360. This is available from Standards Australia at a minimal/reasonable cost.
1.4 Both operators and CASA should ensure that their audit procedures detect excursions from documented procedures. Because of the inevitable intentional and unintentional excursions from procedures when a new system is introduced, it is imperative that sound audit procedures are in place to identify and address such excursions.

1.5 CASA should further investigate the reasons for increased workload and decreased productivity in specific organisations. This would be done most practically by creating a case study of those organisations that have reported reduced workload and increased productivity. This case study would be an informative document that would then assist and guide other organisations where appropriate.

Chapter 2: Operators’ Set up Requirements

2.1 The FMS should be thoroughly planned out by CASA and market surveys completed prior to implementation. This would help CASA to define clear guides and definitions as well as provide greater organisation throughout the implementation period.

2.2 CASA should provide operators with clear guidelines and information about the FMS prior to implementation. Before starting to implement a FMS, operators should be aware of the nature of FMS, how it will benefit them, and CASA's expectations should they choose to proceed with the FMS. This will allow a clearer understanding of the FMS goals and aims, and prevent misperceptions from occurring.

2.3 CASA should formulate an industry toolbox, providing operators with several options of templates on which to base their FMS to suit their specific operation. The need for some form of FMS template became clear. Providing operators with several FMS policy options, which they could tailor to their specific operation, would:
   • communicate CASA's expectations of an ideal FMS;
   • reduce the stress associated with writing a FMS; and
   • reduce the cost associated with writing a FMS.

Chapter 3: Policy Statements

3.1 CASA should provide one or more policy examples to all operators as a guide. Policy examples are a way in which CASA can provide guidance as to the relevant considerations and structure for all operators. Examples are considered highly meaningful from the operators’ point of view because they reduce the degree of guesswork and assumption to a minimum. However, guides should be created and delivered with caution and include detail of all appropriate steps and cycles. From CASA's perspective, this may most easily be achieved by creating multiple templates; for example, small, medium and large operations and/or commercial, mustering, ballooning, etc.

3.2 Where operators are unsuccessful in meeting CASA's FMS policy requirements, content coaching should be provided by CASA. This is particularly important to avoid operators having to submit a large number of drafts for consideration. It is therefore likely to reduce workload for both CASA and operators. The content coach from CASA should be technically and experientially qualified in fatigue management.

3.3 CASA should ensure that the responsibility for document release and approval of FMS components does not sit with one individual. At least some of the frustrations reported by operators may have been averted if the appropriate uses of Company Sky One had been communicated. It is unlikely that a communication that had been double-checked by two or more FMS team members would not fulfil operators’ needs. Similarly, if approval of FMS components were double-checked, the outcome would be likely to have more consistency across CASA. Furthermore, CASA staff involved must be trained with a view to achieving maximum consistency when dealing with the industry.
Chapter 4: Benchmark

4.1 Future iterations of the FMS should include requirements that relate to risk management. Specifically, operators should be made acutely aware that managing the work-related fatigue does not just require assessment of hours of work. That is, at a minimum, other significant factors should be considered.

4.2 Operators should initially determine which significant factors exist in addition to hours of work. This process would need to consider factors including legal requirements, environmental conditions, aircraft type, experience, as well as occupational health and safety (OH&S). This should be considered a high priority in any future amendments or system developments.

Chapter 5: Roster Audits

5.1 CASA should determine the preferred format for collection of planned and actual rostered hours for future hours of work assessments. This would allow for a clearer understanding by the operators of what CASA's expectations are. This could clearly improve compliance with future assessments and ensure consistency within and across the operations.

5.2 Operators should make a formal commitment to store planned and actual rostered hours for all employees. This is particularly true for shiftworking employees and those affected by flight and duty time regulations. These hours should be maintained in a continuous or periodical manner. Furthermore, it should be expected that these hours would be requested by CASA for future evaluations.

5.3 CASA should provide guidelines as to how operators can optimise flexibility and safety with regards to structuring hours of work. That is, successful implementations by operators should be celebrated and communicated to other operators in order to assist in the tailoring of the system.

Chapter 6: Standby Rostering and Commuting

6.1 CASA should clearly define standby rostering and what it means for specific operations. Depending on the type of operation, it may be that standby should be counted as a form of duty, but in some cases, perhaps not strictly as work. These definitions will impact on the hours counted for fatigue modelling.

6.2 Flight crew members should be provided with practical training and education relating to sleep and fatigue. Specifically, the dangers of fatigue in relation to standby rostering and commuting should be explained and potential countermeasures such as napping and strategic caffeine use should be provided. Other recommendations for training and education are made in chapter seven.

6.3 Ideally, flight crew members should be provided with suitable sleeping accommodation to enable napping upon completion of shift should they wish, before they drive home. At the very minimum however, management and flight crew at each operation should consider the available options for employees to nap. This will encourage a dual responsibility relating to the risks associated with fatigue, standby rostering and commuting.

6.4 During the risk management assessments in each operation, commute times greater than an hour should be identified. The intention of such identifications is not to single out individuals, but rather to create transparency of another potential factor that could increase fatigue within the operation.
Chapter 7: Training and Education

7.1 Operators should be encouraged to continue the use of training and education packages as well as training registers. This would ensure that inductees, ongoing employees and managers have an appropriate exposure to shiftwork and fatigue and any latest research or developments in the field.

7.2 Training and education should be presented in a variety of mediums to maximize absorption. For example, as well as providing reading material, either formal presentations, or group workshops should be organised to help generate discussion and deeper thinking on behalf of both management and flight crew.

7.3 Electronic copies of Practical Living for Shiftworkers, or other appropriate packages, should be made available to organisations. This would reduce the cost compared to purchasing printed booklets and would also assist in delivery of training in remote sites.

7.4 An investigation into the viability of an aviation-specific version of Practical Living for Shiftworkers should be undertaken. If this investigation determines such development to be viable and of value, it would not be a complex or expensive task to undertake.

7.5 All FMS users should be educated in FAID, or whichever computer-based package is being used. It is critical that management and flight crew understand what packages such as FAID should and should not be used for. Although discussed elsewhere, the use of risk management processes in conjunction with roster assessment is the most appropriate approach for managing work related fatigue.

7.6 If the training and education section such as that currently embedded within the Company Sky One template is considered valuable, then it should be incorporated into the overall training package. That is, it should not form a separate document or form a part of the policy for the organisation.

7.7 As a minimum, CASA should provide operators with a list of the topics that are considered relevant for flight crew fatigue training and education. Ideally, a training and education template would be provided by CASA as a part of an industry FMS toolbox. This would ensure that a minimum content is provided and that accurate, practical information is supplied by all operators to employees and their families.

Chapter 8: Personal Responsibility

8.1 The specific legal requirements of both individuals and managers should be distilled from the relevant legislation. This should then be incorporated into the training and education package.

8.2 Formal procedures for self-reporting of fatigue-related issues should be implemented. This should include a no-blame response from management at the time of the report. However, it is appropriate to include follow up interviews to determine the nature of the incident. This determination should conclude that the reasons are appropriate or not. In the cases where an individual, regardless of the nature of the difficulty, requires support, it should be made available by the organisation. If it subsequently determined that an individual is inappropriately using the self-report system, performance management processes may be appropriate.

Chapter 9: Effects on Operation

9.1 CASA should create case studies of effects on operations as reported following FMS implementation. This is likely to include both positive and negative observations and experiences and should provide an honest and practical way for other operators to optimise their own FMSs. Ideally, these would be provided early in the development stage.
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APPENDICES
APPENDIX A: DESCRIPTION OF FAID

A work-related fatigue model

The working definition of fatigue is that of a dynamic balance between two competing forces. That is, forces producing fatigue and forces reversing the effects of fatigue, that is recovery.

Essentially, the model allocates fatigue or recovery value to work and break periods based on four factors:

• duration of shifts and breaks;
• timing of shifts and breaks;
• prior (seven-day) work history of individuals; and
• biological limitations on sleep and recovery.

The information on which this model is based has been produced as a result of significant experimental studies into the effects of shift lengths, the timing of shifts and the importance of work periods at different times in the past. This experimentation has been undertaken over the previous decades at various facilities throughout the world. In addition to this information, the model has been developed and validated within our own facility, within simulated work environment and in field-based situations. The development and validation work is considerable as has been published in a range of international peer-reviewed journals and books (see references 1 to 7 below; these can be supplied to Union Pacific upon request).

The model does not make decisions on which work schedules are most appropriate in specific workplaces. What the model does however, is provide information that can be useful when decisions about fatigue management need to be made. Tracking fatigue scores in relation to incident frequency, absenteeism levels, employee sick days or other organizationally meaningful data would allow a clearer illustration of the relationship between hours-of-work and its related costs.

Defining the Scores Produced

To differentiate between schedules, four levels of work-related fatigue scores are defined. Standard fatigue represents fatigue scores up to the maximum fatigue scores produced for a Monday to Friday 0900 to 1700hr standard work week; that is, a score of 40. Moderate fatigue scores are those which are up to 200% of the maximum score produced by the standard work week; that is, a score of 80. High fatigue scores are those which are between 200 and 250% of the maximum scores produced by the standard work week; that is, a score of 100. Very high fatigue scores are those which are between 250 and 300% of the maximum scores produced by the standard work week; that is, a score of 120.

A recent study indicated that scores between 80 and 100 (that is, high fatigue) are equivalent to the predicted level of work-related fatigue achieved after 23-24 hours of continuous sleep deprivation (starting at 0800h). This result was observed when the sleep deprivation started at 0800h on a Monday, following a week working Monday to Friday 0900-1700h and with Saturday and Sunday off. Performance impairment at such a level of sleep deprivation has been associated with blood alcohol concentration over 0.05% in a recent study (8).
APPENDIX B: DOCUMENT CHECKLIST

_ Current FMS Policy
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Precursors to current FMS Policy
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Communications between CASA & operation (re. FMS)
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Communications between management & employees (re. FMS)
Notes:________________________________________________________________________________________
.................................................................................................................................

_ CASA FMS audit report
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Internal FMS audit reports relating
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Budget/expenses accrued for the FMS
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Training register
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Training materials
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Pre/post FMS rosters
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Grievance records
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Incident/hazard/occurrence reports
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Annual Report
Notes:________________________________________________________________________________________
.................................................................................................................................

_ Other relevant documents
Notes:________________________________________________________________________________________
.................................................................................................................................
APPENDIX C: MANAGEMENT INTERVIEW TEMPLATE

This interview is being conducted as part of an evaluation and validation of the FMS as a potential alternative to CAO 48. While CASA have commissioned this research, all responses you provide me with today will be completely confidential. Any documents, interview responses or other material you provide will be de-identified before included in any report.

I’m particularly interested in your opinions and experiences related to the FMS. I will ask you a series of questions – some of which will be supplemented with a circle response form – related to basic understanding and opinions of the FMS; the FMS impact on work operations; the FMS implementation process; and fatigue-related training and education.

I am interested in gaining as much insight as possible into your personal experiences and opinions of the FMS. If you have any stories that relate to questions asked along the way, feel free to interrupt me and share them.

General

Attitudes
How would you rate your overall satisfaction of the FMS in addressing fatigue-related issues? Please circle one:

Very Good    Good    Average    Poor    Very poor

How would you rate the overall usefulness of the FMS to manage fatigue? Please circle one:

Very Good    Good    Average    Poor    Very poor

What do you see as the major strengths of the FMS?

What do you see as the major weaknesses of the FMS?

In preventing fatigue related accidents/incidents, the FMS has been: (please circle one):

Very effective    Effective    Average    Not very effective    Not at all effective

Understanding

According to your FMS, what are the maximum number of hours that a person may be rostered to fly in a consecutive 24 hour period/week/month/etc? __________

What is the minimum break between shifts/per 7 days/ per acquittal period? __________
Work
In your opinion, does the FMS have a positive or negative impact on general work life? (please circle one)

Positive  Negative

Have you noticed any major changes in the company's operations since the implementation of the FMS?

Rosters
What is your opinion of the fatigue effects of standby rostering? How is this addressed in the FMS?

Can you remember any incidents where flying operations were changed away from initial schedules because of factors such as weather, staffing, etc.?

Was fatigue considered/managed when making these changes?

Incident/Hazard/Occurrence Reporting
Have you ever received any incident/hazard/occurrence reports relating to fatigue?

Have you noticed any significant changes in the frequency or detail of fatigue-related reports since implementation of the FMS?

FMS Implementation
Can you describe the major steps required to set up your current FMS?

What was involved at each of these stages?

Who was involved at each of these stages?

Was there any union involvement before, during or after the FMS implementation?
What were some of the difficulties that were faced during implementation? How much time did each of the following take & who was involved?

- a. developing FMS policy;
- b. documenting budget/resources;
- c. auditing the impact of FMS on operations;
- d. auditing rosters with the use of FAID;
- e. developing contingency plans;
- f. designing and administering education/training programs;
- g. reporting incidents/hazards/occurrences;
- h. assessing the impact on aircrew quality of life; and
- i. recording assistance/interaction with CASA – ease of use; understandability; roster analysis.

How was the fatigue benchmark set? What is it? In your opinion, what should it be? What is this based on (ie. data collected, experience, flight crew reports, etc.)?

**Training & Education**

What sort of communications did you give to flight crew re. FMS? What forms were they in?

How would you rate the overall usefulness & effectiveness of the training program? (please circle one)

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
<th>Very Poor</th>
</tr>
</thead>
</table>

How was the training delivered? Eg. classroom, workbooks, handouts, etc.

What were the major topics covered?

Was there anything not covered that you would have liked to be included?

Was there anything that was included that you think wasn’t necessary?

Do you consider training and education as an essential part of the FMS?
Theoretical v's Actual

In your view, what would be the overall goals and objectives of an ideal FMS? (provide a list)

How well do you think the actual FMS you’re operating to reflects the ideal model? (please circle one)

Very well    Well    Average    Not well    Not at all

What are the specific differences between the actual and an ideal model?

What needs to be completed in order to achieve the ideal goals with the current FMS?

How have you gone about doing these so far?

Do you have any plans to further these in the future?
**APPENDIX D: FLIGHT CREW INTERVIEW TEMPLATE**

This interview is being conducted as part of an evaluation and validation of the FMS as a potential alternative to CAO 48. While CASA have commissioned this research, all responses you provide me with today will be completely confidential. Any documents, interview responses or other material you provide will be de-identified before included in any report.

I’m particularly interested in your opinions and experiences related to the FMS. I will ask you a series of questions – some of which will be supplemented with a circle response form – related to basic understanding and opinions of the FMS; the FMS implementation process; the FMS impact on work operations; impact on your social life; and fatigue-related training and education.

I am interested in gaining as much insight as possible into your personal experiences and opinions of the FMS. If you have any stories that relate to questions asked along the way, feel free to interrupt me and share them.

**General**

**Understanding**

How well do you think you understand your current FMS? Please circle one:

<table>
<thead>
<tr>
<th>Very well</th>
<th>Well</th>
<th>Average</th>
<th>Not well</th>
<th>Not at all</th>
</tr>
</thead>
</table>

What is the maximum number of hours that a person may be rostered to fly in a consecutive 24 hour period/week/month/etc? ___________

What is the minimum break between shifts/per 7 days/ per acquittal period? ________

How was the fatigue benchmark set? What is it? What should it be? Why?

**Attitudes**

How would you rate your overall satisfaction of the FMS? Please circle one:

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
<th>Very poor</th>
</tr>
</thead>
</table>

How would you rate the overall usefulness of the FMS? Please circle one:

<table>
<thead>
<tr>
<th>Very Good</th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
<th>Very poor</th>
</tr>
</thead>
</table>

What do you see as the major strengths of the FMS?

What do you see as the major weaknesses of the FMS?

In preventing fatigue related accidents/incidents, the FMS has been: (please circle one):

<table>
<thead>
<tr>
<th>Very effective</th>
<th>Effective</th>
<th>Average</th>
<th>Not very effective</th>
<th>Not at all effective</th>
</tr>
</thead>
</table>
**FMS Implementation**

What sort of communications did you receive from management re. FMS? What forms?

In approaching management about fatigue/FMS/safety concerns, I feel (please circle one):

- Very comfortable
- Comfortable
- Average
- Not comfortable
- Not at all comfortable

**Work**

In your opinion, does the FMS have a positive/negative impact on general work life? Please circle one:

- Positive
- Negative

Have you noticed any major company changes since the implementation of the FMS?

Relative to pre-FMS, what are some of the major changes you have noticed for:

a. alertness at work
b. hours of work
c. time off
d. salary
e. annual leave

**Work Duties**

To what degree has the FMS impacted upon your work duties? Please circle one:

- Completely
- Some
- Not sure
- Slightly
- Not at all

How does the FMS affect your work duties?

**Rosters**

What is your opinion of the fatigue effects of standby rostering? How is this included in the FMS?

Can you remember any incidents where flying operations were changed?

Was fatigue considered/managed when making these changes?

**Incident/Hazard/Occurrence Reporting**

Have you ever reported a fatigue related incident?

Do you know of anyone that's every reported a fatigue related incident?
Commuting
Do you feel that fatigue affects your safety/driving performance commuting to/from work?

Approximately how far do you have to commute to and from work? ___ km’s; ___ mins

Training and Education
Have you received any training/education re. Fatigue/FMS?

Did you receive any training prior to FMS implementation?

How was the training delivered? Eg. classroom, workbooks, handouts, etc.

How would you rate the overall usefulness & effectiveness of the training program? Please circle one:

Very Good    Good    Average    Poor    Very poor

Do you consider training and education as an essential part of the FMS?

What were the major topics covered?

Was there anything not covered that you would have liked to be included?

Was there anything that was included that you think wasn’t necessary?

Social (non-work)

Sleep
Do you sometimes feel that your sleep is shortened because of non-work commitments? Do you think this is because of the way your roster is scheduled?

How would you improve this situation?

Relative to preFMS, have you noticed any changes in the opportunity you have for sleep?:

• Timing?
• Amount?
• Quality?
Social Time

Relative to preFMS, have you noticed any change in the quality or amount of family time you receive?

To what degree has the FMS impacted upon the time you receive for your social life? Please circle one:

<table>
<thead>
<tr>
<th>Completely</th>
<th>Some</th>
<th>Not sure</th>
<th>Slightly</th>
<th>Not at all</th>
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To what degree has the FMS impacted upon the quality of your social life? Please circle one:

<table>
<thead>
<tr>
<th>Completely</th>
<th>Some</th>
<th>Not sure</th>
<th>Slightly</th>
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</table>

Relative to preFMS, have you noticed any other specific effects on your social life?

Fatigue Effects

Have you ever felt that your performance/alertness was impaired by fatigue? Describe.

How much sleep do you try to get per 24-hour period? Different for day/night sleep?

Do you feel personally responsible to ensure you sleep in the times you’re supposed to?

+ Sleep diaries

Ideal v’s Actual

In your view, what are the overall goals and objectives of an ideal FMS? (provide a list)

How well do you think the actual FMS you’re operating to reflects the ideal model? Please circle one:

<table>
<thead>
<tr>
<th>Very well</th>
<th>Well</th>
<th>Average</th>
<th>Not well</th>
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What are the specific differences between the actual and an ideal model?
APPENDIX E: STATEMENT OF WORK

Background

At present, twenty commercial air operators (Annex A) have been granted CASA approval to manage fatigue in flight crew using Fatigue Management Systems (FMS) as an alternative to Civil Aviation Order (CAO) 48. The use of such systems in this context is seen by CASA as a field validation of the FMS concept previously employed only in the surface transport industry.

The purpose of this contract is to conduct an evaluation of the effectiveness of the FMS as a process for regulating fatigue in aircrew employed in domestic flight operations and as a potential alternative for CAO 48.

A CASA approved FMS includes the following components:

- Document Control
- Policy
- Identification of Fatigue Risks
- Fatigue Risk Control Measures
- Education and Training
- Consultation
- Communication
- Fatigue Monitoring
- System Review
- Responsibility and Accountability
- Contingency Planning
- References
- Transition Arrangements

Statement of Work

1. Complete a literature review sufficient to establish the scientific context for FMS as a fatigue management strategy.

2. Assess, (through document review, onsite visits, interviews, and the use of survey instruments as appropriate) report and compare management and flight crew attitudes and opinions about the FMS including but not limited to:
   2.1 Ease of use
   2.2 Understandability
   2.3 Overall satisfaction
   2.4 Its impact on aircrew Quality of Life and
   2.5 Overall usefulness.

3. Using FAID as a tool, describe the levels of fatigue present under the FMS and compare these fatigue levels to those present under the operator’s previous CAO48 exemptions. This evaluation is to consider both normal and abnormal operations

4. Describe the effort and training required for operators to set up and administer an FMS.

5. Describe the effort and training required for CASA to set up, administer and audit an operator’s FMS.
6 Describe how the fatigue level benchmark was set and evaluate its appropriateness in terms of
   6.1 Operational impact
   6.2 Control of aircrew fatigue
   6.3 The frequency with which FAID scores exceeded the benchmark.
   6.4 The frequency with which FAID scores did not exceed the benchmark but probably should have
       i.e., inherent operational insensitivities of FAID
   6.5 Realistic representation of an operational fatigue limit.
7 Describe and evaluate the effectiveness of the Operator’s FMS policy statements.
8 Describe and evaluate flight crew members awareness and practices with respect to their responsibility
   for ensuring that they obtain sufficient sleep prior to duty.
9 Describe and evaluate the effectiveness of the Operator's fatigue training program.
10 Describe the impact of the FMS on:
    10.1 Industrial harmony
    10.2 Productivity
    10.3 Cost/benefit
    10.4 Incident, hazard and occurrence reporting
11 Describe and evaluate the effectiveness with which unanticipated changes to flying operations were
    managed i.e., were fatigue-related risks identified and/or managed?
12 Comment upon the effect (if any) of standby rostering and travel to/from the workplace on fatigue levels.
13 Make recommendations as appropriate.

Timeframe

The contract will commence on 1 May 2002 and end on 31 December 2002.

Deliverables

1 A detailed research proposal and work plan incorporating the items listed in the Statement of Work
   and other potentially useful considerations is to be submitted to CASA for approval before any data is
   collected or onsite visits are completed. Due Date 15 May
2 A progress report is to be submitted to CASA by 15 July 2002
3 The final report addressing all items on the agreed work plan is to be submitted to CASA by 31
   December 2002.
APPENDIX F: FLIGHT CREW MEMBERS’ ATTITUDES AND OPINIONS TOWARDS THE FMS (TRANSCRIPT)

1. Flight Crew
Interviewer: How would you rate your overall satisfaction of the FMS?
Flight Crew: Average.
Interviewer: Do you want to expand on that?
Flight Crew: There are some areas where technically with the system, we can legally do the work but it may be a very, very long day, like for example, I did a flight a flight down south one time and it ended up being about an 18 hour day. It was a split, we had a few hours off, but I could do that night, come back, have four hours sleep and then work the next morning. At night, really bad weather, and technically you’re really tired at the end of the shift, sleep three or four hours and then get to work again.
Interviewer: How would you rate the overall usefulness of the FMS? In managing fatigue?
Flight Crew: Probably good. It definitely does if you look at the points…making sure you get the right amount of sleep from finish time until the start time of the next shift.
Interviewer: What do you see as the major strengths of the FMS?
Flight Crew: The major strengths are that because all your work is programmed in, you can’t do any dodgy things. Like if you have a standby period at home, normally with CAO48 you could just do that because there isn’t a record of it, whereas the FMS probably requires you to account for that.
Interviewer: What do you see as the major weaknesses?
Flight Crew: Definitely the longer hours.
Interviewer: Has that changed a lot?
Flight Crew: It has yeah. For example, under CAO48 the maximum you could really work was 11 hours normally, you could extend up to 12 hours, technically you can go up to 18 or19 hours.
Interviewer: So that happens?
Flight Crew: Very rarely. I supposed that's only one time I've done 18 hours but normally I don't get close, the maximum might even be three or four hours of flight or duty time.

2. Flight Crew
Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue-related issues?
Flight Crew: Are we talking how it measures fatigue?
Interviewer: Yes.
Flight Crew: Poor. Purely because in our business it doesn’t take into account risk, task associated risk, which I think it should be doing. That's the main point that it should be taking into consideration that a guy, if he's out there at 2 o’clock in the morning, he's at far more fatigue risk than a guy swanning around here at the moment. Is that reasonable? Is that poor or is that average do you think?
Interviewer: It’s up to you.
Flight Crew: Well honestly, I think that's one thing its got to address in this business, quite heavily.
Interviewer: Instead of your overall satisfaction, how would you rate the overall usefulness of the FMS in managing fatigue?
Flight Crew: With regard to putting it on the computer, in its present form, it's fine. I mean if you take away the risk assessment and all that sort of thing and you get on the computer and you say OK who's at most risk, yeah, its easy to see who you don't roster on the next card, under its present form, but it doesn't tell me whose tired and who isn't. As I said, the standby thing is a classic. Because some of the new captains don't sleep very well, or even some of the older guys, don't sleep very well when they're on nights. Its obviously tiring which what this is...

Interviewer: You've said a couple of the negatives of the FMS, do you see any positives of the FMS?

Flight Crew: I think modified, it's a fit. There have got to be better ways than CAO48, there's no doubt about that...

Interviewer: Better as in more flexible, or...?

Flight Crew: Better as in more flexible in our business but also 48 was never a good measure of whether you were tired or not was it? I mean flying in the middle of the night is more tiring than flying around in the middle of the day, and 48 never addressed that, it did with its registered 10 till 6 and all that sort of stuff a bit, but if the system addressed the problems then yes, I think its got good potential, but it's a fair way off from where I sit right now.

Interviewer: And the negatives: you said it was open for abuse.

Flight Crew: Management abuse.

Interviewer: And its non task-specific?

Flight Crew: Non task-specific.

Interviewer: Is there anything else?

Flight Crew: It doesn't take into account that standby disrupts sleep patterns in some aircrew. How you measure that is not for me to say, but I know the guys, purely on a personal basis, they don't sleep well at night, so we roster accordingly. Or I won't say accordingly, we try and not put them on ??? because some of the older blokes will quite happily go on nights, they'll quite happily volunteering, so you manoeuvre your own people around to do that, but it doesn't ???

3. Flight Crew

Interviewer: How would you rate your overall satisfaction of the FMS? Please circle one:

Flight Crew: Average. We haven't actually been running it from day to day

Interviewer: How would you rate the overall usefulness of the FMS? Please circle one:

Flight Crew: Very good. Given a little time to mature, it will be good.

Interviewer: What do you see as the major strengths of the FMS?

Flight Crew: Flexibility from a company point of view. Compared to what we're operating at the moment is fairly updated, which is 50 years old. Could be very good. Most people realise that it's in the immature stages, but see its potential

Interviewer: What do you see as the major weaknesses of the FMS?

Flight Crew: What the main weakness was, that it didn't really account for the type of operation. It didn't really differentiate between pilots flying light aircraft, or airline category aircraft - risk assessment needs to be put in place. Too broad
4. Flight Crew

Interviewer: OK, so next question. How would you rate your overall satisfaction of the FMS?

Flight Crew: Very good

Interviewer: And the next one as well – as far as the usefulness of the FMS goes – just generally.

Flight Crew: Very good. Well, yeah, I suppose it is very good. I was going to circle excellent, but that’s starting to go a bit over board.

Interviewer: Alright, so what do you see as the major strengths of the FMS?

Flight Crew: Major strengths –

Interviewer: Compared to the old operating system

Flight Crew: Just I suppose – I suppose you can get the people who are trying to make their operation more efficient and pushing people to the limit. Under the FMS, you aren’t pushed to the limit – it’s a safe guard.

Interviewer: Do you feel less fatigued when you’re working 5 days instead of 6?

Flight Crew: Oh, it doesn’t make any difference to me, honestly. It’s not a particularly high demanding job.

Interviewer: Are there any weaknesses that you can see with the FMS?

Flight Crew: Nah, well I haven’t really thought about it that much. No. I do it because I have to – it’s my job

5. Flight Crew

Interviewer: How do you rate your overall satisfaction of the FMS in addressing fatigue related issues?

Flight Crew: Yeah, good.

Interviewer: The next one’s pretty similar but instead of your overall satisfaction how would you rate the overall usefulness?

Flight Crew: Very good. For us it’s good because it comes back and do another job or extend the day or whatever it might be.

Interviewer: And do you think it does control the fatigue?

Flight Crew: I think so. You need to have some limits in place, otherwise people will just keep pushing themselves, and I think this one’s just a little better than the CAO48 because you don’t have to have so many hours off the plane at 10pm and 6am and all that sort of rubbish. Its just too hard to remember all that as well.

Interviewer: So this one’s a lot more simple?

Flight Crew: Yeah, because if we’re away we just phone in our duty times and they’ll put it into the computer and give us our score or if we’re here every night we have to give our score to [the chief pilot] so he look at the sheet and say ‘he’s sitting on 50, he’s not really fatigued’.

Interviewer: So that probably falls into my next question, what do you see as the major strengths of the FMS?

Flight Crew: The ability to work any time, without restriction, or very little restriction. Like, for example, last Friday night I started work at 8.30 in the morning and I was flying around regional NSW and I did 2.5 hours of flying and then I came back and then at 4 o’clock I went to Adelaide and signed off back here at 1.30 in the morning. In Adelaide I had about three hours on the ground, whereas if I was under the old system of the extension I probably could have still done, I went into town, we dropped off the patient, had dinner in Rundle Street, and it just meant I could take that bit of extra time because I knew I wasn’t going to bust the limit, otherwise I would be having to stop. I was buggered when I got back and I didn’t get out of bed until lunchtime or just after lunchtime on Saturday.
Interviewer: Do you know what your fatigue score was up to?
Flight Crew: 72.2. We did the forecaster before we went and said a couple of hours in Adelaide for dinner put it all in the computer because I wanted to make sure it wasn’t going over 75.

Interviewer: So major strengths: its simpler than CAO48, and working time without restriction, are they the only strengths you see of it?
Flight Crew: Pretty much.

Interviewer: What about weaknesses, are there any weaknesses you can see with the FMS?
Flight Crew: Not that we have any problems, but I've spoken to other guys, it doesn't seem to be much different between a shift change, like between doing a week of days and a week of nights to get your body clock back into sync I don't think. They were talking about that but I haven't done any.

Interviewer: You mean it lets you change too easily, it's not hard enough?
Flight Crew: Speaking to the guys who do night freight and day freight, there's a company here that is on it I believe, they're mainly based in Melbourne and somewhere else but they've got a couple of planes here. They've got one aeroplane and two pilots for that aeroplane, well they've got a couple of aeroplanes but there's one in particular and the pilots swap around on a weekly basis because the plane pretty much works 24 hours a day. It'll do freight all day...

Interviewer: Is that [named operation]?
Flight Crew: No, the [operation]? Yeah, yeah, [operation], [operation] as well. I think [operation] is the main one, they only do five hours of duty because they're in a hotel all day, they swap around, normally do a week on, week off, or two weeks, two weeks. There doesn't seem to be much differentiation in trying to get you sleep pattern back.

Interviewer: That's interesting. Is that the only weakness?
Flight Crew: Yeah.

6. Flight Crew

Interviewer: How would you rate your overall satisfaction of the FMS?
Flight Crew: Poor. Not really set up for this type of operation - it's too broad and tries to cover too much - needs to be specifically written for a specific type of operation.

Interviewer: How would you rate the overall usefulness of the FMS?
Flight Crew: Poor. Management would think it's wonderful - pilots maximise time of work, which - not good for pilots - very difficult to try and work out in advance how things work out

Interviewer: What do you see as the major strengths of the FMS?
Flight Crew: Flexibility in rostering would be the major strength. No other strengths

Interviewer: What do you see as the major weaknesses of the FMS?
Flight Crew: Too broad a document - not specific enough to the operation

7. Flight Crew

Interviewer: Next question. How would you rate your overall satisfaction of the FMS?
Flight Crew: Satisfaction. What do you mean by overall satisfaction?

Interviewer: Satisfaction I guess in comparison to CAO48?
Flight Crew: OK.
Interviewer: Average? The next one’s similar, in managing fatigue how would rate the overall usefulness of the FMS?

Flight Crew: I mean, it’s obviously good because I’ve never come anywhere near it, as far as I know. Sometimes your fatigued and it doesn’t even register. So I might just go average on that one.

Interviewer: Do you feel that you do fly fatigued? Underneath the system or there is potential for you to fly fatigued underneath the system?

Flight Crew: There is, I mean, it’s going to be hard not to be. You have a late night or something like that.

Interviewer: Work related?

Flight Crew: Not really no, especially over here, because we have the weekend off. But when we are not over here we normally work Saturdays as well. Definitely need the time off, by the end of the week you sort of have to have time off. We are sort of doing fairly high flying hours as well.

Interviewer: Average. What do you see as the major strengths of the FMS as compared to CAO48?

Flight Crew: Well what side do I look at that, my side or the company’s side?

Interviewer: Both

Flight Crew: I can’t really see any strengths.

Interviewer: Come back to it anytime, what about weaknesses?

Flight Crew: Well there is the fact that they can work you more. Which I suppose is a plus for them and a weakness for us.

Interviewer: Have you heard about that happening in many operations?

Flight Crew: Not really, no. That’s a good thing with us we do 3 on and 1 off so it doesn’t really affect us as such. But there is always the thing that it could.

Interviewer: How would you rate your overall satisfaction of the FMS?

Flight Crew: As the FAID system?

Interviewer: The whole document.

Flight Crew: Well it’s getting tweaked now isn’t it? I’d like to see the parts sorted out for it because those are sort of in limbo at the moment, like the 4 hr part in it.

Interviewer: Would that affect your operation or the way that you operate?

Flight Crew: Yes, it would affect me. I find it to be pain in the backside to have to go, and put in my hours, and I think, oh gee I want to split that, oh heck I only had a 3 ½ hr break now I’ve got to call that a full duty. Doing away with that would make things a lot more user-friendly. As it stands at the moment, I would probably rate it as a just below very good. Closer to the average. But once its all done, which I believe it is going to be done, then I would go ??

Interviewer: In controlling fatigue, how would you rate the overall usefulness of the FMS?

Flight Crew: Same again.

Interviewer: What do you see as the major strengths of the FMS?

Flight Crew: My situation is slightly different. When I came into Australia and started applying here I went basically straight onto this FAID system because it was in its trial period. However, back in South Africa the laws regarding how many days off how many hrs max. to be flown in a period and two days off and then two consecutive days in a two week period and so on and so forth, those were also as convoluted in South Africa as they seem to be here.
I've had to look at the CAO48, and have had to become familiar with it and it exactly that, very convoluted and very difficult. Whereas this system I find to be far more user-friendly, I don't know that's the right term, but certainly it's a damned-side easier coming in the morning, putting in your start time and putting a finish time and it tells you if you're fatigued or not. Forecasting as well, so I can look ahead and say, I've had three or 4 long days am I fit to fly, or would I be fit to fly. I'm feeling good, I punch in what my expected future flying hours are going to be for the next couple of days and I get a result. And it says, 'yes you're fatigued' or 'no you’re not'. Okay it can change from one individual to another, but it certainly works as a guideline there and it's a benchmark, something to measure against. So yes, I prefer that system.

Interviewer: How often would you get up towards the upper limit?

Flight Crew: Oh, not very often. We've had a pretty busy month this month, but even if you look at my graph this month, I'm well clear of it. On one or 2 days probably got up to around the 75 mark....

Interviewer: And did you feel a significant difference in fatigue at that level?

Flight Crew: Oh no, I knew I was working, but I certainly wasn’t at a stage where I wasn’t going to be able to cope with the situation. I didn’t feel like I was up there. I was quite happy with that. And then when [the chief pilot] was on leave, and I had been doing all the flying, it was about a 10 day or 2 week period, again it was peaking up a little bit but nothing, and I didn’t feel fatigued either. The nature of our work, like now, I might be considered at work now, but I’d just clock off if I wasn’t doing this interview, I’d go home and have a snooze if I wanted to. It's not like e.g. cattle mustering in the outback, where guys do 10 -12 hrs a day, and flying all day and really struggling. We've got short periods of intensity and the rest is pretty relaxed.

Interviewer: So what do you see as a major weakness of the FMS?

Flight Crew: Really trivial type things. User-friendliness of the actual package (FAID specifically because I don’t know any of the other ones) just the filling in of the spreadsheet, I found a bug in the program which we’ve let them know about, - if you wanted to delete a couple of records off the spreadsheet, normally for a user-friendly package if you wanted to delete one record, there are two little widows that pop up, and you say, okay I want to delete record 45 and normally it would delete 45 and leave the second square blank. If you did that with this system, it just can’t. It had to have a start and end record number. So if you wanted to delete only one record, you’d have to say delete record 45 to 45. When you open the windows to put in the day the month the year and the time for your start for example, it has a format where you need a space between. But in the spreadsheet it gets ?? so then when you go to edit directly on the spreadsheet you have to remember to take the gaps out. They’re trivial things, not a big deal. But a little more thought could have gone into how the data entry is done and manipulating it as well. Every time you hit the enter key it could automatically go to organise the data, why would you have to go to select and re-orbit? I thought I found another bug but its not proven yet.....

Interviewer: So the only weakness you see is the FAID program?

Flight Crew: Yes, I've actually got 2 sets of data but I haven't had a chance to pursue it any further where 2 identical sets of data, I seem to get a different plot on the graph. The fatigue levels in the data, when you just print out the ? of the spreadsheets with the rest period and so on, they reflect exactly the same, but when you plot the 2 sets of data one graph peaks higher than the other. They follow the same pattern, but one just goes slightly higher. I haven’t pursued it enough to send it in and say, hey you’ve go a programming problem, but that's one that I'm going to pursue. There is another one, 5 minutes can make a vast difference in the program. e.g. if you put in 5 to 11 and then 1 minute past 11 it will make quite a difference. But I don't know how they get about that.
9. Flight Crew

Interviewer: OK, well perhaps we’ll start with the first question on your sheet: How would you rate your overall satisfaction of the FMS in addressing fatigue-related issues?

Flight Crew: I’d say good – um – I won’t be surprised if you or CASA wanted to bring our peak score down. But I think – ah – I’ll circle good. I think the big thing with child flight is that we have our standby crew. We fly 2 crew, and have a standby crew available. So you have that in the back of your mind. And it’s a great – and our operations are you know – and you’ll say ‘get home its’ or whatever you want to call it. You know saying ‘I’ll do this job and keep going and then I’ll be right’. Where here, when we come back to [the base], that’s it. So that’s different. And I think the other thing is that [our operation] flies 2 crew. And I think that’s – whoever did that way back in the infancy – you know when [our operation] first started – that’s a big thing. Um, and a lot of [this type of] operators if you take that deal, fly single pilot. And that’s great but – um when you’re getting worried about flying hours, that’s an issue. And then people can’t go to sleep for whatever reasons, and have not had a good sleep. Whereas if we’ve got 2 pilots, generally one will have a better sleep than the other one. So, I think, a combination of a number of things makes it work for us.

Interviewer: OK, great. The next question’s pretty similar: How would you rate the overall usefulness of the FMS to manage fatigue?

Flight Crew: Yeah – again, FMS you know, you’re not talking about FAID. FMS is very good if people have got the right attitude about it. And I also add in there culture – you’ve got to change people’s culture

Interviewer: You’ve obviously read the James Reason book, or the James Reason material

Flight Crew: Oh, I’ve seen the swiss cheese model, and things like that. But I think for a lot of people – yeah, I think again, it comes back to a lot of people being educated with the black and white line. And that comes back to CAO48. And see, I raised this with the company as well firstly with [a CASA representative] when he was at CASA. Pilots when we do our exams, and when we’re doing air law, we’re passing exams on CAO48. But now, they’re saying ‘throw out 48 and use a fatigue policy’. But, there’s no such thing in exams at the moment, and CASA will probably throw it into the exams. But every fatigue policy is different for every organisation. So what questions are you going to ask? So, you open up a whole new can of worms. So in any exams on air law, you’re talking about duty time and flight time. Yet, when I instilled the policy with [the CASA representative], he wanted to change the terminology to work and non-work, which is – a pilot when he’s doing all his study when you reach the CAO’s, it always talks about flight time or duty time. So, you get – straight away, you’re getting people a bit apprehensive, or they’re unsure. So yeah, for a pilot - you try to read the documents, and there’s a lot of grey areas in there. Even in the fatigue policy, there’s a lot of grey areas. And pilots will interpret it – I could read it, [pilot] could read it, and we’d come to a completely different conclusion. Now, I don’t think CASA has thought it through – they haven’t gone into it that deeply.

Interviewer: OK, so what do you see as the major strengths of the FMS?

Flight Crew: The great flexibility. At the end of the day, as a pilot, it allows me to get out and do my job, and not be inhibited, and not be restricted. But, it still pulls me up as far as safety wise goes. Um, every pilot is different, and some people get tired quicker than others. And that could be for a number of different reasons: they don’t sleep well; you know, they’re rebuilding a house, whatever. They’re going through a marriage break up, and all those things. They’re running a small business on the side. So all those things are thrown into the melting pot.

Interviewer: And are they considered within your FMS or...?

Flight Crew: Well yeah, as [the chief pilot] said – in our case – and I can only talk in [this operations’] case, if we do any outside flying, we have to put it into the fatigue into our opsmart.
And if we’re doing – say you’re doing some labouring work or whatever, our first responsibility is to our employer. So, if we’re on duty, or if we’re on standby, we’ve got to make sure that we’re fit and healthy and able to do the job. So, I guess that comes back a bit to the person. That comes back to the attitude thing – people’s attitudes.

Interviewer: So, you just said the strengths – what about the weaknesses? Do you see any major weaknesses of the FMS?

Flight Crew: There’s a lot of grey areas in there and I think if you get operators or employers, they can, yeah push people right to the limit. And that’s where we’re lucky with [the chief pilot] and the organisation here – and plus the other pilots – everyone’s got a good attitude. And yeah – that makes a big difference.

Interviewer: So that’s the main weakness – that it’s open for abuse, or…?

Flight Crew: Yeah – and I think that you need to sit down and. People don’t like change – no matter what. And people are very regimental and you know. So, you’re talking about changing a culture through aviation. And you’ve got a pilot that’s been flying for 20 years, always used to CAO 48, not change, or couldn’t be bothered – doesn’t want to learn about it. So, I would say education 7 hours, whatever you want to call it – you’ve got to try and change people’s mindsets, or whatever.

10. Flight Crew

Interviewer: How would you rate your overall satisfaction with the FMS?

Flight Crew: Its fine because I was basically working its got noisy in here, sorry about that.

Interviewer: So do you want to circle that...

Flight Crew: Its fine, yeah, its very good.

Interviewer: How would you rate the overall usefulness of the FMS in controlling fatigue?

Flight Crew: Excellent, because just the course we did with the booklet and all the rest of it gave us clues about how to control fatigue

Interviewer: What do see as the major strengths of the FMS? Were you operating under CAO48?

Flight Crew: Obviously I prefer CAO48, I got two days off, I only had to work five days. So quite frankly, the fact that I signed a contract previously to work six days anyway when the company had an exemption from CAO48. So I don’t like that - anyway, I’m pretty used to working six days a week. So really the FMS has just been an advantage because I now get a set day off whereas it used to vary, and so I’ve now got a set day off and an extra day off occasionally, depending on the numbers we’ve got.

Interviewer: And its busy at the moment isn’t it?

Flight Crew: Relatively quiet at the moment. Its medium, we’re not flat out.

Interviewer: So do you see any other strengths of the FMS compared to...?

Flight Crew: I was very interested in the booklet that we... the training booklet, which was excellent.

Interviewer: So it raises awareness do you think?

Flight Crew: Yeah, its helped me out at home and the way I sleep and all the rest of it.

Interviewer: And what do you see as the major weaknesses of the FMS?

Flight Crew: I can’t really say any weaknesses, in the sense that its really just the way CAO48 ???
**11. Flight Crew**

Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue related issues?

Flight Crew: I’d probably say poor to very poor.

Interviewer: How come?

Flight Crew: I think the FMS as it stands at the moment, is maybe a little bit too simplistic for the aviation environment to be quite honest. I understand that start work early and work long hours and things like that, you’re going to be reasonably fatigued, vary the hours it’s going to be fatiguing, however it doesn’t address the stresses of the aviation environment and how they affect fatigue, that’s basically it.

Interviewer: If you had to circle one?

Flight Crew: I’d probably put it about there.

Interviewer: The next one’s pretty similar but instead of your satisfaction, how would you rate the overall usefulness of the FMS?

Flight Crew: As it stands I’d probably again say poor but I think it has potential with more development, so I’d go there.

Interviewer: What do you see as the major strengths of the FMS?

Flight Crew: It does provide you with a bit more operation flexibility. CAO48 and the various exemptions have what I call a number of hard limits which while were well intended may not necessarily do anything to improve the safety of a particular flight. If we’ve got a guy bumping up on a hard limit, say 100 hours, its hard to say that if he goes to 142 that he’s going to be unsafe, and yet that’s totally illegal. I think there should be provision for the whole situation to be looked at and the guys continue to fly as long as they’re feeling. So FMS does offer a bit more operational flexibility.

Interviewer: Is there anything else you can see as a strength?

Flight Crew: It should be a reasonably predictive tool and useful in a rostering basis.

Interviewer: And what about the major weaknesses?

Flight Crew: As I see it at the moment probably too simplistic. I understand you can modify the FMS score by classifying task as high risk and so on, there needs to more direction or more thought put in to how that should be applied within the aviation environment, maybe more research in the actual effects of various types of operation on fatigue. Simplistic, that’s probably it I’d say.

**12. Flight Crew**

Interviewer: Next question on the sheet. How would you rate your overall satisfaction of the FMS?


Interviewer: The next one’s very similar. How do you rate the overall usefulness of the FMS in managing fatigue?

Flight Crew: Very good.

Interviewer: What are the major strengths of the FMS?

Flight Crew: That one’s answered too. In the fact that we can work that seven days. Like a lot of our work, we good day on the seventh day.

Interviewer: What do you see as the major weakness of the FMS?

Flight Crew: Having to phone in your hours everyday.
Interviewer: So more administration for you?

Flight Crew: It's not bad when you become a habit. Especially because we are a half an hour behind here, up there in Brisbane, by the time you land and if you land at half past four and its five o'clock up there everybody has gone home.

Interviewer: Is that the only weakness, do your think?

Flight Crew: It's not really a weakness, but a very small irritation. I don't know if there is any weakness in it ??? I would have to really think to see if there is any weaknesses in it. Not as far as I know of anyway.

13. Flight Crew

Interviewer: How would you rate your overall satisfaction of the FMS as it is currently?

Flight Crew: The system I think is good, its only the application itself that lets it down. The FAID application, the software application.

Interviewer: How do you mean?

Flight Crew: It was originally designed for train drivers and it so happens I worked in the railway prior to this so I think it could be changed, and I think that's what it needs is someone to sit down with the program and change it to aviation specs.

Interviewer: So what sort of things need to be addressed?

Flight Crew: [the chief pilot] and I were just discussing this. Different levels for different jobs. I mean we've got charter, air work, SAR, air work includes a hell of a lot of things, it can include transporting government agencies around which is part of air work, its not charter, its not paid for so it's a little bit higher, however if someone slings for the same amount of hours you're going to be a lot more tired.

Interviewer: What's slings?

Flight Crew: Slinging loads and slinging aerials. Maybe fire fighting with a bandy bucket, a bucket underneath, that's a lot more dangerous than just travelling with passengers, and that's where...its very difficult to manage, especially with the 206 the single engine pilots, because they have three different tasks and they're all interchangeable, and they're all different levels, so to administer it and keep an eye on all those ???

Interviewer: So how would you rate the...

Flight Crew: I think I like it. It's a lot better than the old 48.

Interviewer: A lot of people have said that. And the next one as well, how would you rate the overall usefulness of the FMS Flight Crew compared to CAO48?

Flight Crew: Again it's the application itself, not the system. I wonder what they are getting at there? Is it the application?

Interviewer: Well, the system itself, how it works within your operation?

Flight Crew: From my perspective, it works very good. Ours is pure and simple, we don't do charter so its one or the other.

Interviewer: And what do you see as the major strengths of the FMS?

Flight Crew: I think the majority of the rules pertaining to its use are quite simple to use, it wasn't difficult, because I had to basically instruct my people how to use it and it was very simple, unlike 48 which is Flight Crew implicated.

Interviewer: And that's a major strength?
Flight Crew: well, it's been only six weeks...

Interviewer: Alright, what do you see as weaknesses?

Flight Crew: Again, the software application. If I would just explain that... What I did when it first came about, obviously we would enter our times in there and get as are, no problem. However, it didn’t allow us to enter our hours we’d flown, what types of flying it was. So what I did was I brought about an Excel spreadsheet and we had a bit of help from the guy the put the FMS in as well. So I brought that about and basically do all the calculations in FAID then you have to cut and paste the points are and put it in. No! I missed a step. Firstly you put your times in Excel, it then converts it to a time that's compatible with FMS, you cut and past that and put it into FAID, calculate the scores and then put it back to Excel ??? I think there's something like 36 different steps. So that's where the biggest downside of that is. And everyone ??? and for people who are computer literate...

Interviewer: Yeah, its not very user friendly is it?

Flight Crew: Its not very user friendly.

Interviewer: So do you think its reasonable that different operations, say SAR, would have a different FAID Flight Crew score from charter?

Flight Crew: Yeah.

Interviewer: They do at the moment don’t they, 75 for charter. Do you think the scores are fairly reasonable, too low or too high or it varies between different weather conditions or...?

Flight Crew: Yeah, that's a point, I never thought of that. Its going to be more stressful the worse the Flight conditions, but definitely in the area of air work there's a thousand different jobs you can do in air work where there's no allowances. Its difficult to say because I don’t fly line all the time, I do more administration with a lot of air work in between. And I work long admin hours but I include those as work hours and I go very close to the maximum score...

Interviewer: But you probably wouldn't feel it a much as somebody that was flying continuously...

Flight Crew: That's right.

14. Flight Crew

Interviewer: As far as your attitudes towards the FMS goes, what's your overall opinion of the FMS – as far as how effective it is, ...

Flight Crew 1: I guess going back in the history of the minutes, it was probably outdated – we’ve gone from that sort of system, to a system where we had exemptions to CAO 48, and you know – special exemptions for specialized operations – so obviously approved by CASA. So, yeah, I think that we’ve gone from something that was overly restrictive, through to something that was designed for particular operations, it may well have been better designed, but it was tailored at that, to something that, well at the end of the day comes down to, well, how do you feel, which is terribly subjective and – well, with fatigue, the more fatigued you get, the less capable you are of making those decisions. So, when you’re sitting at 13.5 hours of work, and trying to decide well, am I fatigued or not, the management system, I don’t think, gives you a lot of help in making those decisions. Um, and like I say, it just comes down to feelings. I mean with FAID, you’ll note that at 14.5 hours, you’re no where near the limiting score. And that's about the same when you’ll start to think ‘am I nearing my limit?’ but the FAID programme specifically, I don’t think, gives you any support, assistance, in helping you make that decision. Out of a score of 80, we’ll be sitting at 35 or something. Whereas you’ll think it's much higher.

Interviewer: And do you [LOOK AT OTHER PILOT] think the same?
Flight Crew 2: I think it’s good – if it’s used – well, [the other pilot] put up a valid point over there. And one of the limitations of the CASA – one of the areas of risk assessment. If you maturely use the FMS, I think it can be extremely advantageous for the organisation. It’s difficult to correlate a lot of information to keep the FMS simple. And it’s been my opinion – to keep it as simple as possible without compromising safety – the simpler the better.

Flight Crew 1: For this sort of operation, you need to make a decision - NOW

Flight Crew 2: Yes, there are problems with it, but the company’s dealing with that

Interviewer: What do you see as the major strengths of the FMS?

Flight Crew 1: Identification of problems such as sleep inertia - I define that as a possible cause of aircraft accidents - that’s sort of been brought out. If you wake up, plan a round trip, and then later run out of fuel, well then sleep inertia may well have been a cause of that accident. It’s probably caused a lot of discussion and unease amongst pilots – it’s hard to correlate that to the fatigue management system – it doesn’t seem to fit.

Flight Crew 2: From the pilot’s point of view, it’s flexible to an extent as well. One thing that I’ll pick up on there is that due to the contentious nature of any fatigue management system, it’s increased the volume of knowledge due to the contentious nature of it. I think it’s just increased the knowledge of all the pilots tenfold. I think that’s the major plus – that people actually understand the FMS.

Interviewer: And what do you see as the major weaknesses of the FMS?

Flight Crew 2: FAID – however, that’s being addressed at the moment. I don’t want to see it any more complicated than what it actually is.

Interviewer: and limitations?

Flight Crew1: Well, there’s a whole bunch that I could say here. I just feel that the rest periods – you shouldn’t assume that your rest periods at work – that you’d rest the same as what you would if you were home resting in your own bed. If you get to work and work for an hour, log off, it now assumes that I’ll be recovering from fatigue at the same rate I would be asleep at home in my own bed. You know, I only just got up hours before – I’m not going to go to bed at 8.30. I am becoming more fatigued as the day goes on. And so, if I don’t do a job until that night, FAID says – oh no, he’s fine, in fact better than when he started this morning.

15. Flight Crew

Interviewer: Next question: How would you rate your overall satisfaction of the FMS?

Flight Crew: Average to good

Interviewer: Yep, what do you think could be better?

Flight Crew: Um, I think the computer to change it over from the old programme to the new one – and the thing that I probably find most fatiguing about all this is all the paperwork. And ah,

Interviewer: has that increased a lot?

Flight Crew: Yes it has. And we have a system at the moment, which uses an ops - ah - it's called a CRS, and ah, we have to do that. Originally when I first came to this job...

Interviewer: What does CRS stand for?

Flight Crew: I don’t know – no, I’m not very smart. He designed the system to allow us to keep track of all the missions that we’d been on and all the data break down. So when we needed to talk to the health fund about money or analyse things, it was all there. And then opsmart came along and the idea of the opsmart was to be compatible with the FAID system, and also be compatible with the CRS. And that hasn’t happened. Now whether it’s going to happen and it’s just a transit period, I’m not really sure, but I don’t really have
a great confidence at this stage. There are people that are a lot smarter than me, or not smarter, but a lot more aware of the situation that will make - I mean they're going to sort it out. So, I think when that comes about, it will be a great thing.

Interviewer: OK, the next question on your sheet is pretty similar, but rather than your overall satisfaction, how would you rate the overall usefulness of the FMS in managing fatigue?

Flight Crew: Oh, good.

Interviewer: Great, OK. What do you see as the major strengths of the FMS?

Flight Crew: Flexibility – it extra flexibility which is a good thing.

Interviewer: Is that a good thing for you as well as for the company?

Flight Crew: Yeah. But if you want me to say the weaknesses, I believe that an unscrupulous operator, which we don't have here, could take advantage of that flexibility, and ah. You know, if [the chief pilot] was to resign tomorrow and we were to get someone of a different nature come in, it might get a bit ugly. Yeah.

Interviewer: Is that the only weakness you see?

Flight Crew: Paper work, like I mentioned before.

16. Flight Crew

Interviewer: How would you rate your overall satisfaction of the FMS? Compared to your old dispensation?

Flight Crew: Good.

Interviewer: Instead of your satisfaction how would you rate the overall usefulness of the FMS in managing fatigue?

Flight Crew: Good.

Interviewer: Stops people flying fatigued?

Flight Crew: Yes, as best as you can humanly possible do, yeah. I mean its still a lot left up to the individual, you know.

Interviewer: So you said one of the strengths of the FMS is that its more aviation oriented, are there any other strengths you can see of the FMS over your old dispensation?

Flight Crew: I think its more of a freedom to leave it back to the individual of how he feels.

Interviewer: So more responsibility on the individual?

Flight Crew: Correct.

Interviewer: Do you think the individual takes that responsibility pretty well?

Flight Crew: At this level of flying, yes.

Interviewer: Is that the only strength?

Flight Crew: That one, and I think it makes you more aware of how fatigue comes into the work place. Especially shift working.

Interviewer: So they're the strengths, what about the weaknesses, have you seen any major weaknesses associated with the FMS?

Flight Crew: No, because I haven't had that much to do with it. Just going through it in the in-house auditing.

Interviewer: What sort of auditing processes have you had?

Flight Crew: When I first started here in January this year, I read through the handout that the [chief pilot] gave me.
Interviewer: was the handout the actual FMS?
Flight Crew: Yes, and then prior to starting shifts here we went through it all and discussed my answers to questions and different things that I thought were appropriate to add to it or take away from it and then three months later we went through it again to make sure I was up with it and understood what was going on, basically.

17. Flight Crew

Interviewer: If you turn to the next question, how would you rate your overall satisfaction of the FMS compared to your old system of operating?
Flight Crew: Very good. I think one of the big things about having this FMS is that it brought home to everybody that ??? is an issue and we should only be working five days a week instead of six, because I worked for another company where ??? had to be brought in, ??? we moved and everybody suddenly realised they couldn't operate under the exemptions anymore ??? five days and everybody felt the difference, because you never actually had a complete day ??? Your evening off, you were flying in the morning and then you had your evening off so if you wanted to go out for a meal or something or other depending on your personal standards, and that was your relaxation, you had to get some sleep during the day before you went out for a meal, or if you went out for a meal and then by 9 o'clock you're nodding asleep and the following day you're ??? and then the following evening you've got to go to bed early again. So it wasn't satisfactory at all in terms of FMS, I think yes, it's actually ???

Interviewer: Excellent. Great. ??? How would you rate the overall usefulness of the FMS in controlling fatigue ???
Flight Crew: In controlling fatigue? I wouldn't say very good, and I wouldn't say average either. ??? I would like to say it was good, yeah.

Interviewer: What do you see as the strengths of the FMS?
Flight Crew: There's a lot of background information ??? with it, it gives a lot of guidance, whereas beforehand we were purely operating on 'you cannot do this, you cannot do that'.

Interviewer: So just reason behind the rules?
Flight Crew: Yeah, that's it. It gives you a bit of background, a little bit of information as well, ???

Interviewer: Anything else?
Flight Crew: We learnt a lot through the education of the FMS and about fatigue management, the onset of fatigue, basically we were educated in the actual ??? of fatigue which previously we hadn't, and that made a huge difference. Suddenly we were talking about ??? headaches or nodding at the wheel, I mean nodding is obviously quite a ??? that were actually mentioned in the booklet. And everyone was like ???, never knew that that was associated with it. And it just brought home to us that there are risks to our health rather than just feeling tired all the time. That's one effect but... it had huge benefits in educating the staff.

Interviewer: What about weaknesses, do you see any weaknesses related to the FMS?
Flight Crew: The big weakness I think with the FMS is that it has no control over what happens when you're not at work, you never know whether people are leaving here and then they're partying all night.

Interviewer: ???
Flight Crew: Well, in our Operations Manual and in our contract with pilots we are prohibited from having another occupation that is not approved by the company. That's not to say that they don't do it on the quiet.
APPENDIX G: MANAGEMENT ATTITUDES AND OPINIONS TOWARDS THE FMS (TRANSCRIPT)

1. Management

Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue-related issues?
Manager: Oh, it's very good. Circle?

Interviewer: Yep - circle, that's great. Next question, which is pretty similar: How would you rate the overall usefulness of the FMS to manage fatigue?
Manager: Um, I'd say good. It's not very good because I don't know. You'd have to look at it, and you've got to be able to appraise what you're doing as to whether you think it's very good. I don't think we're that far into it as to whether you say it's very good. But, we're getting there. It does is it's qualified what we put in the ops manual, and the be all.... the get out of jail is that we're not commercially pushed... the get out of jail is that if you're tired, we have a standby so there's no need for you to do the work. Because you know, there might be emotional problems or something that effect a pilot, and nobody knows about it. I mean, you're always the last to know. But um, that's the way it works. I mean, we've got someone to cover if you're tired, or if you're crook, whatever. So, it works well that way.

Interviewer: What do you see as the major strengths of the FMS?
Manager: Everything I've just said. It's enabled us to effectively provide a service and also adequately address fatigue issues without going too far one way or too far the other way. So, we've invented the rules, and this concurs with the rules, so the rules are pretty good.

Interviewer: And any weaknesses?
Manager: Haven't found any yet. Oh, the only weakness that I would say, is that it came out that we had to do 3 practice reports, as though some body had gone over.

Interviewer: Dummy reports?
Manager: Yeah, dummy runs. But, we, I mean, why do that? We all speak about it so regularly that the issues never come up. And we've gently gone forward. I mean, we had the FMS in for 3 months. Then we looked at extending the 2 hours. We trialed it for a month. Everyone was happy with it. And I think one of the things that did come up, was that it wasn't - it's a learning process for everyone I believe. And it's good to see that CASA are - rather than playing it with the big stick, and saying "this is the way you'll do it", you're actually consulting with us. Because, we're not going to dick around. We're not going to say oh 'we should be doing 10 more hours'. We're not going to use it as militant, to be regressive. Obviously in the industry it's there, trial it. If you find it's bad, say, but we're not finding it's bad, and I really, I've been around the other operators and the other services too. I've been at it for 22 years, and I don't get how people can be finding it that bad. I really don't. The thing is, as I said before, you've got to have a cut off line there, where it can't be abused, but it can't be underused either. I mean, you've got to have it there because the people who are auditing it have to know that it's sensible and have to have confidence in us. But as soon as you've got confidence in it I think it's fine.

2. Management

Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue-related issues?
Manager: Again, I would say that it should alert a company to the fact that people, within whatever limit it sets, reach that point that where they become impaired like they seem to be .05 alcohol, where we have a zero alcohol tolerance. From that point of view, it should point out
to them that there's a danger. Now it's whether or not the management chooses to accept it. So, yes it'll address it, but it won't, by itself, fix it. So if these guys in here, you know if the management of the company, decide "well hell I know that" but my job's still going flying, because I've got a job to do and that's what's got to happen. So it's not going to fix it, it's going to make people aware of the issue but...

Interviewer: So even 80's possibly too high a limit
Manager: You could say that 70 was too high a limit for some people
Interviewer: OK
Manager: You've got to put it back onto a personnel basis every time. I come from an agriculture background so I've flown the big haul, 15 hours flying, but it never bothered me, it wasn't a problem. But you can get guys to go out on any one day doing the platform work, you might go out and do 2 hours and just because of weather conditions or something, you're worn out. So you've got to stop. You can go out another day and you can do 5-6 hours and feel fine. So its got to be driven from the top, responsibility on the people doing the job, and the company and the management trusting their people. If they don't do it that way, all it will do is make whoever runs the system aware that these guys are over the limit, but if you don't tell them, or you don't use that information... Because a lot of aviation companies aren't going to get audited by anyone unless they have an accident, and if they have an accident, realistically they can just come back and say "we didn't really understand what this was. It was just something that CASA wanted us to do." Because CASA, they can put out no training, leave it to management, for the operators, they haven't run a forum and explained it all in any depth so that the guys understand. So there's a way out for anybody if something goes wrong. So yes it will highlight the relevant score for the person that's done it, if the information is put in correctly, but whether or not it fixes it comes back onto the management of any company.

Manager: From an information point of view, I would say it's very good. It gives us the ability to, as I said to you on the way over, if we can run it and say, this is the system we work under, and by running it through here, our guys are going to have the equivalent of .05 alcohol reading after the third day. But he'd be knocked back because we had a zero alcohol policy. Now our policy says that you will not drink after nine o'clock at night, if you are working the next day, so again, it comes back to your own company policy and that's in there as a back-up. Not because of it, but if we want to maintain back-ups, we've got to have good guidelines ourselves so that's why this has not been an issue, but it does give you the tools to say see, there it is on my paper, you can't work, and your guys are the same up the tower, so if you know your guys up in the tower are half-cut by three o'clock in the afternoon, because you're working them too hard. It's no different for a pilot versus a linesman climbing a tower, and that's what... and for us is the whole purpose. It's not just for pilots. But information-wise I'd say it's very good.

Interviewer: How about the overall usefulness of the FMS
Manager: If you use it when you're looking at contracts and things it's very good again because you can say look, these are our limits, so we can do that job because the aircraft can fly all day long, doesn't matter, but you have to pay for two pilots, it's going to be an extra cost to have two pilots there. So right at the start you can analyse the job plot the best way to do it, and you can do it with some sort of scientific justification for what you're going to say and then the power companies really can't argue with it. If the power companies were to take on these management systems as well, as no doubt in the future they will, well then they're going to be up against the same thing. So I'd say it's very good.

Interviewer: So, from what you're saying, I'm getting the feeling you might think it could be open to abuse if it's not managed properly.
Manager: Definitely open to abuse.
Interviewer: Is this more so because the FMS is relative to CAO48
Manager: We put limits ourselves as a company irrespective of whether you’re flying or just sitting on the ground, we can actually go and fly 8–10 hours a day as well as go and stand there for 8–10 hours a day, the thing doesn’t know any different, so all day you can put in just a low score because you’re just sitting on the ground, but we do all ours on high rating anyway, so you can make these guys go out in the field and fly all day long. In actual fact this is better than most concessions because if you’re just working daylight hours you could fly all day long and it depends what limits you set as a company. I think we said that if you’re going to fly over 35 hours in a week you cannot do it without speaking to myself. So it's whatever the hour limit we put on it. If this is going to do away with CAO48 and take away, our guys can do 900 hours a year plus 100 hours private, that’s a 1000 hours a year you can fly so this really puts no limit on flying, only puts a limit on flying as to what the company puts on it, so for unscrupulous operators it doesn’t matter what we have in place for guys like that its not going to change the way they’re doing things, they’re the sort of guys who are going to put an automotive bearing in a aircraft so therefore they crash because it’s the wrong bearing, but it was twelve dollars and the aviation aren’t concerned about it, and its round and it fits, so you’re not going to change, so this is only perhaps won’t be able to put whole reliance, have to look at it company by company basis and there’ll be companies where, like ourselves, I don’t believe because we get audited by the power companies I don’t believe CASA would need to audit us any more than once every three years when they do the re-certification audits, we can’t hide anything, but there will be companies that I reckon need to be audited every six months, if not more, its like how serious do they want to get about it. For us it was fine.

Interviewer: So what do you see as the major strengths of the FMS?

Manager: The ability to highlight the scientific background, how people react to working hours, that's what its being done for, it can then highlight areas as the guy said to us at the railway that whichever way they did it there was one area of the day you’re at risk, so then you can say to them, hey its between three and four you’re a real problem so be real careful, it doesn't stop the job, but it just highlights that that area of time you need to be extra careful, so from that point of view its good.

Interviewer: Anything else that you see as a major strength?

Manager: Well, lets say if they were going to make it run in conjunction with your AOC, your air operators, then that's fine that's one less thing you've got to do in twelve months, if they can get it sorted so that companies like [operation] aren't, because what I see will happen is there will be guys who will abuse the system, and they’ll go ‘how are we going to fix it?’, and then it will affect companies that are trying to do it right which is what happens now.

Interviewer: Is that in other areas as well or just the FMS?

Manager: It's in all areas. You'll get people who will abuse the system and people who will do it right. I mean we have to do it right because first we’re [a certain type of] contractor and second we have aircrafts to do it, most people go 'Oh, I’d like to have an aircraft because I really like to fly' and then ‘I'd like to find some work to pay for it' so they’ll do things at rates that they shouldn’t do it at, they’ll do it at rates that can’t afford, you know, they can’t afford to be pilots but they’ll do it all with one pilot, nine times out of ten they might get away with it but the tenth time they’ll have an accident, and then that’ll cause turmoil and then who can do what, and so forth, so the system is going to open to abuse, so I believe for it to work the system is going to have to be put in place on a company by company basis, and some companies will require auditing on a more regular basis and others won’t, if CASA aren’t prepared to do that and be serious about it, which they generally in the past have not been too serious about a lot of things and whether its because changes are coming from further up that are affecting them all the time I’m not sure, but it will be good if CASA is prepared to be serious.
Interviewer: what do you see as the major weaknesses of the FMS?

Manager: The weaknesses of it would be that if you give someone, like old Joe Blo out there, he's just a one man operation, you know struggling to make a dollar we'll give him a point score of 85, because he's only flying by himself, the guy's got a licence to go and do whatever he wants, they should make people in that situation and then keep them safe, for them to do that then they would have to charge a higher hourly rate which would allow them to do the maintenance properly on the aircraft, its not rocket science in what they can do, I mean you speak to CASA at any one time and they'll say 'We've got 32 applications for AOC', I mean why, we've got enough people going broke now, why do we need more people going broke, and then Joe Blo out there, he's not with the public, he's not any risk so really he's not our concern so we'll give him 85 or 90 and then just leave him go to it, and then if we give him a high score he's never going to bust it anyway so we don't really need to audit him anyway, so they're not actually keeping him safe, they're relying on him as a person. Now there's a guy who got pulled out of the sky, you know, got aircraft containers taking off ships and went through the aircraft pilot, you know the flying component twice your life, and he's up and running again now, they're not serious about doing anything, all these things get put in place are only going to hinder the people who try and do it properly, hinder is not the right word, but, we've gone ahead and done it, we've got it in place, and its taken time, money, effort to do it. These other guys, there's going to be generic ones of these printers, $300 you'd be able to buy one off Joe Blo, it'll go through, they'll have a fatigue management system, they won't need you to change about anything but they'll have one, and they'll have a nice influence score because there's a one-man operation running around out in the bush, nothing's changed, so as far as changing anything, nothing changes anything, its just another way for CASA to take their hand out of something and go 'we're not setting any guidelines CAO48 we'll set rules, you will not fly this, you will not do this, you will not do that, but its based on nothing, but if you have an accident while you are working inside of that thing that they said you could be, leaves them liable for litigation, by taking away CAO48 and putting it back on the company, and that's what they're doing.

Interviewer: Do you think that's a weakness?

Manager: Is a weakness because they're not controlling anything, they're not changing anything, they're just putting another system in place in place, they've changed nothing, in the aviation industry who are crooks, we all know the guys, you can't say that's the job you did did what you charge, well that hourly rate you can't pay for that aircraft, so what are you doing, what's not happening, if they want to get serious they could sort it out, they don't want to get serious so this isn't really going to change diddely-squat, its just going to take the hands out of one pilot they'll try and get everyone to have one, and have a photo of the generic ones out there, which they're already doing, someone will produce them, everyone will have one, nothing changes.

3. Chief Pilot

Interviewer: How would you rate your overall satisfaction with the FMS in addressing fatigue related issues?

Manager: How would you rate your overall satisfaction of the FMS...I suppose I put average, for certain reasons, but...

Interviewer: Do you want to elaborate?

Manager: The FMS really only controls what the staff person does at work, so as the chief pilot, I can only control what my pilot does at work, I can't dictate what time he goes to sleep, how much sleep he gets, what he does in the afternoon, what he does in the evening, and that is what more produces fatigue than what's happening at the workplace. And I don't know that that will ever be a control because that really comes down to their own common sense and their own attitude towards work really.
Interviewer: So do you think its as good as it could be?

Manager: Yeah, I think it is. It hasn’t really changed what we do in our operation at all, it just legalised what we do in our operation. So before we had the FMS we were operating the same way for eight years until it suddenly dawned on everyone that we were actually in contravention of the CAO48, which everyone had been misleading and so when we tried to operate to that it was extremely restrictive on the operation because of our hours. So we changed, the FMS really to legalise what we did for years and years and years. So it wasn’t like the FMS came in and suddenly our whole work thing altered, all it did was make it CASA approved.

Interviewer: How would you rate the overall usefulness of the FMS?

Manager: Probably very good, in terms of the FAID system and the way it all operates and comes together to help manage work related fatigue, its very good. And the FMS or the FAID system gives you something to base your reasons on. So instead of going to management and saying ‘you know, I don’t think he should work tomorrow, because he’s done this many days and he shouldn’t’, you can now simply whack it in the computer and it flags him as ‘yes’ or ‘no’. Its given you a benchmark to work on.

Interviewer: What do you see as the major strengths of the FMS? You said before that it legalises…?

Manager: Yeah, probably the major strengths of it are that using the FAID program basically gives the benchmark of whether someone can work or not, so instead of me just having to make decisions on whether I feel someone has done too many days or too many hours, it allows me to put it in the computer and say ‘yes I can’ or ‘no I can’t’. It takes the decision making out of management’s hands I suppose.

Interviewer: Are there any others that you can think of?

Manager: Probably for my staff its made us formulate more set rosters for them, whereas in the past we used to just work on a six-day on, six-day off rule, and you ended up with whatever days happen, because we didn’t have very many pilots it was a case of ‘oh, tomorrow’s quiet, you can have tomorrow off’ type thing, so at 8 o’clock at night you’d find out you had the day off. Now it wasn’t just pilots, that was management, everyone, whereas now everyone’s on a set roster and they know when their days off are next week within reason.

Interviewer: Is that ???

Manager: Yes, but with [this] industry it does always change, and because I have Saturday off I could’ve worked Sunday, so I could’ve changed the roster to work Sunday and rolled it around like that, but that would’ve impacted on everyone else there, so at certain times of the year we try to be flexible with it, but at other times it can be formulated, so its probably made us set the rosters more in concrete than we ever have, which for their families it has given them more forward planning on when their days off are.

Interviewer: What do you see as the major weaknesses of the FMS?

Manager: That it doesn’t control… that it can’t control what your staff do outside of work hours to a large degree.

Interviewer: Is that the only weakness you see?

Manager: Probably, in terms of the setting up of it. From the pilots’ point of view the FMS is probably quite excellent in terms of I make sure they’re knocked off at 11:30 and they’re gone. From management’s point of view its just a load of rot.

Interviewer: How much work has it been?

Manager: Not the actual running of the FMS its not a lot of work, once its set up its fine, the actual writing of the manual and the setting up of it took me hours and hours and hours, but the actual running of it, its fine. For me, I’m the management, myself and [colleague], we’re both on call 24 hours a day, so I might put on my thing that I knock off at 11:30, but I’ll get phone calls this afternoon and I’ll get phone calls this evening and I’ll get phone calls on my day off and that’s just management, you can’t have a document that says what you knock off you
can’t do. From the pilots’ point of view it’s excellent, I have something in place that says at 11:30 you’re gone, and they’re gone, and they don’t have anything to do during the day, so they can go home and have a three-hour sleep during the day and rejuvenate and things but for management it’s really tight.

4. Management

Interviewer: How would you rate your overall satisfaction with the FMS in addressing fatigue related issues?
Manager: I think personally it’s very good.

Interviewer: how would you rate the overall usefulness of the FMS to manage fatigue?
Manager: I think it’s good, but probably we could improve it a little bit. I don’t think it’s perfect, I think there’s room for improvement, so we’ll go along that road as we go, it’s an evolving sort of document.

Interviewer: What do you see as the major strengths of the FMS?
Manager: The biggest thing with the FMS is it gives the pilots clear understanding of fatigue, and presents them with solutions as to how they can avoid fatigue-related risk

Interviewer: Do you see any major weaknesses of the FMS?
Manager: Yes, I think the biggest thing is that the fatigue score can be misleading. FAID, used without any other measures and safeguards can lead to an inaccurate perception of fatigue, which can be just as dangerous as having no limit in place.

5. Management

Interviewer: How would you rate your overall satisfaction with the FMS in addressing fatigue related issues?
Manager: It’s a bit hit and miss on that, isn’t it? Basically as I said to you earlier I believe the FMS system is good, and its very good from our point of view, all it needs is a little bit of tweaking to make it a lot better. So I would call it very good.

Interviewer: How would you rate the overall usefulness of the FMS to manage fatigue?
Manager: I would say the same thing, gain it does need a little tweaking in the way we handle it.

Interviewer: What do you see as the major strengths of the FMS?
Manager: To us it’s the flexibility, compared with CAO48 anyway, we can look at a guys fatigue score and see how he feels and then we can send him back out again whereas the CAO48 he might have had one hour toady and one hour the next day and six consecutive days having one hour and he’s limited, he can’t fly the next day purely because CAO48 says he can’t. We have got the flexibility in this to put him on.

Interviewer: And how about the weaknesses?
Manager: The weaknesses are purely in the weighting. In other words an eight-hour duty is an eight-hour duty but if you’re flying long line work or if you’re flying charter and resting for four hours... For instance we have a couple of jobs in the Torres Strait, one is we do a long line job and the other is we may carry the medical people from one island to another. You arrive at the island, the doctor goes and does his work and you go to bed for four or five hours in the MAP upstairs with books and the TV, but at the end of the day they’ve both got exactly the same hours. So we’ve either got to change the score level or we’ve got to change the weighting system of the input. The problem of the score level as I see it is they change jobs over a week period, you might do two days long lining and two days medical, anyway that’s the sort of tweaking I believe it needs. Another thing is the FAID system; I believe the FAID system is completely not user friendly at all. It’s difficult.
6. Management

Interviewer: So if we answer your first question on your sheet, how would you rate your overall satisfaction of the FMS in addressing fatigue related issues?

Manager: I think it's very good. Very good to excellent. I mean it's not very user friendly in a lot of the program part, and we're still a bit messy in the manual itself, but that's only a case of tidying it up and refining it a bit.

Interviewer: The next question's very similar, how would you rate the overall usefulness of the FMS to manage fatigue?

Manager: Its great as far as we're concerned, because being a small organisation we do it in real time, we don't have to roster, we don't have our flight bases, when we are going to do something we can plan ahead, put it on the system, say yes, that puts us on the system. Because we actually have operations programmed a fair way ahead you can actually look ahead and take time off before the job as opposed to a lot of people where they have to take time off after the job, we can actually really set ourselves up nicely for managing it and it works very well.

Interviewer: What do you see as the major strengths of the FMS?

Manager: Flexibility.

Interviewer: Can you tell me how that's changed since CAO48?

Manager: We do a lot of out stuff privately and a lot of our stuff commercially and because there's an IFR component in what we do, an Instrument Flight Rating it really precluded us doing anything else. We'd do say a 2.5 hour flight in IFR out to a ship and then come back here and have 10 hours off waiting for our bloke to come in to the anchorage, so then we'd just have to go and do a 10 minute job to pick him up and bring him back which we couldn't do because of the 10 hour and 16 hour conflict, it was hopeless. And then even thought the bloke had been away from work for 8 hours or 9 hours it still had us constricted there, but its just useless.

Interviewer: So you're allowed to do that now completely within...?

Manager: Well, provided we manage the fatigue, provided you're fit to work that's really the only requirement, that's really how the system works, and to take rest when you say you're taking rest, not to fudge it and go and put a new roof on your house or something, that's all part of it, and that's what's in the manual. That's how that's written and that's what makes that an effective system.

Interviewer: So, flexibility, is that the only strength of the FMS that you see, or the main strength?

Manager: Its easy to use as well, and it cuts down on the paperwork and it cuts down on the accounting at the end of it when you can just present the graph and just say 'there we are that was my score all the way through'. Trying to write down the CAO48 tables and things was just a nightmare. I have nothing good to say about CAO48 at all.

Interviewer: What do you see as the major weaknesses of the FMS?

Manager: Well, people have to understand that you have to... It could be abused by people who don't take the rest effectively. It would allow an unscrupulous operator to drive people fairly hard. You're never going to beat the punching clock. If a person doesn't put their numbers down then it becomes inaccurate, so that's one of those issues. Its honesty in how things are done. But when we were doing things privately and commercially we had to separate them and before we had the CASA audit one of the things being said was 'well we're not quite sure about this mix of private and commercial'. I said, we don't do that now. When somebody comes in through the door, they log on with the FAID system and log off when they walk out the door. And that's what we consider the measure – the time they spent in the office,
and flying being part of being in the office as well. You can manage it quite nicely that way. But as I said, it can be abused by people doing short measures. And we don’t really want a punching clock at the front door, do we?

7. Management

Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue related issues?

Manager: You want comments on it or just...?

Interviewer: Circle and then comments as well.

Manager: I’d say at the moment it’s poor, because by its own admission you can work two 19 hour shifts back to back and that defies common sense and logic doesn’t it? Which is why we put in boundaries ourselves.

Interviewer: So does your FMS at the moment have those boundaries?

Manager: No.

Interviewer: It’s going to though?

Manager: The reason for meeting tonight is to finalise them, everybody has got to be happy with them, they’re the guys that have to work with it, there’s no point in giving them something that they’re not going to, or don’t want to, or dislike. That’s why its got to be a consensus, if that’s the right word.

Interviewer: The next question is pretty similar, but instead of your overall satisfaction, how would you rate the overall usefulness of the FMS?

Manager: Very good.

Interviewer: Did you want to expand on that at all?

Manager: After people have done the shift work booklet, done the test and some of the questions in it, you know, going to bed and getting to sleep, what’s the best way, male and female- every single one of us mentioned have sex. Or kiss the kids goodnight, or whatever. It’s true. Well somebody said it’s the original sleeping tablet isn’t it? Not going down that track, not going to touch that one.

Interviewer: So what do you see as the major strengths of the FMS?

Manager: Its making people realise that there is a fatigue consideration.

Interviewer: Makes people more aware...?

Manager: Yes, makes them more aware both that there is fatigue, that lifestyles will really affect fatigue. People are saying ‘I never really thought about that’ from doing the tests, well have a think about it, because everything that book talks about is common sense, but not many people have put it all together and used it to predict a fatigue level. People go ‘yeah, it does, I hadn’t thought about that’. I know that a couple of guys have changed their lifestyles a bit over it.

Interviewer: Even diet and stuff like that.

Manager: I was just about to say food and eating. They’ve changed what they eat before going to bed and getting a better night’s sleep.

Interviewer: It makes people more aware, are there any other major strengths that you see over the old operating system?

Manager: I think its allowed pilots to work every day, because under the old system, it really was unworkable in some areas. You might go out and do one hour of flying and you’d sit around for 8, 9, 10, 12 hours in a motel room, doing nothing, or you’d go for a walk or sleep if you wanted to, and jump back and do an hours flying at night, and that by any strength of the
imagination is not a hard day of work. Under the old system, unless you had dispensations you couldn’t do it, so the commercial practicalities have been over the impracticalities of the CAO48 have been overcome.

Interviewer: In that it allowed more flexibility?

Manager: It allows an operator to undertake chartered jobs for people that previously they wouldn’t have done because it entailed over-nighting, and they didn’t want to overnight, they wanted to come back that night, paying two pilots, that made the job too expensive so people wouldn’t do it.

Interviewer: So there are economic benefits as well?

Manager: From all three parties. If you apply the disadvantage rule there’s always three parties to consider, and each of those three parties has been advantaged by it.

Interviewer: Three parties as in the operator, the pilot...

Manager: The customer, operator, and the pilot.

Interviewer: So is there anything else you see as a major strength?

Manager: Its simplified.

Interviewer: You see it as much simpler?

Manager: CAO48 was always a huge can of worms, because under some of the dispensations you couldn’t do what you could normally do under straight 48, although it had benefits in some areas it had restrictions in other areas, and so people were using 48 for five days of the week and then they’d have a couple of off duty times and say ‘lets use the dispensation today’.

Interviewer: So it was either or.

Manager: Yeah. And then there were those who were saying now once you’ve got the dispensation your entire operation must be conducted under that dispensation which is probably right, but there’s a huge number of grey areas.

Interviewer: So we’ve talked about the strengths. What about the weaknesses? Do you see any weaknesses with the FMS?

Manager: As it exists there are a huge number of weaknesses. Obviously you can do two 19-hour shifts back-to-back, which defies every bit of common sense when you think about it. It allows people who just want to keep working and working and working to do exactly that, because its conceivable that you could work 365 days a year without a break under it.

It allows some commercial operators who might be a bit callous perhaps to just work people to death. They can say ‘hey, I’ve got a fatigue system in here, go and put your fatigue score in, your fit for flying. One of the weaknesses is getting management, I believe, to accept the statement for a pilot ‘I’m very tired, I’m fatigued, I don’t want to fly’. ‘What’s wrong with you, you’ve only got a fatigue score of… fly or lose your job.’ It’s the unspoken threat.

Interviewer: So it’s more of a change of culture, and that’s hard to achieve. Do you have any idea how that could be changed?

Manager: I think it should have boundaries put in but they’ve got to be very careful boundaries. I think the boundaries have got to be ‘pre-fixed by… may require…’ type statements because you put them in too definitely and there’ll be times when they’ll walk both sides of the boundary line, because they might have a couple of jobs on for a week and they’ll have one week in three years but they’ll need to get the job done, they’ll need to walk both sides of it. Because of that, I believe you’ll need to have a ‘may require’ statement rather than ‘thou shalt’.
8. Management

Interviewer: Firstly, how would you rate your overall satisfaction of the FMS in addressing fatigue-related issues?

Manager: I’d rate it as good. It’s definitely a substantial improvement over CAO 48 – that’s no question whatsoever.

Well, I’ve got a fairly diverse background in aviation. I’ve flown some airline stuff, I’ve flown regional, um… I’ve done a lot of corporate, charter, um, military flying. And it has been obvious for many years that it didn’t work for CASA. CAO 48 just doesn’t work in the sense that it’s very inflexible; they were never interested in changing the system. They didn’t respond to suggestions of well, there are other ways of doing this. What about American system of the 14 hours duty, 10 hours flying? I’ve done a lot of flying overseas, and worked in a lot of other operations, and ah, it was quite obvious that the Australian system was quite deficient in this area. Trying to find a better system is another problem of course. I mean, it’s very easy to knock things down… you know, if you’re going to criticize something, you really need to be able to offer a system which replaces the issue itself.

So, the actual concept of the system, I have no problem with. And from what I’ve seen of so far, it seems to be very satisfactory in the sense that it’s far more flexible. It’s taken away a lot of that inflexibility. There are some areas that I don’t agree with of definitions and interpretations and so on. The work and non-work for example. One thing you’ll find on [location], which you’ll have to take into account, is that very few pilots are permanent employees. We estimate the level of part time or casual pilots is around about 90%. There are very, very few pilots now who are full time employees.

Interviewer: The next one’s pretty similar, but instead of your satisfaction, how would you rate the overall usefulness of the FMS to manage fatigue?

Manager: I’d actually go to very good, because it allows that flexibility to mix, match and if a guy is tired, there’s no minimum requirement he can go back to. Whereas, with 48, you could have your minimum CAO 48 rest, come back and still be totally fatigued. There are some reservations about that. I mean you can do anything within your intention and the FAID system in this case. Ah, to rest the person, give them the required time off. You send them home and there’s that young baby in the house. That person could come back to work under either situation, equally fatigued. But I think this has more potential for handling it better.

Interviewer: Great, OK. This isn’t a circle one. You’ve already said that flexibility is a major strength of the FMS. Do you see any other major strength of the FMS?

Manager: Um, I think from the guys, the feedback that I’ve had from the guys, the major strength is that they’ve had input into it. And management in most of the companies are open to listening and to changing the situation if they need.

And if you want the corollary of that, what’s the biggest disadvantage: the biggest worry of the guys operating under the system is that the system is valid. And I mean that when they’re given a score, they have confidence that the information has been inputted properly.

Interviewer: And you see that as a weakness?

Manager: Yes, a very big weakness. Because they don’t necessarily get involved in the mechanics of producing the scores. And what I would like to see is that when the roster comes out, it’s actually produced with a predicted fatigue score, and then afterwards, they’ll get the actual so they can compare it and see how they’ve gone. And OK, you know, the end blew out, because that broke down. And when they can see yes well, that that correlates to how they felt, I think it reinforces that the system really does work.

Interviewer: Sure, and do you think the score does correlate to how they feel?
Manager: I think so. From talking to the guys and talking to guys in other companies, most of them seem pretty happy that it seems to be a practical system. And I think that's what they like about it - that it's not just an airy-fairy hypothetical thing. That it actually does mirror pretty well how they've gone or what's happened to them. But there still is reservation that even though they're well within the fatigue score, they don't get fatigued. There has to be recognition of that - that it doesn't prevent them from getting tired – depending on what the activity is. You know, if you're burbling along towards the late afternoon, you are going to get tired. You know, it depends on how many hours you've been on duty.

9. Management

Interviewer: How would you rate your overall satisfaction with the FMS in addressing fatigue related issues?

Manager 1: I'd say from the GM's perspective, very good.

Manager 2: That's what I was going to say.

Interviewer: And the next question's pretty similar, but how would you rate the overall usefulness of the FMS to manage fatigue?

Manager 1: Can I preface what I'm going to say? We've actually sat here and looked at fatigue scores versus work profiles, because what we actually initially sat down to do was, OK, what we'll do is Islander out of [location] will be different to an Islander out of [location] because we have two Islanders in [location] who've got to fly 3,700 hours a year, we've got one Islander in [location] who flies 702. Three crews there, five crews there, different environments, different demands, what we'll do is, we'll track what the fatigue score says relative to the task of the region for the aircraft, and even thought that we may end up with base specific, aircraft specific, ??? different fatigue type scores as an ??? objective. You get out there and you quickly discover tracking ??? is nonsense, you can't do it, and even if you could come up with a score that says the guys on the Islander, because of the time of the day that they fly, their scores should be 45, you get back to the commercial implication that you can't set that as a limit because there is an occasion where if they fly once outside of that ??? or twice outside that ??? it'll pop them over 75. But they're not actually fatigued. You see what I mean? So you can't do that, you're stuck with using 75 because you've got to accommodate those commercial circumstances all of our experience, even if you're only go back since we've been tracking fatigue score against flight and duty says its not a problem, these people are not tired, no, very often they'll be tired but not to the point where its been reported as being a safety incident, so you've got to leave it at 75, so its like ??? nothing, really nothing, its not a meaningful management tool.

Manager2: It was initially implemented or forced on the company by CASA the leading part of it was the FAID scoring whereas that is the secondary or minor part of it, it should have been more on the FMS on how you construct the FMS whether its been on rostering protocols etc, but that was never brought to the attention of the company, and it wasn't until [Manager1] took the feedback from the crews back to CASA that they actually realised that what they were going out with wasn't really correct. They were basically putting out this FAID scoring system as being managing fatigue, which it isn't.

Manager1: There is a management system around it, but at the end of the day, what the tracking of FAID scores against our rosters and against our current concessions, its validated that our current concession is actually valid. So why can't we keep operating that way? And get rid of this score.

Interviewer: If your concession is under the score then there's no reason why you can't.
Manager 1: But three or four instances where it’s gone over the top. I mean we’re flying over 400 sorties a month, so we’re talking that’s an example of 4000 sorties.

Interviewer: And it’s gone over 85 or over 75?

Manager 1: Over 75.

Manager 2: I haven’t seen anything over 85; bloody 82s, 83s, but that’s for the simulator depending on when we can get the slots in there, there’s a 3 to 7 shift and then they might do an early flight back on the third day when they’re traveling back or something like that.

Manager 1: The people who’ve got the sim for the guys from [location] to get to the sim major evolution, so they’ve got all that travel time which is duty on top of they’ve just come off the roster...

Interviewer: Where’s the simulator located?

Manager 1: In Sydney. So then they’ve got to have time off when they get there to get into the sim, then the sim after that they can’t travel home, or because the sim’s 24 hours a day and we tend to get the back of the clock simulator periods, they can’t do them.

Interviewer: Because of their fatigue scores, even though there’s no risk associated?

Manager 1: That’s right. All this has a commercial implication.

Manager 2: I think the majority of our high scores have been on dead air travel back home from...

Manager 1: One pilot in [location] came off some leave, flew three early starts and broke 75, and said I’m great, I can do this, and [another pilot], he busted but he wasn’t fatigued. To me if it says anything it says what’s wrong with out current concession? And why are you introducing all these other complexities that make the conduct of our business almost impossible. On that theory, its based purely on the hours of the day, it doesn’t take the stresses of the environment or the different tasks or the different aircraft types or anything. I’m trying not to be cruel here, I’ve circled poor, but I mean...

Interviewer: Seriously, the more honest you are the better the evaluation will be.

Manager 1: It looks like I’m trying to be jaundiced, I don’t want to look like that. I mean quite honestly, if I describe these situations to you its...

Manager 2: The other thing it misses out on whilst it takes in some circadian rhythm stuff there’s people that are morning people and people that are afternoon people...

Interviewer: That’s how I think about fatigue and that’s why training is so difficult because everyone is so...

Manager 2: I’m great with the early morning stuff, give me late night stuff and its not so good, but another captain I used to work with in [location], and you put him up before 9 o’clock and its not a happening thing but he’ll be there until 2, 3 o’clock on the morning. [This pilot] stays up all night late and you ring him before 10 o’clock in the morning and he’s still...that’s his natural cycle, so I mean its supposed to be if you want to go down that safety ??? type thing it should really be based on people’s natural cycles as well because that’s going to have a big impact even though it will vary from individual to individual, and then it just gets difficult.

Interviewer: If you could mention any, what would you see as the major strengths of the FMS?

Manager 1: Its actually not inherent in the FMS itself, its inherent in the fact that trying to take an open minded view to FMS and accept it as a system that could improve fatigue, its actually forced us to look at that system and our own system in conjunction, its driven us to the outcome of sorry I don’t think the FMS particularly contributes something, but the fact that we’ve been through that exercise is really quite good, because its pretty much validated the way that we operate is relatively safe, I mean as safe as an aviation environment can be, so that’s been good because really, and I can understand the CASA concern, you’ve got concessions out there that, well what validates a concession, what makes it real, how do you prove that that’s OK, so this whole process as a company I think has made us have a good look at that
stuff and say really at the end of the day, although we do work in a tiring environment, it is challenging, more challenging than say scheduled operations, we’re not doing too bad. So from that point of view its been good, but with our FMS itself...

Manager 2: I suppose the other thing as well is that it brings you back to the prescriptive limits and you can re-validate whether those prescriptive limits are accurate or not in determining critical fatigue.

Interviewer: Do you guys have prescriptive limits?

Manager 2: Only under the current exemption, yes.

Manager 1: That's the other thing too that I think is an important point, we are actually running our FAID scores against our current concession, so what you see as an upper limit is banned by your current concession, in other words, we’ve got a ban there anyway, we’ve never pushed beyond that boundary, so what's the limit we go to find out where you can take people to in terms of fatigue score, we actually think our concession is pretty much on the limit of where things are at. But you remove that limit and quite legally you can actually push that out a lot further. Is that safe? You see what I’m saying? We've validated the current limitation; we believe that limitation is about as far as you ever want to push people. Take that boundary off and this thing comes in, if you want to be commercially unscrupulous...

Interviewer: So you think prescriptive work practices are a necessity?

Manager 1: Yeah, absolutely. Absolutely. You can't rely on something that the score is solely the hours of the day. It just doesn't work from a couple of perspectives. And you actually have no boundary on the industry. We were issued a concession last November or something, I could’ve driven those people into the ground quite legally. Or any other number of people in the company, just driven them into the ground in terms of score.

Manager 2: I think that's the thing. With the FMS, when it was first put across, there's unscrupulous operators that can and would do that to their people, now all of a sudden, on this safety based case they're working past what was previously a logical amount of work. Hard to justify in that case I think.

Manager 1: I think charter operators, Whyalla Airlines, I’m not saying ... give this to them, where the margin in the business is only a couple of percent whether you’re going broke or whether you’re staying alive, and you don’t have any prescription. Overall you’ve got a system where the integrity of the system’s worse than when you... you may have had numerous bloody concessions over there, perhaps what you actually use an FMS for is not to be the system itself, but to validate the bloody concession. Like in essence, we didn’t set out to do it, but that’s what we’ve done here, we’ve validated... our concession’s OK, but as a company we don’t really want to go any further than this because we’ve been forced to take a very close look at it all and maybe that's what you use this for, not as a tool which is out there managing the industry.

Interviewer: OK, you’ve validated your current concession. Major weaknesses, you’ve said that work hours are only about 10% of everything...

Manager 1: That’s very subjective, saying, if I sent somebody out in an Islander seven days in a row, they shouldn’t be flying that seven days, whereas this ting says you can go and fly, so I would think, having flown for many years that the environment that you are in, the nature of the task, the stress of the job, all of that, noise, vibration, hot, all that sort of stuff, the simple demands in a task from one day over another, I guess to simply distil that to the hours in a day is ???.

Interviewer: Do you see any other major weaknesses other than those you’ve already mentioned?

Manager 1: The score itself, I mean it doesn’t capture the true fatigue levels. It's not a real refector of fatigue, it's a refector of the hours of the day you work, two different things.
10. Management

Interviewer: So for the first one, how would you rate your overall satisfaction of the FMS in addressing fatigue-related issues?

Manager: I think its very good. With what you’ve come up with.

Interviewer: And how would you rate the overall usefulness as opposed to satisfaction of the FMS?

Manager: I think better. Its better than average, I wouldn’t say its very good, I would say its better.

Interviewer: Do you want to expand on that at all?

Manager: Only that we haven’t had enough time to really give you a clear ‘how’s it going?’. We need at least 12 months to two years doing the numbers and reviewing it and getting a handle on it and at the moment only two or three in the company up to speed with it all, and making even our staff fully aware.

Interviewer: How long have you been operating on it? When did it get approved?

Manager: We’ve sort of had it in place now for about six months, like we’ve had a five months period to work through issues and that was just as a trial, so it would be about six months. Out of that we’ve seen that our stock intake needs to be slightly better and what we have identified from these audits is that we do a number of things that address fatigue, manage risk, we’re definitely into risk management, so I think it’s much better than CAO48. It’s like chalk and cheese.

Interviewer: How is it better than CAO48?

Manager: Well CAO48 … here we can do the numbers, we can review it, we can check it, where can make people aware of the role of the families, whether they read it or not, much better information available for the people with issues of fatigue, I can honestly say we’ve acknowledged fatigue because what we’ve done in the past, we’ve tracked that, three weeks on one week off etc, and the numbers that we’re doing now I think can be a little bit more looked at with experience we’ll have a bit more knowledge about doing the numbers. If you have a long day with duty times, it will affect the amount of flying you might be able to do the next day. Whether it would be hard or not you can take it, start at 6 and knocked off at 6 is a fairly long day. Nine out of ten people would work that time anyway so its not a hard day. If they’re only flying three or four hours or four or five hours they haven’t had a hard day in my opinion, but the figures show that’s hard, so what we need to do is learn how to use the system, do we need to have better timesheets, do we need to go and say you are at low risk now, medium risk, high risk and that becomes part of using the system. At the moment we’re just working on high risk and working to that. And we can show this in the sheets, how the guy was doing no flying at all for a duty for a whole week ??? sitting in a room watching TV and reading a book waiting for the phone to ring, whereas a guy that’s actually been flying in that same period would have high levels of fatigue and be ??? so there’s some twitching, this is experience we haven’t got yet and that’s why I can only give you a five month overview.

Interviewer: So what sort of risk management principles have you got in place?

Manager: First off, our customers, key customers, the electrical industry, have a number of systems that they want their contractors to manage, the like of… prior to completing the project, we talk about projects being insulation of places, platform work with a regulator office in Queensland you need to have a work method to proceed, you need to trial that procedure, procedure needs to have a risk assessment completed and be signed by management. That’s got nothing to do with CASA, its what the customer wants. He’s an electrical customer and he wants electrical requirements, so what we do is work with him within the requirements and develop risk assessments for every one of our major tasks with ??? on the lines and the training component and have approval and we go out and conduct the job. And that’s together with the ??? we do a lot of development before we actually get to fly and that’s the regulatory requirement and then there’s the electrical industry requirement that you will work to critical ???
work to a standard. Now here in Australia the electrical industry has put together a magazine or booklet. It's a guideline called the EFAA and that's the Electrical Flight Association Australia guideline for line fly work. Helicopters and it sets out their training level for pilots etc, type of aircraft, well not so much type of aircraft. For example it talks about how you determine your ??? we then have a system that we've developed here, and its called the International Standard IEEE (Institute of Electronic Electrical Engineers) with has this ??? called the IEEE standard 516 which looks at the critical procedures for developing ??? lines. We've actually gone another step, we've taken that formula, built a computer-aided system, put the formulas into it, put the aircraft dimensions into it and ??? power line on the computer to scale with our helicopters, and we model the project, and we can then fly up to the wire ??? and it will tell us if we can do ??? or not at all and we do that for every platform. So that's a huge risk assessment. ??? actual procedures are in line with industry requirements. Our industry have very good documented systems and procedures for doing tasks. Ours are equal to theirs if not better. We have a hundred different procedures and manuals and in those procedures if we were doing a task we would take 01 which is ??? 02 which is the position of the aircraft 05 ??? along the wires 07 could be doing marker???? 06 ??? off the wires so put them all together and here's the procedure for that job. We then take the calculations for that structure, put them in the back and here's the procedure for that job. Works out very well.

Interviewer: So you do this before every shift?

Manager: Before every job. Detail what the requirements ??? So that's completed. And just in terms of our company we have procedures for having to review our work method, we have a procedure for it ??? a procedure for getting information on a weekly basis back to on how's the aircraft, getting the information coming back so that everyone's kept informed, and all this is managing the risk, and I'm sure that's why we won an award, because clearly people out there know that we do that. ??? an attitude, ??? a culture it's another way we deal with our risk that [the chief pilot] may have mentioned, we're prepared not to work one week of the year, do something else. Our industry have very good documented systems and procedures for doing tasks. Ours are equal to theirs if not better. We have a hundred different procedures and manuals and in those procedures if we were doing a task we would take 01 which is ??? 02 which is the position of the aircraft 05 ??? along the wires 07 could be doing marker???? 06 ??? off the wires so put them all together and here's the procedure for that job. We then take the calculations for that structure, put them in the back and here's the procedure for that job. Works out very well.

Interviewer: You've already mentioned that one of the major strengths of the FMS is that it ??? compared to CAO48. Do you see any other major strengths of the FMS?

Manager: No. I'd need more time to be honest with you. We haven't been running it long enough to really give it a fair hearing. I've seen some weaknesses and I've explained them to you, when not flying shows ??? person with the same amount of duty time. It needs to address in my opinion how you rate low level risks that are targeted. I'd like there to be a bit more documentation in regard to that, or some instruction on how we go about that. It needs to come out with consistency in how you record that information. At the moment we're left to recording our own duty sheets. We're looking at whether we should review our timesheets because its not perhaps tailored towards that information. As in, what are you doing when. There needs to be some more guidelines. If a pilot sits in a vehicle and gets very ??? with 30 minutes to helicopter landing time sits back and reads a book, he is deemed to be at work, he is deemed to be on duty. I'd question whether fatigue management is really fair and reasonable. Yesterday our crew were working, they were in the air at say 7 o'clock and by 12 o'clock they couldn't fly, then they went and sat under a tree for three hours and perhaps did a bit of flying at the end of the day. Clearly their fatigue's not that bad, but the overall period, you could say they were out there all day. So that needs to be managed perhaps a bit better than what's current. We need more guidelines or more input. If there is then I'm not aware of it.
Interviewer: And is that the only weakness you see of the FMS?

Manager: Yes, I’d say so. I know there have been some research and development on the level of alcohol??? That information needs to come out more, and what ratings they ??? that at. 0.80 seems to be equivalent to 0.05, that’s a documented fact. If that’s the benchmark, then so be it, but at the moment I’m not a hundred percent sure that we’ve got clear guidelines on how. If you talk to [the chief pilot], which you have, he’ll tell you that when we first came up with it we looked at 80 and then we looked at 70 and then we came up with 75 plus or minus a percentage and there seemed to be a little bit of ‘we’ll put our finger in the air and go with that one’. That’s OK, we’ve resolved that issue, we’ve run some numbers, and it showed our current work practices were fine for the level that we’d fixed. By running it and doing it more, and setting the guidelines ??? we might find that if we change low risk/high risk that we may really only need 60 or perhaps we should have had 77, and that comes with experience, and we don’t have that yet.

Interviewer: So you think that will be something that will come out in the next twelve months possibly?

Manager: We have the system now to go in there and change the level, but who’s value judgement ??? I’d like to get more information on what they deem to be low risk. ??? We’ve ??? vehicle for 30 minutes or an hour driving to work. It’s a given that most people in the industry in any employment expect to drive 30 minutes to and from work. So why is it different for a pilot when he’s out in the field. A nice motel room, its an ensuite room, its very comfortable, they’d have to keep waking you up, don’t have the wife waking you up, sometimes its even better than being home, and then he sits for 30 minutes and might drive out to the airport, surely his time starts when he’s at the helicopter, not when he walks out of the motel room. I feel that’s an inconsistency. Duty time is not to me when I walk out of the motel room or walk out of the front door of the house. Given that in the industry its 30 minutes it should be the same for pilots, and they should take off lunch. They have a half an hour break, ??? I’m having a break, I’m away from work, having a coffee, having a sandwich, my duty time shouldn’t overall reflect that. I mean it is for everybody else. Its part of their employment conditions.

11. Management

Interviewer: You’ve already said that the FMS was quite a lengthy process, but now that you’ve got it in place, how would you rate your overall satisfaction with the FMS in addressing fatigue related issues?

Manager: Oh yeah, its good. Do you want me to circle it?

Interviewer: Circle it. The next one, how would you rate the overall usefulness of the FMS compared to what you were operating on before? Poor?

Manager: It was a lot easier before. It’s a lot more difficult.

Interviewer: Is that just in setting it up or in every day operations?

Manager: Well if you take what I was doing as not being above board because I was doing six days when I shouldn’t have been, I also can ask them to do other duties after 5 o’clock, for an hour for example, I can’t do that anymore.

Interviewer: So its decreased productivity.

Manager: Absolutely. Unequivocally. But has it cost me any money, not really. And is money a factor? It is to a point. Its not the overall factor. So in terms of its usefulness I think its very poor. I just to qualify my answer for you.

Interviewer: Now just a general description question that doesn’t relate to this, what would you say are the overall strengths of the FMS?

Manager: Two fold: it allows the pilot to know what his working conditions are, knows his limits, and
secondly, I know what the limits are as well. That in itself is one, the other is it educates them better on fatigue related matters. Whereas in the past, yes I’m a bit tired but there is no reason for it. They may not have understood why they were tired, I think now definitely there is definitely an education process.

Interviewer: And the weaknesses?
Manager: I’m not sure that there are any to be honest? I don’t have a problem with using a FMS at all, I think its quite good. As I say it’s a good tool. Weaknesses? Apart from limiting being able to work and productivity, but you accept that, so its not really a weakness.

12. Chief Pilot

Interviewer: In terms of your current actual FMS, can you rate your overall satisfaction with it?
Manager: I think it’s good - there will never be an excellent one. I think that if we can nail this degree of hazard or difficulty with various tasks, then it will be very good.

Interviewer: Do you think that’s a likely thing to happen in the future?
Manager: I think, yeah, I think it will be worked on, and then someone probably far smarter than me is going to come up with something that will actually be better. But really, what needs to happen is that the FAID system, needs to, and again, I’ve mentioned this in discussions with aircrew, needs to have a hell of a lot more research done on it. Taking into account some environmental factors. I.e. somebody at some stage is going to have to work out that if 23 degrees is the ideal temperature for us to work at, what detrimental factors come into play and by how much if it’s 33 degrees, or minus 10 degrees? When that happens I think we’ll be well on the way.

Interviewer: Can you rate the overall usefulness of the FMS?
Manager: The fact that it has actually put the responsibility back on the employees as far as being fit for work is a very useful thing. Historically there has been nothing to say - as I said - if you turned up at 5.30 tomorrow, and you looked like you just crawled out of the sack, ah, I would say well, we are not obviously fit for work, you should not have even come into work. And you would say "okay". Previously there has been nothing written down to say well that’s the way it works. So in that aspect it’s good. It has certainly increased people’s awareness of fatigue – they now walk around thinking about it. There’s various people who sort of rub their hands together, and how can I get fatigued. But I suppose you’ll get that with anything – it’s just human nature that people will try to find holes in things. But as far as people’s awareness of fatigue goes, it’s very good - it’s never happened before really. And, so overall, good.

Interviewer: As an overall statement, what do you see as the overall strengths of the system?
Manager: Just that not only are the aircrew aware now of what causes fatigue, and possibly how to help minimise it, but also the extent of my ancillary staff are now aware of any engineers’ no principle to - you just can’t come and grab somebody every 5 minutes to go and do this or that - I mean this is their task that they’ve got a certain amount of energy or availability to do their tasks, and if you want to use them because you want them to help push a truck out of the mud, you’ve got to be aware that maybe they’re now not available at the time to go and do what we actually pay them to do.

Interviewer: And the weaknesses?
Manager: The FAID system. And the risk assessment.
13. Management

Interviewer: How would you rate your overall satisfaction of FMS in addressing fatigue related issues?
Manager: Average

Interviewer: And how would you rate the overall usefulness?
Manager: This is to a degree thinking of potential and not necessarily a snapshot in time at the moment.

Interviewer: Do you want to elaborate on the average you gave your satisfaction with the FMS?
Manager: Yeah, there are a number of areas that I'm not convinced are valid yet, no that's the wrong word, I think we've got a long way to go before it's a satisfactory fatigue management tool. There are so many anomalies in it in terms of not being able to recognise if certain activities are far more fatiguing than others.

Interviewer: So the risk assessment and risk management?
Manager: Well risk assessment is something we're just getting our head around now in terms of... but yeah, I guess the risk assessment implications of different types of tasks is not something that was in the initial fatigue management system and its only something that we're now being instructed that we need to incorporate, but this is an example of what I spoke about before about the sophistication. There is a degree of training and understanding and organisational culture that needs to grow along with something like this so that people even understand what a risk assessment is in terms of measuring the relative fatigue accumulation levels in different tasks and how that can be reflected in the system and in the scoring and balancing commercial imperatives against real fatigue and real fatigue against employee concerns about where this whole thing might lead so they're going to load it against future possible abuse rather than present... so there's a lot areas in there where my satisfaction level is far from excellent or very god at this stage and its all of those sort of things that we really don't have an answer to at this stage.

Interviewer: So what do you see as the major strengths of the FMS?
Manager: Flexibility.

Interviewer: What do you mean by flexibility?
Manager: Not necessarily longer hours but for instance a lot of our type of work is low work load in terms of, if you consider that a pilot's prescriptive limit for a normal year of flying is 900 hours and one of our pilots could be as low as 150 in the year because of the kind of work that we do and the fact that they're only working half a year because they're on rotating tours, every aircraft has got four crews because they've got two day and twp night and there's only a day crew and a night crew there at any one time so if you've got a 500 hour contract like ??? Surveillance, that's a 125 hours per crew per year. If you narrow that down you're getting less than one hour of flight time per day. However on the prescriptive system that we have it didn't matter whether it was 900 hours or 100 hours, so time off during the day for instance we can give people whole days where they are virtually not working at all. But an FMS system will be able to look at that and therefore there will be a lot of cumulative target risk fatigue score and you may be able to do some quite intensive flying over the period of a day without exceeding the loop. So that sort of flexibility is what I am talking about. Also we had situations where on one crew we had a day crew and a night crew on an AirMSR contract, are you familiar with the MSR, what that means?

Interviewer: no.
Manager: Medical and Search and Rescue. But we had to have a night crew there because the old system being as prescriptive as it is, you couldn't have the day crew responsible for any night, you had to have the night crew there, but in the whole year there were 18 hours of night flying, this year there's even less there's 15 hours. To have a complete crew for 15 hours annual work is a nonsense. With the FMS you can bring other people in off other
contracts to address those very irregular and infrequent night requirements without having to have a whole crew so from a cost point of view and flexibility could with an unethical company could lead to abuse, and apparently it has in some instances according to some input I’ve had recently. So the issues of industrial relations that have to hand-in-hand with this, this is where the attitudinal effect comes in, if your staff are fearful of what this might mean, then their whole approach to it becomes a guarded on, but at the moment the majority of our people have the same sort of attitude that you heard [the chief pilot] say just now that they think it’s a good system, but it just needs tweaking. I wouldn’t be quite as optimistic as that but it certainly is working for us.

Interviewer: So flexibility, is that the only main strength that you see?

Manager: No, I guess the other thing is that is has the potential of truly avoiding crewing an aircraft with fatigued crew, rather than a prescriptive limit on paper that says you can expect a pilot to do a certain amount of flying. In this situation our crews know for a fact that if they feel fatigued and they feel the flight may be at risk because of their fatigue they know that the company will support them. So the whole issue of raising the awareness of fatigue rather than the awareness of work limits has had the effect of people being somewhat more conscious of it and so I think it will lead to a truly safer operation.

Interviewer: What are the major weaknesses of the FMS?

Manager: This is speaking as somebody who was in the development of it but not nearly so involved in the ongoing administration of it. There are anomalies in the software, things like in one section of the software…

Interviewer: Are you talking about FAID?

Manager: Yeah. If you record your work time as finishing one minute after the hour rather than one minute before the hour you can have a blow out of a significant fatigue score which is a nonsense, and as soon as you have things like that people will start to manipulate the software to produce the desired result, either to the company’s benefit or the individual benefit. I think the overall system at the moment does not have a means of measuring relative fatigue in different operations, and throughout the term risk assessment before, we’re trying to get our head around that at the moment. Its not a matter of not understanding the risk assessment process, it’s a matter of not understanding how to apply it in this situation, and we’re just trying to figure out how to do that at the moment, whether we need to pull in a consultant on that, so that…

Interviewer: Have you read the Australian and New Zealand Risk Assessment Standard?

Manager: Yeah. I’ve been involved in risk assessment before, I’ve pulled examples from my previous experience in airborne electrical maintenance in particular and passed them on to [the chief pilot]. But stepping from a standard and examples to applying it in this situation is a bigger jump than perhaps a lot of people realise. If you’re living in that and you’ve been involved n that for a while its probably quite self evident, to us its not so self evident.

Interviewer: Its completely different for every operation, I agree with you.

Manager: We’re just trying to figure out how to even structure the matrix to determine which points we’re trying to measure them and then having to involve staff in the process to make it halfway valid, is finding the time, is getting the staff educated as to what is involved in this risk assessment process and once again this burden of administration just starts to rise up like a ?? out of the depths, it becomes overwhelming at times. The weakness that that highlights is the whole issue of the administrative burden, now I’m sure there are ways around that, and other organisations that have more predictable schedules can validate a particular roster and never have to go back to the software or anything else as long as they are within the constraints of that, but in our situation we have no idea when we’re going to fly because its an on demand situation, so we’re at this stage and unless somebody can show us differently we are at the point where… last week for instance the long ranger didn’t fly one hour, but there are weeks
when it might fly 32 hours in a week. And in that process somebody might be out for 13 hours but only fly two because they've gone out, they sit on an island waiting for the clients to do what they're doing, reading a book and then they get back in the aircraft. Measuring the difference between that and actually flying all day and how to plot that into the system, how to make forward projections so that you manage your crewing, can we accept a 3 am flight tomorrow night with the crew that is on for night tasking? We have to do these forward projections. If they fly that, if there target risk fatigue score toady is 65 and we have them on that flight in a day’s time, what will their target risk fatigue score be at the end of the flight. Can we accept the flight? Well, all of that requires a manipulative skill in the computer software and an understanding of the crews, its way, way higher than I think anybody would...

14. Management

Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue related issues?

Manager: It addresses them in a good area, but it could improve. I wish you’d put ‘fatigue related issues in regard to aviation’ because different fatigue related issues in regard to aviation as to a bloody train driver or truck driver.

Interviewer: Absolutely. What do you think they could cover more...

Manager: We’ve discussed all day. You weren’t aware of the news out here that ??? low score ??? load ton of freight. Everybody thinks you just see the plane fly, but that’s not what its about. That’s what makes you tired, day freight. Its not the bit that makes you tired. We’ve pointed out as I said to you on... jetlag, the days when you ??? jetlag wasn’t before ????.

That question would have better ??? is aviation related to fatigue management?

Interviewer: That inherently means aviation because its within the aviation environment.

Manager: Next question, how would you rate the usefulness of the FMS, is that our FMS?

Interviewer: Your FMS.

Manager: I reckon we’re good or very good. I reckon the one we’ve got is one of the better ones. Have you read our documents?

Interviewer: Yes.

Manager: I would say its very good.

Interviewer: Yes, it is. What do you see as the major strengths of the FMS?

Manager: The biggest thing we’ve got now, and it’s a scientifically proven fact that its 25% safer than CAO48.

Interviewer: Where did you get that statistic from?

Manager: That came from [colleague]. Where did I read that? Ask [colleague].

Interviewer: Yes, because I noticed you’ve got that on the front and I thought, I haven’t seen that.

Manager: He got it down there, but its not the only place they’ll ???? It’s a statement he made. ???

Interviewer: I haven’t been involved in this from the start, so... is that the only strength?

Manager: No, safety and flexibility. Begins at flexibility now, from a commercial point of view, begins at flexibility. Safety is a big one, but flexibility is the better one, because under CAO48 if a guy went out into the bush and through no fault of his own he got delayed or something then he was over his limit. That was after he’d put in 15 or 16 hours, so technically and legally we couldn’t even get him home. Now you can. You can bring him home with a rest in the middle. CAO48 would surgically disbar him, there was no flexibility in it. CAO48 related to stick hours flying, it didn’t relate to duty time. ??? it’s not the stick hours that make you tired, it’s all the other stuff.
Interviewer: What do you see as the major weaknesses, as opposed to the strengths, of the FMS?

Manager: Recording the data. That's all.

Interviewer: That's the only one?

Manager: Just recording the data. The post-data not the pre-data. The pre-data is easy because when you do the roster you can do it.

15. Chief Pilot

Interviewer: So the first question in here, how would you rate your overall satisfaction of the FMS in regard to fatigue related issues?

Manager: Excellent I reckon. Compared to CAO48, 48 its there in black and white, but when it comes down to it, like it doesn’t work for us and it's ridiculous anyway, but our operation, ballooning being ballooning a it is, you can only start at a certain time, finish at a certain time, it's not like general aviation where you can jump from doing a morning flight one morning, a night flight the next, then its jumping and chopping, you do an eight-hour light one day and the next day just a single hour. Its very set, very general, it doesn’t change, so when it comes down to that, 48, there’s no education in 48, and you work in these requirements and you’re right as rein. Well, it's just like that. That's the way they were looking at it, we wouldn’t have needed the FMS, we can see the structure, it doesn’t change, so bang, bang, bang, here you go. Thank you very much ??? exemptions were out there. With the FMS its very easy for us to get into it ??? I think it would be a lot more time consuming for those guys that are chopping and changing their hours, inputting into the FAID system all the time, validating the rosters, it would be very time consuming. The only thing that we changed on ours was obviously at the monthly audit when 25% of the pilots ??? are putting in their actual rostered hours work, it was a waste of time for me. We did it for three months, and they said yeah you don’t have to do any more because its not exceeding the validated roster, you're obviously not exceeding ??? To me FMS is great and the guys actually learn something from it, they're educated. Like I've been doing ballooning now for 14 years, getting up early for 14 years, and I used to work 6 hours in the past, six days a week with no set day, whatever, its general things that you just learnt from practical lessons, shift work on diet, on sleep, on what you should be eating before you go to sleep, how to get better sleep. Things like medical problems, where is that coming from, its ??? Yeah, definitely. Very good. ??? operation might be a little bit different.

Interviewer: How would you rate the overall usefulness of the FMS for managing fatigue?

Manager: I'll just go very good with this one. As in once again, they aren't fatigued very easily. If I was doing a different sort of operation it would be harder, but for us it's fine.

Interviewer: What do you see as the major strengths of the FMS?

Manager: It's the education pretty much. The guys actually learning and understanding a lot more of why they’re doing it instead of just being told yet again this is it. This is black and white, this is how you are going to do it, no explanation why, but now they actually know the why and they can understand it.

Interviewer: Do you think it is their responsibility?

Manager: With the comments made in one of our meetings, after it most of them said, no not really we haven’t changed much because once again have been in the work for many years themselves so they’ve been taught to do it the whole time, its not something new to us. Where as if you are a shift worker going odd hours, you now on one day every week, 9 to 5 the next day, or might be doing night stuff, they've been learning a lot more, for our guys, you’ve got to get up early, got to go to bed early, its just something we've been set in our standards for many years.

Interviewer: What about the weaknesses?
Manager: again for us there is a ?? I’d say it would have been a weaker system if you had to input every roster, its going to change, its going to change. Ours would be a pain in the butt. At the moment the only time we have to input it in is if we are going to do a day out, not a normal flight day. If we want to have an early start ?? have validated for the rosters, put in there just as a safety backup, ?? having outside the rostered hours ?? paperwork and I had a 3 o’clock start, and before that roster I’m only allowed to work six hours but I want to work eight hours, I have to validate it first before I can do that, if I want to work longer hours then I’ll put in a backup which isn’t in that book but it is in the new one that’s going out that you have to have a finish time of 5 o’clock. That’s the latest. Even though ?? I got to show you I had a 6 o’clock finish and a ten hour day on one of them, and I’m still within it, but if you work closer to the end of it and they worked over those five hours, the period between the start and finish time just compromised it a little bit, so just putting that safety a little bit. Once again, its easy enough for us but other operations, possibly not.

16. Chief Pilot

Interviewer: How would you rate your overall satisfaction with the FMS in addressing fatigue related issues?

Manager: I’d say its very good/good, right up there, I guess our primary concern when this first came about is that the old concession against CAO48 had evolved over many, many years, you know 10 years or more, and we’d already worked under it for a long period of time, and we were reasonably happy with the fact that it managed the fatigue adequately, all the pilots and crew were comfortable with it, and our primary concern was that it was going to a major change in the way we did things, and a major change in regard to making it more difficult, but not necessarily safer and less fatigue to do what we do. Because at the end of the day, 3 o’clock in the morning is 3 o’clock in the morning. It doesn’t matter whether you’ve had the whole day off or whether you’ve been sitting here ?? the office, to a certain extent, not totally of course because we all know fatigue accumulates, but 3 o’clock in the morning is 3 o’clock in the morning and really its impossible to have… I suppose you could have permanent night shift staff but even then that’s got problems. So its really impossible to totally cater for that. There’s going to be some element of fatigue at 3 o’clock in the morning now matter what roster you’re on. So the concern was that we were going to have a new system imposed on us or implemented that made it harder, that made us change the rosters around, people coming and going a lot more often, but at the end of the day really didn’t have much effect on the dangerous aspect of fatigue. In fact in some ways it could be more fatiguing because if you had a roster where people are coming and going more often, they’re travelling a lot more, they’re being disrupted, and lets face it, when you’re at home its not a fatigue-free zone.

Interviewer: Especially if you’ve got kids.

Manager: If you’ve got young kids especially, and quite often you’ll come to work to have a rest, you know. And a lot of people are doing things on their house, renovating and painting and that sort of thing, we’re all human and we all do that sort of thing, and we can’t quarantine people what they do when they’re not here, so I could easily have seen it developing into a situation where we were in fact working harder, perhaps doing less hours at the base, but working harder and facing a bigger fatigue problem. And that’s one of the other issues with this whole thing of course, is that people criticise the 48 hour roster system, where you’re here on the base 48 hours straight, but the advantage from my point of view and the company’s point of view is that we have people in a controlled environment for that period of time, as opposed to the 10, 14 roster where you’re doing 10 hour days as you know, and two 14 hour nights. Now the two 10 hour days, they might go home and go raving all night, partying, not that professional people would, but they may go home to a house with small children, they’re up all night with the children, whatever, next day they come to work and they’re pretty fatigued but they’re on day shift so they do it, the next night, same thing,
and then the following day is off, but they may be a triathlete out training or out digging ditches round their new house or whatever, they arrive for work that night thinking I'm just going to work to have a sleep because I've had it...

Interviewer: But then get called out on night...

Manager: the moment they get here they're out on a long job somewhere so whilst the 10, 14 roster on the face of it you'd say its less fatiguing because you're working less because you certainly are, its got the potential to be far more fatiguing because you're not in a controlled environment, whereas here when you have people for 48 hours, if I look out and see someone who’s digging a ditch on the base here in the hot sun, I can go out and say you’re on shift tonight, go and have a rest. When they’re at home I can’t do that. I’ve got no idea what they’re doing. So you know its kind of diverting a bit but to answer your original question we’ve been up good or very good because its allowed us to carry on doing what we've always done the way we've always done it basically.

Interviewer: If you had to circle one?

Manager: Somewhere in between good and very good. I suppose it would be very good, because it's a little bit of extra documentation, paperwork etc, but that's no bit deal with the computer age.

Interviewer: The next question's pretty similar, but instead of your overall satisfaction, how would you rate the overall usefulness of the FMS in managing fatigue?

Manager: I’d probably say good because we don’t use it as a monitoring tool to any great extent, not at this stage anyway, as I say we just use the old criteria of the old dispensation, because we know that's a very good general guide to keep us within the FMS limits, so as a management tool, and the FAID program as we talked about is a bit basic, the next step will be teaching the pilots how to monitor it, but generally speaking they're probably not going to do it very often...

Interviewer: If it never exceeds 80 or...

Manager: They know that unless something very unusual happens they’re not going to exceed that. Something that unusual, we’d have standby pilots coming and going all the time, it would be all hands to the helm, you know, for that period, so we would know that there was a chance of fatigue score going fairly high.

Interviewer: What do you see as the major strengths of the FMS?

Manager: Flexibility. It doesn’t worry us too much in that our roster hasn’t changed, but I suppose if there was ever going to be a change of roster, it makes it very simple, you can just run a couple of dummies through the FAID, if it all seems to work OK you’re away laughing you know. So that's a great bonus. Its pretty clear and straightforward and the benchmarks and the goals and the goalposts I may as well say, are pretty well defined, you’d know in our case we’ve got to stay below 75, otherwise, if we go above 75 it triggers...

Interviewer: And do the pilots pretty much understand what that means?

Manager: Yes. Fairly much. Although not having a great deal to do with the program directly, we’ve gone through it, I’ve shown them and explained it, but their level of understanding is... not that my level of understanding is great but their level of understanding is really 'well we don't really need to know that much about it at the moment so we rely on the old parameters'.

Interviewer: So what about the weaknesses?

Manager: The program itself?? Unless you have a database like ours where it does it for you automatically. It'd be a nightmare, you just about have to employ a secretary to sit there and do nothing or a few days a week to sit there and put it in for you, I don't know how you get around that other than having a database like ours.
Interviewer: Did you build that program yourself?

Manager: No, we got a guy in Sydney to do it. Aerosoft, [a consultant], he’s done [another operation’s] as well. It’s a good program, it does all sorts of stuff, does your approach currency and all that sort of stuff, so we’ve tried to get everything in the one parcel and the FAID is just a part of it. Weaknesses...? That’s probably it really, the monitoring thing. I suppose the problem with us is it’s very difficult for us to pre-emptively determine what our duty is going to be, we could be sitting here on 40 units, fatigue score units, and you could say well if I get a job which is going to give me six hours of duty, that will put me up to 75 units, so I’ll have to be careful about a six-hour duty job, but you got no idea how long a duty job is going to be. Because you’ll get a call ‘oh, it’s a one hour flight over to [location] for a road accident’, its easy, you’ll get on route, they’ll divert you to another job down at [location], and you’ll get to there and be diverted to [location] Hospital, and you’ve got no idea. You can’t say, I know we’re at [location] Hospital and this patient’s about to die but my duty’s just...I’m going to have to fly home then. It doesn’t kind of...would you mind not bleeding so much till I get my relief pilot back up here. So its all good in theory, but the reality of this job - you’ve just got no idea.

Interviewer: How did that work under your last exemption?

Manager: No problem, because the way the last exemption worked is that this was a trigger, so there’s a 24 hour period and the last example I have is three hours, and three plus three is six so the pilot at this point is sitting on six hours, the trigger only occurred when he exceeded eight hours, so he knew two hours into this job, we’ll call that five hours, so he knew at this point, that’s two hours, he’d just exceeded his eight hours of duty, so he knew he’d have to get a standby pilot in to relieve him, but the beauty of the concession was that the standby pilot, he only needed to be relieved by the standby pilot on arrival back at base, so he couldn’t undertake another mission. Now we used to deem that if he was diverted on a mission that was still the same mission, practically speaking he’s still leave ??? for the same job, but the moment he arrived back at base here, ??? go for a period of time to get a standby pilot in, so when he arrived back at base the standby pilot’s here waiting, he hands over and clocks off for 10 hours. But there was no limit on how much he could exceed eight hours by, it was a trigger.

Interviewer: So he could technically work for 24 hours more?

Manager: Technically he could, provided it was the same mission, yeah. Practically speaking of course we never have, and if it got to that stage we would make sure we did something about it. 14 years I’ve been here and its never ever happened like that. And it was the same with the others as well, the 12 hours in 48 and under 4 hours between midnight and 5, the same thing, sorry the night is five, so lets say he took off at midnight, when he gets to 4 am and knows he's going to have to be stood down, but they even wrote in that they didn’t have to be stood down until 7 am, so he could still undertake another mission, say he arrives back at 5...

Interviewer: So he’s worked for five hours?

Manager: He’s worked five hours. He could in fact take on another mission provided he was stood down by seven. As I understand it, the practical reason for that was there wasn’t much point in calling a standby pilot at 4 am, out of a dead sleep, he’s had it anyway, so you’re better to wait and then get it him in here by seven. That’s the rationale behind it.

Interviewer: That makes sense.
17. Management

Interviewer: How would you rate your overall satisfaction of the FMS in addressing fatigue related issues?

Manager: Could I just expand on the question a little bit? Satisfaction of the FMS, do you mean our [operation] FMS?

Interviewer: Yes.

Manager: I've got a vested interest here, because I helped set it up, I'm currently part of the system, and I make a point, I don't want people to be inhibited in what they say. We have a traditional problem with pilots, there's two things, they want to fly, and they want to get paid, and pilots aren't paid very well, a lot of our people are on less than $30,000 a year.

Interviewer: Is that full time?

Manager: That's actually... I'm full time and I'm on $35,000. But that's their whole income and they often won't speak up, whether it's a fatigue issue or a maintenance issue or a personal issue, they're tired or... that's fatigue, they would prefer not to speak up, because it might mean they don't get programmed the next day, therefore they don't get their flying hours, ??? or they don't get the opportunity to earn another $180 for that day. Around here, I think we've pretty much broken down those barriers to say we must have a mature system. If you've got something to say you must say it, and I'm part of the senior crew that says we must accept that and not allow any primal urges to say '???', go away', you know what I mean? We must accept that. In the way that [the chief pilot] fills his duty as a chief pilot, [the manager] accepted the process and the way that I hope to manage it, I think our response to that question is very good, and I hope that you can confirm that when you talk to a lot of us. When I talk to pilots tonight, when you talk to pilots tonight, because I've asked people to speak up, not particularly for you ??? on what you're doing, but in terms of, if they're tired the only way I can know is if they say. They're educated and its been grilled in from day one as part of their training course they have the right, they not only have the right, they have the responsibility...

Interviewer: And do they?

Manager: Yes. One bloke said the other day, I said 'now if you've got something to say, speak up', and it wasn't actually about fatigue, it took him 24 hours mind you, and he said 'yeah, I do have something, I'd rather have my day off in [location] than in [location], and I said 'well, its going to cost us', because we've got to transport a pilot one way or the other, and I said, 'let's give it a go and see how you feel, you know it'll cost us another $180, but its probably worth wearing that to be a quality operator' and that indirectly helps fatigue. I mean here's a bloke that rents a house in [location], but sleeps in it three nights because he's back and forth to [location].

Interviewer: Instead of your overall satisfaction, how would you rate the overall usefulness of the FMS?

Manager: Very good. And I say this with extreme bias, if there were ten options in this world and one of them was CAO48, I would put CAO48 at the bottom of the list. Its arbitrary, its got this rights issue built into it, it allows poor managers to say 'its not against the law, I can force you, you are employed by me, I can make you work this day, get on with it.' It allows managers to say that. And the blokes feel they haven't got ??? But fatigue actually says from day one, fatigue management is a system responsibility. CASA has great difficulty managing fatigue, so the shift in responsibility is such that now it's shared equally between the operator and the pilot. I don't think its fair to expect CASA to manage the individual fatigue of every one like this old fashioned audit process, you can't expect CASA to come and validate every work time elapsed. They probably have trouble doing it to one company like ours because its so complex, so how could they do it to a whole industry? Its hardly fair. We've given approval by CASA to operate a FMS for which we are very grateful, the responsibility is shared equally between the pilots themselves and the management, and its a partnership that we really foster. There are times when they are told, for anyone who comes up and says...
‘fatigue management has got no limitations’ I actually ??? them straight away and say ‘yes, it has and I’ll show you’. I can show them even on the basic FAID approach, if they were ??? come to a full stop, we won’t allow anything over 75 points for an example, but they ??? we go with the plan, but when we get a roster here, and I can show you later a roster like [location], we will still run it alternate days, because even though you can run it in a row it just comes up near the limit too quickly, and we know from personal experience that its fatiguing, its more fatiguing than the indicator will indicate, but we build that into our people and the system, because FAID is a just quality indicator we’ve got, its nothing more.

Interviewer: So what do you see as the major strengths of the FMS?

Manager:    Appropriate time management related to the individual. Consequently that allows the company flexibility. So it's the individual that's important to us, it's the individual that's out there doing the work, if they're educated that they’re the partnership with management they understand fundamentally, I explain this to them, the difference between an intensity based system which is the key leading model, it is really foul, I don't know if you’ve looked at the New Zealand attempt, point score complexity???. By the same token ??? intensity, and effort type things, they do develop fatigue in a sense and they’re respected. But a total effort based system, I can’t make work even in my little brain I can’t even consider. But a sleep based system I’m really confident that it can work, provided somewhere along the line there's respect for the effort and intensity type issues. So the sleep based system I’m very comfortable with, but there must be on overlap. You’ll see our [operation] tonight, some blokes they grade it. It pumps them up. It’s not quite as sweaty and strength as going to the gym, but they say it really wakes them up. It’s a really good for the first sector, but what they’ve got to be careful of if they’re using that effort to pump them up for that first sector, they’re likely to go into a dip for that second sector and have a greater risk. They need to understand the balance in the factors, in total. But that said, there must be respect on the sleep system for some of the other stresses like environmental factors like whether its hot or cold, fumes are challenging, whether there's effort in loading, or effort before getting to the flying bit, all those things must be considered, and we try to do that in terms of, a good FAID can't look after that, that must be considered in this.

Interviewer: What do you actually enter into FAID, the duty times?

Manager:    We enter work times. We do our best, I don’t know how well you've looked at our system, but we stay away from the term duty, because there's so much tradition in the term duty that people tend to take it the wrong way, so we say this is a sleep based system, and we’re only going to deal with sleep and work, we’re not even going to consider rest as sleep. We’ve got clear statements in there ‘sleep is rest, but rest is not necessarily sleep’, so we’re interested in sleep. And when we come to work, work is the flying plus the sign on, sign off time, the flying just happens to be incidental in the middle of it. It could be operating a tractor, it could be something else, but a quality educated mature pilot won’t find it any more difficult to fly than you driving a car. There might be a little bit more effort here and there, but it’s the human factor that’s important, not the actual work you’re doing.

Interviewer: So what do you see as the major weaknesses of the FMS?

Manager:   I think the fact that if you’ve got an unscrupulous operator they could still administer it in their favour. But I also think that's the same weakness in CAO48. The way people used to beat CAO48 is simply alter the records, so in terms of an unscrupulous person, you can do this with accounts, you can do it with anything, if you had to talk about a paper trail for accounting and that, the unscrupulous operator wouldn’t get away with it for some time. I think the best thing in our type system, we have pilots faxing their work times on a daily basis, they keep a copy of that, we keep a fax copy, and there’s a duplicate copy in the flight book, so the chance of someone manipulating those times for example, which is how you beat 48, is really quite remote.
Management 1

Interviewer: Can you briefly describe the major steps required to set up your FMS from word go to when it was implemented?

Manager: How long have you got?

Interviewer: How long have I got? Five minutes.

Manager: We first heard about it through CASA, and various pilots publications, that it was happening, and if you looked at the new rules that were being proposed it was going to become a requirement for an AOC that you have a FMS system in place. Whether that happens in the next four or five years or whether it happens later on this year or next year I don't know. Rather than be part of the last minute mad scramble, which it will be, let get in and get going... I had a think about it and look at it.

Interviewer: What did you look at, what sort of things were you given?

Manager: There wasn't much from CASA, all that CASA really had was that you would have to have a fatigue management system, end of story, and what the devil is an FMS? We ended up getting hold of the Uni of South Australia I think it was, I made quite a few phone calls to get through to people who could tell us what was going on and how it was going about it and I ended up talking to [a consultant] quite a bit, and then [another associated consultant] who ended up being the guy I dealt with most and they gave us a bit of background material and information to read and think about and as a result we thought lets do that, then we got to talking to [the consultant] as to what guidelines we were going to need to meet and talk about when we produced the policy manual that we were going to operate to. We started putting all that together and then we started talking to CASA, now [a CASA representative] was there and then she wasn't and she was there and then she wasn't and taking sabbaticals here and I got quite cranky with CASA, just a bit of consistency. And then [another CASA representative] came on the scene, and it became much easier then because you had one point, whether or not he was doing it all, but at least he was a contact point and maintained continuity, and we talked about the do's and don'ts and the wherefores and ...

Interviewer: So you didn't get anywhere with [the first CASA representative]? Had you written anything or...?

Manager: No. Almost gave it all in with respect to her, she'd been busy, and I notice some of the operators here have been talking to her recently and they've said come back in six months and we might be able to look at for you, and that's not the way you do business. That's what happened there, and I know when [the other CASA representative] took over apparently there was stuff like that deep on her desk, that's nothing offensive, she might have just had too much work put on her, but we got on with [the other CASA representative], and he produced a generic document, a master if you like, so a lot of the stuff we'd been doing ...

Interviewer: So you'd already written something before he gave you this?

Manager: We'd already written it, and I expect [the other CASA representative] probably used a lot of documents that various organisations had written to pull together a master document. Some might say there's a bit of plagiarism there, but what the hell, at the end of the day it worked. And there was a heck of a lot of toing and froing and how we are going to deal with it all, there's a lot of stuff we did with the FAID company.
Interviewer: Interdynamics?
Manager: Interdynamics. And he came out here a couple of times in the middle of it all. He said at the end of the day you’re going to have to buy, but leave it and let’s talk about it when you get approval, then we’ll get the software. And I said no, we’ll buy the software now, and that got CASA’s attention pretty well, because ‘oh, you’re actually serious about it’. Yes. Hello, hello! And then there was only some minute changes, punctuation.

Interviewer: How many times did you submit it to CASA before it was approved?
Manager: About six times, I think.

Interviewer: So how long from start to finish did it take to set up and implement?
Manager: Six months.

Interviewer: Do you think that was acceptable time?
Manager: I thought it should have happened in about half that time. I thought three months would have been much more acceptable.

Interviewer: How long did it actually take you to write the first time?
Manager: 60-70 hours.

Interviewer: A fair bit of work.
Manager: It was a lot of work, yes.

Interviewer: What were some of the major frustrations you faced during the implementation? There was obviously the [CASA representative] issue.
Manager: The [CASA representative] issue. The re-submission because you do it, you incorporate all the changes and you’d send it in and they’ve changed their mind again. One of my comments was ‘ok, we don’t have a problem if you’ve managed to change something, that’s fine, that’s what the submission process is all about, but for goodness sake tell us everything you want, we’ll do all that, and then we’ll give it back to you and its all over. Why do we have to keep on this rebounding stuff, which unfortunately is a common CASA problem.

Interviewer: They kept on changing their minds as to what they wanted?
Manager: Yes.

Interviewer: Is that the main issue?
Manager: I think part of the rebounding stuff… I remember [the other CASA representative] saying their legal people are saying this is how it has to be phrased, that’s fine, why didn’t that happen the first time around? In your thought, I didn’t say it, I thought ‘aren’t you guys talking to each other?’ That was the most frustrating thing about it, the continual resubmission. I used to keep all the submissions as a set, then we got version one, two, three, four, and it started to get dangerous because then you’d end up opening up the wrong one, so I’d just kill it all now and replace it with the current version.

Interviewer: How did you find the assistance you had from CASA overall? Were they helpful?
Manager: Yes. In the latter days when [the other CASA representative] arrived on the scene. It was quite good. There was virtually nothing before then. There was a sort of ‘ok, put it all together, submit it and we’ll have a look at it.’ But that’s CASA, and I’m not being critical of them in one respect. They don’t have any generic or master copies of things. They’ll give you guidelines for stuff and it then becomes interpreted. It depends on whether they got knocked back last night or got drunk or got a hangover or whatever. It’s the mood of the day that governs the acceptance of a document.

Interviewer: Sure. The help was good once [the other CASA representative] came on board?
Manager: Yes.

Interviewer: Did CASA give you any help in developing an education program?

Manager: No.

Interviewer: And you’ve just used Practical Living for Shiftworkers is that all you’ve done?

Manager: A lot of it has been on an informal basis, talking about it with pilots and sitting down here and might have been upstairs over pizza and a couple of beers, or even at the pub, you know Friday nights, not this weather but when the weather… they’ve just re-done the pub up there and its beautiful.

Interviewer: Yeah?

Manager: You might get around a table there and...

Interviewer: I should come on a Friday.

Manager: Yeah, well why not? And there’s pilots, hundreds of pilots, dozens of pilots, all the bankrunners all get down there a bit, that took a very large part in discussing the training of it because you get into a formal room and everybody’s a bit reluctant, just need to get a couple of beers under their belts and ...

Interviewer: You find out the real issues.

Manager: But that’s how it got working.

Interviewer: But CASA didn’t really have much of an input into that at all.

Manager: No. They’ve had absolutely nothing to do with it. I rang them, the FOI at the time, I said ‘look we’ve got fatigue management implemented and do you guys want to come and have a look at it’, and they had no idea. They said ‘no, we’re aware that you’ve got it, we don’t do anything about it.’

Interviewer: Really?

Manager: Because Canberra had done it, they weren’t involved in it, they weren’t in the loop.

Interviewer: Do you think that will change?

Manager: It’ll have to, won’t it? I mean we had a major audit a couple of months ago, they said we’re not going to audit your fatigue management because we don’t know anything about it. That’s fine, well don’t do it. And they get in here and the next thing you know they’re starting to ask questions about auditing. I said ‘hey, hang on, I’ll just stop you right there if I can’. I said ‘you said quite formally a few weeks ago that you’re not going to talking about fatigue management’ ‘Well, why are you?’ ‘Um, because…’ ‘No, no, no, why are you?’ I could see where they were coming from but I said to them I don’t mind being audited but if you’re going to do it, you ought to know what they’re talking about or someone that knows what they’re talking about. I said ‘you’ve got neither’.

Interviewer: That’s right. And the separate audit’s happening next week anyway isn’t it?

Manager: Mm. And I said ‘anyway, you give me elements of the system you’re going to audit me on and that’s not in it. Don’t start wander into a entry meeting for an audit and suddenly start developing new elements you’re going to start auditing me on. Likewise at an exit meeting don’t throw up stuff subsequently that wasn’t mentioned at an exit meeting, because I’ll throw it in the bin. That’s why you went and did your course?

Interviewer: How are the fatigue benchmark levels set? Is 80 ??? CASA. And you’re thinking about changing that?

Manager: We’re thinking seriously about reducing it. Howard’s reaction over there...

Interviewer: What did he say?

Manager: Good. Good. Nice to hear that.
Interviewer: Can you really briefly describe the major steps involved to set up your FMS and who was involved at each of the stages?

Manager: The first step was understanding what CASA wanted, then the people involved were myself, [the general manager], [another pilot], [the rosterer] and we were just working through, trying to understand what they actually wanted.

Interviewer: How long did that take?

Manager: It took us the better part of 8-9 months.

Interviewer: Wow

Manager: Oh yeah, it was a time consuming process.

Interviewer: And were you writing stuff and giving it to them in that time?

Manager: We were to-ing and fro-ing with CASA, both verbal and written. We had a concession or dispensation off everyone I caught, which went in for a 12 month renewal, they said no we’re going to be here for three months, you have to put in place this or we’ve got CAO48. OK, we’d better get onto FMS, what have we got to do? We hoed and hummed a bit, I think we got that thing reissued three times, [a CASA representative] was the first one, then [another CASA representative] was doing it then [another CASA representative] was doing it. It was very time consuming because...

Interviewer: And were they helpful?

Manager: I would say they were pretty helpful. Certainly [the third CASA representative] was right up there with “let’s get out there and get it done” but I think [the initial CASA representative] was put there because she might have had the qualifications but she didn’t have the understanding of exactly what she was doing. Now whether that was because she wasn’t told or didn’t know, I don’t know. [The current CASA representative] was fine, as far as — hey we haven’t had a response from our thing we’ve put in

Interviewer: Audit

Manager: And our other one is running out, so reissue it. So we kept operating, because we couldn’t operate within the limits of CAO48 anyway. It was a time consuming process...

Interviewer: So it took 8-9 months - and at the end of that did you have a document?

Manager: At the end of it we had our handbook and everything that we’d sent in and what we were going to do and how we were going to do it. Then we received a thing back to give us a five-month trial period. At that time we put out a memo to everyone that we’ve got our FMS in place and we’ve got a five-month trial to introduce this. Part of it was that they must ring every day now because that is an integral part of us as a company monitoring what they’re doing in the field.

Interviewer: So that’s already happening beforehand as well.

Manager: It became a major part of how we monitored them in the field because everyone is so remote, then that changing the wording now because some of it that said that responsibility was his task is to do rostering but the chief pilot is responsible for the outcome of the roster, so its just the wording like that but it didn’t really matter at the time because it didn’t make any difference so we’re changing that wording which is happening as we speak we’ll get the insurance reissued now for another five months which will give us time to go through and make all those changes. We were hoping to have them done before you came through but its been a while happening and its only been a week anyway.

Interviewer: Yes, its been very close unfortunately.
Manager: They were very thorough, they’d obviously done their homework we had several CASA reps - there’s our local fella and we had a guy from Canberra who was with a big tall fella

Interviewer: [The current CASA representative]? 

Manager: [The current CASA representative]. Obviously done his homework, read it inside out, knew that on page 16 was different to page 45, so that was good for us because it’s just a matter of tidying it all up, so they’re going to reissue it, we’ll make the changes, we’ll go ahead, so I think they were very thorough with their audit. They allowed two days, they were going to have a day, but again it comes back to our procedures are in place, there was no big plane crash for us, so it was no big deal.

Management 3

Interviewer: Great. Can you just describe for me really briefly the major steps required to set up your current FMS?

Manager: Yep. The hardest thing to do was find information about what was required. And then, when we talked to CASA, they didn’t know much about it. What we saw of what was available was not adequate. We had to hunt around for someone that knew something about it, and came across [a consultant]. We then commissioned [the consultant] to actually write the program, and this is one of the things I think needs changing -- that CASA could make it much easier by putting out a generic program - that all you do is tailor in the required tasks. We then paid [the consultant] to produce the [company] program - which obviously was a tailored program. And he said a certain percentage of this is standard. These pages will be the same for any operator. Then that went to CASA and that was reviewed a couple of times, requiring rewording. It was accepted and we were given a time frame to implement the training.

Interviewer: What sort of time frame?

Manager: A month. That was from the staff having a run through the program, and some of them had been done prior to the actual finalizing once we knew it was going to come. We then went up to [location]; we went to some to the guys up here; and with the skywriting guys, we went to them. So we went to the people, and ran them all through the program, and then the program was implemented. And by the way, this is done on the premise from CASA that if you do not have a fatigue management program, you maybe won’t have an AOC. Which is fairly typical of CASA. And then, when you try and comply, you get this ‘oh yeah, we can’t help you: you’ve got to do it’. Which is very unhelpful on their part. But, having said something like that, they should say ‘Within 2 years, you’ve must have a fatigue management program. Here is what we think is a suitable basis for fatigue management program. You may need to modify it to suit your operation.’ That would be, to me, far more acceptable to the industry. And then when they showed up and did the audit, obviously pissed off that they don’t have something that they can go through and measure. This was a normal CASA audit.

Interviewer: OK, so you haven’t had your FMS audit?

Manager: No, this was a normal operations audit. We had 3 or 4 FOI’s scheduled to come in for a week, which happens from time to time. And of course, they now have to look at fatigue management as a part of the audit. But no, apart from costing a fair bit of money, we didn’t have any major problems in setting it up.

Interviewer: What was your approximate budget for it?

Manager: 20 grand – around there, which is a lot for a company this size. The thing is, it came out before they ran the safety management thing – the safety system. It came out with a QANTAS guy, who had a major guy doing it for CASA. And he came out to see what we thought of CAO 119 and what have you. From an operators’ perspective, and because now they’ve been given the job of making it work. And I said well look out there – you don’t see
Mercedes – you don’t see new airplanes’. And that’s not because we don’t want them. It’s because there's no money out there. Say it costs $100 000 to implement the new requirements. And say we have a gross profit of say 10%, that costs 1.1 million dollars more to pay for it. And you just don’t find that. And the concept is great, but the reality is there’s no money out there. You try to put up rates, and they’ll ditch you for someone else.

Interviewer: Has there been any union involvement?
Manager: There is no union. The pilot federation fell by the wayside at the end of the Ansett collapse. And effectively, the pilot federation is still there, they put out newsletters and so on, but they have not addressed fatigue management that I’m aware of. There are a few guys who have gone to other unions, but effectively there is no union on the pilot side of it that’s effective in aviation. The quick answer is no.

Interviewer: OK. You said that CASA weren’t all that helpful in setting it up. What sort of assistance did you get from CASA?
Manager: Fuck all
Interviewer: None?
Manager: Fuck all. Oh, on the local level - they had no idea of fatigue. It was done by the one unit in CASA and that’s it. Now, I’ll have to modify that. There was assistance given from [the current CASA representative] when it came down to the crunch, and I think [the last CASA representative] did get some good help from him.

Interviewer: From [the current CASA representative]?
Manager: Yeah. And when push came to shove, we were told - [the last CASA representative] I think started in late November, early December. It was lodged in January. We were told they wouldn’t be able to look at it until May. And that really doesn’t do the relationship with the department any good.

Interviewer: Did you get your exemption extended until then?
Manager: Our exemption ran out in February, and we had that extended to the to June or July this year. But they were really putting pressure on people to do things. One of the issues with CASA, which happens from time to time, is that we really got stuck into them over this, and then all of a sudden, they started talking to us. But it was only when they were forced to. And on the day that our exemption were to be extended, they actually approved the Fatigue management in February. They went from not even being able to even look at it from January to May, to getting it approved and what have you – other than a few bits and pieces that [the last CASA representative] had to change – but under pressure, they approved it. So, no it wasn’t a real cozy feeling. And unfortunately, that is not uncommon with our dealings with them. And not only with us, but with other people’s dealings with CASA. They really are not customer orientated. They don’t appear to have any accountability. In this case, they know they’re not going to give you an exemption - full stop. Leading up to it, when they started making rumors about taking away exemptions, which had been operating for many years, I wrote to them and didn’t even get a reply. I sent them an alternative system - not a fatigue management system, but an alternative system. I didn’t even get a reply - even with the threat of the loss of that system. And it was not until I actually went and said ‘you have not replied to me’, so they replied. And I wrote somewhere around August, and got that reply on the 31 December. Not even an acknowledgement that it had been received. So the introduction of the fatigue management system was not warm and friendly at all. And there was a lot of fiddling and fuddling and disorganization on their part. And [the last CASA representative] got spat out of the system down there, and I think we were very fortunate, because he had the inside knowledge of how it should be done. And I think without the inside knowledge of how it should be done, it would have been very hard – especially for the smaller operators. They just don’t know how to do it. Especially when it costs 10, 15, 20 thousand bucks. And who’s going to spend that sort of money for a non-guaranteed result?
Management 4

Interviewer: Can you just briefly describe the major steps involved in setting up your FMS?
Manager: Well, to start off, the um, correspondence with... I don't even know the name of the company... [a consultant]

Interviewer: That's us
Manager: Through you, started off through there in collaboration with [another EMS operation]

Interviewer: How did you get on to them?
Manager: Well, I'm really good friends with [a chief pilot] up at [location]. He's their chief pilot up there. And uh, I said, we do similar rosters, because they do the 2, 2 and 2, whereas we do have the 2, 2 and 2 roster. But their work's different - they're shorter jobs. So, we agreed to go in together. We went halves in it. And they got what they wanted, we got what we wanted, and it's just a little bit of to-ing and fro-ing with CASA to get it through.

Interviewer: So do they have the same policy as you?
Manager: I think similar. I haven't read theirs since the end. I think the bulk of it was together - that was to cut costs, and also, you know, your local procedures come into it. Theirs are slightly different to ours.

Interviewer: Great. What do they call themselves?
Manager: It's [name] - yeah, the [name] - they come up through the reigns of the [contractor] association.

Interviewer: OK, so how involved were you in setting up the FMS?
Manager: Um, I did the typical manager thing and delegated. No, [a pilot] was pretty keen. I asked him if he wanted to do it, and he said 'yeah, that would be great'. And he actually kept me informed all the way. And when it came to the final bit, just negotiating with CASA, it was easier for me to, you know, they were sending it to me on the e-mail, saying 'we want this changed, we want that changed'. It was easier for me because I've got a doing with [this operation] a lot longer than [the pilot]. Where as [the pilot] stumbled on to it not long after he started here, and um, [the pilot] kept me informed, and I kept him informed. And in the end, I think we ended up with a good product. It was easier to have someone doing the bulk of it, and me just liaising, because I was doing heaps of other stuff like buying a new helicopter and all of that. But, I was real pleased with his work.

Interviewer: Excellent. Has there been any union involvement?
Manager: nope

Interviewer: Okay
Manager: We stay away from that!

Interviewer: What were some of the difficulties faced during implementation?
Manager: The computer system. To be able to get the Fatigue Analysis InterDyne um, and the other word that's there. The FAID system. To get it, to fully understand what's required out of it. Otherwise, there wasn't really a great deal of... What it was, was that it's a new day, and now we just put it in again.

Interviewer: How did you learn it, did some one come out and speak to you or?
Manager: No, I think [the pilot] spoke to the FAID people over the phone and then, also liaising with [my friend chief pilot], because [he] was a couple of weeks ahead of us. So liaising with him, and between all of us, we sort of sorted it out.

Interviewer: And you said you've got that linked to the other programme now?
Manager: Yeah, the Opsmart – it cost us a bucket load the last part. Originally it was going to cost us $600. Now I think it's up to about $2600 now. Because we're finding things – why have something that only does part of the job? So, you keep on tweaking, and it's probably 99% there now. But we'll find something else that we want it to do. So, yeah.

Interviewer: I guess it's the same as any system. So, how much time did it take to implement from start to finish? From the day you were told no more exemptions, to being accepted?

Manager: It might be over about 12 months. I think it was protracted because I don't think CASA knew what they wanted. It was sort of like that draconian rule that 'well what do you want', 'well, we're not really sure what we want, but you tell us what you're going to give us and then we'll tell you if it's what we want'. That came across – that was blatantly obvious, and I don't think that they actually said that they knew what they wanted, but hopefully, well, they seem to have a fair idea now. I'm unaware of anybody that has a system that's had major problems with it.

Interviewer: So, just as a ball park figure, can you tell me the budget for the FMS?

Manager: Oh God, does that include the new programme we've got at the moment? I'd say, well it was about $3000 to you guys – 3 or 4 or something – under $10 000. Is that a close enough ball park?

Management 5

Interviewer: Can you describe briefly the major steps required to set up your FMS? From the day you first heard about it?

Manager 1: What should have happened or what did?

Interviewer: What did happen, and then what should have happened probably.

Manager 1: Actually it initially came across as you haven't got much choice in this, it will go in ???

Interviewer: Was that with a phone call or with a letter you found out about it?

Manager 1: The company had been invited by the time I got here, but we called [a CASA representative] and ??? meetings, we had lots of correspondence and emails, we had great difficulty with definitions, all sorts of things, basically we were given an outline of what an FMS document should look like, and it ??? we've got to produce an equivalent sort of document written around the company. Some of the stuff in that document itself is…

Interviewer: That was the Company Sky One document was it?

Manager 1: Its quite inflammatory to our employees. They actually resent some of the stuff that's in there quite strongly.

Interviewer: Can you give me an example?

Manager 1: The education part says, some of them said the definitions were…they get read verbatim, they don't get read within the context of an FMS, so it seems like the entire definition of work was changed. So when we actually as a company tried to put in some notes to those on our FMS to describe that no, this is the difference between work work, and FMS work, and this is what this definition is... and submitted it on our first FMS, they tried to take all them out, because they are the definitions and nobody can vary them. Well, yeah, hear what you're saying but without some sort of description this is the sort of problem this is creating. People get very angry at this sort of stuff, and it doesn't make for good industrial relations, and it doesn't make for a good safety system to get people like this day one, before that sort of stuff. It was very much 'you will do this, you have little or no choice in it because you'll go back to CAO48, you don't do this, which of course in this flexibility from the concession which we currently have, and this is the way its to be done, and the day its got to be done by.
Interviewer: And was that all [the CASA representative], or [another CASA representative]?

Manager 1: Mostly [the first CASA representative].

Interviewer: And then you said you had some dealings with [another CASA representative] as well?

Manager 1: ??? By the end of last year it was like ‘hooly dooly, we’ve got some concerns with this, plus we’re not ready’, we don’t believe... here’s one of the other big things, you implement your FMS and the you’ve got six months to do your training. What? This is a safety system. So you're going to give us a concession to run on an FMS without having achieved the training first for a safety related system, folks, this is about as crooked as you can get. The cart before the horse. So, no, that's when I said, no I don’t want to do that, I believe organisationally I will lack credibility and it doesn’t contribute to safety. ??? workforce look like a clutz from day one. I don’t want to do that. Lots of issues like that. Which is when we said, sorry, we’re not going to get there from here right now, and we’re getting a developing concern about how effective this system is, we need more time to look at it, we’ve bought the software, we’re going to implement the software, we’ll have a look at the way the scores come out relative to the way we’re working things and we’ll try and figure out how we can use this system, still with the intention, yes, one day, we’ll have an FMS. Sorry, looks like a duck, smells like a duck!

Interviewer: So what sort of assistance did you get from CASA other than the Company Sky One document?

Manager 2: No.

Manager 1: Not very much. Sat down and talked to [the second CASA representative] a few times early in this year, and said, [the second CASA representative] we’re quite concerned about this because it just doesn’t seem to be quite adding up, it just doesn’t seem to be capturing the real fatigue effect, here are the implications to us, this is why it doesn’t marry up with the way we work, this is the commercial implication, this is the industrial relations implication, its just not making sense. Its not that... we set out with the objective to bring it on board, its just not adding up. She started to say, ‘well, I think you’re right, and no, you don’t need FAID’. Great, that’s $40,000 down the tubes. ‘Yes, I accept that what you’re saying is that you could put a safety case that says your current concession actually constrains the way you work to a point that is acceptable from a fatigue’... and in any aviation environment anybody, anyway, anyone has got the right to put up their hand and say ‘I’m fatigued! This is not safe’. And within our culture we try and reinforce the fact that you will never be penalised for that, so can you tell me what we’re doing here. I’m not trying to put [the second CASA representative] in the spot, although she’s left CASA now, she’s saying ‘you’re right’, well what are we doing here? Why are we here? Why uniquely are we in this group here that’s been forced to do this? Why are you calling this a trial when there is no element of engagement by CASA at all, no collection of data...

Interviewer: What sort of data would you like to see them collecting?

Manager 1: Even just to sit down and to look at the types of things that we’re seeing and say scores are nonsense boys, this is meaningless. This is not a trial, what it is its blackmail that says ‘implement this or go back to your old concession’. And in fact it's flawed in the sense that all you can simply do is write your old concession one-way or other as a management scheme. And for most people who don’t fly back of the clock they way we do on occasions will never affect them. Or you can have a very limited management statement and a score, and run your people to the score, or although that's not what you’re meant to do. There's no checks, no balances, no auditing, nothing that makes this scheme real.

Interviewer: When you actually submitted your FMS policy...

Manager 1: It was accepted. Oh, lets go back and re-fix the definitions, and put in stuff that we thought was ludicrous, and frankly that was also where the alarm bells were going off because... earlier this year, I don’t know if she's still about, she fires out all these... after having been
given all these immutable definitions, which we have now taken to our workforce and we’re trying to sell as credible definitions, she comes up with some new ones, puts them out to industry and says ‘can we have your comments on these please?’ And I said, well yeah, first up, they were immutable last week, now they’re not, secondly here are the problems that trying to provide these definitions to our workforce have created. I would suggest that you take a look at these aspects of it. Never heard a dicky bird back. Not a word, let alone a sentence. Nothing, zip. I mean, tell us this is a credible system? Tell us this is being managed by CASA in a positive sort of manner? And we’re going to hook our commercial future to this? No thanks, we want to go into the bucket with the airline thank you until you get your act sorted out, we’ve got too much at stake here.

Interviewer: Have you had much to do with [the current CASA representative]?

Manager 1: I need to sit down with him shortly and say sorry, [the current CASA representative], we don’t want to play in your sandpit. I don’t know what his reaction’s going to be but we’ll certainly take it??? because what RMD got ??? chairman of the IAAA, and had this meeting with people and just asked a simple question, explain to me how this is a trial? There is nothing in the way this has been done that says this is a trial. What data collections has there been, what analysis of that data ??? shaping the new requirement has to be, how the ??? auditing requirements or implementation requirements or standardisation for the industry, there is no standardisation of this, and for what? For a system that simply measures fatigue out of hours in a day. Don’t stand up and say that that’s a fatigue management system. The stuff that you’re not measuring has a bigger impact than the stuff that you are measuring.

Interviewer: Yeah, that’s fair enough.

Manager 1: I shouldn’t be saying that though.

Interviewer: That’s fine. Has there been any union involvement along the way?

Manager 1: Not yet, but there very likely could be.

Interviewer: What sort of budget has been attributed to this?

Manager 1: Quite substantial for a company of our size, we’ve probably already spent in excess of $50,000.

Interviewer: Is that including training and everything?

Manager 1: Buying software, training, buying the publication that they fill out.

Manager 2: The Practical Living for Shift Workers.

Interviewer: Have you got one for each employee?

Manager 1: Yeah. Frankly for the investment we haven’t seen much return. So its not like we walked away from this, you know what I mean?

Interviewer: I can definitely see that.

Manager 1: We’ve given it a real good go and unfortunately at the end of the day it doesn’t look good.

Management 6

Interviewer: Just really briefly, can you describe the major steps that were required to set up your FMS, and probably the issues you had along the way?

Manager: Once we were made aware that we wouldn’t get the concession renewed, it was only going to be extended for a limited period of time until we got the FMS up and running...

Interviewer: When did you find that out?

Manager: Must be about June last year I suppose. Whenever the correspondence started, about June or July. At that time we were dealing with [a CASA representative] down in Canberra, and speaking
to him initially it just started to appear pretty obviously to me that this was just something that was too much for me to handle, I just didn't have the expertise, so I contacted [a consultant] and we started the ball rolling, and [the consultant] was taken on as consultant.

Interviewer: At what point did you hook up with [the other operation]?

Manager: Pretty early in the piece because it was going to make it slightly more economically advantageous for us in that we shared the costs a little bit with [the consultant], [the consultant's] expertise, plus the fact that we had, well the rosters, basically we had identical rosters, so it's got to make a lot of sense to hook up with [the consultant], sorry, to hook up with [the other operation], the problem then though, and I think [the consultant] would fully know that we were frustrated and that the period of time, and I suppose that it was just one of those things, it was such a new thing for CASA and us and everybody else, so there was a lot of goalpost shifting for a while, you'd submit something...sounded like it was going to be OK and then the answer would come back 'No, we want this changed, we want that changed' and then it went on for weeks and weeks and we submitted maybe 10, maybe more FMSs, till eventually perhaps through attrition we just wore them down, eventually they gave it to us for attendance!

Interviewer: So how long did it take from start to finish?

Manager: Probably about three months, I think. Two or three months.

Interviewer: How long do you think it should have taken in an ideal world?

Manager: Well, in an ideal world I would have thought a few weeks, a couple of weeks. I think at the moment people are only taking a couple of weeks to get it done, I would assume, because all the groundwork's there, really should just be a pro forma, this is the structure the FMS has to have, these what you have to have in place, the training you have to have in place, blah, blah, blah, checklist, tick, tick, tick, really shouldn't be any more than that I wouldn't have thought. It depends how they are going to implement it. At the moment they seem to have taken away from the AOC renewal, whereas previously it was all part of the AOC renewal whereas now it's a separate item all together.

Interviewer: I think while its being refined and...

Manager: If they keep on that line its going to create a fair bit of extra work for CASA, and I guess the ultimate aim is to merge it back into just a straight AOC renewal process. But that makes it hard too because it becomes a bit untidy, because now we've got an Ops Manual, we've got an FMS, they're kind of dovetailed together but they're not the one document. I suppose that is a criticism, I don't like things to be untidy like that, I like things to be... here's the Ops Manual and part of that Ops Manual should be the FMS, should all just be included. Unfortunately the FMS is a bit verbose, it's a bit hard to include that, you could do. I suppose that's what [the chief pilot] was aiming for with that other thing, just slip it in your Ops Manual.

Interviewer: Was there any pilot involvement along the way?

Manager: Not a great deal because it's a bit hard to have the pilots involved when I had no idea what I was doing myself. But certainly when we got to the stage of entering the FAID data and all that sort of thing, yes, there was then, especially with one of the pilots who was pretty good with computers, he's been involved then, but then other than the training the pilots didn't really want to know about it, all they wanted to know was are we doing things the way we were doing things? Once they were sure of that they couldn't have cared too much.

Interviewer: So how would you describe the assistance you received from CASA when you were first implementing the FMS? Were they pretty eager to help out?

Manager: Oh yeah. We were dealing with [a CASA representative].

Interviewer: How did you find her to work with?

Manager: Yeah, she was OK, quite pleasant, there was another lady there as well.
Interviewer: [another CASA representative].

Manager: I think I was confusing you with her actually.

Interviewer: A lot of people have!

Manager: Yeah, initially. The other problem with CASA is they had quite a few personality changes, or personnel changes, during the process, that made it a bit hard, you didn’t know exactly who you’d be dealing with next week, and that caused problems, it would have been nicer if there had been a bit more continuity of personnel, and with [a previous CASA representative] it was fine but I think it was a bit grey at times as to what he did want. Once he’d put out the… he’d keep knocking back the FMSs and say ‘no, it’s not what I want etc’, once he’d put out his pro forma, the Sky One document, I think that made things a lot clearer, because we could see exactly what he wants, so we’ll write along those lines then. And I think that was probably the turning point, yeah.

Interviewer: Did you have that before you employed [the consultant]?

Manager: No. [the consultant’s] one he originally did is in that file I’ve given you, and he felt it was pretty reasonable, we thought it was pretty good, but it didn’t conform to the …

Interviewer: Was it substantially different?

Manager: Yeah, quite a bit. It didn’t obviously conform to what CASA had in their mind as what they wanted as a pro forma on this thing, so it had no chance, but, we didn’t know what the pro forma was, so we were just shooting in the dark. that made it a bit hard. There was a bit of ear-pulling for a while, we got there.

Management 7

Interviewer: Can you describe the major steps that were required to set up your current FMS?

Manager: The first major problem was to get the paperwork through, in other words we had to produce a fatigue manual, I think that was the biggest hurdle, once we had that in and approved we then had to educate the people not only on the fatigue side but also on the administration of it as well. And that basically is probably the major steps.

Interviewer: How much involvement did you have in both of them?

Manager: Whilst I didn’t do the briefing I attended all the work with [the consultant] and I also attended all the lectures with [the consultant] with all the bases as well. Well I flew with him up to Thursday Island, we had a [location] base there, and a [location] Base so I went and sat down with all the guys so I was learning as well. So we sat down with the [location] people as well.

Interviewer: What were some of the difficulties that were faced during implementation with regard to actually developing the policy?

Manager: I would never have done it without the assistance of a consultant, it was just too big for my level, for my experience. I think that I’m a good pilot but that doesn’t make me a good psychologist trying to get these things through. Whereas [the consultant], the guy that we actually got, his history is his an ex-airforce RAJ pilot at one stage, he got out of the services, he then was a Chief Pilot helicopter with a rescue helicopter in north Queensland, sorry, northern New South Wales, so he knows our side of it as well. While he was in the Antarctic, talking with pilots they believed that fatigue was one of the major factors that aviation had to address. So when he came back to Australia he actually did two years at the University of New South Wales at Newcastle studying fatigue and he’s actually written papers on it. Now we believe that he is absolutely ideal for us, because he knew both sides of the story and if it hadn’t been for him I’d still be staggering through, whereas he staggered only a little bit to get it through, and talked one to one with [a CASA representative] and that got it through. I’d have to get a consultant. Its almost the same thing as quality assurance
which they’re insisting that we do. Its very difficult for an aviation company at our level to have those sort of people available within the company. The same about the risk management, I can tell you lots about the risk management system, [another consultant] from Aerosafe spent a few days down there...

Interviewer: From Aerospace?
Manager: From Aerosafe. Do you know her?
Interviewer: No.
Manager: She’s very good. And I’ve got the 50 Australian and New Zealand Standard on it, which is???
but it still doesn’t tell me how to do it, really.

Management 8

Interviewer: Can you describe the major steps required to set up your FMS? Just briefly, and who was involved at each stage?
Manager: To get an FMS, to get people interested, the first thing that happened was some sort of convincing at the highest level because its going to cost...
Interviewer: Are we talking from a CASA perspective or from...?
Manager: From operator’s perspective. I was the one that did some work for here said it’s a damn good idea to save some money. The first step was education, understanding process, senior management willing to learn and invest. Its not a lot of money but it costs something. And if it doesn’t cost money directly it costs the time for existing staff, so there’s a cost, it still comes down to profitability. When they’ve decided they then ask me, what the best way was, and I said bring all the pilots in and let them know what its basically about and that they have the right to have input. Now pilots being pilots they all listened but some of them didn’t input, it was typical of what happens in CASA and other things, you get two sides of the coin, you get the pro-actives and the anti’s, both have fair voice and their concerns must be listened to. So we made sure there was awareness established of that and when they made input, as we were writing, formulating, improving the base document, that was all put in there. [the manager] is a bit ‘click, click, its all done’ type stuff, but the truth is he managed to get his head around it. None of these things just happened, they’re built. Basically we went back to the people and said this is what we’ve come up with, the reason you were given some choice here is because it’s a shift in responsibility. It’s a partnership between management and this group that we must be able to work to move the freight between here and here in these type of times. And its worked out remarkably well.

Interviewer: So was it mainly you that wrote it? Actually did the writing?
Manager: Yes, there was some input from a fair few people but people that did the writing were another bloke by the name of [consultant] and a little bit of [the chief pilot’s] stuff.
Interviewer: What relationship does [the consultant] have with the organisation?
Manager: He is basically a computer consultant. When we get to it I’ll just show you the system that we’ve set up. I actually met him when I was at CASA because he was doing some of the computer stuff and he was interested in having system that recorded flight and duty times and aircraft hours, being able to input directly into FAID so you didn’t have these awkward processes. What Interdynamics have done with the software is they’ve built in some level of protection so they’re the only ones that can allow... they actually have...I’m not fussled but clearly they’re a bit like Microsoft in that they want to protect their products. Fair enough. My opinion is fair enough but I have to go through two processes. Instead of just having all the numbers in there, there’s the FAID score, I have to juggle it. So [the consultant] was the ex-policeman/ computer programmer that helped us with some of the system development and some of the writing.
Interviewer: So that's possible for future...?

Manager: Yeah. The other thing here, we might look at that but cost... I'm not sure what the cost was. I'll just tell you there's another thing in this. When I was doing the work for CASA we had to have a transfer system. It had to be auditable, it had to be system related. It had to be affordable. And the second you say that... we even approached [a fatigue consultant] for a paper system so people...

Interviewer: How many versions of the FMS did you have before the final one got accepted?

Manager: Probably only one.

Interviewer: So it went to CASA once and then you fixed up the changes and it was accepted?

Manager: Yes, there was a very high level political push...

Interviewer: Ahh.

Manager: ...because the water got muddied by personalities getting involved and statements that had started to move significantly from the base model that been set up without explanation. Because all the base model that was set up was set up in the Asian ??? Research and it was given out in good faith on those grounds, and then when we applied the goalposts had moved. So unfortunately it needed a very large peripheral shove to get it through.

Interviewer: Who is responsible for auditing the FMS? As far as internal audits go?

Manager: Me.

Interviewer: How often does that happen?

Manager: We've only been operating 3.5 months. I would estimate that that would happen every 6 months, and after the second one we'll have a formal review and then go for another 6 months before an audit. So its about 6 month audits, but I'll show you how the system works???

Interviewer: Who was responsible for designing and administering education and training programs?

Manager: Me. But I built that on behalf of CASA. One of the problems with industry is, lets take our place here as an example. [the chief pilot] is a highly qualified Chief Pilot. I don't know whether he's tertiary qualified or not, but he's a very capable pilot. [The manager], the managing director, he's got a business vein, he's quick on a whole lot of things, definitely not tertiary educated, and an accountant that can use a calculator but between them to put together a systemic document, and this company wouldn't have been much different than 80% of the other companies around, its just not an option to write... you need another set of skills to get into business organisation, but there's nothing wrong with these people, but ??? are generally scratching for dollars, just operationally, you know, fly planes and make a little bit of profit and screw up the taxes and then your planes and make a little bit of profit and then screw up their taxes again. That's basically what they do. And get into trouble with CASA and try to fix it up and screw up their taxes. So its really organisational horsepower that most general aviation hasn't got. When I spoke with [a CASA representative] and the decision to put together example documents rather than dictatorial stuff that CASA traditionally does, everyone initially agreed that that was the way to go and the primary reason behind that is you can't expect general aviation, the document is a 50 page document and that's a lot of effort for someone, and the document is no way near as important as understanding the systemic function. Its just that the document is needed to be it all together and ??? and defensible. So that's why that style of document was established. There was a lot of logic in that, and until the adversary started to get in and play politics it was an accepted and legitimate way to go. I've got a feeling CASA will act in the right sense to fix that. But the average GA??? person, I don't know if you've managed to talk to [another operator] at [location], if you haven't get onto him because he's a good person. He's a top bloke. He's a bit of a rough nut at times, but he's got it up his... did I answer the question?

Interviewer: The question was education and training.
Manager: I’ve got over ten years in training. I was director of training at ELI training school, the
Australian Aviation College in Adelaide. I was what they term the ??? I put together the
actual education aspects of that training, and even though I could have used other people
around here, when it came to the fatigue element, when I was ??? I was working 70 hour
weeks just to understand fatigue as intended by the Centre for Sleep Research and what
NASA had written and what other people had written, so I ended up being the best person
in the organisation to do it from a fatigue and an education perspective.

Interviewer: What sort of assistance did you have from CASA as far as setting up the FMS goes?

Manager: Technically, and this is a silly type of thing, I had launched in good faith these example
documents as they had grown up from version one to version six, so technically I had
version six that I had been a major part of, there were other significant inputs to that, there
was [a CASA representative]. He’d had a little bit, he wasn’t a major input but he was well
aware of the stuff, [the other CASA representative] hasn’t had a major input but he was well
aware of the whole deal but people like [other CASA representatives] had all had corrections,
inputs, and I was really only the coordinator of that. At two major stages I’d asked the
Centre for Sleep Research to formally review that and they did that, and that was the base
document. So if I was to take a non-political view of CASA’s support, the time I got out and
someone decided they wanted me to help with fatigue management it was quite significant
because that document exists. If that document didn’t exist...

Interviewer: Is that Company Sky One?

Manager: The last version of Company Sky One. Now don’t forget tuck in behind that also was how to
use not abuse FAID and all these other things because I’m sure you would have found now,
and flying helicopters is one that comes to mind, initially in total ignorance of the program
they just to do two hours on, two hours off, two hours on, two hours off, two hours on,
two hours off. Broke all the rules of getting a decent sleep and they reckon they can do all
this stuff basically forever. And I had to say we’ve got to have some fundamental rules that
won’t allow you to do that because that’s a weakness of FAID. You just enter two hours on,
two hours off and it basically says you can go forever. Clearly we need big quantities of sleep.
Traditionally four hours is minimum, [the fatigue consultant] actually turned around in public
and said ‘why four, why not 3-5?’ because [the fatigue consultant] needed to get away from
absolute figures, and that’s alright, I can respect that, and even when we get down to the
science of this 80 points, [the fatigue consultant] says ‘well, I know we said 80 but what
I really want to say now is 75-85’. And I respect that.

Management 9

Interviewer: How was it implemented? Can you just briefly describe the steps that you took?

Manager: We contacted the Centre for Sleep Research, and we went through and got on to Howard Veal
who was doing it and sort of started putting out the feelers, and then he told me I had to start
writing something, so I did that, and then we compared notes and he sent me some of his
suggestions stuff and over the period of a year a guess we got it into the form where we could
get a CAO exemption, and run with it from there. As part of the validation phase we did our
audit six weeks ago I suppose now, and the exemption now is current with our charter licence
or our AOC, we just have to tidy up the manual to make it more useable, and that’s what we’re
in the process of doing. We promised it will be done by September, or end of September.

Interviewer: What sort of information did you get from the Centre for Sleep Research?

Manager: Not a hell of a lot. I’ve got the copies of the emails, basically they gave me some scores
or suggested scores and I asked them a question there and they basically put me onto
[a CASA representative] because he was handling it as far as CASA was concerned, and
just about all the dealings from then on were with [a CASA representative], and then I’ve
been talking to [another CASA representative] on and off for a long time.

Interviewer: And now she’s left
Manager: Yeah, but as long as we don't lose the program that's the main thing. To my way of thinking, to get past lawyers these days you have to have something that is an official benchmark and this is as close as we've ever come to it, the fatigue management in aviation, CAO48 rules are I think practically unreadable and absolutely useless, and well outdated.

Interviewer: Well it's very old.

Manager: And it's hopeless. And we need something we can use, if we can apply it, this one has the flexibility that you can, and that's why I'm in favour of it, I think it's a wonderful system.

Management 10

Interviewer: Can you describe the major steps required to set up your current FMS? You've already described some of them?

Manager: What have you got down for what I've already said?

Interviewer: I've got it on tape... you applied to CASA...

Manager: Well, I applied for an exemption to 48, initially.

Interviewer: When was that?

Manager: Roughly, three years ago. That never happened. I was then directed by the letter to provide a FMS and risk analysis...

Interviewer: How long ago was that?

Manager: We've had our FMS for 12 months, so it would have been 18 months prior to that. I got the letter, there were three or four things I was required to do, one of which was the fatigue management system. That's when I talked to my friend [name], we put together a submission based on what we thought was acceptable.

Interviewer: Do you still have a copy of that submission that I can get that sometime?

Manager: He probably hasn't got it.

Interviewer: It would be interesting to see it.

Manager: When I was talking with [two CASA consultants], they indicated that our current FMS is probably a bit overbearing, and I've gone 'yeah, probably!' And she sort of indicated that we might need a refinement, and I said 'a bit like the one I sent to you 18 months ago', and she looked at me a bit strange, and she probably thought that yeah... which was the original one which I'd submitted ??? If I can find it you are welcome to a copy of it. So we went from there, submitted my submission, no wasn't good enough, to-ing and fro-ing, arguing and yelling, Howard turned up on the scene with his 70 pages, re-wrote that probably four times, more perhaps until we got it right, and then once we got it right it was overnight we got the exemption. So the process was quite tiresome, drawn out unnecessarily, but as I say I felt that that was because they didn't really know what they wanted. Has that changed, who knows?

Interviewer: And was that you, only you, from [your operation] that went through all of that?

Manager: Mostly, initially, yes definitely. Certainly spoke with [the chief pilot] about it and got his input on it where it was appropriate. The pilots at that stage, not so much, but no particular reason other than I wanted to get something that was workable before I let them have a look at it, because there's no point giving them the reigns at that stage, but certainly, once the new one came out, before it was implemented they had an opinion on it, read it, talked about it.

Interviewer: Did they make any changes?

Manager: No they didn't. Not at all.

Interviewer: Was there any union involvement?
Manager: Any what?
Interviewer: Union involvement.
Manager: Any who? Unions? What are they? They're a thing of the past aren't they?
Interviewer: Unfortunately no.
Manager: No.
Interviewer: Do you have a set budget for the FMS, or was it a pay as you go thing?
Manager: ???
Interviewer: Approximately how much do you think you spent on it? Considering man hours? You might have paid your barrister?
Manager: Nah. He's a friend, luckily. Look it'd be only a guess but if you took man hours into it, you'd have to be taking $20,000 plus, realistically. It's a lot of money. But then what's safety worth? Nothing recently! No, probably $20,000 plus easily probably. I've never really sat down and budgeted it, I didn't think there was any point. It'd make me feel depressed.
Interviewer: What's the effect that audits have had on your operations? Have you done any internal audits?
Manager: Yes. You can have a look at them at the meeting, just ask Shaun for them. It was actually quite good. We made some changes. Basically at the meeting, the meeting before we said that in a months time we would be doing an audit and rah, rah, rah, and asked people to go away and think about anything they'd like to change, we came back with three or four things.
Interviewer: Were they significant things?
Manager: Not really. It was really about the administration of it, as opposed to any effect that it had on the pilots, it was really doing random audits, applying ??? one, and then actually having to import rosters. Again, my argument originally with [a CASA representative] was that they don't change, there may be an hour here or any hour there, but that's it, so that was it, we changed that. No I can't recall. And then we submitted that to the girls, and they came back and said yeah.
Interviewer: And what was your opinion of the CASA audit.
Manager: It was alright. I didn't really know what to expect, given that I'd dealt with [the CASA representative] previously. At the end of the day they were good, they were constructive, they agreed that there was probably too much in there than was irrelevant, and I would have to agree with that, they have sent us back since then an audit report, which I've flicked through but I haven't read, [the chief pilot's] read it. All in all I was pretty happy with it.
Interviewer: What's your opinion of FAID?
Manager: Bloody hard to use! The way in which you input our roster and times is antique to say the least, yeah, it needs to be a bit more user friendly in terms of inputting, what it spits out, yeah, its ??? You've got money in your meter?
Interviewer: Yes.
Manager: Good, because they're coming. I think what it produces is OK, but there's not a lot of flexibility in terms of what you do in a roster, like some's low risk, some's high risk, but I believe that's been remedied in this next version. More explanation is required on the fatigue indicators, like 40, 100, 80, yeah right, well what does it mean? It doesn't mean anything to me. [The CASA representative] says you must do this, I go, OK that's what I'll do.
Interviewer: Do you think that 80 is a safe limit?
Manager: I'm working on 75.
Interviewer: Is there any reason for that?
Manager: Howard told me I had to. I wasn’t happy about it, given that I know that [our competition’s] working on 80.

Interviewer: How close do you come to that benchmark?

Manager: Generally speaking, not really. High 70’s, early 80’s. There’s one I think that comes out at 74.7. I think that’s [the chief pilot]. I’ll have a look at the rosters. It’s interesting all these documents and rosters and keeping them all on file is all well and good but what do you do with them? I guess that’s slightly different to other people where their rosters are changing, whereas ours aren’t, they’re static. The other thing with FAID, something that really annoys people but I can’t think what it is now. We’ll come back to it.

Management 11

Interviewer: Just briefly, can you describe the steps that were taken to set up the current FMS and who was involved for each of these stages?

Manager: In the initial period, [the chief pilot] would give you a better understanding, he would know exactly what we did. [the chief pilot] was the project manager to actually implement the system. We employed our consultant to a ??? and CASA also recommended [a CASA representative] and we had another girl called [CASA representative] had some involvement early in the piece. Mainly [CASA representative] ran on with it from there.

Interviewer: [CASA representative] you mean?

Manager: Yes. In general what we’ve done, the actual handbook draft came through from the review myself and ??? have a look at it early in the piece. In a nutshell, [our consultant] had involvement to make sure it would interface into our QA system.

Interviewer: QA being quality, right?

Manager: Yes. She supported [the chief pilot] in helping that process, and the other guys definitely had a process to put it in line with what CASA would require. At the end of the day, it was achieved and implemented pretty well. I think certain parts of the handbook are very good, ???

Interviewer: What sort of improvements are being made?

Manager: It will list more the sorts of things that we actually do. It’s just a template that they have. That’s how I see it. It will be more reflective of quoting the correct clause or checking the ??? or the fatigue manual or the admin manual or the quality manual.

Interviewer: When are you expecting that would be done by?

Manager: I would liked to have had the handbook re-done since we bought it from CASA before you came.

Interviewer: It would be good to get a copy of that, if that’s OK, when it’s completed.

Manager: OK I’ll get it to you. It will reflect more what we do. The sort of things that we talk to you about are not all reflected in that, and that’s managing risk of fatigue. I think with a little bit more effort, and feedback from CASA. I mean I thought the last audit we got from Ian was very, very good. He put it very simple, how it would be, weed out thing that weren’t right, he took it out, he’s got rid of all the yabber, he had a full day here and a lot was accomplished.

Interviewer: have you kept track of the budget or resources spent to create the FMS?

Manager: I have a fair idea, with the cost of the software, the labour requirement really is not a problem to me because it’s in our monthly wages anyway. I daresay it’s in the order of $10,000. We’ve also spent training with fatigue we’ve got one guy from [consultant] came in to do a training session for us that’s about another $1,200. Not counting the labour from our side, the software, implementation and training, would be between $10-$12,000.

Interviewer: How ??? the system was used in your actual company?
Manager: Talking about QA...
Interviewer: I'm talking about the FMS
Manager: We all knew that the five-month review was to happen and to me that was the review.
Interviewer: OK that's fair enough
Manager: And once we do that, we will then implement in our QA, put in there a yearly fatigue review, for management, Sign off that we've done that and then we might do that around a training week, I mean once it's up and running we'll review it more often. Getting the information together and learning a bit more about it and seeing how it fits and I'm sure we'll probably get some positive feedback from CASA and how people perceive it. It will be very curious to see what other companies have assessed themselves, like how they've managed recording the risks — high risk, medium risk, low risk.
Interviewer: That's a common confusion and that's something that CASAs only recently put an emphasis on.
Manager: Well I reckon its come with duty time because my view is that 9–5 or perhaps 7–5 or 6–4. We're not flying every second of the day???
Interviewer: How have you found the actual FAID programme fitting within your company?
Manager: Not hard to work, [the rosterer] picked it up pretty quick.
Interviewer: Do you think it's effective?
Manager: It's not hard to work, it produces what we need.
Interviewer: Do you think it's a good control measure?
Manager: I'd like to see it changed a bit, where it actually allows you to show clearly, time off. We show a week off before we actually put any time in there, so if you've been a week away and then you've got three weeks off. Inputting some of that data just doesn't quite show you that time I don't believe, or if it does it doesn't look fair to everyone? a bit of feedback in that line, she inputs it. [The consultant] and I sat down and did an introduction to it? It's not that hard, its user friendly, what we have to do as a company now is make it interface with some of our other work, and I think if it were to interface more easily with Excel and Access it might make it a bit more user friendly. It's got to be a Windows based environment, and I think that would be good if it would interface, so therefore when entering duty times you just slot them in, not have to key them in twice.

Management 12

Interviewer: How much input did you have in developing the FMS policy?
Manager: Me? A lot of it. I was instrumental in a lot of it. Myself and [the operations manager]. He had already done one or two, in his CASA capacity, and then we were the first one's he did outside his CASA capacity, and I was pretty instrumental in what I thought the company wanted in it. And [the chief pilot] backed me up and [the chief pilot] put his two bobs worth in and we?? and whatever we finished up with is what we got.
Interviewer: How much help did you get from CASA throughout the entire process?
Manager: None.
Interviewer: So how did you know what to do or how to go about doing the FMS?
Manager: CASA put out a set of guidelines for us and I employed the operations manager to do it.
Management 13

Interviewer: Can you describe the major steps required to set up your FMS and who was involved?
Manager: I guess first of all coming to terms with understanding what the requirement was, engaging a consultant to assist with the process...
Interviewer: What consultant did you use?
Manager: We used a former IFR pilot that was doing post grad studies in HR in Newcastle. He’s in the States now but we took him on to do that because he’d been involved in fatigue studies as part of his post grad work, so he was fairly knowledgeable in the area. And he also understood our operation, so those two things made it... we had him work with [the chief pilot] and myself and then the next stage was CASA’s involvement in assisting us comply with what the CASA understanding was of the requirements at that point.
Interviewer: And that was [a CASA representative]?
Manager: Yes. And [another CASA representative] too to a degree, but [the other CASA representative] was off a bit of that time with sickness and so forth, so [the CASA representative] was the principle one. And then the acceptance of the system, I guess the next stage would have been the training and implementation, I guess the phase we’re in at the moment is review and revision.
Interviewer: When you first got told that you had to set up an FMS, what sort of information did you get from CASA?
Manager: Talk to [a fatigue consultant].
Interviewer: And that was pretty much it?
Manager: What they said was, and it was understandable, that the only way to achieve a departure from the normal CAO48 was to demonstrate an equivalence of safety through an accepted basis, or a basis that was accepted... how did they put it, I don’t know what they used... a scientific basis, but what they were talking about was something that was essentially able to relieve CASA of the burden of responsibility, so that they weren’t going to have to stand up in court and say I approved this, they could stand up in court and say what we approved was something that is the product of academic research and so forth, so I initially talked to [a fatigue consultant] by phone and then we got some of the trial FAID software, but it wasn’t really until [the CASA representative] produced the template document that we were really able to get our teeth into it and say OK if this is what CASA wants... and that was really the biggest determining factor, what does CASA want.
Interviewer: So you think the template is necessary?
Manager: I think the template is an absolute essential is you’re going to have any success in operators, because we go back to this sophistication issue, otherwise you’re asking helicopter or aviation operators to become fatigue experts and able to craft their own fatigue management systems, and that’s just not possible. Its like asking you to fly the helicopter for us. We’re in different professions and our expertise is in different areas so in terms of compliance its far, far easier to comply with something that is presented as a draft document that is then customised for the individual requirements, that is manageable, but not to develop the thing from scratch, unless you’ve got somebody very unusual on site.
Interviewer: Was there any union involvement before during or after the FMS implementation?
Manager: No. Thankfully!
Interviewer: What were some of the major difficulties that were faced during implementation in terms of... you’ve already spoken about developing the FMS policy...
Manager: Understanding, implementation once again I’d say [the chief pilot] could be more helpful with this, but what I was aware of, the lack of consistency and understanding amongst the crews, even in things as simple as how do you define work, so you had some people who at 10 o’clock at night the phone rings, pick up the phone, the take off is at 7 o’clock tomorrow morning, fine that’s four hours...

Interviewer: You’ve got minimum four hours ???

Manager: That was the original document, and we originally had 90 hours maximum duty time in 14 days, which was a hangover from the previous one, and this had been busted all the time, so some of the crew were reverting to their pre-[operation] practice, which was standard in the industry, that if you’re going to exceed 90 hours then you change your entries so that you don’t exceed 90 hours. And I was amazed at the lack of integrity that was just considered normal in some of their backgrounds. So to convince them that that was not the intent that we really wanted something that worked and then [the CASA representative] bless his heart said one day when I called him and said we have a problem, he said what's your problem, and I said well this 90 hours, and he said take it out, and I said what do you mean take it out, and he said you put it in, you can take it out, its your call. And so we took it out. And that was just to get around these situations where somebody's sitting out on an island reading a book for 13 hours, but you do that four or five days in a row and you've just blown your fatigue scores through the roof, and you duty time. You do that for four or five days in a row and you can’t fly the next week.

Interviewer: have you kept a track of your budget for the FMS?

Manager: No, that would be very difficult, and all I can say is plenty.

Interviewer: are we talking thousands, hundred thousands, tens of thousands?

Manager: Just as a wet finger in the air approach I would have to say it would be $50,000. That’s for development and implementation, that doesn’t count the amount of money we lost during the 18 months...

Interviewer: Which was… what did you say, 300... ?

Manager: $200, 000.

Interviewer: What sort of impact has the auditing had on your operations? Have you done an internal audit yet?

Manager: We’ve had an external audit from CASA, have you got a copy of that?

Interviewer: Yeah, I do. And how did you find that?

Manager: I think the audit is a fair statement, the frustration is, [another CASA consultant] and [the chief pilot] will probably tell you the same thing, [the other CASA consultant] would say how do you know 65, 75 or 75 and 80 or whatever we’re running on are valid target risk fatigue scores? Well that’s what you told us. Yeah but how do you know? We implemented this system and we were told to use those three scores and we’ve gone ahead and used them, we hadn’t even got to the point of asking the question: is there a basis to those that we can justify? So [the other CASA consultant] coming on strong about risk analysis at that point I felt it was accurate but it was unreasonable because we’re still trying to figure out what the whole thing means let alone know how to do a risk analysis that comes up with a meaningful answer. And the time that that’s going to take to go back to the crews, explain to them what it is we’re after, explain to them the necessity for their input and for their experience and then to get that input in a meaningful and reliable way on which to base planning, I mean all that is not part of doing business and earning revenue, so I guess there are aspects in that audit that we sort of went ‘oh, gee’. We thought we’d gotten past the half an hour into another major exercise. And I’ll tell you what I told CASA at the time, you’re using the industry to do
your research for you. If that had been clear at the outset then there might have been a different approach to it but it became clear, and maybe it wasn’t even clear to CASA, but it became clear over a period of time that CASA didn’t really know and CASA ??? and they were desperately trying to stay one step ahead of the industry. But effectively by staying one step ahead the industry was never compliant, and we’re not compliant now as a result of this audit. So it was frustrating.

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Interviewer: How would you rate your satisfaction of the assistance and interaction you had with CASA re. the FMS?

Manager: You would have to divide it. Initially, I would suggest – when they told us we had to do this, the cooperation from CASA was in the negative – you wouldn’t even get into scale. What they were telling us was that all our exemptions were being withdrawn, and by the way, you have to produce something that we are not even going to tell you what it is. Um… [a CASA representative] came in, and I suppose that was the first indication from CASA that they were even interested in the situation. He as an individual probably performed and helped us to the level of 7/10, I think it probably sits at around about 6 at the moment. And I think with this, we really feel like we’re doing all the work, and that someone else is sitting around, waiting to see what we’ll come up with.

Interviewer: Did they provide any help with the interpretation of actually setting up the FMS?

Manager: Well, I suppose they did – ah – out of a score of 1-10, it would have been a 3. As I said, we had no guidelines at all, and ah, we were producing documents that got sent up there, and they said ‘well, that’s not really what we wanted’. I mean, this is not unique to the FMS. CASA historically is renowned at doing things to their satisfaction – ie. CASA must be satisfied. It’s actually a legal term that they’ve got in there, in their own legislation. And satisfying CASA is a fairly interesting thing. Between regions, if the local guy says to me here – sorry if I’m boring you with this, but it’s probably important that you understand and this is the difference between regions – CASA might say to me here, that in order for you to have an air operators’ certificate, you have to describe to me in detail how you do the charter flight from Adelaide to that party. Now I can write a set of guidelines and say this is how I’m actually going to do this charter flight. I can submit that to the local office here, and the local office might say "well I’m not satisfied that this is exactly how you do it, or that you haven’t covered certain parts of it here there and everywhere. It should be much more detailed than what you’ve said". Well, somebody in Western Australia can submit exactly the same set of details to their office over there, and their guy says “yep, that’s fine”. And this is a big, big problem that CASA have got. And that's I think why a lot of these exemptions were then pulled in and sent to Canberra. Because, as you can probably work out, now I can’t do the job, I can’t fly to this party, because CASA have said "well no, your details are not acceptable". But Bloggs over in WA can do the same thing. So he's not got a thousand dollars in his pocket coz he's done the job, and I’m sitting here, still writing details because it hasn’t been accepted. So, yeah, the problem of satisfying CASA is an Australia wide aviation industry problem. They have this rule to say you have to satisfy this, but the specifics are not detailed. So you just keep sending up stuff until one day ‘BING’ you’ve actually been accepted. And how did I do that, well I don’t know, so I don’t care.

Interviewer: As far as the ease of use goes, as far as establishing it and now using it goes, how well does it work?

Manager: Now using it, it works quite well. I’ve still got, and I suppose one of the problems that I had, was when we get something that’s out of left field with the FMS – take the bush fires up in Sydney. Everybody up there except us was working to various exemptions or CAO 48. CASA turned up actually out in the bush with all the operators, and they said look, we’re going to exceed our flight and duty times. CASA said “oh well, here’s a piece of paper you can
exceed your flight and duty times for this, to do that, under these conditions”. My people ring me up, and say “how do we exceed a work practice”, and I say “right, OK”. Nobody in CASA can tell me, because nobody really knows really anything about FMS. So what I said was “OK, you can fly this many hours extra over this week long period, but to incident with that, you’ll have to be staying in a motel, you’re not to start before this hour, and your peak fatigue scores instead of being 80, must be 65. And they go “yep, we’ll do that”. So all my pilots – I don’t know, I had half a dozen up there – said “yep, right”. And then when [two CASA representatives] turn up here, I said to them, “well here’s the situation I had, and this is what I did. What’s the legal ramifications of that?” They said that “I guess that I did an on the spot risk assessment, and made a reason judgment”. And I said “Oh, OK, so that’s all there is to it”. And they said “yeah”. So, I’m still not really sure if something like that happens again where my authority stands. I mean, the pilots are right, because the chief pilot said do this. But CASA have not had any guidelines for this to take place. In the old days, I would have called the FOM that I have here locally, and say “we’ve got this situation, it’s a one off, a state crisis or whatever it is – this is what I want to do”. And they would ask me what safety precautions I’ve put in place. I’d tell them and they’d say “Oh yeah, OK, well you go ahead and do that”. I’ve never had a CASA guy say to me “no you can’t do that”. But it leaves me in an interesting position if something did actually go wrong.

Interviewer: Can you give me any indication of the actual budget used to set up the FMS?
Manager: Budget for the FMS – you may be surprised to know that there is no budget – it’s been unlimited. Whatever had to be done – so that first one, the little skinny one cost me $600, the big one cost $14,000, god knows what it’s cost since then.

Interviewer: Even time and resources
Manager: Well, I can tell you that if someone was paying me to do what I’ve done so far, they would be up for around $60,000 in my time alone over the last 7 _ months. But, there is no budget for it. So, I hope that the financial director doesn’t come and ask me one day what it all cost.

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Interviewer: Can you describe the major steps required to set up your current FMS?
Manager: ??? What we did to set it up? I think I first wrote an introduction letter to … what’s his name…
Interviewer: [CASA representative]?
Manager: No. Oh yeah, I suppose the initial thing was with CASA, we enquired what we had to do to get an exemption from CAO48. So we enquired with CASA about an exemption from CAO48, they indicated that we needed to set up a FMS, and they gave us a contact at your university…
Interviewer: [fatigue consultant]?
Manager: With [the fatigue consultant]. So then I wrote an introductory letter to [the fatigue consultant], outlining our work, company and our operation, and then [the fatigue consultant] wrote up an FMS for us, and sent it to me, and then I looked through it and changed what needed to be changed to make it fit our operation and then there was quite a bit of back and forth ??? with that before we were able to formulate one and send it through to CASA.

Interviewer: Was that a long process?
Manager: Probably took us… I don’t think I’ve got some of the initial paperwork that we did, it was that long ago, but it probably took a good three months, minimum three months to get it all set up.

Interviewer: So you sent it through to CASA, was it accepted straight away?
Manager: They sent it back, requested a couple of changes and then we did those and then it was accepted.
Interviewer: Were they reasonable changes?
Manager: They were reasonable changes. They were just really taking their time. I think really without making any major change to it.

Interviewer: Was there any union involvement in the FMS implementation?
Manager: No, none at all. And there was probably very little pilot involvement as well.

Interviewer: But the pilots were fine with it, they didn’t…?
Manager: No one’s ever complained about it, in all our flight safety meetings, we hold monthly flight safety meetings and…fatigue, fatigue, rolling roster and they’re to be held every Monday, Tuesday, look to see whether there’s a rolling roster Nil issues, Nil, fatigue, Nil, fatigue, Nil, that was just me telling them to watch something, Nil, Nil, Nil, no one’s ever come with anything, no one’s ever put through a fatigue report, no one’s ever come through with a fatigue concern, nothing at all.

Interviewer: It sounds like it’s a pretty approachable situation as well.
Manager: I think so, I think they find it pretty approachable, I think so. But I couldn’t answer for them.

Interviewer: As far as difficulties that were faced during implementation, I’m looking at things like how much time did they take and who was involved, what was involved, can you describe developing the FMS policy? You’ve kind of already done that but is there anything you’d like to add?
Manager: No, not really. It was a huge job to set up, just all the issue of setting it up, and getting it going and writing everything. It was a huge job.

Interviewer: Was it unreasonable do you think?
Manager: No, I don’t think it was unreasonable, it’s just some people are good at writing manuals and putting it all in words and some people aren’t.

Interviewer: How about the budget and resources you had to put into it?
Manager: I don’t know.

Interviewer: Has it just been pay as you go?
Manager: We had to pay [the fatigue consultant], and that was it really. There wasn’t any budget, the company didn’t go OK lets work out what its going to cost and we’ll do it, they just wanted it done. So it was like get it done whatever it costs. Because CAO48 was too onerous and restrictive, it didn’t suit ballooning at all. ??? really detailed what the company could do.

Interviewer: How about auditing the impact of the FMS on operations?
Manager: We’ve done one internal audit, and CASA’s done an audit.

Interviewer: And that hasn’t really impacted operations much?
Manager: I wasn’t here for the CASA audit, [the operations manager] did that, so [the operations manager] could probably comment more on that, we have got their audit report back, there are a couple of things they wanted done, pretty minor, and our internal audit was just myself, [the operations manager] and [the general manager] sat down and looked at it and decided it was running fine and there wasn’t really any changes that we deemed were necessary.

Interviewer: Do you have to develop contingency plans as far as the rosters go?
Manager: There's not a lot that has to happen really. I know we've got here contingency planning, extension of the rosters work periods, we've never had anyone go over 11:30, the only time we had it happen one of the pilots... about three weeks ago we had 14 holes in an envelope, put in an envelope, and we just changed the roster, we basically rang the office, closed numbers of two balloons for the next two days and took two of us off the roster, pilot wise, and we just did maintenance, came into the shed at 7 o'clock, 8 o'clock each day and did our maintenance, got it fixed. But we don't have that formulated anywhere that if this happens this is what we'll do, it's just that that's what we had to do that time to get it done. And that was the only thing that extend our rostered work periods, would be mainly if the balloon gets damaged and needs to be repaired.

Interviewer: How much effort was involved in designing and administrating the education and training programs?

Manager: Of the staff? We did the Living for Shift Workers thing, and we just gave them all a manual and told them to go away and have a look at it, read it...

Interviewer: The FMS manual you mean?

Manager: Yeah, they got a copy of the FMS manual, and one of these here...

Interviewer: Yes.
APPENDIX I:

Company SkyOne

Fatigue Management System

Description, Policy and Application

This document is intended to be an example of the type of presentation needed to substantiate a fatigue management system.

If you use this material you are required to adapt it to your operation.
2.2 Scope

This policy applies to all aircrew flying for Company SkyOne whether directly employed or seconded.

While we recognise the demands that from time to time are placed on maintenance, loading and support personnel this policy is at present confined to
the fatigue management of aircrew for the purpose of flight safety.

THIS DOCUMENT WAS INITIALLY PREPARED TO FATIGUE MANAGE
PILOTS, HOWEVER THE RECENT FATIGUE STUDIES ARE A SOUND
SCIENTIFIC BASE ON WHICH TO FATIGUE MANAGE CABIN CREW,
MAINTENANCE ENGINEERS, AIR TRAFFIC CONTROLLERS OR FOR THAT
MATTER ANY GROUP OF PEOPLE. THE FAID MODEL PERMITS THE RISK
TO BE A FACTOR IN THE MANAGEMENT ACTION.

2.3 Definitions

These definitions are intended for use within this Fatigue Management System and may not be altered or used elsewhere without agreement.

DUTY IS NOT DEFINED HERE AS IT HAS BECOME AN ABUSED AND
CONFUSED TERM WHEN USED OUT OF CONTEXT. TO REDUCE
CONFUSION WE HAVE OPTED FOR TO USE THE TERM WORK (TO
REMAIN CONSISTENT WITH THE STUDIES) AND EMPLOYMENT TO HELP
KEEP THE INDUSTRIAL ISSUES SEPARATE.

Fatigue Index
The fatigue index is an indicator of fatigue expected to be induced by working a
roster. This is determined by the use of a computer program called FAID
(Fatigue Analysis InteDyne).

Fatigue Score (FS)
The fatigue score is derived from the time of the day worked, the time of the
previous days work and the length of the time off or "non work" between the
work periods. The maximum score indicated during any set period is referred to
as the Peak fatigue score (PFS).
- Scores to 40 is considered normal for standard day work
- Scores between 40 and 80 is more typically encountered by shift work,
  irregular work and stand hours.
- Scores above 80 are considered high and indicates a fatigue risk.

Risk Target Fatigue Score (RTFS)
This score is a setting in the FAID software that allows the operator to nominate
a "risk level". This setting does not influence the FAID algorithm but generates
colour alert indications.

UNTIL YOU RISK IS FULLY UNDERSTOOD A RTFS SETTING OF "HIGH 80"
IS AN APPROPRIATE STARTING POINT.
Work
Work is any task that is required to be carried out associated with the business of an
employer or if self-employed, any task related to employment.
Note 1: Work includes positioning at the behaft of the operator and any
operator required training.
Note 2: Work for the purposes of fatigue management also includes any
flying activity that may have been undertaken during a non-employment
period.

Non-work
Non-work includes all activities other than work.
Note 1: An important element of non-work is where the normal human
function of sleep occurs. During any non-work period the facilities for sleep
must be available and it is assumed sleep will be taken to satisfy personal
needs, approximately seven hours thirty minutes per day.
Note 2: Standby for the purposes of fatigue management is considered
non-work, provided all standby conditions are met.

Work Period
The work period starts when work is started for an operator and continues until
that person is free of all duties.
Note 1: Unless an aircrew member undertakes flying external of his or her
employment, is self-employed or works for another employer the work
period falls within the employment period.

Aircrew
An aircrew member is a qualified person charged with duties essential to the
safe operation of an aircraft in flight.

Flight Crew
Pilots
... 
Cabin Crew
Flight attendants... Flight Nurses
... 
Maintenance Engineers
Qualified aircraft technical... 

ENSURE YOU DEFINE THE PEOPLE OR GROUP OF PEOPLE YOU WISH
TO MANAGE UNDER THIS FATIGUE MANAGEMENT SYSTEM.
Standby conditions
Standby conditions means that:
- Suitable sleeping accommodation is available, in an environment conducive to sleep
- Sleep opportunity exists
- Some recreational facilities are available
- Some form of sustenance and drinking water is available
- There is no employer requirement other than the requirement for personnel on standby to stay rested and sleep if it is reasonably possible to do so.

Standby at home
Standby at home is that portion of the employment period that the flight crew remains at home prepared to be called for flying duty.

Note 1: Standby undertaken in suitable standby accommodation under the standby conditions is for the purposes of fatigue management is non-work.
Note 2: The flight crew is to remain rested and must not undertake any activity that might cause excessive fatigue or inhibit flying performance such as the consumption of alcohol or periods of extreme physical exercise.
Note 3: The pilot or flight crew must rest and should sleep if it is reasonably possible to do so.
Note 4: The family, partner or living companions of the flight crew must be aware of the conditions required by the crew in order to sleep when at home and those conditions must be maintained.

Standby at work
Standby at work is the portion of the employment period that the flight crew is in the company standby facilities, which includes suitable sleeping accommodation, and is prepared to fly.

Note 1: Standby undertaken in suitable standby accommodation under the standby conditions is for the purposes of fatigue management is non-work.
Note 2: The flight crew is to remain rested and must not undertake any activity that might cause excessive fatigue or inhibit flying performance such as the consumption of alcohol or periods of extreme physical exercise.
Note 3: The flight crew must rest and should sleep if it is reasonably possible to do so.
Note 4: Standby does not exclude the pilot or flight crew undertaking some activity relating to flight preparation or personal aircraft qualifications.
Note 5: Standby may include any form of company required training or work. Should such activity occur, the work period is deemed to have commenced?
Note 6: Standby does not exclude the pilot or flight crew undertaking limited personal responsibility of professional aircraft completing limited pre-flight checks or generally being prepared to fly by reading NOTAMS and weather reports, provided this is not an employer requirement.
Split shift
A shift, a work period, is considered split when a significant gap occurs between successive work periods during which the flight crewmember is relieved of all work.

Note 1: To be considered a split shift, for the purpose of this fatigue management system, the period between the duty periods must include at least four hours at suitable sleeping accommodation.

Note 2: The facilities must be of suitable standard for sleep and must be available for total sleep period.

Note 3: The flight crew should sleep during this period if it is reasonably possible to do so.

Note 4: The sleeping period between a split shift may be taken at home if both the company and the employee agree that the conditions are suitable for sleep.

Suitable Sleeping Accommodation
Suitable sleeping accommodation means facilities that are conducive to sleep. It must include a comfortable self-contained room or compartment with a single occupancy bed for each person. In an aircraft this must include a bed that is comfortable, flat and horizontal, allowing the occupant to sleep on his or her stomach, back or either side. The accommodation must be suitable for sleep under the local conditions. It must be subject to minimum noise levels including low occurrence of random noise. Facilities to control light, temperature and ventilation may be necessary. Insect screens on doors and windows may also be required.

Note 1: For standby at home or in private accommodation the bed may be other than "single occupancy" but must be suitable for sleeping too.

RESTING ACCOMMODATION: NO DEFINITION OF RESTING ACCOMMODATION IS PROVIDED BECAUSE IT HAS NO OFFICIAL STATUS FOR THE PURPOSE OF REDUCING FATIGUE. TO REDUCE FATIGUE SLEEPING ACCOMMODATION MUST BE PROVIDED AND THE CREW MEMBER MUST SLEEP IF IT IS REASONABLY POSSIBLE. IN THIS DOCUMENT TRY TO USE THE TERM RECREATION INSTEAD OF REST BECAUSE SLEEP IS ALWAYS REST BUT REST IS NOT ALWAYS SLEEP.

Positioning
Positioning is that travel required by the operator used to position the flight crew for flying duties before or after flight.

Note 1: For the purposes of fatigue management positioning is always considered work, unless it takes place in suitable sleeping accommodation.

Note 2: Once work has commenced it continues until the end of the roster or a qualified sleep opportunity, at suitable sleeping accommodation is achieved. If the sleep opportunity cannot be qualified, a four-hour default value may be used.

Note 3: Positioning that is required immediately before a break may take place at fatigue levels higher than normally planned provided that person has no further decision making responsibilities such as driving home.
Employment period
The employment period is that time that the flight crew is contracted and paid by the employer. The employment period may include:
- Standby at home
- Standby at work

Note 1: For the purposes of fatigue management, part or all of an employment period may be considered non-work.
Note 2: Formal employment activities except general preparation to fly and private study for personal aircraft qualifications are considered work.

Non-employment period
The non-employment period is that time the flight crew is not paid by an employer.

Note 1: The flight crew has a moral and an employment responsibility to remain fit to fly even when this may inhibit some recreational activities during the non-employment period.

Definitions that do not match your operation must be removed from this document, as they may distract or make the document more difficult to understand than it needs to be. Similarly, if other definitions are needed you may insert them. However, definitions are subject to CASA standardisation so there is a need to ensure the definition provided remain unchanged.
3 Identification and Assessment of Fatigue

3.1 Indications of Fatigue

Pilots learn from experience and the training and education materials that indicators of fatigue are involuntary nodding off, waves of sleepiness, having trouble focusing, a lack of energy, irritability, poor hand-eye coordination and an inability to recall the last five minutes. Similarly, the consequences of fatigue are both physical and psychological and include delayed reaction times, reduced vigilance, reduced ability for complex decision making, lapses in concentration, increased risk of unintentional tapping or "micro sleep", making errors and hence an increased likelihood of accidents or injuries.

3.2 Potential fatigue related risks

The effects of insufficient sleep on individual performance are profound and affect a variety of areas including:

- **Biological**: Cognitive performance impairment leading to decreased ability to process information and make timely, appropriate decisions and actions.
- **Psychological**: Alariness impairment leading to decreased ability to remain awake. Clearly, such impairment can lead to increased likelihood of accidents and injuries.
- **Social**: Mood changes such as increased irritability, decreased motivation and morale.

Research by the Centre for Sleep Research has clearly demonstrated that fatigue-related impairment is not dissimilar to the effects of moderate alcohol intoxication. That is, significantly delayed response and reaction times, impaired reasoning, reduced vigilance impaired hand-eye co-ordination. This research indicated that after 17 hours of wakefulness fatigue-related impairment on a hand-eye co-ordination task are equivalent to a blood alcohol concentration of 0.05%. This demonstrates the clear need for fatigue management in the aviation industry. This comparison in no way implies that Company SkyOne will tolerate a blood alcohol concentration greater than zero during any employment period.

3.3 Causes of Fatigue

Determining all of the factors that cause, and contribute to, fatigue has proved difficult. Determining the relative importance of these factors under different conditions has been problematic.

At a fundamental level, fatigue can be viewed as the consequence of inadequate restorative sleep. The most critical acknowledgment to make with respect to sleep and recovery is time of day. The quantity and quality of sleep that can be obtained in a break period of particular duration is significantly dependent on the time of day it occurs. This is because humans are programmed to sleep at night but is exacerbated by the fact that there are more needs competing with sleep during the day. Consequently, working during the night hours is more fatiguing than the same work performed during the day.
The sleep deprivation and fatigue experienced by an individual may be largely dependent on the interaction between the roster and the individual worker's social and domestic circumstances. In addition to work-related causes of fatigue, non-work-related factors can also contribute to fatigue. Non-work factors such as sleep disorders, individual differences in coping strategies and psycho-social needs such as domestic duties can cause additional fatigue. As with work-related fatigue, non-work-related causes of fatigue contribute to overall fatigue by a reduction in the opportunity for sleep and recovery.

3.3.1 Napping

Therefore "sleep" is primary in the reduction of fatigue. Rest and napping practices are useful mitigation against short-term stressors and adverse conditions that reduce the rate of accumulating fatigue but they do not reduce fatigue, only sleep effectively reduces fatigue. When a particular high intensity, demanding, mentally and/or physically stressful work occurs, breaks, rest, napping etc are appropriate. These can be used as immediate and appropriate mitigation of short-term fatigue and this means that within a fairly narrow band over a longer period, average fatigue accumulation is similar for most human beings. This fatigue on a longer-term basis, daily and weekly, can only be managed by tracking sleep and work periods.

There is a caution associated with napping. Sleep inertia may be induced and this can slow considerably, a person's ability to achieve the necessary performance level and awareness to go back to work. Napping is not considered sleep and this is one of the reasons the four-hour discipline is applied to sleep management.

3.4 Sleep and Circadian Rhythms

Pilots are often required to work shifts or extended hours at times when they normally would be sleeping. Similarly, pilots are often required to attempt to sleep at times when they would normally be awake. Thus, shiftwork can be considered to be a biological disruptor.

The requirement to be awake at night and asleep during the day can disrupt natural body rhythms that repeat approximately every 24-hours (i.e. circadian rhythm). These rhythms are associated with many human functions including body temperature, alertness, performance, and sleep. Disrupted rhythms impact on the quantity and quality of sleep and on task performance, and create a perceived sense of personal imbalance.

Disruptions to normal sleep routines are often associated with night work or extended working hours, where the major difficulty is getting adequate undisturbed sleep during the day. The cumulative result of these disruptions is insufficient recovery sleep, commonly known as sleep debt, leading to increased fatigue and impaired performance.
3.5 Work and non work

From an OHS perspective, fatigue is most appropriately conceptualised as either work-related or non-work-related, and may be defined as an increasing difficulty to perform physical or mental activities.

Maintaining intense concentration for extended periods, being exposed to temperature extremes, or working in a high-risk situation, may cause work-related fatigue. Non-work-related fatigue may be caused by sleep disruption due to family members, stress associated with financial difficulties, or domestic responsibilities.

3.6 Lifestyle

Levels of work-related fatigue may be considered to be similar across different individuals performing the similar tasks. Work-related fatigue as defined, can be measured and managed at the organisational level. However, non-work-related fatigue is highly variable between individuals and is dependent on a person’s environment as well as their physical and mental attributes. Therefore, non-work-related fatigue is best managed at the individual level. Nevertheless, under OHS legislation, it is a requirement of all employers to provide access to information that allows their employees to make informed lifestyle choices. By providing relevant and accurate information, employees are more likely to minimise the impacts of non-work-related fatigue.

Effective management of work-related and non-work-related fatigue is likely to produce benefits to pilots and their families. Pilots may experience improvements in morale, safety, productivity and attrition rates. Individuals should expect improvements in health, wellbeing, motivation and quality of life.

3.7 Social and Family Disruption

Work scheduling that is based solely on organisational requirements may not acknowledge the personal, domestic and social needs of its employees. The disruption of family and social life may result in pressure on relationships, domestic workloads and community activities. As with sleep and fatigue, this has implications for task performance, health and safety, morale, absenteeism, productivity and attrition rates.

3.8 The Consequences of Fatigue

The consequences of fatigue are both physical and psychological and include delayed reaction times, reduced vigilance, reduced ability for complex decision making, fatigue, increased risk of unintentional napping or "micro sleep", making errors and hence an increased likelihood of accidents or injuries. Long-term exposure to irregular work or extended working hours may have adverse effects on the health of an individual.
Pilots should ensure that all hazards associated with irregular work and extended working hours are identified and reported. Hazard identification will be part of the day-to-day management of pilots' workplaces. In addition, regular formal audits are planned to occur to document the identified risks. The Chief pilot is responsible and accountable for these processes and their legal compliance.

Information on hazards can generally be accessed from either internal or external sources, including:

- **External**
  - reports or reviews by external consultants specialising in work scheduling, shiftwork and fatigue
  - research findings into the impact of extended working hours on work performance, health and safety.
  - CASA audits

- **Internal**
  - daily, weekly, monthly and annual working time records.
  - fatigue occurrence reports.
4 Facilities and Services

CompanySkyOne provides facilities and services as part of this program to minimize fatigue. We also provide sleeping accommodation to reduce fatigue by allowing sleep in specified circumstances.

Suitable sleeping accommodation and crew room facilities. Aircrew on standby at work are provided with sleeping accommodation at work. Other company employees are informed not to disturb the standby crew, as the opportunity to sleep must be preserved.

Standby crews are not required to sleep if they are not tired and they are encouraged to undertake some mind occupying recreational activities. Exercise in the mini gym is important however no continuous activity that is considered work is to be undertaken. The aircrew may not initiate "work" without instruction or approval of the Chief Pilot or his delegate. These crew facilities are also suitable for recreation breaks during working periods. A light snack is provided for each standby crewmember.

CompanySkyOne crews working split shifts are provided with hotel accommodation and a meal at the hotel. For the split shift to remain valid the crew must be at the hotel for no less than four hours. To this end transport from and to the airport is also provided.

Advice on diet and physical fitness is a component of the induction-training course.

Consultative rostering techniques are used when possible with the operations manager responsible to ensure that the highly motivated pilots do not breach the fatigue limits by volunteering for additional flights.
AirMoves Pty Ltd trading as CompanySkyOne is a low capacity RPT and charter operator based in Canberra ACT, operating under AOC 115633. Most of our operations occur in Southern NSW and SA. However, we do charter Australia wide and at present we have a support contact with the RFDS.

The current fleet of CompanySkyOne consists of seven aircraft as listed below:

- **3** Piper Seneca PA-34 VH-VQV, VQO, VOX
- **2** Beech 85-A50 VH-HHI, HHH
- **2** Britten-Norman Islander BN-2B VH-YYY, YZ

This Fatigue Management System is designed to permit our operation against the recent significant fatigue studies, primarily studies conducted by the University of South Australia, Centre for Sleep Research (CFSR). Rostering is managed specifically against fatigue risk indicators as distinct from industrial issues.

CompanySkyOne acknowledges and requires pilots (all aircrew) to adhere to company policy and procedures set out in this Fatigue Management System, this is consistent with the duty of care CompanySkyOne must provide for all employees. Similarly, employees must take all reasonable care in the acceptance of rosters and any work undertaken external of CompanySkyOne.

**FATIGUE MANAGEMENT SYSTEM IS A COMPANY DOCUMENT THAT HELPS DIRECT AND MANAGE COMPANY STAFF. HERE, SENIOR MANAGEMENT OF THE COMPANY MUST COMMIT TO THE FATIGUE MANAGEMENT SYSTEM. THE COMPANY MUST RECOGNISE THE CHAIN OF RESPONSIBILITY.**
5 Education and Training

CompanySkyOne recognises that an understanding of fatigue and strategies to minimise fatigue throughout all levels of the organisation is highly significant to the success of the fatigue management system.

To this end, CompanySkyOne provides fatigue management training to all management, aircrew, and operations employees and is committed to helping educate families, partners and living companions about fatigue in general. The material used in this training often uses the term shiftwork where our operations are better termed as irregular-work and extended working hours. This training is provided to reduce and minimise the additional work related risks associated with fatigue.

5.2 Induction Training

New flight crew undergo an induction-training program that introduces them to the other employees, the facilities, the aircraft and publications of CompanySkyOne. In particular new flight crew, regardless of their employment status are required to sign an understanding and acceptance of the CompanySkyOne Fatigue Management System.

The program includes training on the following:

- The importance of a fatigue management system; that is, why we as an organisation are committed to managing fatigue effectively.
- Indicators of fatigue.
- Effects of fatigue on health and performance.
- Duty of care for both employers and employees.
- Potential causes of, or factors influencing, fatigue.
- Crewmember rhythms and their relationship to work scheduling.
- Shiftwork schedules and design principles.
- Hazards associated with irregular work and extended working hours.
- The impact of irregular work and extended working hours on health.
- The impact of irregular work and extended working hours on safety.
- Individual strategies for managing irregular work and extended working hours.
- Individual strategies for mitigation of short-term tiredness, effort, stress, conditions.
- Responsibilities of both management and employees as part of the fatigue management system.
As CompanySkyOne uses the PAID application as a tool to predict and evaluate fatigue the induction training also includes training to a user competence level, allowing flight crew to quickly and efficiently record duty (work) time data and understand the relevance of the fatigue index.

The training provided by CompanySkyOne enables employees and employers to:

- Ensure informed decisions regarding rest and fatigue risks,
- Perform critical self-assessment in terms of fitness-for-work, and
- Understand and recognize situations of sleep disruption, sleep deprivation and fatigue and that action necessary to reduce the risk.

Syllabus of training -- Fatigue and Fatigue management

This training does need to be clearly identified but it does not need to stand alone. That is it may be a subject in its own right in the induction course or it may be a major topic within the human factors element of your training.

An integral part of the effective management of fatigue will be the raising of awareness and the training of managers, supervisors and employees in fatigue management. Awareness raising and training addresses all the following but is not limited to:

- The methods of minimizing the risks associated with shift and irregular work.
- The responsibilities of both the employer and the employee in managing the requirements of business operations.
- An understanding of the physical and psychological effects shift work has on employees.
- How to identify potential and or existing problems associated with lack of sleep and fatigue.
- Individual coping strategies to best minimise the adverse impacts of shiftwork, irregular work and extended working hours.
- Services made available to help employee’s better cope with shiftwork, irregular work and extended hours.
- Use of the PAID software to provide a fatigue indication.
- All flight crew are required to complete the “Practical Living for Shift workers” training package, including the submission of all exercises.
- Assessment of employees understanding of this material is responsibility of the CompanySkyOne delegated training manager.
- Employees’ families, partners and living companions are invited to participate in the “Practical Living for Shift workers” program. Should they not be able to take up the training offer, appropriate and relevant fatigue educational material is provided.
Recurring Training

Flight crew are assessed on their understanding of the material provided and an annual training program, which refreshes the key elements of fatigue hazards, risk and management is mandatory for all crew. CompanySkyOne provides this recurring training in the form of a self-paced worksheet that takes about four hours to complete.

PILOTS WILL BE ASSESSED ON THEIR UNDERSTANDING OF THE MATERIAL PROVIDED AND ROUTINE 'REFRESHER' COURSES SHOULD BE ARRANGED ANNUALLY AS PART OF ON GOING PILOT TRAINING PROGRAMS.

Assessments

CompanySkyOne will make a formal assessment of flight crew competency of both the induction and recurring training elements of fatigue management. Records are kept to enable the training manager to deal with training issues and for the purpose of CASA audits.

Competency based assessments

CompanySkyOne conducts competency assessments on the "Practical Living for Shiftworkers" program. Material to assist this is contained in the assessors guide to Practical Living for Shiftworkers training package.

REFERENCE MATERIAL SHOULD BE STATED IN THE SECTION 12 REFERENCES.

EDUCATION MATERIAL MUST BE PHYSICALLY HELD BY THE TRAINING MANAGER (SYLLABUS, WORKSHEETS, VIDEOS, ANSWERS) AND BE AVAILABLE FOR AUDIT.

THE TRAINING MANAGER'S RESPONSIBILITIES MUST BE STATED IN AN ATTACHMENT TO THIS DOCUMENT AND LINKED TO THE TRAINING MANAGER'S DUTY STATEMENT.
6 System Function and System Review

The function of the fatigue management system is integral in CompanySkyOne's operation. Fatigue is considered routinely from contract signing (personal and company contracts), the employee induction process, roster design and roster management. Middle, long-term fatigue and the fatigue management system itself are formally considered during the annual system review.

6.1 System Function

The key elements of the CompanySkyOne fatigue management system are outlined in this document. The system functions are about how these elements are linked by processes that are designed to ensure fatigue is considered appropriately in each facet of the day-to-day operations.

Induction training and education processes outlined in Section 6 of this fatigue management system are important because they promote the key elements of fatigue, and when they need to be considered, and by whom. There is no doubt that at work and their families need a full awareness of fatigue. CompanySkyOne provides introductory educational material to families too. Importantly, this includes provision of CEO form 27, the fatigue occurrence report form that we encourage be submitted when an employee or an employee's family has any concern about fatigue.

6.1.1 Fatigue Occurrence Report

The responsibility for handling a fatigue occurrence report lies with the Chief Pilot. The submission of a fatigue occurrence report may not be refused. The report does not need to be on the prescribed form but it is required to be in writing.

The Chief Pilot and one other person are required to address the report and decide if the matter is urgent or routine.

- Urgent: If the occurrence is considered urgent the Chief Pilot will act to resolve the issue within 24 hours.
- Routine: If the occurrence is considered routine the Chief Pilot will act to resolve the issue within 7 days.

Note 1: A fatigue occurrence report not resolved within the prescribed time becomes the responsibility of the CEO for immediate resolution.

Note 2: Record of the actual report and the action taken is kept on file, as this is a critical factor in the operation of the fatigue management system. In addition, these records will be referred to as part of the review process that will include an examination of all reported occurrences, as well as any incidents that may have been associated with hazards arising from irregular or extended hours. The review will also draw on these reports to determine trends that may require preventative action.
6.1.2 Rostering Practices

Each roster is validated before its implementation. In the design phase the operations officer is to take into account those factors that influence fatigue. It is not possible to generate a roster that will meet the task requirements and be fatigue free. The principle is to design rosters that minimise the fatigue risk. The factors affecting fatigue are studied in the education program. While not exclusive, the following list of factors are considered:

- Minimise irregular rosters.
- Publish the roster as early as possible.
- Maximise opportunity to sleep during a non-work period.
- Plan rosters to exceed 90 hours work in any 14 day period.
- Personal contract limits are adhered to or consultation on overtime is a requirement.

6.1.4 Verbal Consultation

Should the employee not wish to submit a Fatigue Occurrence Report the Operations Manager or the Chief Pilot is required to listen to the concern and make roster adjustments as they see fit.

6.1.5 Flight Safety Meetings

Every three months Company/SkyOne holds a Flight Safety Meeting and fatigue is listed as an agenda item. Any accident, incident, or near miss that potentially was fatigue influenced is discussed, otherwise these are discussed elsewhere.

All general fatigue issues are required to be discussed.

All fatigue occurrence reports not previously tabled at a Flight Safety Meeting must be tabled, discussed and the actions taken reviewed. Further action is taken when necessary. Follow-up of this further action becomes an agenda item for the next Flight Safety Meeting.

Record of the fatigue considerations is made in the minutes of the Flight Safety Meeting. These minutes and the fatigue occurrence report file are critical factors in the Company/SkyOne fatigue management system.

6.2 System Review

Every twelve months Company/SkyOne formally reviews this Fatigue Management System. At least the Chief Pilot and one other person is required at this meeting in which all aspects of the fatigue management system are addressed.

Questions that need to be asked include:

- Is the system working as designed?
- What are the perceived problems?
- What actions are solutions to the perceived problems?
- How can we make our Fatigue Management System more effective?
The Chief Pilot calls a dedicated fatigue management review meeting at least annually. This is a formal meeting to be attended by the Chief Pilot, the Operations Officer and the Safety Manager, and any representative of the line pilots. Minutes of the meeting are placed on file.

The primary function of the system review meeting is to identify and make the necessary adjustments to the fatigue management system to improve its function. The agreed changes are drafted and when signed off by the Chief Pilot or delegate are distributed to amend all the relevant CSO documentation.

Company SkyOne amends the master file and prints or provides a complete file of the new version of the fatigue management system for total distribution. Advice is given to destroy old versions and the operations officer publishes details of the fatigue management system status on the operations room noticeboard. A chronological record of each fatigue management system is maintained as an audit record.
7 Consultation and Communication

7.1 Consultation

Company/SkyOne recognises its responsibility under OH&S and equal opportunity legislation, where employers have an obligation to consult with employees in relation to hours-of-work. This process of consultation will assist in the development and maintenance of a safe workplace by ensuring schedules and workloads that are reasonable and practicable. Employees will be involved in the development and design of work schedules, taking into consideration the design principles set out above. In addition, employees should be involved in all future discussions regarding changes or adjustments to their shift system.

Pilots are encouraged to discuss their roster and any fatigue issues with the operations officer at anytime.

7.2 Communication

The development of effective work scheduling and task allocation will be achieved through consultation with the operations manager and the Chief Pilot.

The following communications systems are available in Company/SkyOne.

- Formal: Pilots safety meetings are held every six weeks and the submission of a Fatigue Occurrence Report.
- Informal: Verbal in crew room discussions and debriefing sessions.

7.3 Reporting and Investigation

The reporting and recording of fatigue occurrences is important to Company/SkyOne. This responsibility falls initially to the Chief Pilot.

All Company/SkyOne accident, incident or fatigue investigations will include a fatigue analysis of the work at least 7 days prior to the event.

7.4 Feedback

Company/SkyOne holds pilot safety meeting every ........ weeks where fatigue is agenda item for report handling and discussion. Minutes of these meetings are kept circulated and a copy kept on file.
8 ROSTERING: FATIGUE MANAGEMENT

8.1 Fatigue Monitoring

The function of this section is to describe the procedures in place whereby management can monitor individual fatigue levels, the relevance of the system and compliance with the fatigue management system on a repeated, ongoing basis. This section helps to answer the question: 'At any one time, how do management know that the system is managing fatigue effectively?'

ROSTERS
Each roster must be:
- Identified
- Detailed, and
- Validated.

It is understood that some standby type rosters will appear difficult to validate. These may need to be applied to the FAID system three or four times to establish your roster limits. Once the limits are recognised and the detail recorded that roster may be operated. When a predictive approach is not used post flight monitoring of the "most at risk" rosters is essential.

The management of CompanySkyOne recognises that because of the nature of work scheduling, unanticipated workloads and individual differences, the system of fatigue management requires constant monitoring and evaluation.

The roster is prepared by the operations manager or delegated person 14 days in advance. The minimum rostered periods are:
- 4 hours work periods
- 4 hours at the sleeping accommodation between shifts if split shifts are rostered.
- 96 hours or less work to be rostered in 14 days.

The FAID software may only be used in accordance with the data entry discipline as advised by CASA.

8.2 Fatigue Prediction

The Fatigue Audit Index (FAID) software is used to continuously monitor pilot fatigue. The primary indicator is the peak fatigue score (PFS).

After the roster for each pilot is loaded into the FAID application the "Analysis function" is used to provide a fatigue prediction for that roster. The period, which is analysed, will include at least the previous seven working days.
The analysed data will show the fatigue scores for the complete roster cycle. If
details of the future roster are available they may be entered to produce a
longer-term fatigue forecast. Should the peak fatigue score exceed 80 units (or
the accepted RTFS) for any roster period that roster is not permitted to
commence.

A new or adjusted roster must be entered so that the indicated peak fatigue
score for the next roster is less than the RTFS. The roster is saved as a record.

8.3 Rosters

Company rules for the three rosters are presented in the

CSO 2-5 split
CSO 2-7-1 day
CSO 1-5 night

WHERE THE EMPLOYMENT, WORK CYCLE CANNOT BE FORESEEN FAID
MAY BE USED IN "REAL TIME", PROVIDED EACH PERSON'S WORK
HISTORY IS KEPT UP TO DATE IN FAID AND A PROCEDURE IS
DESCRIBED THE METHOD IS ACCEPTABLE.

8.4 Fatigue Control

8.4.1 Post Flight Analysis

On completion of each duty period the actual duty times are to be provided to
the operations manager.

The operations manager is to select the 20% of pilots considered most likely to
be a fatigue risk and enter the actual duty times into FAID application and
analyse these actual times. When the peak fatigue score remains less than 80
units (RTFS), the only action required is results must be recorded for audit
purposes. Should any actual peak fatigue score exceed 75 units, for a RTFS of 80, the
chief pilot is to be advised immediately. The chief pilot is to act to:

- Directly monitor that pilot and ensure the pilot and the company
  understand the consequences of the fatigue risk;
- Discuss the with the Operations Manager and the pilot and decide if the
  risk is acceptable;
- Take corrective action to prevent a reoccurrence of unnecessary fatigue
  related risks, and
- Record the occurrence and ensure it is considered at the next Flying
  Safety Meeting or Fatigue Management System Review meeting.
3.5 Extension of duty

 Occasionally, non-rostered flights may be flown. The conditions under which, in terms of fatigue limits, a pilot may consider a non-rostered flight or unplanned charter are:

- The pilot feels physically and mentally fit to undertake the proposed flights, and
- The pilot's predicted PFS will not exceed his/her RTFS during this work period.

OTHER NECESSARY APPROVALS WOULD THEN NEED TO BE OBTAINED.

Note: Any extension to or additional duty to the printed roster requires the actual duty times to be entered and analysed by the operations manager or delegate using the FAID software to ensure that continuing that roster will not exceed the RTFS. Should the peak fatigue score exceed the RTFS, the next rostered duty is not permitted to commence until there is evidence that there is no unaccustomed fatigue risk. Alternative arrangements will be made so that the pilot does not operate and become a fatigue risk.

Record Keeping
CompanySkyOne acknowledges the record-keeping requirement and keeps all rosters and personal work period records to have them available for a three CASA audit cycles.
Foreword

CONTENTS
List of effective pages

1 Introduction
This Fatigue Management System

2 Policy
Purpose
Scope
Definitions and Abbreviations

THE BOLD TYPE INDICATES THE GENERAL HEADINGS THAT SHOULD BE RETAINED. THE ITEMS LISTED UNDER THESE HEADINGS ARE THE CRITERIA THAT NEEDS TO BE ADDRESSED. THESE LINE ITEMS ARE NOT INTENDED TO BE HEADINGS BUT THEY MAY BE, THEY ARE SIMPLY ITEMS THAT MUST BE ADDRESSED IN A FATIGUE MANAGEMENT SYSTEM. WHERE THESE ITEMS ARE NOT IMPORTANT TO YOUR COMPANY OR OPERATION THEY MAY BE COVERED IN A LINE OR TWO, CONVERSLEY SOME ITEMS (DEFINITIONS) AND TAKE TWO OR THREE PAGES. IF FOR YOUR COMPANY AN ITEM SITS BETTER ELSEWHERE, PLACE IT THERE. THERE IS NO NEED TO REPEAT ANY ITEM

3 Identification and Assessment of Fatigue

Indicators of Fatigue
Potential fatigue related risks
Causes of fatigue:
- lifestyle issues,
- indicators of fatigue,
- consequences of fatigue (both physiological and psychological), and an understanding of
  sleep and circadian rhythms.

Procedure for identifying and reporting fatigue related hazards

4 Facilities and Services
Facilities and services provided to or available for pilots,
Crew recreational facilities
Crew Sleeping Accommodation
Opportunity for uninterrupted sleep?
9 Responsibility and Accountability

9.1 Responsibility

The purposes of this section are as follows:

To clearly articulate management recognition of the importance and responsibility to manage fatigue;

To demonstrate your recognition that managing fatigue is the responsibility of both management and employees;

To demonstrate to employees that as part of ensuring the safety of all employees, management is committed to managing fatigue within the organisation; and

To detail the responsibilities of both management and employees within the fatigue management system.

The management at CompanySkyOne recognise that under OHS legislation we have a duty of care to our employees, contractors and the public to provide and maintain a safe and healthy workplace and therefore to manage fatigue effectively.

The Board of Directors and Management of CompanySkyOne accept that it is our collective and individual responsibility to ensure that fatigue is managed within our organisation. We are committed to managing fatigue effectively throughout the organisation.

To this end, Management will:

- Regularly consult with employees on fatigue-related issues associated with irregular working hours, and the management of fatigue within CompanySkyOne;
- Ensure that all employees have a genuine opportunity to contribute to the outcomes of roster designs and that there are clear avenues to provide feedback to employees on any fatigue-related issues raised;
- Provide regular, up-to-date information, instruction and training to employees on fatigue-related issues and strategies to minimise fatigue;
- Proactively seek out and remain abreast of current research on fatigue;
- On an ongoing basis, monitor workloads, shift rosters, work practices and compliance with the fatigue management system, to ensure that no employees are placed at a fatigue risk;
- Not roster a pilot to fly who is suffering from, or may suffer from given the circumstances of the flight, fatigue;
- Regularly review and evaluate the effectiveness and relevance of the system and have procedures in place to make adjustments to the system as appropriate;
- Provide the necessary facilities and support services for employees required to work irregular and/or non-traditional hours.
Employees will:

- Participate in the education and training program;
- Fly only when they consider themselves to be free from fatigue which may affect judgement and performance;
- Utilise provided time free of duty for recuperation and sleep;
- Report all occurrences arising from hazards related to irregular working hours;
- Perform critical self-assessment in terms of fitness for work;
- Proactively recognise signs of sleep deprivation and/or fatigue in themselves and others, and then act accordingly;
- Report to management, via the appropriate procedure for consultation, the circumstances in which fatigue and lack of sleep are impacting on their well-being and workplace safety.
10 Contingency Planning

If all contingency factors for your operations have been addressed in previous paragraphs there is no need to repeat them. Contingency items generally relate to tired or fatigued operating crew not being fit for duty.

A further example of contingency management is where an operator provides a car for the crew to get from the airport to the accommodation during a split shift. If the car broke down, then the crew may not have the specified time in suitable accommodation. If the rest period was insufficient the whole period would count as duty and invalidate the roster. Flying the crew in these circumstances would constitute a fatigue risk and be "non compliant" with the fatigue management system. Should an accident occur would the operator be liable?

If discovered by audit or by required notice the operator may be fined or have the right to operate under a fatigue management system withdrawn. In the worst case the operator could be threatened.

Roster contingency

Should a pilot report unfit for duty, the Chief Pilot or Operations Manager may roster a suitably qualified pilot in accordance with the extension of duty roster conditions. Ideally, the Chief Pilot or suitably qualified pilot would take the flight. If no suitable pilot is available the flight will be delayed or cancelled.
11 Contractual Considerations

This section addresses those issues that do not directly relate to fatigue but need to be recognised as legitimate contractual and or industrial issues.

Casual Employees
Casual employees are required to provide a work history (work as defined in this fatigue management system) of seven days before commencing any employment with Company SkyOne. Any person not providing this information is considered a fatigue risk and may not operate a Company SkyOne aircraft.

All Employees
A full, part time or casual employee of Company SkyOne that does significant “work” for another employer or for one self is to ensure that this work is correctly considered and input into FAID so the indicated fatigue score remains valid. The employee must maintain work records and ensure he or she does not become a fatigue risk when working for Company SkyOne.

Group Liability Awareness
Company SkyOne alerts all interested parties of the potential liability should they adversely influence the application of the Company SkyOne Fatigue Management System. This liability relates to the “chain of responsibility” as presented in the House of Representatives Report: Beyond the Midnight Oil. This liability extends beyond Company SkyOne and may include external parties such as the customer and the unions.

12 References

A  CSO 2-5 split Validation Report (CSO file 2121/01)
B  CSO 2-7-1 day Validation Report (CSO file 2121/01)
C  CSO 1-9 night Validation Report (CSO file 2121/01)
D  Shiftwork Policy 1998 CFR report (CSO file 3232/01)
E  Practical Living for shift workers Workbook (CSO file 4242/01)
F  Practical Living for shift workers Assessors Guide (CSO file 4242/01)

The references lists those reports and other Company manuals that provide evidence and substance to the operation of this fatigue system. These documents must be referenced within this description and must be available on request. They are not to be provided with your submission.

The references listed here must be updated periodically as part of an ongoing process to ensure that your company keeps abreast of current fatigue research. This is a function of the review process.
13 Attachments

Insertions into other Company SkyOne documents:

A Operations Manual - Insert
B Duty Statement Fatigue Line Items:
   • Chief Executive Officer
   • Chief Pilot
   • Safety Manager
   • Operations Manager
   • Aircrew
C Rotating Work Practice
D Fatigue Occurrence Report form
Attachment A  Insert to Operations Manual

Section 2A

A2.8 Fatigue Management

2.8.1 Duty and Flight Time Procedures

CompanySkyOne sponsors a 'Fit to fly' policy that all operational flight crew will be appropriately rested before flight so they are fit for that employment period. They are to have sufficient sleep between duty periods so they are fit to complete each rostered duty.

2.8.2 Responsibilities

The rostering officer is responsible for producing a roster that produces a peak fatigue score (FFS) on the FAID system of 50 or less.

All flight crew are responsible for entering directly into the FAID system duty start time at the beginning of the shift and duty end time at the end of the shift. When staging away from home base the times must be provided to the operations officer within 24 hours, or before the next flight should an extension of work be required.

2.8.3 Rostering Procedures

When assembling rosters the rostering officer is to consider operational and industrial conditions and all fatigue issues, these are to include:

- Short and long term work history
- Recent health limitations
- Any issue that may impact on "opportunity to sleep"
- The member’s wishes (include family considerations)
- Any relevant Fatigue Occurrence Report

Employees may influence the roster by timely inputs, however all must understand that CompanySkyOne has contracted tasks and some personal requests may not be met in the short term. Fatigue issues will need to be addressed where rostered requests affect other employees.

2.8.4 Consultation Procedure

Pilots are encouraged to discuss their roster and any fatigue issues with the operations officer at anytime. This may not be practical in a busy environment so CSG form 27 “Fatigue Occurrence Report” Attachment C is provided and may be presented to the Chief Pilot at any time. The chief pilot must respond within seven working days.

Fatigue Management is a formal agenda item at all Flying Safety Meetings. During this meeting all CSG form 27 must be actioned.
As CompanySkyOne uses the FAID application as a tool to predict and evaluate fatigue, the induction training also includes training to a user competence level, allowing flight crew to quickly and efficiently record duty (work) time data and understand the relevance of the fatigue index.

The training provided by CompanySkyOne enables employees and employers to:

- Ensure informed decisions regarding rosters and fatigue risks,
- Perform critical self-assessment in terms of fitness-for-work, and
- Understand and recognize situations of sleep disruption, sleep deprivation and fatigue and the action necessary to reduce the risk.

Syllabus of training — Fatigue and Fatigue management

THIS TRAINING DOES NEED TO BE CLEARLY IDENTIFIED BUT IT DOES NOT NEED TO STAND ALONE. THAT IS IT MAY BE A SUBJECT IN ITS OWN RIGHT IN THE INDUCTION COURSE OR IT MAY BE A MAJOR TOPIC WITHIN THE HUMAN FACTORS ELEMENT OF YOUR TRAINING.

An integral part of the effective management of fatigue will be the raising of awareness and the training of managers, supervisors and employees in fatigue management. Awareness raising and training addresses all the following but is not limited to:

- The methods of minimising the risks associated with shift and irregular work.
- The responsibilities of both the employer and the employee in managing the requirements of business operations.
- An understanding of the physical and psychological effects shift work has on employees.
- How to identify potential and or existing problems associated with lack of sleep and fatigue.
- Individual coping strategies to best minimise the adverse impacts of shiftwork, irregular work and extended working hours.
- Services made available to help employees better cope with shiftwork, irregular work and extended hours.
- Use of the FAID software to provide a fatigue indication.
- All flight crew are required to complete the “Practical Living for Shift Workers” training package, including the submission of all exercises.
- Assessment of employees understanding of this material is the responsibility of the CompanySkyOne delegated training manager.
- Employees' families, partners and living companions are invited to participate in the “Practical Living for Shift Workers” program. Should they not be able to take up the training offer, appropriate and relevant fatigue educational material is provided.
Appendix 1 to Operations Manual – Roster 2

CSO 2-7-1 day (XON mine)

This is a regular charter schedule designed to service the XON goldmine. This is a 10 day cycle as follows:

Day 1 OFF
Day 2 OFF
Day 3 FLY 0830-1500
Day 4 FLY 0830-1600
Day 5 FLY 0830-1500
Day 6 FLY 0830-1600
Day 7 FLY 0830-1500
Day 8 FLY 0830-1500
Day 9 FLY 0830-1500
Day 10 OFF

Validation

Ref: See Section 12 References: CSO 2-7-1 day Validation Report

This report validates the roster using the FAID application. The pilot normally arrives at work at 0800. FAID entries are made from 0800 as the preflight is routine and the aircraft is always fueled and prepared the night before. The loading considerations are straightforward. The work times entered into the FAID are from 0800 to 1630 for seven days straight. The highest FAID index indicated is 71.656556 on day seven, consequently the pilot is not considered to be at any additional fatigue risk and the roster is valid.
Appendix 1 to Operations Manual – Roster 3

CSCO 1-6 night (Canberra – Hobart) NOT PROVIDED

This is a regular charter schedule designed to service the XXXXXXXXXXXXXXXX. This is a 7 day cycle as follows:

Day1 OFF
Day2 FLY
Day3 FLY
Day4 FLY
Day5 FLY
Day6 FLY
Day7 FLY

Validation
Ref: See Section 12 Reference: CSCO 1-6 day Validation Report

This report validates the roster using the FAID application. The day seven, consequently the pilot is not considered to be at any additional fatigue risk and the roster is valid.
Attachment B  Statements of Duties

THE STATEMENTS MADE HERE MUST BE SPECIFIC TO FATIGUE MANAGEMENT AND MUST BE INSERTED INTO DUTY STATEMENT FOR THAT PERSON. A REFERENCE OF THE LINK MUST BE MADE SO THAT IF ANY ADJUSTMENT TO THE STATEMENT IS MADE IT IS REFLECTED IN THE DUTY STATEMENT.

Chief Executive Officer

21. Take immediate action to resolve any fatigue occurrence report not resolved by the Chief Pilot within the specified time, record actions and file.
22. Counsel the Chief Pilot on the handling of fatigue occurrence reports, record actions and file.

Chief Pilot

83. Manage and monitor operating crew fatigue levels to ensure safe flying operations.
84. Establish benchmarks to ensure pilot fatigue predictions are accurate and take action as necessary to prevent a pilot flying when fatigued.
85. Monitor actual roster duty times to ensure each pilot’s PFS remains at 80 hours or less.
86. Process urgent fatigue management reports within 24 hours, take appropriate action and keep a record on file.
87. Process routine fatigue management reports within 7 days, take appropriate action and keep a record on file.

Safety Systems Manager

6. Manage and monitor operating crew fatigue levels to ensure safe flying operations.

Operations Manager

6. Ensure the roster is published 14 days in advance.
7. Enter the roster times into the FAID application software, produce a hard copy for the pilot and ensure electronic records are saved.

Pilots

1. Report for duty in good physical condition fit to fly.
2. Report to the Chief Pilot or Operations Officer as “unsafe” if:
   - In the last 24 hours you have had less than 5 hours sleep, or
   - In the last 48 hours you have had less than 12 hours sleep.
5 Education and Training
Fatigue
Mitigation of short-term stress and conditions
Fatigue Management:
- Syllabus of Training
- Induction Training
- Recurring Training
- Competency Based Assessments
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8 Monitoring of Fatigue
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9 Responsibility and Accountability
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Employer Responsibilities
Employee Responsibilities

10 Contingency Planning
Pilot unit to fly.
Short notice options.
Who can authorize the change.
Who is responsible for the decision
Attachment C- CSO Rostering Work Practice

CSO Prescribed Limits and Rostering Criteria

This document identifies fatigue scores generally associated with work. Research indicates, and CASA have accepted, that the boundaries between the various levels of fatigue are not as absolute as implied by the use singular numbers. The CSO RMS uses Risk Target Fatigue Score (RTFS) of 80 units, read this as RTFS 80+5, for normal operations. This means that individual fatigue scores of 75 should generally planned not to be exceeded during any work period (this rosting work practice limits individual PFS to 75 at the planning stage.

Company SkyOne is required to internally audit when the PFS is within minus five (75) or plus five (85) of the defined RTFS (90). The company is required to advise CASA when any individual Peak Fatigue Score (PFS) exceeds the RTFS plus five units (85).

For situations where life may be imminently threatened, e.g., responding to an urgent medical evacuation request, CSO may elect to operate at the RTFS of 85 for that operation. This would mean that an internal audit would have to be initiated for any score greater the RTFS minus five (80), with CASA advised should a PFS exceed RTFS plus five (85). The adoption of a maximum RTFS of 85 requires a clearer understanding of the risks involved and a strategy to mitigate those risks.

To ensure that fatigue levels are managed effectively, and in keeping with the CSO imposed limits, the following protocol should be observed when rosting aircrew for work:
- As a general principle, and unless operational contingencies dictate, at the planning stage aircrew should not be programmed to exceed a peak fatigue score in excess of 75 for a rostered period of work.
- The work period for single pilot operations should not exceed 10 hours.
- The work period for two pilots operations should not exceed 12 hours.
- When crews are augmented with an additional pilot and observer, the work period is not to exceed 15 hours.
- A minimum of 10 consecutive non-working hours should precede any work period.
- The aircrew being rostered should not have had a work period of six or more hours on each of the previous seven consecutive days.
- The aircrew being rostered should have had a minimum of two 24-hour non-work periods in the previous 14 days.
- No aircrew are to be rostered for work where a fatigue risk is indicated.

Recognition is made that rostering regimens that are better suited to local conditions (and aircrew preference) but do not conform to the above protocols can be undertaken provided they do not create unacceptable fatigue impacts. However, the overriding criterion is the conduct of safe operations and the requirement to ensure that work is not undertaken in a fatigued condition.
Attachment D  Fatigue Occurrence Report form

CSQ form 27 : Fatigue Occurrence Report

Crew Restart and Fatigue - Consultation
Input to Chief Pilot

From: ........................................ Date: ........................................

Subject:

Please state work hours (as related to the Fatigue Management System):

Work hours last 24 hours: .............
Work hours last 48 hours: .............
Work hours last 7 days: .............

Restated work hours next 24 hours: .............
Restated work hours next 48 hours: .............

Chief Pilot:
1. Release Report and investigate (FAID index ≥75)
2. Action
3. Record
4. Table at Flight Safety Meeting
5. Inform CASA (FAID index ≥65 only)
11 Contractual Considerations
Duty of Care
Advice to Families and Partners
Provision of "work" history
Provision of "flight hours" history

12 References
Scientific Base Material
Training Material
Roster Validation

EVIDENCE, REPORTS ETC CROSS REFERENCED IN THIS PRESENTATION, MUST BE LISTED HERE BUT NOT INCLUDED IN THIS DOCUMENT. THESE MUST BE AVAILABLE ON REQUEST.

13 Attachments

A Operations Manual — Insert
   Appendix 1 to Operations Manual — Rosters
   • CSO 2-6 split
   • CSO 2-7-1 day
   • CSO 1-6 night

B Duty Statement: THOSE LINE ITEMS RELATING TO FATIGUE ONLY
   • Chief Executive Officer
   • Chief Pilot
   • Safety Manager
   • Operations and Training Managers
   • Pilot and other Aircrew Responsibilities

C Rostering Work Practice

D Fatigue Occurrence Report form
List of Effective Pages

Document Control

This fatigue management system is a controlled document in the sense that only the current document is valid. Only authorised amendments may be made and these may be by pen, page or if possible by republishing the whole document.

Should any amendment to an attachment (inserts to other company manuals) occur then that amendment must be immediately reflected in the appropriate manual.

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CEO PUE 89
21 September 2001

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1 INTRODUCTION

Fatigue is the physical and psychological condition that results when an individual's ideal physical or mental limits are exceeded. Fatigue increases with time from an individual's last quality sleep and with physical or mental exertion. The Occupational Health and Safety Act has identified fatigue as a risk factor to be managed and controlled. Both the employer and the employee have a duty of care to ensure that adequate sleep can be obtained between shifts so that fatigue does not reach dangerous levels during work hours.

Both longer work hours and work at irregular hours directly reduce the opportunity for sleep. Furthermore, sleep is often reduced in people working irregular hours due to increased competition between sleep and other daily activities, such as social or family commitments. Sleep loss during night work is typically 1-3 hours per day and can accumulate across a block of shifts.

This systems approach requires employers and employees to be aware of, identify and minimise risks via consultation within the workplace. Specifically, this fatigue management system involves:

- conducting a risk assessment that takes into account the risk factors associated with fatigue
- developing and implementing measures to adequately minimise the risks
- documenting the procedures that ensure operating crews are fit to fly

Company SkyOne as an employer ensures that:

- operating crews are aware of the risks associated with fatigue and their role in minimising the risks
- employment periods, work times, rosters and roster cycles are structured and managed to avoid or minimise fatigue
- exposure to excessively stressful conditions is controlled to within acceptable limits
- suitable sleeping and recreational facilities are provided for use during split-shifts breaks, standby or when deployed.
Company SkyOne aircrew is required to ensure that:

- their activities outside working hours do not increase the risk associated with their work duties, in regards to themselves, passengers, other employees or the public.

- they get adequate sleep and are not in a fatigued state before commencing an employment period.

- they contact the operations manager or chief pilot should they suspect an increased fatigue related risk, without exaggeration or emotion.

This is an integrated employee and management approach to fatigue management that provides a flexible rostering system. Consultation between pilots and company management, including the Chief Pilot, is an essential element of this system. While maintaining flight safety, this system is designed to have benefits for both pilots and the company.

Managing fatigue is one of the components of an overall approach to fitness to fly; other factors include the management of alcohol, diet and lifestyle.

REMEMBER THIS IS A COMPANY DOCUMENT THAT IS ABOUT HOW MANAGEMENT MANAGES FATIGUE WITHIN THE COMPANY. THIS DOCUMENT IS NOT ABOUT CAO 48 OR CASA.
2 POLICY

This policy document is the result of research into sleep and fatigue. We base our system on much of the published work of The Centre for Sleep Research at the University of South Australia.

Flying activities present some inherent risks. These are not significantly more than other transport professions but the environment is very unforgiving. An error of judgement could well cause multiple fatalities where in a motor vehicle a similar error may not even result in damage to the vehicle. For this reason CompanySkyOne policy is never to fly airlow that could be considered a fatigued risk.

Fatigue can arise from both work and non-work related activities and can have an effect on an employee's state of alertness with consequent impacts on employee work performance and well being. There are several types of work related fatigue that may be induced by the work environment, the work task or sleep patterns.

It is our policy that risk associated with fatigue is controllable and unnecessary.

Our policy recognizes of the responsibilities of employers and employees under Occupational Health Safety (OHS) legislation. In this legislative framework, a safe system of work needs to be provided to protect employees and other stakeholders.

2.1 Purpose

This policy provides practical guidance to CompanySkyOne management, operating crews, other employees and all employees' families on how to minimize risk arising from the hazards associated with irregular and extended working hours.

The hazards associated with irregular working hours not only arise as a direct consequence of the shift system in a particular workplace but also are associated with the way individuals and groups respond to the system in-place. Specifically, these hazards may include, but are not limited to: falling asleep at work, poor communication at work, ignoring safety requirements and falling asleep on the way home from work.
APPENDIX J: MANAGEMENT OPINIONS OF STANDBY ROSTERING & COMMUTING (TRANSCRIPTS)

Management 1

Interviewer: In your opinion, what are the effects of standby rostering on fatigue?

Manager: Well, I don’t like standby rostering at any time. Because you can’t do it - I mean you’re restricted enough with it, and I’d rather be working. There’s nothing harder than doing nothing. You can go to the beach and take a paper with you, or your mobile with you. It’s hard because you don’t know the situation and you’re trying to fit your sleep patterns into it. You know, to me, standby rostering is a real pain in the ass. We actually don’t do much of it.

Interviewer: Oh don’t you?

Manager: Nup.

Interviewer: Only up in Singapore

Manager: Singapore would, because they run the two sets of crews for [the client]. Here we don’t. You’re either rostered on or you’re not. With the caravan, the guys are rostered on standby for that, but it’s fairly minimal down here.

Interviewer: How is the standby covered within your FMS?

Manager: It’s duty time. So, it automatically goes in as duty. You can’t roster a casual on standby without paying them. It’s OK if like up in Singapore, all the guys are on full-time salaries. Your roster comes out, and you’re the standby crew. That’s fine, but here, you might say ‘well I might want you to fly tonight’. And the first question they ask is ‘well, are you going to pay me for it?’. And if you say no, they say well... So it has more to do with the basis the guy is employed on. We only put people on generally if we’ve got work for them. And we don’t generally have guys who are on call.

Management 2

Interviewer: In your opinion, what are the effects of standby rostering on people?

Manager: That’s not what I’m totally familiar with because we’ve just started that. We didn’t contemplate standby rostering. Under CAO48 you could go on standby for 12 hours and then go and do a 12 hour shift. Under this, no, because its duty, I forget what we say in there about whether it is duty, whether standby is duty, what I’m saying is that we’ve only implemented standby rostering within about the last month, five weeks, one of the nights?? He goes on standby from about 3 or 4 in the afternoon.

Interviewer: Is that including duty time?

Manager: No. But I think he’s got to be ready to fly from about 9 or 10 o’clock. But he’s only got to be hanging near the phone in case he’s got to go and then he fires up and then he goes.

Management 3

Interviewer: In your opinion, what are the effects of standby rostering on fatigue?

Manager: That’s, well no, because the guys have been here long enough now, it doesn’t really effect them. If you go out on a job and you know you’re going to blow your duty time, you know, you’re usually getting a couple of hours notice. Very rarely does it happen. And because we all try to work it in the way that if you know you’re going to blow your time as I said before,
blow your duty time, you’re going to call the guy before 10 o’clock at night so that he can sleep here rather than having to call him in at 2 o’clock in the morning. So, you try to preserve his rest time. I don’t think they really care whether they sleep at home or they sleep here. They might get a little bit less sleep here, simply because of you know,

Interviewer: Chatting to your mates and stuff
Manager: Yeah, you know, you’ve started, you’ve just driven for half an hour to get in here, and then you’ve got to, you start your wind down phase again. That’s about the only thing that I could see it would effect, but it’s negligible. The guys like it like that. Because they’d rather get a full night’s sleep here. Because you can be up at 7 or 8 in the morning, whereas at home, you might be up at 6 o’clock with the kids. So, it’s a bit of an advantage.

Management 4
Interviewer: Do you have a standby rostering system?
Manager: No.
Interviewer: No? OK, that doesn’t apply. Can you remember any times when flying operations were changed so that fatigue scores were affected?
Manager: Yes, reduced.
Interviewer: Or increased, so that someone would have reached their limit in fatigue, so that fatigue would have been a consideration...
Manager: Yes, yes.
Interviewer: Does that happen often?
Manager: No.
Interviewer: No? And how do you manage that?
Manager: Well, we would have had a job at one of our three or four ports of call and come down to [the main site] and then want to go down to [another airport], across to [another airport] and back, and its ‘oh yeah, we’ll plan that’, and I say ‘hang on, lets have a look at his fatigue, no sorry you can’t do it, look at the fatigue score.’ So we need to call another pilot in, so when the aircraft gets back here, he jumps out and another pilot jumps in and does perhaps the [shorter] trip, so yes, we do change things around. Tasking in there is governed by the PFS fatigue score.

Management 5
Interviewer: In your opinion, what’s the effect of standby rostering on fatigue levels?
Manager: Standby rosters, having people available to be on call, is... If the customer requires it, if the customer is prepared to pay, so be it, a lot of people have them on rosters, its not that hard just work to your level.
Interviewer: So if you’re on standby that’s all run through FAID as well?
Manager: If they’re on standby they’re seen to be on duty aren’t they. Is that what you would ??? I would, if I was on standby, its no different to being on duty, we have pilots on standby, this is what we’re talking about, he’s on standby in Adelaide over the bushfire season, they have really high weather pattern, he sat in a room watching TV and having coffee for two weeks, it was really hot, in the high 40 degrees, didn’t fly once, so he had fatigue levels ??? around 74 or 75. So he was on standby, if the client pays then they pay, pays our wages sitting in a room there???
Management 6

Interviewer: In your opinion, what is the effect of standby rostering on fatigue?
Manager: I don’t think there is one.

Interviewer: Have you had standby rostering? Oh, you don’t have standby rostering. Not applicable then.
Manager: Not really, it depends what you class as standby rostering. They’re rostered six days a week, or five days a week, if they work that week, if they don’t they don’t. On a low passenger day, would you classify that as standby? We don’t.

Interviewer: If they’re rostered on then no. [Our competitor] has a system where they are on standby, and if the customer numbers are high enough they work but otherwise they can assume they are not.
Manager: I guess that’s not dissimilar to what we do. ??? No we don’t call it standby rostering. But I think they’ve got a couple of different structures for their pilots and the way they pay them. For example, one of their pilots is on a four days a week, and he would obviously be on a standby, so that’s three a month ??? but he wouldn’t have seven day roster, whereas most of my pilots do, so they know exactly when they’ll be in.

Management 7

Interviewer: Do you have a standby rostering system within [your operation]?
Manager: Our planes take off at ten past ten today to go to Sydney. We got a power company ringing us saying they want to [start a new contract] down at Mullindindee on Sunday because it’s the only day they can get the [resources], you can’t ??? with that.

Interviewer: How much notice do you get for that sort of work?
Manager: If we have a storm come through, I get a phone call at 4 o’clock in the morning saying I want a helicopter at 6, so I get out of bed and go and get a helicopter to be there at 6. We can’t roster for that. The phone could ring in two minutes and go: Blackhawk substation’s gone out, we need to get people to Blackhawk substation, or anyone of their substations, so, you can’t roster for that, you just have to cope with it.

Interviewer: In your opinion, what are the effects of that sort of rostering on fatigue? Do you think that increases fatigue?
Manager: What increases fatigue is sitting around and waiting all day. If you get up in the morning and go flying, then you’re fine. You can get up, start flying at 7.30 or 8 o’clock, fly your 5–6 hours, go home, feel happy. If you get up in the morning and sit around and you wait, and you wait, like people in the search and rescue organisations. They just hurry up and wait, that’s what they do, they get into work and they wait for the phone to ring, to see if they’re going to get a job. You sit around all day and wait, if the phone rings at 4 o’clock, you probably shouldn’t go flying, because you’d be yawning, you’d be tired ??? that’s what we do. It doesn’t matter whether you’re in the flying game or whatever game, you sit around all day and wait you’ll be tired. Umm I’ve really forgotten what the question was…

Interviewer: In your opinion, what are the effects of that sort of rostering?
Manager: For us, because we just work daylight hours, no drama.

Interviewer: Do you run that sort of ??? through ???? before you’d work it? or...
Manager: Well, our machines can’t fly at night you see, so if you start after 6:30 and finish before 5:00 you’re fine as far as that’s set. That’s no problem. That’s your normal rhythmic ??? but if you get to the afternoon and you’ve had a day sitting around, the pilot has to decide, whether he takes the chance or not.
Interviewer: Regardless of ???

Manager: Regardless of ?? or regardless of anything that's going on, he's got to be the one to make the decision.

Management 8

Interviewer: We were talking about standby rostering a minute ago, in your opinion what are the effects of standby rostering on fatigue?

Manager: I would have to say its got a bit of a positive effect actually. If someone knows they're on standby, they're restricted to some extent in what they can do, they can't go on a long drive anywhere.

Interviewer: So it makes people more aware that they need to be alert...?

Manager: They've got to be available. I think we have in the new enterprise agreement we've actually stipulated that you have to be within four hours by day and 45 minutes by night off base. So straight away somebody can't just go and decide to drive to Melbourne and back in the day, you can't drink when you're on standby, and we've trained everybody to understand the things that are linked to fatigue, so effect on standby, I know myself, I know I'm on standby limits what I can do and generally speaking I would do less stressful sort of...

Interviewer: Do you feel that your sleep is any different on standby?

Manager: No, it doesn't bother me. Its possible that you could be sitting there thinking you might get called and worrying about it, most of us tend to get fatalist and we try and live our lives as if the phone's not going to ring, and if it does, it does.

Interviewer: How often would you get called in?

Manager: I've got a standby call register I'll show you in a second, about once/twice a month between all the pilots.

Interviewer: So not very often. So typically its very unlikely you'd get called in on standby.

Manager: Pretty unlikely. Unfortunately it'll always happen when you've got something on! But that's life you know. But that's the other issue with [this operation], they found it hard because they're doing standbys all the time because they're doing such big hours, and that's why this roster is just too hard for them because you were really doing two days off, two days standby, you were almost certainly going to get called, and then you're on again so you are virtually two on, two off.

Management 9

Interviewer: In your opinion, what's the effect of standby rostering on fatigue?

Manager: Standby rostering? It can be very demanding, but we don't run standby in the same...we do in some places...we have built into our staff that standby at work is standby at home. It has significant benefits but it relies very heavily on the pilot being educated and particularly for standby at home because you can't police it. But you must develop a trust and a communication with those people that they will take this sleep opportunity should it be required or should they feel tired, because they could get called out on three hours notice to do this 17 hour trip to Beijing. Mind you, that's probably only 6.5 hours of flying and a bit of waiting, but if the wait is not long enough to get a decent sleep in a hotel and you're away from home, you're not likely to sleep well on the first night, you don't know the conditions, what about the noise outside, how many time zones, all those factors are in there, so that said, what we don't do is we don't put people on standby for a week at a time and expect them to wait on day seven and expect them to perform, because the boredom factor is the same thing that can happen to a 747 pilot sitting at 35,000 feet. We aren't that good at doing nothing. They're better off to be occupied to some level.
Management 10
Interviewer: In your opinion, does standby rostering have any affect on fatigue levels?
Manager: Honestly, probably not on fatigue levels, on family life.
Interviewer: More the social life?
Manager: Yes.
Interviewer: Because you can’t plan?
Manager: You can’t plan until 8 o’clock at night when the company decides you’ll be working or not. In terms of standby rostering, like all these red days on our roster these are standby days.
Interviewer: How often would you be asked to work a standby day?
Manager: Over this six week period they’re all doing quite a bit of it because we’ve got really big numbers, but generally this is what our roster would be, none at all, and it would be a real special occurrence, someone ringing up and saying I’m sick and can’t work and me being out and having to ring and saying hey [pilot] can you work tomorrow on your day off? Now if [pilot] came back and said no I can’t I’ve got something planned or no its not possible then I’d have to go OK you can’t, but most of your pilots would be flexible enough to know that it’s the tourism industry and yeah, OK, I’ll work. Now I can’t control what time they go to bed on their day off. That’s where I’m saying I can’t control what’s outside of hours pilots, most of them are pretty sensible, and you don’t catches up more on your family life than your work life, where you’re exhausted and can’t ???

Management 11
Interviewer: What’s your opinion of the effects of standby rostering on fatigue? Do you have standby rostering?
Manager: Not really in the sense that you’re talking about there. I guess the [northern] operation may... follow that up more with [the chief pilot] but the [northern] operation may fit in to what you’re... it depends on how you define standby rostering because effectively there are times when they are on standby but most of their flights they know about three or four days in advance because a ship is coming in but the actual time of the flight moves forward or back depending on the progress the ship makes, so in the last 24 hours they will find out no later than 12 hours beforehand exactly when they need to time the flight. So there’s a sense in which they are on a standby roster but...

Management 12
Interviewer: Do you have a standby rostering system?
Manager 1: Yes.
Interviewer: How do you take that into account ???
Manager 1: Standby under the current concessions is not considered at work.
Interviewer: So its standby at home?
Manager 2: Yes.
Manager 1: Or at work if you’re in the right surroundings, but at our bases we don’t so you’re either standby at home or you’re standby in a five star hotel, and that’s not counted as work.
Management 13

Interviewer: Do you have a standby rostering system?
Manager: We have another pilot that we use at times we need to.
Interviewer: Does he come under the FMS as well?
Manager: Yes, he’s with a different company but they’re just now going into the same system. But all that is required under our manual is that we have his work start and finish times for the last 7 days. We can put that in the program. He just keeps emailing stuff to us so we keep that on the roster anyway. And provided we have his 7-day work history, we can say yes he’s fit and off we go.

Management 14

Interviewer: Does your operation have standby rostering within its rosters?
Manager: Standby?
Interviewer: Standby rostering.
Manager: Yeah, it depends on your word standby. For instance we don’t have a guy that’s here, off, 36 hours that we could call in. We don’t have a standby like that. But we do roster them for 12 hours at a time in Thursday Island, like for instance they know they’re on duty from 6 am until 6 pm, and if there’s a search they’ll be called out, but when we’ve finished that 12 hour shift, another crew come in, so it’s not really a standby, they’re actually rostered for duty, and if they’re not required they can go to bed, it’s not really the same as in the old CA048 where you could roster a guy on 36 hours standby at home.
APPENDIX K: FLIGHT CREW MEMBERS’ OPINIONS OF STANDBY ROSTERING & COMMUTING (TRANSCRIPTS)

Pilot 1

Interviewer: Do you have a standby rostering system?
Pilot: No. [Our operation] doesn’t do a whole lot on the weekend, but [our sister company] does and sometimes they will say we’ve got a few bookings coming up, there’s a couple of pilots on other jobs. and that’s as close as it gets but he said that to me last Saturday about Sunday and the phone didn’t ring until 4 o’clock or 5 o’clock Sunday night and that was only for a job on Sunday.

Interviewer: So do you think that increases your fatigue, when you are waiting...
Pilot: No, I don’t worry about it. When I first started I used to be worried about being too far away from home or having a beer in the afternoon with a mate because I wanted to work, but I don’t care now. If it comes along, that’s good, but I’m not going to lose any sleep.

Interviewer: Do you feel that fatigue affects your safety/driving performance commuting to and from work?
Pilot: Sometimes on the way home I’m really tired. You get tired just sitting in the aeroplane doing nothing, well not doing nothing but say you’ve got the autopilot, so you might feel a little bit tired when you get back, but then when you came back in, cleaning up the aeroplane, doing duty time, you sort of wake back up again.

Interviewer: Can you fill out on the sheet approximately how far you have to commute to and from work?
Pilot: Is that the round trip or just one way?
Interviewer: Just one way. About 25 kilometers, and how long does that take?
Pilot: About 35 minutes. Because there’s no one on the road at 5 o’clock in the morning.

Pilot 2

Interviewer: Do you have standby rostering within your operation?
Pilot: Not really. We’re either on or off.

Interviewer: Do you feel the fatigue affects your driving performance or safety when you are commuting to or from work?
Pilot: No, I always have a sleep before I go home, because it takes me over an hour.

Interviewer: You have to drive that far?
Pilot: Yes, I live at [location].

Interviewer: Approximately how far to have to commute to or from work?
Pilot: Yeah but I don’t commute to and from work. Well I come in on Monday morning fly away into the sunset, or sunrise actually, and come home on Friday afternoon and go home again.

Interviewer: So where are you based then during the week?
Pilot: [location], so probably only drive from the motel ten or five kilometres. Yes it’s not very relevant that, to our type of operation.
**Pilot 3**

Interviewer: In your opinion what are the effects of standby rostering on fatigue? Do you have a standby rostering system?

Pilot: No we don’t, because we have a set roster that is put out in advance, so the Chief Pilot sends it all out so we know exactly which days we’re on, one day a week, usually one day either side of our set day off there might be a case where you may or may not get the day off, but you basically just assume you will, so ??? Unless you very early, but ??? you’re going to have a day off, and that’s purely down to numbers. So we’ve got a roster set two weeks in advance.

Interviewer: So you already know?

Pilot: Yes.

Interviewer: Do you feel that fatigue affects your safety or driving performance when you are commuting to and from work?

Pilot: No, fatigue should do, but it doesn’t, I don’t have any problems with that.

Interviewer: Approximately how far do you commute to and from work?

Pilot: About 60 kilometres. It takes me about…my drive starts at four, and I get to work at about 4:50.

Interviewer: About 50 minutes?

Pilot: Yeah.

Interviewer: That’s a pretty long drive.

Pilot: I take it slowly because there’s a lot of kangaroos on the way home when its dark, so take it easy. I could do it in 45, but I don’t so…spend a bit of time waking up.

**Pilot 4**

Interviewer: Do you have standby rostering in your part of the operation?

Pilot: Well, standby in that at any stage we’re both available, but we’ll know what our roster or our workload will be a few days ahead. And so we are on a form of standby for those flights, but if there’s nothing on the roster we don’t go on standby waiting for a job to come up, because we know days in advance what our flying is going to be, its not like we’re an emergency helicopter service where we’ve got to be at work from 8 to 8 or whatever it might be.

Interviewer: That type of standby, does it have any effect on fatigue at all?

Pilot: No

Interviewer: Do you feel that fatigue affects your safety/ driving performance commuting to and from work?

Pilot: I’m sure it would. Oh no, I’d say it wouldn’t because driving to and from work, if I’m fatigued, at that state, I wouldn’t have been going to work. So it’s assumed then that I haven’t got fatigue, otherwise I wouldn’t have gone to work. In the general work environment, where a guy’s just come off work of a 24 hr shift, then he could fall asleep at the wheel, but in our circumstances that’s not really going to happen. Unless I come off duty and I hang around here for an extra 10 hrs and then I’m tired and driving home.

Interviewer: Approximately how far do you have to commute to and from work?

Pilot: 9km one way, 15 minutes.
Pilot 5

Interviewer: In your opinion, what are the effects of standby rostering on fatigue?

Pilot: I think um, it's a good system.

Interviewer: Do you think that standby hours should be considered in fatigue scores?

Pilot: No

Interviewer: Do you feel that fatigue affects your safety and driving performance when you’re commuting to and from work?

Pilot: Does fatigue, or does the fatigue that I experience from this job?

Interviewer: Does the fatigue that you experience from this job

Pilot: Um, I think it could but again, we all have a sleep here first.

Interviewer: Do you really have a sleep before finishing a shift?

Pilot: Depends on the shift. I mean, at the moment, I haven't done anything all day, so I'd just go home. Yeah, if I've been out all night and I feel very tired, and then I'd go and have a lie down and then drive home.

Interviewer: And you’d do that? That’s encouraged?

Pilot: Yes it is.

Interviewer: OK, next question, approximately how far do you have to commute to and from work?

Pilot: Oh, about 50 km's

Interviewer: 50 km's, and how long does that take?

Pilot: Well, without getting any speeding fines, approximately 35-40 minutes

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Pilot 6

Interviewer: What's your opinion of standby rostering?

Pilot: I think it should be treated as per the old system, the old CASA system treated it as... you could do a whole lot of standby... I don’t know what the answer to your question is, whether it should be counted as duty, no, but as a form of duty, yes. If we put a pilot on nights, under the old system he starts at 1800 at finishes at finishes at 6am, if he gets called out it all becomes duty. Whereas what the guys get worried about, you now I got the FMS and the company put some examples in, you know you could be called out at 2 o'clock in the morning and go back to bed at four or go back to the units at four, and then start at eight, and then go till 12 and then start again at four in the afternoon. Now everybody believes that's dangerous, and it is, but under the FMS we can do that. On the computer you can quite happily do that, that's fine, and common sense you could never roster people like that in the old system. I think that associated with the risk of the task that is not covered is problems with the system, helicopters are probably a bit different from the ??? we're very task non-specific and they’re task specific and ??? to run with it, so we can be called out in the middle of the night ??? and we are ??? in the middle of the night all the time ??? So we’re a bit of a different area I think.
Pilot 7

Interviewer: Do you feel that fatigue affects your safety/driving performance when commuting to and from work?

Pilot: Yep

Interviewer: Have you ever felt too tired to drive, for example, after a shift?

Pilot: No, definitely not, but you are still, well, I don’t know … what did you actually say again.

Interviewer: Do you feel that fatigue affects your safety/driving performance when commuting to and from work?

Pilot: I mean to it does, because it depends on what you did the night before really.

Interviewer: Approximately how far do you have to commute to and from work?

Pilot: It’s different everyday and different from one state to the other. When I’m at home it’s only about 15 minutes from over here it’s about 20 minutes and then I don’t have to drive.

Pilot 8

Interviewer: Do you ever do standby rosters?

Pilot: No.

Interviewer: Do you feel that fatigue affects your driving or safety performance when you are commuting to and from work?

Pilot: Definitely.

Interviewer: How do you take account for that or are you just aware of it?

Pilot: Just aware of it. It is actually a concern we don’t report that at all.

Interviewer: Approximately how far do you have to commute to and from work?

Pilot: A kilometre???

Interviewer: And how long does that take?

Pilot: About five minutes.

Pilot 9

Interviewer: Fantastic. And how often to you get called up from standby when you’re at home?

Pilot: Again, it depends on the time of the year, but you might get called up one day out of your standby. In saying that, I haven’t been called up for the last 6 weeks.

Interviewer: Is it something that you’re continually thinking about when you’re on standby at home?

Pilot: Well, for a start, I would break it down pretty simple. I can either have alcohol, or I can’t. If I’m on standby I can’t. Right? So, for those 2 days I’m on standby, at any stage – at 2 o’clock in the morning if I get a phone call, I’ve got to be ready to fly. So, it’s an unwritten rule at [operation]. We can’t go out and dig ditches all day if we’re on standby.

Interviewer: That’s a good excuse not to do any housework!

Pilot: Yeah, exactly! And on that 2 days standby, we can’t go out and to any outside flying.

Interviewer: Alright, um, we were talking about standby rostering a minute ago. In your opinion, what are the fatigue effects of standby rostering on fatigue?
Pilot: What are the effects? Well, it obviously reduces your fatigue – or it can. The reason I say that is – as I said to you before, you have an option – you’ve got – what am I trying to say – you can call your mate in if you’re tired. So,

Interviewer: OK, you’re talking from the perspective of the pilot that’s not on standby – so that they’ve got a back up if they do get tired. What about for the pilot that’s on standby?

Pilot: Well again, in simple terms, you can’t have a beer – that’s all.

Interviewer: So it doesn’t make you more fatigued or anything

Pilot: No, no. If you’re sensible about it, you just – everyone’s different, but you eat your normal meals at your normal times. You go to bed when you normally would, but you have a bag packed, and you’re ready to go. Most of the time here, we give each other plenty of notice. With [our operation], you’ve got to be within an hour and a half’s travel to the base here at [the base], so that gives you a lot of scope to live. You don’t have to live in [location] or you don’t have to live right on the place’s doorstep.

Interviewer: So, how is standby considered as far as FAID score? Is that considered in the FAID score?

Pilot: No, no it’s not. The reason we don’t include it is because, in effect, you’re not doing any duty hours. And if they start, if CASA, or if you suggest, or I’ll talk about CASA – if they want to include that in the fatigue score, it will be very limiting to the point where companies will go broke to the point where companies will have to employ more pilots to sit around and do nothing.

Interviewer: What’s your opinion of the effects of standby rostering on fatigue?

Pilot: What, if I use the extra day?

Interviewer: Well, if you’re on standby, and you’re on call, do you feel like you’re more or less alert if you’re waiting for a phone call?

Pilot: No, we usually know sort of at least 24 hours before hand whether we’re going to work or not – it just depends on the numbers and who’s available. We’ll have a pretty good idea – the numbers usually don’t change. We can pretty much trust that at the latest we’ll know at 8 o’clock the night before – but usually that morning, whether we’re going to be working or not.

Interviewer: Do you consider fatigue to effect your driving safety going to and from work?

Pilot: Ah, yes, yeah definitely – driving yeah.

Interviewer: Yeah, when do you feel it the most? Driving to work or –

Pilot: Well yeah, because you’re getting out of bed so early, and ‘sleep inertia’ –

Interviewer: Well done!

Pilot: Yeah – remembered that one. Yeah – I try to get up and have at least _ hour before I head off. But sometimes you sleep in and it’s oh shit – you have to get up and go in 5 minutes. You have to look out for kangaroos, and if you get there in one piece, then you’re right.

Interviewer: Approximately how far do you have to commute to work?

Pilot: I travel about 15 kms

Interviewer: And how long does that take you?

Pilot: 15-20 minutes. 20 minutes - yeah.
Pilot 11

Interviewer: Do you have any standby rostering within your operation?

Pilot: Yes. There’s a couple of days out of that fortnight, sorry, the day after the fortnight one person is standby in case we have an additional flight.

Interviewer: And in your opinion what are the effects of standby rostering on fatigue levels?

Pilot: No different. Normally their scores are below that anyway so there’s no difference. And even if we do take someone in that’s say staying for a couple of extra days it really doesn’t impinge on their score.

Interviewer: Do you feel that fatigue affects your safety or driving performance when you’re commuting to and from work?

Pilot: No.

Interviewer: Approximately how far do you have to commute to and from work?

Pilot: ???

Interviewer: And how long does that take you to drive, just approximately?

Pilot: ???

Pilot 12

Interviewer: In your opinion, what are the effects of standby rostering on fatigue?

Pilot: Do you want to define that a little bit more?

Interviewer: Standby rostering at home, waiting, do you think that waiting for a phone call, or constantly being aware that you could be called in increases your fatigue levels?

Pilot: For sure, you can never get quality time and switch off and just be yourself at home, you’ve always got to orientate what you’re going to do and how you’re going to do it around the phone call.

Interviewer: Do you find that you sleep any different?

Pilot: Yes, most definitely.

Interviewer: Lighter sleep?

Pilot: Yes, you can never get that deep sleep.

Interviewer: Do you think that’s accounted for in your FMS?

Pilot: Yes I do. I’m pretty sure it’s in there. Again for me, only working during the day anyway, you don’t go in to the depths of what the other guys are going through, but from what I’ve seen of it, it certainly does take it into account.

Interviewer: Do you feel that fatigue affects your safety or driving performance when you are commuting to and from work?

Pilot: Most definitely.

Interviewer: How do you experience that and also cope with that?

Pilot: Like I had a bad night at home with newborn baby, so I’ll make sure that this afternoon I have a sleep and prior to going home this afternoon I’ll have a shower before I actually hit the road.

Interviewer: Cool shower or warm one?

Pilot: Warm. Don’t like the cold.

Interviewer: Approximately how far do you have to commute to and from work each day? Just one way.

Pilot: Its about 12 minutes, 20 kilometres.
Interviewer: What is your opinion of the fatigue effects of standby rostering?
Pilot: It's not included in work hours.
Interviewer: How is this included in the FMS?
Pilot: It's not currently, but it definitely should be.
Interviewer: Do you feel that fatigue affects your safety/driving performance commuting to/from work?
Pilot: Absolutely.
Interviewer: Approximately how far do you have to commute to and from work?
Pilot: Oh, about 10 km's - 5-10 mins.

Interviewer: Now you guys work a standby rostering system during busy periods, in your opinion what are the effects of standby rostering on fatigue?
Pilot: It does have an effect in that you’re coming out for another day's shift and you’re obviously not going to have much time off, but I think because everybody is aware that this is OK, and they are probably just that little bit more alert, but I still think the standby system is better than being rostered six days straight on.
Interviewer: And that's obviously managed by the FMS? And FAID?
Pilot: Yeah. It does indeed. We don't do anything that's outside of it. And its an excellent tool, because the office otherwise could have us working seven days a week 24 hours a day.
Interviewer: Do you feel that fatigue affects your safety or driving performance when you’re commuting to and from work?
Pilot: Yeah, fatigue certainly has an influence on it, yeah.
Interviewer: Approximately how far do you have to commute to and from work?
Pilot: About 35 kilometres and it takes about 30 minutes.
Interviewer: 30 minutes?
Pilot: 25 minutes.
Interviewer: Depending on what time of the morning?
Pilot: Yeah. If the alarm has not been very welcome that morning it might take me 20!

Interviewer: Do you feel that fatigue affects your safety/driving performance commuting to/from work?
Pilot: Yes.
Interviewer: Approximately how far do you have to commute to and from work?
Pilot: 6 km's; 5-6 mins.
# APPENDIX L: TRAINING PROGRAM ELEMENTS INCLUDED BY EACH OPERATION

<table>
<thead>
<tr>
<th>Operation</th>
<th>Info Included in FMS Policy</th>
<th>Practical Living for Shiftworkers (PLFS) Booklet</th>
<th>PLFS Competency Based Assessments</th>
<th>Consultant presented workshops</th>
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APPENDIX M: MANAGEMENT OPINIONS OF FMS TRAINING & EDUCATION (TRANSCRIPT)

Management 1

Interviewer: What sort of communications did you give to flight crew about the FMS when it first started, they obviously got memos throughout it?

Manager: Yes, we got memos, you’ve got a copy of that email there, we subsequently had a meeting about it all, they were all given copies of the ‘Practical Living’ and asked to complete the questionnaires.

Interviewer: They did that in their own time did they?

Manager: Yes. Take it home, or if they were going away for a day in a motel room, whatever.

Interviewer: Did you have a look at their answers?

Manager: I’ve marked all their answers, marked them all because I also got the assessors course thing as well.

Interviewer: So memos, meetings, and practical living, is that about it? Do they all have their own copy of the FMS?

Manager: Yes.

Interviewer: And they keep that at home or here?

Manager: Wherever they want to. Its theirs.

Interviewer: Have you checked in any way that they’ve read it?

Manager: The manual? Yes, just by talking about it. A couple of times its become evident that people haven’t read it and I’ve said ‘hey, if you want to answer the questions that’s fine, I’ll listen to all the answers you’ve got but when you do it make sure you do it with the benefit of the facts’.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?

Manager: That’s asking you to tell how good I am, isn’t it? I think its good, because its been basic, its been practical and its been effective. Its been effective because people have recognised the fact there is fatigue, because the system is working therefore the training system must be working.

Interviewer: Is there anything not covered that you would’ve liked to have been included?

Manager: I think more emphasis needs to be placed on the recognition by pilots of actual fatigue levels. In terms of saying ‘hey, I am tired and I’m not working any more and that’s it.’ Because up until now its been a pretty generic kind of statement.

Interviewer: So more emphasis on the pilots’ responsibility?

Manager: Pilots and management’s responsibility to recognise the level of fatigue that means stop. And when one of the parties calls stop, that’s it. If management says stop flying, the pilot says ‘yeah, OK’, if the pilot says ‘stop flying’ the management says ‘yeah OK’.

Interviewer: Is there anything else that you would’ve liked to see?

Manager: The only other thing is practical stuff like the hands on bit, but that’s unique to each organisation. That’s development type stuff in the flight and duty, pay program into the one type stuff.

Interviewer: Was there anything covered that you don’t think was necessary?

Manager: I don’t think so, because one facet seemed to literally lead on to the other and it was all interconnected and you remove one element it may well become a bit disjointed. You can talk about diet and rest habits and sleep patterns and the whole thing, it’s a package, and
to remove any elements of it would cast doubts on the credibility of your research and putting all this together, wouldn’t it? So if this isn’t needed, how credible is your research that you’re putting in to practice. If someone’s saying that this is not needed, how do we know there’s not another 10 aren’t needed either.

Interviewer: Yeah. That’s true. Do you think that training and education is an essential part of an FMS?

Manager: Yeah, you’ve got to have that. I don’t know that people are very keen on getting too involved, in fact I’m sure they’re not keen in getting too involved with the training.

Interviewer: Are you talking about the pilots or the operators?

Manager: Both. I think there’s going to be the person who’s driving it, in this case me perhaps and every organisation will probably have one or, if it’s Qantas you might have a department, they’ll have to have a good in-depth understanding of the how’s and why’s. I think the rest of the people need a nuts and bolts of it. People are monkey see, monkey do, show me how and I’ll do it. No, I don’t want to know that, just show me how and I’ll do it and what do I need to get out of it. Results, that’s all I want to know about that. That’s why I’ve marked all the exams, all the tests.

Interviewer: So how often do you think training and education in Fatigue needs to occur?

Manager: On induction. I would say on a random ongoing basis because people are different. Like [another pilot], who you spoke to earlier, he’s just picked it up and he’s with it all the way. there’s other people who need it drawn to their attention every 6-10 weeks.

Interviewer: So how would you monitor that?

Manager: I don’t think you could formally monitor it. I you put in a formal monitoring programme a) you’re creating more paperwork; we don’t need that I can tell you. I think it’s on a personal interpretation of how a particular person wants it, if I was handling it.

Interviewer: So you think the individual, informal chat, more than…?

Manager: I think it’s much more effective, because then you can address the areas where the guys are uncertain or unsure of, and their not going to be the same every time round, between pilots.

Interviewer: Where do you see a need for… — oh, there’s no right or wrong answers at all, so you don’t think I’m biased any one way or the other — do you think there’s a need for recurring training, say every six months or 12 months or two years, or…? like as in informal, sit down, information…

Manager: Probably a formal six monthly meeting, about which people could sit down and brain storm and chat and not mix it up with perhaps a quality assurance meeting or anything like that, but just have a team management meeting, even if it’s informal over a BBQ or whatever because people are going to be much looser and you can talk about their conquests or ??? or some Sheila told them where to go or whatever and you’ll get good stuff coming out. You’d have to have someone there who’s smart enough to know how to listen and separate the chaff from the hay. J ust ask some open questions and sometimes you’ll need to ask a closed question to stop that line of...

Management 2

Interviewer: Can you briefly describe your training and education program?

Manager: Well first, [a CASA representative] came here, and was here one or two days. We ran a lot of sessions in the first place while we trying to put the program together. We were given instructions, “You will have this book, and this book only” When you read through those they are really to do with shift work, they are not aviation specific.
Interviewer: You didn’t find them useful?
Manager: No at all…
Admin: Absolutely ridiculous. That’s one thing they asked us is “have we sent out one of these books to each one of our pilots”. We said, “No, because (a) these books are very expensive and (b) half those questions don’t even apply to us”.
Manager: I mean, you can see where the phrasing comes through. But I think I can say the training they got came out and the guys understand a bit more now. Effectively fatigue is just replacing the word tired. If you’re tired you shouldn’t go flying. So a lot comes back to commonsense, they’re trying to put names to everything now, but…
Interviewer: So, have you done anything besides the books?
Manager: We have a training week every year we have a lot of things that we have to keep current for the electrical industry but every year we bring everyone together from around the country and we’re here for a week. Through that week we brought in people like [a consultant] and he had a yarn to everyone about how the system was developed and why and what it was equal to so that they understood it. I don’t believe there is any training you can do for ???. What you have to do is probably train the management more than the people.
Interviewer: And does that happen?
Manager: We were that way inclined anyway, because this is what our policy is and that’s driven by what the safety side of risk assessment we did and all the stuff we carry out, how we can maintain the work that we do on an ongoing basis is to have limits. So we’ve set limits. They’re not limits the guys like. The limiting factor can be different on any different date so we don’t have limits as such we have guidelines and that sort of thing, changing the guidelines over the last few years, because if you set a limit, then some people expect you to work to that limit and won’t understand it if you don’t. If you make them understand that you have guidelines and that priority is one of safety and doing the job properly and then how many hours you do is weather related so you have people understand that, then we don’t have the power company ringing up and going ‘your guys aren’t doing this and aren’t doing that’. We didn’t actually run any training, we had people come to talk to them, we put out the handbook about it, we sent them a memo to say, its in place now if you have any queries or concerns write to us, let us know.
Interviewer: Did they do the exam with the book?
Manager: Its really not relevant to us. It was what they produced. And we bought one copy because they said you had to have it. We bought it, had a look at it and said, its there, if someone’s going to do it, they can photocopy it or they can go through and write it out, but ??? because in the eyes of ??? what do we do now, we know we can work here, we know if we’re not feeling up to it, if we’re crook, we don’t have to do it, and really we’ve probably only lost two or three days where crews have been on the ground because people have been sick. So we’ve had a really good run. The guys say ‘I don’t want to be out in the field not working’.
Interviewer: So that’s almost training in itself, the realisation that they’ve got that they don’t have to work. They obviously know that the management ???
Manager: For sure. You shouldn’t do anything without a reason. If you haven’t flown today you should have a reason why you haven’t flown. If its an absolute slack reason because you were out last night then we deal with it that way, if its because of the weather then … I mean we don’t control the weather so they don’t have any pressure. The only pressure that they put on them is what they put on themselves. And mostly our guys just go along and do exactly what we expect of them.
Interviewer: So do you see training as a ??? essential ??? for management?
Manager: For management, yes, for people in the field, no. While they need to understand what it is I don’t think there is any training you can do for the people in the field, you can make them aware, you can say ‘look if you’re tired don’t do it’. If you call it fatigue it confuses people, you tell them if you feel tired, well that’s what fatigue is. Fatigue just means tired. No big scary thing then. For management of companies people may be like that, they’ve got to be trained to understand the limits and then if they understand the limits then they won’t pressure the people in the field to do any more than they should.

Interviewer: So the responsibility is on the management, more so than on ???

Manager: My word. It should be. It needs to be. It needs to be there. I mean the guys in the field need to be responsible for themselves but they need to feel not pressured to do something. Most people have accidents and why did you have it, ‘well so-and-so wanted me fly there and wanted me to do this and do that’, what was going to happen, ‘well he was going to thrash??? me’, you don’t need that, but that’s our ???. This unfortunately is not going to change it. You educate the management and you’ll have no problem lower down, well, not lower down but down the line.

Management 3

Interviewer: What sort of communications did you give to flight crew when you first implemented the FMS?

Manager: Well, they already knew about it because they all had input. Yeah, they all had input and we sort of bumbled around, and pulled it all together, and I think we’ve done it reasonably well. Because they all seem fairly well with it. And we sort of talked, I mean, everyone sees each other all the time. It’s pretty rare that you wouldn’t see one of the guys here for 2 weeks, and everybody talks. And I try to keep a free flow of information. If something comes up this crew, I tell the next crew. And with the ops manager, he flies as a line captain too, and so the dissemination of information is quite easy.

Interviewer: Great. Next question on your sheet: How would you rate the overall usefulness & effectiveness of the training program?

Manager: Oh, good. Yeah, it’s opened some people’s eyes to ‘yeah well, you should try to have 5 hours sleep at night’. Especially if someone has young kids. I mean, you might be getting up to help your wife out and having 2 hour breaks or something like that. It’s not useful sleep sometimes.

Interviewer: So, you did Practical Living for Shiftworkers?

Manager: Yeah

Interviewer: Is that all that you’ve done?

Manager: Um, plus we talk about it a lot I think. And we got some good information from [a CASA representative]. [The CASA representative’s] going to start looking more at some of the information that you guys have, and also from NASA. He recently got something from NASA and disseminated it.

Interviewer: Is there anything not included in the training that you would have liked to be?

Manager: No, I mean, if you’re sensible, then you know about it. And education’s a big thing in aviation anyway. It’s all, you know, it’s all lego blocks that you build on.

Interviewer: Do you consider training and education as an essential part of the FMS?

Manager: Yeah, yes I do. And I think the big thing that’s come through is that in December, they’d forgotten about stuff we talked about in July. So, at least once a year, like the CAO20-11 every 3 months, it’s going to be raised formally at our ops meetings to see if anyone’s having any problems. Plus [the CASA representative] will have input into any new developments, or anything like that that’s come out.
Interviewer: And the training will happen every 12 months?
Manager: Yeah. That’s what we’ve agreed to with CASA. Because we do flight training every 3 months. It’s all just part of it to keep your currency up.

Management

Interviewer: Who was responsible for designing and administering education and training programs?
Manager: Me. But I built that on behalf of CASA. One of the problems with industry is, lets take our place here as an example. [The chief pilot] is a highly qualified Chief Pilot. I don’t know whether he’s tertiary qualified or not, but he’s a very capable pilot. [The manager], the managing director, he’s got a business vein, he’s quick on a whole lot of things, definitely not tertiary educated, and an accountant that can use a calculator but between them to put together a systemic document, and this company wouldn’t have been much different than 80% of the other companies around, its just not an option to write... you need another set of skills to get into business organisation, but there’s nothing wrong with these people, but??? are generally scratching for dollars, just operationally you fly planes and make a little bit of profit and screw up their taxes again. That’s basically what they do. And get into trouble with CASA and try to fix it up and screw up their taxes. So its really organisational horsepower that most general aviation hasn’t got. When I spoke with [a CASA representative] and the decision to put together example documents rather than dictatorial stuff that traditionally does, everyone initially agreed that that was the way to go and the primary reason behind that is you can’t expect general aviation, the document is a 50 page document and that’s a lot of effort for someone, and the document is no way near as important as understanding the systemic function. Its just that the document is needed to tie it all together and legally defensible. So that’s why that style of document was established. There was a lot of logic in that, and until the adversary started to get in and play politics it was an accepted and legitimate way to go. I’ve got a feeling CASA will act in the right sense to fix that. But the average GA??? person, I don’t know if you’ve managed to talk to [another operator], if you haven’t get onto him because he’s a good person. He’s a top bloke. He’s a bit of a rough nut at times, but he’s got it up his... did I answer the question?

Interviewer: The question was education and training.
Manager: I’ve got over ten years in training. I was director of training at ELI training school, the Australian Aviation College in Adelaide. I was what they term the ??? I put together the actual education aspects of that training, and even though I could have used other people around here, when it came to the fatigue element, when I was ??? I was working 70 hour weeks just to understand fatigue as intended by the Centre for Sleep Research and what NASA had written and what other people had written, so I ended up being the best person in the organisation to do it from a fatigue and an education perspective.

Interviewer: What sort of communications did you give the flight crew when the FMS was first brought in?
Manager: They had their formal induction training, which was about five hours all up which included the book from you guys and the exam that I wrote. They received a copy of the formal document, the document at the time was pre-approval document, they subsequently received the updated version and then we have a book around somewhere called ‘Fatigue Readings’ which gives some internet stuff to look at and also some extracts from that. It gets to the point that there’s so much material, there’s so much material on fatigue that I had to start thinking where do the aeroplane operations come into this? We had to group it ??? relevant information or else people would simply lose interest on bulk. Since then we’ve been able to find ??? Readings and work records that come in and there’s always some link to fatigue. We have a general communications process in that immediate information like rosters and operations directors meeting is actually transmitted by email, so that should get through
within 24 hours, but what happens if people don’t open their email? If it’s urgent we follow it up with a phone call. If it’s urgent, urgent we follow it up with a phone call. We’ve only just got onto this, mail out payslips fortnightly, we’re making it a bigger envelope and we’re following it up with mail outs, so that’s the primary individual, but also in key places like in our PelAir??? office, I shouldn’t say that we have a mascot office ??? with PelAir??? who are our friends and competitors, we are starting to put different material at that point for reference. So if someone’s received a ??? and they want to reference it and they’re away from home because they’ve got it at home and they’re not here at [operation] but they do call into [location]. So at key bases we maintain… but that said, that still needs work to get it 100%. That’s not only for our fatigue management stuff, because we have our flying operations, we have dangerous goods, we have all these and fatigue management. So there’s a whole lot of things that need to be covered not just…fatigue management is a very important element but its one in a group of important elements.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?
Manager: I would like to say very good but I’ll only say good.
Interviewer: Out of modesty?
Manager: No I always find things that I’m sure I’ve said properly but people come up, it given variation, but a lot of the time its not quite what I want... the other day I had this bloke not recognising its??? I said ‘you’ve got to recognise it, otherwise we can’t do it.’ Its important that in that slot in the middle, you must fundamentally know that you must have sleep opportunity in there. You can’t jump on the ??? and run a small business. You can sit down at the pub without drinking with your feet up and watch the girls go by if you want, but if you’re tired, a bed must be available and you must be able to go and take the opportunity, so I think its so culturally removed from CAO48 that some don’t care as much as I do.

Interviewer: Do you see training and education as an essential part…?
Manager: Absolutely!
Interviewer: What would you like to see included that’s not already?
Manager: I don’t know. Its fundamental because I want to be able to trust people to a fairly high level that they will do the right thing by themselves, their bodies, their families. Look, I don’t know, I think its all there, to me it wouldn’t be complete if it wasn’t there and even if there was an identified formual requirement if I found... see this is the way we treat CASA stuff nowadays, its not just do what's necessary by CASA or by the law, its make sure they’re covered, but do what's necessary. So you might have company requirements that are of a higher standard than CASA, and clearly that's the intention of the law, its not meant to be a minimalist approach. Education and training is always seen as a cost. I don't have a great deal of problem with that. I see education as primarily communication anyway, that develops trust. So I can't actually think of something that's not within my control to actually get the people in and give them some more computer training or whatever. But with the computer training we do give to people they generally don’t use it anyway, they don’t need to, they just need to have a level of confidence.

Management 5

Interviewer: What sort of communications did you give to air crew regarding the FMS and also ???
Manager: We gave out a memo, told them what we were doing, gave them all a copy of the handbook, we then gave them more training at their training week, where we had people from Inter Dynamics come and gave a spiel.

Interviewer: What did that training involve, include?
Manager: It was actually very good. He talked about history towards it and talked more about the rail use of it and how they use it to manage work hours
Interviewer: the history of fatigue management?

Manager: Yes. Fatigue management. How we come up to it, what it is, and all the rest, and answered any of your questions. We didn’t have a lot of questions but the feedback I have was that it was a good session. The thing about FAID at the moment, the FMS, and I don’t think it addresses this, is that if you identify that the only way to manage it is to work down that path, and he gave the example in rail, that they identified an area that whatever they did they had this little bit of risk, and they manage that risk, and made aware of that risk, and they went down that path. In some ways that’s what the old CAO48 ?? make him aware. I wonder how the flexibility would be when you have an area where you want to make a phone call or do we do this do that and go down that path and this guy can be on a job in a project where it identifies over our limit. I dare say the time will come when we’ll try them out and find out whether its OK, I think it was worthwhile. I mean that’s what we’ve done anyway. Given that we’re implementing it, we didn’t give everyone a handbook and say give me your comments, because we’ve got 20 staff, basically implemented that working group, put together, this is what we’re doing, here’s a copy of the handbook, take it home, show your family, read about it, come back with your concerns, and we gave some training at the training day. In general things haven’t changed, we don’t expect a lot of feedback from your staff if things are going well.

Interviewer: How would you rate the overall usefulness and effectiveness of that training program?

Manager: I wouldn’t say it was very good but I’d say it was definitely better than average though. We’d spent the money and got the guy out here and the feedback was good.

Interviewer: Did he include any lifestyle factors?

Manager: Yes he did. He gave out examples. He gave out a brochure to everyone and he gave examples of using it and how to implement them. It was good.

Interviewer: Excellent. Was there anything that wasn’t covered that you think should have been?

Manager: No. It was meant to be ‘get there and he’d answer anyone’s question’.

Interviewer: Do you consider training and education as an essential part of the FMS?

Manager: Oh yeah. If you’re radical in what you’re doing, we weren’t, we just went through a system that worked ??? you just need to give the education if you tell them nothing’s going to change and it hasn’t, they’ll say ‘so be it, what’s in it for me then? You’re not giving a pay rise.’ ???

Management 6

Manager: One of the things that was specified in the trial period was that all the education had to be done within 90 days for all the pilots - and at that stage, I think it was around 90 pilots

Interviewer: What sort of education was that?

Manager: Well, it wasn’t specified what it was supposed to be. But what we did was, I sent [a pilot], I took him off of his line duties, and sent him to every base to talk to every pilot. He made a presentation on causes of fatigue, fatigue inducers, symptoms of fatigue, you know, all that sort of gear. So, he ran a course that took around about I think 2 hours per person over that 3 month period, all to meet that agenda. So, it was a pretty big issue. And now he’s built this package, infact he’s only just sent it up to me, which was a fatigue management awareness course, which involves this handout, and that power point presentation [POINTS TO DISC] which you can have as well.

Interviewer: Do you think that the Training and Education is an important part of the FMS?

Manager: Definitely. I think that, particularly with the aviation industry, because if you’ve met any pilots, you’ve probably figured out already that most of them think they’re prima donna’s of the skies. So yeah, generally extraverts, and they are – their psych profiles show that anyway,
and that's not such a bad thing in aviation at times. But, yeah, 10 foot tall and bullet proof is a common conception I suppose, and what the education does, is alert people to factors that they probably never thought of before – although some of the more thinking people probably would have thought about some of these. But the education processes, while it goes on, not only does it identify symptoms of fatigue, and actually spell it out, it has various countermeasures that you can take to help minimise it, and some lifestyle guidelines as well, so that possibly you won't end up in that state. So yeah, the education is good.

Management 7

Interviewer: Can you tell me about your training and education system?

Manager: Within [this company]? Which bit?

Interviewer: Well, you obviously use Practical Living for shift workers

Manager: Yeah, talking specifically about fatigue. Probably in relation to fatigue that's about it. We get the monthly newsletter from Air Services which has got the fatigue… all the pilots get that, religiously, once I get it I send it to them. One of my other pilots, he's away on holidays at the moment, he's pretty keen on fatigue related issues, so he speaks up. They're conscientious guys all of them, very. They're good blokes.

Interviewer: So how was the Practical Living for shift workers administered? Was it done in a group setting or…?

Manager: No, individually to read, you were given a set time to do it by, which is a month, then a month after that you were given a test out of the other handbook.

Interviewer: I can't remember what it's called either.

Manager: I was going to say, you probably have more to do with it than me. I thought the books were actually very good. Very practical. Expensive, but that's OK. $25 bucks a book I think they are. No, they're good. They certainly give people a better insight into why they are tired, whereas before, feeling a bit buggered ??? So yeah, its good. I think that's all that's required in our situation.

Management 8

Interviewer: What communication did you first give the flight crew when you implemented the FMS?

Manager: We brought them all in, we did it in two sections, every one of the current flight crew were brought in, sat down and went through the course, which was in that book, which was what we developed, there were 10 or 12 in the first one and 10 or 12 in the second, that included the office staff and everybody, we all sat the course and did the exam at the end of it. Everybody did that including me. That implemented it, and we were lucky at that time that we had [a CASA representative] here to ask all the questions of, he was sort of semi-quasi staff ??? later on full time at a different level. There was controversy occurred over that because CASA were led to believe that we did our course implementation in one hour, and that rumour floated around ???

Interviewer: I haven't heard it.

Manager: [The CASA representative] then went to [location], we sent him to [location] to explain the FMS to pilots, all the other pilots were employed, sat in exactly the same session for four or five hours, with an hour's worth of exam at the end of it. Its an open book exam. Everybody's got it. Everybody's subsequently got a certificate to say they've done it. Within the first three months we had the first review, I'm not on the new panel, ???

Interviewer: Who is?
Manager: [the chief pilot], [the operations manager], and one or two of the pilots. But I’m not. I do all the reports and that so management can’t ???

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?
Manager: Very good. I think it is one of the better one’s.

Interviewer: Is there anything that wasn’t covered in it that you think should have been?
Manager: No.

Interviewer: Was there anything covered that you think was a bit of overkill? No?
Manager: Pretty good. Seen the [competition’s] one. I think ours is probably a little better than [theirs].

Interviewer: Do you see training and education as an essential part of the FMS?
Manager: Oh yeah, you can’t do without it. You can’t do without the training, you cannot put it together. I don’t believe you can do it on an email and post it to them. ??? I had enquiries on the ??? for [the operations manager] to do another course for somebody, but the whole idea of it, like you’re here now, if [the operation managers] the trainer, he has to go and find what the operations are, because Joe Bloggs’ operation is different to mine, and he has to just go and sort of just hang around. Hang out for a couple of days and just find out what it’s all about, and then he starts, and the training program that he implemented for another company might not necessarily be exactly the same as this one. But I think the nuts and bolts are there in his training course to adapt it to any other company. We have had pilots want to just come up, and just give us the book and he read that book and said that will do, but I’ve noticed [the operations manager] got two or three of them there together and they still take four or five hours to ??? two guys, ten guys it doesn’t matter. I’ve told them, if the ??? its not just the... got to change the whole mindset on it, and that’s the big thing that pilots have to be made aware of. You still get pilots today ??? duty times. And very few of them realise even today as much as you can hammer it into their heads that they no longer are required to put a cap on the number of ??? hours they fly. We’ve actually got one of ??? doing about 105 hours per month, but its all daytime, ??? Under CAO48, 90 hours would pull her up. She’s gone 90 hours. Which meant that of 15 hours we’d have to send more crew up, sit them down on the ground, that ???, if it was all back of the clock flying, in other words only 10 hours a month, yes, you’d probably have to monitor probably really well and you’ve have to watch ??? might not be able to 105 hours, but out in the bush they’re flying all day. They spend 8 hours away from home base and in that 8 hours they do 6 hours flying. In your ??? you couldn’t do that. And that’s the mindset you’ve got to get them to change. You’ve got to get them to ??? I said to you [the chief pilot] and I were probably the worst two offenders. We’re probably the oldest two guys here, we were so set in our ways.

Management 9

Interviewer: What sort of communications did you give to flight crew re. FMS?
Manager: Because we’re a fairly small company, we find a lot of credit in just talking to our guys. So most of it is done verbally. Most of it’s not formalized. You know, I’m the chief pilot, I’m there, the guys, they wander in, you say g’day and sit down and have a cup of coffee with them, and you get the jist of any issues - you know, we’ve got a problem over here, so we’ve got to do something about that. So yeah, most of our stuff is verbal. We talk to them about it, and talked about the runs, talked about how many nights they want to work, what sort of runs they want to work.

Interviewer: So they had a lot of input into the formulation of the FMS?
Manager: Oh yeah. Well, they’ve always had a lot of input into the operation. When we start a run, we look at it, get some of the senior guys to fly it and then come back and talk to us about it.
Even like, where do we stay?  So we look around town to sort out the accommodation. Do we need another car down there?  We've got more cars around the country side than you can poke a stick at. You need a car so they can drive from the airport to the accommodation so they don't have to rely on taxi's and that sort of thing. It's been that way for 30 years. And you're talking to someone who's a hands-on operator. So, a lot of these things you need to have a lot of rapport for. I'm not so sure that would be the case if you came across a company who was a team of investors, operating an aviation company who were running around just trying to make money. Our operation is geared a little differently. The guys have a very practical - they have no fear of coming to talk to us - if they have a problem, they come and tell us or they ask our advice. And it sort of evolved quite naturally. And the point of view that we look at some sort of things, and some of them come to us, and say 'well I'd like to do 3 nights', and we'll sort of say 'well that's starting to stretch things'. It's a pretty good system, and we don't have any problems in a) talking to them. Some of them just do the job and we never hear from them. The only time we hear from them is when they've got a problem.

Interviewer: Did you send out memo's or e-mails about the FMS?
Manager:  It was described to them. We had at least 2 pilot meetings where it was discussed
Interviewer: Do you have minutes of those meetings?
Manager:  Nope, because we don't do that. We brought them in, had the meeting, talked about everything, ran them through the program, had a barbeque and then went home. Then we brought them in for training. But there's an awful lot of input from them with any change in procedures. And a lot of the input is about the organisation of procedures – ways to make it easier, like with the loading and stuff. That's the stuff that sort of screws the whole operation up quite easily. The simpler the better, and the easier the better.

Interviewer: OK, next question on your sheet: How would you rate the overall usefulness & effectiveness of the training program?
Manager:  Oh, I'd only rate it as average. Because, it's such a big concept I think it really needs perhaps a more - an introduction where it's more progressive. For example, an introduction where - these are the major concepts - go away and think about them and then come back. OK now, here's the paperwork, and here's what happened to it. So they get a better understanding of what the process is, what their involvement is and what their requirements are. I think the only problem is that when you go there, you've got to have it read. I don't think there's any problem with that, but I think they need to understand that OK, this is the way that it works, this is what happens when your report comes in, when your record come in. This generates that and then that happens and you know, it transpires. That would be my suggestion to make it better.

Interviewer: How was the training delivered?
Manager:  What we did, was we ran it in group sessions. Because, again, we had the problem of bringing people in - if you do, you have to pay them. So, we paid for them to come in and we tended to do them in one big hit, which is the way we had to do it in terms of dollars. It was run as a group session so there was good input from the guys. [The operations manager] was the manager. And they had the work book and worksheet which they had to fill out and then [the operations manager] ran through the training session.

Interviewer: Do you consider training and education as an essential part of the FMS?
Manager:  Oh yeah. I think you have to - and I think it has to be followed up.

Interviewer: About how often do you think?
Manager:  I would like to see at least 2 sessions in the lead up and then one short review a couple of months out, and then maybe every 6 months - at least once a year. I ust to remind them of what's changed, and incorporate it into the other training, and get their feedback as to what they'd like to see.
Interviewer: What sort of communications did you give to flight crew along the way?
Manager: A lot of informal things...

Interviewer: Chatting and that?
Manager: Yes. My desk is right there, down the back, cup of coffee in hand, over the bar occasionally, but then formally the pilot meetings. Allowing the grapevine to do its thing. And then once ??? started the formal training with the guys everyone got a copy of the FMS, and that sort of thing.

Interviewer: So for the training they all read through Practical Living For Shift Workers, and then just talked it through with you?
Manager: Yes, what I did was... a technical chap, [a consultant], he'll do... you've got the training... so what we did was first of all, and I just used this because I had no idea what was required so I thought we'll just use exactly what's recommended here, so I gave them this, they took it away, worked it through in their own time, then we sat down and we checked that they'd done all the exercises, so I've signed off all their books.

Interviewer: So they actually go through hand write through all the exercises as well?
Manager: Yes. Each section, signed it off. Some of its not really so relevant to us because dealing with 12 hour rosters and stuff like that, night shifts where people do work all night, whereas our guys only work if they get rung and then they go straight back to bed, things like that, but its still relevant so each person went through it...

Interviewer: Did they go through all the sections at once or did you do them section by section?
Manager: They took the book and they did them in their own time and then we sat down one on one or one on two and we went through each section, each question again and discussed each of their answers with the answers that are given here, and then I think it said, at least one month so each of them at least one month after stage one, we sat down again and we did the oral exam, which is at the back, so we went right through this again, each of these questions orally, and that completed their training. I know we did all 40, you're only supposed to do 75% so we just did the whole lot, all 40, and now each year when it comes up annually, I guess I'll just go through these 40 again. I guess there'll be lots of new editions of this coming out in the future, and we'll get new books. Now we've started to get a bit of a resource library together we might get some other training material come in. That's all we've done to start off with, straight out of Practical Living.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?
Manager: I thought it was pretty good. Yeah, it was good. I'd say very good actually because lets face it, some of the stuff in there is pretty straight forward but I think everybody got something out of it, I did. I learnt quite a bit. You know there's some stuff in there, how's your relationship with your wife, make sure you communicate, all these things we know we should do anyway, but saying we should do them doesn't mean they're going to get done, but ??? the fact that fatigue is an overall picture, not just the fact that you go to sleep, wake up...

Interviewer: So it was good to hear them even though they were obvious. Was there anything not included that you would have liked to have seen...
Manager: The guys were most interested to know than the wives and spouses

Interviewer: ...anything not included that you would have liked to have seen?
Manager: No. Not really. I think it was pretty straight forward. I mean you could go into more detail, like the diet section, where it goes through and tells them...I mean you couldn't do much more detail along those lines, but I mean, at the end of the day people are going to eat what they're going to eat anyway, but if they're aware at least that chomping on a big hamburger at 10 o'clock at night's probably not the best thing to do, hopefully they might not do it quite as often as they used to.
Interviewer: Do you consider training and education as an essential part of the FMS?
Manager: Yeah. Yeah it has to be, you can’t just say, we’ve got an FMS now and... get used to it.
Interviewer: So its better having education in place?
Manager: Oh yeah.

Management 11

Interviewer: What sort of communications did you give to flight crew when you first implemented the FMS?
Manager: We did it by hands-on when we first implemented it, now if we get a new pilot in what I do is...
I’ve got a couple of instructors around as well who are familiar with it and they actually take them right through the system and show them how to work it. But we’ve still got a few guys who have difficulty turning a computer on so few have a few little glitches but its getting better.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?
Manager: Ours was good. Only ours, I don’t know how anybody else is doing but I think ours was excellent.

Interviewer: What were the major topics that were covered? They’re obviously all in here, is this everything that was covered?
Manager: Its everything that was covered. That actually worked as his lesson plan as well. We actually sat down, gave everyone one of these and he went through it and talked to it because he’s got a lot of his own experiences so even though he covered that as a topic he elaborated as required, and one that was probably additional that most people don’t look at, as well as the workshop health and safety aspects of it, he was saying your company has got certain obligations to you to give you a safe work place and things like that and he also elaborated on the pilot’s duties as well, in other words you have a duty to the company to arrive to work in a fit state to work. So that was covered as well.

Interviewer: Was there anything not included in the training that you would like to have seen included?
Manager: No, not in the training side, I think the training was good.

Interviewer: Was there anything included that you think was a bit of overkill or not necessary?
Manager: No, I thought that program was good.

Interviewer: Do you consider training and education to be an essential part of FMS?
Manager: Absolutely. You couldn’t do it without it, you’ve got to walk the guys through each one of these, you’ve got to walk through the whole lot.

Management 12

Interviewer: How much effort was involved in designing and administrating the education and training programs?
Manager: Of the staff? We did the Living for Shift Workers thing, and we just gave them all a manual and told them to go away and have a look at it, read it...

Interviewer: The FMS manual you mean?
Manager: Yeah, they got a copy of the FMS manual, and one of these here...

Interviewer: Yes.
Manager: They went away and had a look at it, and the new did a sit down session, talked about it all, and then we did the questionnaire with questions in it, and looked at all them and they all probably found it a waste of time, I don’t know what they say about it, but I’d be surprised if all of them have even read this from cover to cover.

Interviewer: In your ??? did you see the training register?

Manager: Yes. A training register.

Interviewer: Wow, you’ve got a certificate.

Manager: All I have at the moment because we’ve only done it once, and they have a certificate of completion, that’s been issued to [some of the] pilots, and this is the...

Interviewer: So you keep the responses as well.

Manager: Yes.

Interviewer: Is that done individually or is that a sit down in a group one?

Manager: They did it all individually. What we did was we all sat down and looked through it and then they all went off and did it individually and did these, and the we came back together and discussed it all together. So rather than me marking each one separately we just all took each other’s sheets and went through and if anyone had got any wrong answers then we would chat about what they were and whatever, and then we’re meant to do it annually again as well. But I haven’t yet designed the annual questionnaire.

Interviewer: Was that a pretty positive process, the discussions were...?

Manager: I don’t know, I think most of them found it all a bit of a joke really. You know, what’s the best way to wake up from a nap ??? slowly, like, when is the most difficult time for you to drive, after a carton of beer and bottles of rum...! They all found it all a bit like we’re only working four or five hours a day, what are we doing this for?

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?

Manager: Of the training program? I’d say what we provided them with and gave them access to was very good, in terms of whether they’ve utilised it and really taken all that much notice of it would be another thing, I think they basically leave it up to us, the managers, and if we say they can work they say alright, if we say they can’t they go OK. But in terms of the FAID thing on the computer, its all there, I’ve sat them down shown them through it but none of them have really got involved or really taken too much interest or noticed why they can or can’t do things.

Interviewer: Was there anything not covered by the training that you would’ve liked included?

Manager: No. Not really.

Interviewer: Was there anything included that you don’t think was necessary?

Manager: No. Not that we did. Like we’ve got an in here we’ve got a library of stuff that we have to provide, references, and they’re all here available for them to use, but none of them would ever...they’d go who wants to look at that? No one has take these and read them. The only person that would’ve read these would be me when I was setting up the FMS. I would be the only one that’s even actually looked through them.

Interviewer: Do you consider training and education as an essential part of the FMS?

Manager: Not essential from the point of view of the FMS can operate without all the pilots knowing how to do it, its really from their point of view, I’ve given them all the stuff and said guys, read this and make sure you do it. If they didn’t have confidence that management was actually doing things properly then they’d probably take more notice of it to make sure we weren’t overworking them. If they thought that fatigue was an issue or they wanted to get more days off or thought they were being overworked then I bet they’d look at it and take more notice of it. But really they’re on a pretty good wicket and they don’t have too many concerns that way I don’t think anyway.
Interviewer: When were setting up the FMS, what sort of communications did you give to your flight crew?

Manager: There's only the two of us. We've been through the shift worker's package and we've run a questionnaire session on that which we've documented and kept. Every time we've had somebody come through and do the system they've been interviewing all of us, so we've all been talking about keeping abreast of it.

Interviewer: So mainly verbal communication?

Manager: Yes, pretty much. It's all in-house. There's only two aviation pilots here and four marine pilots.

Interviewer: How would you rate the overall effectiveness of the practical living for shift workers program?

Manager: It gives you a good understanding of things. For people who don't do a lot of shift work, we can't even consider this to be shift work because they're not doing that regular rostering thing. It's sort of irregular regular work if you know what I mean; that's how we do it. But it gives everybody an awareness of how it affects the family and how you should let the family know that you should be sleeping, not having the dog and the kids jumping on you and stuff like that. That's quite a good introduction to it. You probably need to elaborate on it, but that's part of ongoing training...

Interviewer: You said that each of you has read through the practicals in the workbook?

Manager: Well, what I did was I scanned all the question pages and put them on a questionnaire and just said to [the pilot], there's the book, it's an open book exam.

Interviewer: Was there any discussion about that?

Manager: We had to start somewhere and where do you start other than there?

Interviewer: Did it generate any discussion thought between...

Manager: Yes, he was having trouble with his morning sickness in Chapter ..., but no, it always does. Its designed as an awareness tool, so that you actually consider what the outcomes will be. It's quite effective.

Interviewer: Was there anything not included in it that you would have liked to have seen?

Manager: For a generic document like that, I suppose there is a lot of aviation stuff that could be put in there and specific stuff, but as a general awareness of working strange hours and shift work its probably fairly good. Bear in mind that everybody that holds and aviation license has to do a lot of those unit factor things ??? and those sort of things. That's all part of the training to get the license, you have to do. A bit of a refresher on that all the time is a good idea.

Interviewer: Was there anything included in the practical living for shift workers that you don't think was necessary?

Manager: No, it was just a general document. It makes you think about other people's perspective other than yourself which is part of management isn't it?

Interviewer: Do you consider training and education as an essential part of the FMS?

Manager: Oh yes. You’ve got to understand how it works, because its not just press the buttons and its okay, you’ve got to know how to apply the rest periods and how to apply yourself to it and how to get the best out of it.
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Interviewer: ??? What sort of budget has been attributed to this?
Manager 1: Quite substantial for a company of our size, we’ve probably already spent in excess of $50,000.
Interviewer: Is that including training and everything?
Manager 1: Buying software, training, buying the publication that they fill out.
Manager 2: The Practical Living for Shift Workers.
Interviewer: Have you got one for each employee?
Manager 1: Yeah. Frankly for the investment we haven’t seen much return. So its not like we walked away from this, you know what I mean?
Interviewer: I can definitely see that.
Manager 1: We’ve given it a real good go and unfortunately at the end of the day it doesn’t look good.
Interviewer: So do the flight crews know anything about the FMS?
Manager 1: Oh, yes.
Interviewer: What sort of communications have you given them?
Manager 1: Pretty extensive presentations on my behalf, twice at each base, and then it’s a continuing source of discussion at what we call the Workplace Consultative Group that meets four times a year, which is representatives from each bases workforce representatives, management, its an ongoing topic of discussion and there’s still a great concern out there with the workforce.
Interviewer: Have you sent around any memos?
Manager 2: Yes.
Interviewer: Have you got any copies of them?
Manager 1: Yes. I have, some even for example related to the, oh… I said we hadn’t had union, but we have had union involvement in fact when I go back. People were concerned enough that they went to the union and that’s the union’s interpretation of what was going on and what the impact would be.
Interviewer: Is that something to do with the definition?
Manager 1: ???? in general?
Interviewer: yep
Manager 1: The union came back with... I didn’t think, with an interpretation that differed from my understanding of the interpretation from CASA. So that caused some trouble. And then there was a lot, a lot of internal email and discussion and stuff started getting floated about around the company that was just factually incorrect. Not directly from the union but because of the concerns raised from all of this. I have to go out, and you know there were emails going from base to base, with all these issues and points, so I got all of them and went back and addressed each one individually that’s real important. ?? done a memo saying here’s all the individual things, this is what were doing, this is what we want. ??? to know that this company will not force an FMS down your throat until you’ve actually addressed the industrial relations aspects of it. Which of course is their biggest concern, and quite rightly so.
Interviewer: absolutely
Manager 1: I mean, if you went and surveyed our workforce. I’d like to think that what they’d tell is we’re a safe company. That we stand behind what we say. That’s your call pal, (to Manager 2:) you’ve been out there a long time.
Manager 2: Yeah, the aircrews basically can see that in the leaving, all our training and safety culture of the company.

Manager 1: With the quality of life changing, the attempts to communicate these days and the commitment to safety is all rated very, very high. Consistently, even by people who don’t even like us for one reason or another. Like, they’ll be leaving, disgruntled for some reason whether its fair enough is a different issue, but never yet has there been one in my thirteen months here that doesn’t say all those things are consistently rated very, very highly.

Interviewer: You’ve already answered the next question. How would you rate the overall usefulness and effectiveness of the training program?

Manager 1: Their training program or our training program? I mean the training that we bought or the training we have attempted to provide?

Interviewer: what was the difference?

Manager 1: We attempted to provide some factual background on where FMSs come from, what its structured to achieve, how you’d go about achieving that, and therefore the credibility of the concept as a whole. To lay the foundation. I actually think, if anything, (oversold?) is not the word, but even the company's level of understanding at that point in time, and that we accepted it up front and at face value what this thing would do for us, we gave it more credibility than it really deserved. Because the presentations I put out at the basis were like three or four hour presentations, and I can’t (buy?) presentations. We would finish at ten o’clock at night type of thing. Quite long, long sessions with the people. And that included fielding all the questions and concerns. So as a company we probably attempted to establish the background to the requirement for an FMS, what an FMS is based on, where the research has come from, what organisations are using it, what's going on around the world and all the rest of it. Which probably gave it more credibility than subsequently we believed it deserved ourselves.

Interviewer: So that means, it hasn’t really picked up on your reservations?

Manager 1: No, except that we were very heartened by the fact, because they thought we were being stampeded into it, and that this was going to be inevitable, and that somehow they would be, their work environment would get worse as a consequence of it, until we go to the point where we were like, ‘sorry, there are too many holes in all of this, we’re just simply not accepting that concessions we’ve signed because of these reasons, and we want at least another six months extension.’

Interviewer: so when does this concession run out?

Manager 1: this one runs out in January. This is the second one. So I think we’ve actually, if you like, you could say the company has bought itself some credibility really because we’ve refused to be stampeded into it. So I think, its given them at least some sense of comfort that this ain’t going to happen just because somebody’s clicked their fingers and is going to stand over us, you know. So that's actually really eased the pressure on us.

Interviewer: and the training and Adam and...

Manager 1: its not very good, certainly not worth the money we paid for it, and didn’t achieve the things we believed, it was going out to achieve. Now, how well did we state our expectations before they went out, probably average at best. Maybe we made some assumptions about what we were going to do. Although we did say before they went out, the chief pilot and them were saying: we’ve got to make it very clear what we expect from this training, we’re paying a lot of money for it. Probably in retrospect, well, we couldn’t because the training we got wasn’t the training we expected. And I like [the fatigue consultant], I think [he's] a really straight guy. He’ll answer any questions, and I’m very happy to deal with that, and I think he's straight up and down. But the training that we received was not what we thought we were
getting. I think that the critical aspect of training for any company is sort of, bringing the people on, so they can understand the difference between being tired and being fatigued. That's the critical issue. All the others, we can deal with ourselves. I mean that workbook, anyone can administer that workbook. And incidently, the workbook itself, if CASA prefers to have said that completing that workbook is enough to say that you’re fatigued aware, there is another flaw in the system. (It's rubbish?) So you see all these little bits and pieces adding up together and you think, phew... the place where I sit feels very uncomfortable.

Interviewer: So do you consider training education as an essential part of any FMS?
Manager 1: Yeah, and not only that, before not six months after. How do you implement something....
Manager 2: You have to have the training first so people understand what....
Interviewer: ... what's happening and what changes are being made
Manager 2: yeah

Management 15
Interviewer: As far as communication goes, what forms of communications did you give to flight crew when you were first implementing the FMS?
Manager: There was the ??? there was draft FMS requested for feedback, there was discussion, there was... there was a fair bit of consultation, now some people may not have been individually consulted and therefore their answer would be there was no consultation, but I would like to think that there was adequate consultation.
Interviewer: Can you just describe how you designed, how you implemented and admin, your education and training program?
Manager: We had the consultant design it...
Interviewer: This was the guy from Newcastle?
Manager: Yes, and he was involved in both delivering and the implementation of it...
Interviewer: How was it delivered? Was it in work groups or...?
Manager: It was in an on-site classroom, competency assessment...
Interviewer: I've got a copy of one of the assessments actually.
Manager: The effectiveness, I think this recent audit has recommended further training.
Interviewer: What sort of further training are they looking for?
Manager: I think they found lack of understanding on the part of some crews about aspects of the system. That's where I think sometimes the expectations in a given area of expertise becomes tunneled down into that area, and the expectations become unreasonable. The 90 hours for instance, I knew ??? it removed, Barry removed it, everybody signed for the amendment that they had read it, and yet those exact same people said to the CASA team that they weren’t sure if it had been removed or not. That's almost a given that you’re never going to get a 100% hit rate with people with training information or written communication so I think the expectations there are laudable, in that particular environment but if we had the same expectations across every area of our operation we would never do anything but train, therefore we wouldn’t have a business.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program that you did?
Manager: I’d say average again. I guess like any training that attempts to educate people for a short period of time would probably only have about 40% retention and that’s off the top of my head, I don’t know what the stats would say, and the only way to improve that is for repetitive training. Informal training value ??? this is the company ??? I’m here to fly, why should I?

Interviewer: You said that the training was delivered in a classroom setting, was it given in any other forms, any sheets to take home or information to take home?

Manager: Yeah, there’s specifics you have. Ask [the chief pilot] because I’ve forgotten, there was definitely additional material that they had for reading and they had articles, some of ??? shift workers.

Interviewer: Was there anything not covered in the training that you would have liked to have seen covered?

Manager: I don’t know.

Interviewer: Do you consider training and education as an essential part of the FMS?

Manager: I’d say yes but that’s a qualified yes because I think there are some situations where an FMS system could be introduced and implemented but didn’t require understanding of the employee, as long as it could be demonstrated that the employees interests and safety were enhanced by the result it really doesn’t matter whether they understand it all. But at the moment we’ve got in place understanding is critical to its success but I know of other operations where it really doesn’t matter a hoot, all the Chief Pilot has to know is if he doesn’t roster that pilot in excess of the pre-planned pre-determined one, he’s OK. So in essence even the Chief Pilot doesn’t need to understand it.
APPENDIX N: FLIGHT CREW MEMBERS' OPINIONS OF FMS TRAINING & EDUCATION (TRANSCRIPTS)

Pilot 1

Interviewer: Have you received any training or education about the FMS or fatigue in general?
Pilot: Yeah, training ?

Interviewer: What sort of stuff was covered in that?
Pilot: Well we went through the whole thing ??? Was that you guys?

Interviewer: No. ??? wrote the program.
Pilot: No it was I remember now. Yes he basically went through the whole lot and showed us a heap of stats and I think he even had a couple of examples of people ??? exceeding. They were passed around.

Interviewer: Did he go into any actual physiological stuff, like how fatigue is experienced or how combat fatigue with ??? stuff or alertness ???
Pilot: He did and he also went in to telling us about non sort of work stuff that can fatigue you as well.

Interviewer: You have a better memory than most people. ???
Pilot: I though it was interesting because ??? week off you sort of not having a week off still ???

Interviewer: How would you rate the overall usefulness and effectiveness of that training program?
Pilot: I thought it was good. But much of it has been forgotten.

Interviewer: Is there anything you would like to see covered that wasn’t covered? About fatigue or even the actual system.
Pilot: ??? I actually bought up to them about ??? Not that I can think of now.

Interviewer: How often do you think that training should happen?
Pilot: Every six months.

Interviewer: Do you see training, this sort of training, as an essential part of FMS?
Pilot: Obviously, yes.

Pilot 2

Interviewer: As far as the communication you received from [the company] – when the FMS was being implemented - can you tell me what sorts of information you received?
Pilot: Well, mainly in the form of ah, and amendment to our operations manual, which guides us to what we do in our every day operations – so it’s part of our bible I suppose. And obviously a part of that I suppose – we had discussions when the chief pilot came down and told us about it in broad terms.

Interviewer: And did that take place in a staff meeting or one on one talks?
Pilot: Nah - it was staff meetings
Interviewer: OK. What sort of communications did you receive from management when the FMS was first implemented?

Pilot: OK, um, just being spoken to – at the meetings they spoke about it, and [the chief pilot’s] progress – how he was going along with it all. And conversations sitting down in the lounge room there just over coffee. And then, when it was implemented, the ah work manual, and that ah, gave an understanding. It was more so the break down of not so much, it was what we couldn’t do rather than what we could do. We didn’t look at how to exploit the FAID system. We looked at our original policy, and what we thought was unfair about our original flight and duty times, and what we wanted, what we liked and what we wanted changed, and then used the FAID system to implement those changes.

Interviewer: Have you ever received any training/education about fatigue and the FMS?

Pilot: Yes I have.

Interviewer: What sort of stuff was that?

Pilot: The work booklet

Interviewer: How did you find that?

Pilot: Pretty good. It was um, yes it was good, it was informative. I got a lot of things out of it.

Interviewer: Was there anything included in it that you don’t think was necessary?

Pilot: Ah, I don’t know.

Interviewer: If you look at your next question: How would you rate the overall usefulness & effectiveness of the training program?

Pilot: Good to average

Interviewer: um, so you were asked to take that away and complete that on your own were you?

Pilot: Yes

Interviewer: And did you complete the questionnaire?

Pilot: Yes I did

Interviewer: And was that done in a group setting, or?

Pilot: Just on my own time.

Interviewer: Excellent. Is there anything that wasn’t covered that you would have liked to have been included? Is there anything that you feel you don’t know enough about?

Pilot: No, no not really

Interviewer: Do you consider training and education as an essential part of the FMS?

Pilot: Yeah.

Pilot 4

Interviewer: What sort of communication did you receive from management when the FMS was first implemented?

Pilot: Training-wise or...?

Interviewer: Just information about what it was or...?

Pilot: It was explained to the ...basically the principle, outline of the system say the maximum levels by the end of the week you receive a certain score. If you receive say 75 you have to report
to the chief pilot, 85 to CASA, and on the run that I was doing they said it looks like this
trend will work out to be this ??? at the end of the week, they explained all the maximum
duty I could do on that run, so yeah, they did training.

Interviewer: What sort of training and education did you receive about the FMS? And in what form?
Pilot: First of all I did it twice, once with ??? Air, but that was for their system, and then I had to do one
for Crane Air, it was reading a book Practical Living ???, I did one questionnaire first of all,
and then all three of them ??? Practical Living ??? questionnaire, and just some information
on how it affects directly my operations, my flying, the route that I fly.

Interviewer: So it was just a matter of reading the book, or ???
Pilot: For me it was reading the book. I believe for the other people, they actually did a course.
I wasn't there at that particular time because I was living up in [location] so I couldn't attend
the course, but I had already done a course ??? that was a couple of days.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?
Pilot: ???

Interviewer: Was there anything not covered that you would have liked to have seen covered?
Pilot: No, it was pretty decent. I think it was really good. Especially in the book, the shift workers
book, there's pretty much all the information you need to know. ??? the best way to ???
working patterns and social interactions and all.

Interviewer: Was there anything covered that you don't think was necessary?
Pilot: I think it was all pretty important.

Interviewer: Do you see training as an essential part of an FMS?
Pilot: Yes, definitely.

Pilot 5

Interviewer: Have you ever received any training or education about the Fatigue Management System
or just fatigue in general.
Pilot: Yeah, ??? articles about fatigue.

Interviewer: Where about, what sort of article?
Pilot: In the aviation ??? magazine. I've read quite a few articles in there.

Interviewer: ???
Pilot: I do not remember, there's one kicking around here too. Don't know what happened to them.
I don't think so. ??? Like you say there is one in there every other week.

Interviewer: What about any actual training from the company, have they provided anything?
Pilot: I suppose really, particularly in the operations manual about it. Yeah when we first started
with the company they remind you about.

Interviewer: How long have you been working here for?
Pilot: With the company, two years. I think, something like that.

Interviewer: So you did some training, when you where doing your ...
Pilot: I wouldn't say it was training, I suppose we were just being made aware of.

Interviewer: sort of things were covered in that?
Pilot: Just the fact that you were tired, especially flying along the job, you get your act together pretty quick. Our former Chief Pilot - he just said those things along those lines.

Interviewer: What sort of indicators were you told?

Pilot: When bloke beside you shakes you, you know you're asleep. No I don't know I can't remember. Fatigue there is a lot of indicators I suppose like when we're working, we've got the indicators to a certain extent.

Interviewer: Indicators that could be logical indicators???

Pilot: Like coming into land on the truck the wrong way it's a good indicator.

Interviewer: That's a fair indication alright. So have you received any workbook or pamphlet on fatigue?

Pilot: Not that I remember, there could have been.

Interviewer: So that probably makes the next one. The next question

How would you rate the overall effectiveness of the training you have received? So you have not really received any?

Pilot: No.

Interviewer: Not applicable. Do you consider training and education as an essential part of an FMS?

Pilot: Yeah, I would think it would be a bit handy, yeah.

Interviewer: What sort of things would you like to be covered?

Pilot: Like you just mentioned, indicators. How the program was actually written and what the guidelines and parameters and the rest of it.

Interviewer: Have you learnt anything about coping strategies or ?? fatigue with lifestyle factors or...

Pilot: Yeah, reading all the time

Interviewer: Published...

Pilot: Alcohol, drink more. Yeah that's probably a few of things you would like to see in it and no doubt there is quite a few more.

Pilot 6

Interviewer: What sort of communication did you receive from management about the FMS? You obviously received the policy itself?

Pilot: The policy itself, and a fair bit of education with it, and we also talked about the pros and cons of the previous dispensation we were working under compared to this and what the company I'd worked for prior to working here had in for their fatigue management.

Interviewer: Where did you work before here?

Pilot: [A] Rescue Service. That's the one that had the big fatalities a couple of years ago. They blamed it on sleep, or they thought it had partial blame on sleep deprivation, and so when I thought of fatigue management I knew exactly what they were talking about, why and how it all worked because that one's a bit of a mystery now, how an experienced pilot can just wake up in the middle of the night with a phone call and be airborne within 40 minutes of the phone call at night, in marginal weather and forgets to top up the fuel tank, so yeah, there's definitely a need for it, and to help people through it.

Interviewer: So that was in informal meetings?

Pilot: Yes.

Interviewer: You said you've received training and education about the FMS, that was just the Practical Living for Shift Workers, is that all that you did?
Pilot: Yes.

Interviewer: And then talk through it?

Pilot: And then talk through it. And any other things I could put into it.

Interviewer: How would you rate the overall usefulness and effectiveness of that training?

Pilot: Good.

Interviewer: Was there anything not included that you would have liked to have seen?

Pilot: No I don’t think so. I was pretty happy with everything.

Interviewer: Was there anything covered that you don’t think was necessary?

Pilot: Yeah, I think it was more in line with shift workers in like a mining situation, not specifically to aviation.

Interviewer: So you would have liked it a bit more aviation specific?

Pilot: I think so yeah.

Interviewer: Do you consider training and education as an essential part of a fatigue management system?

Pilot: Yes.

Pilot 7

Interviewer: What sort of communications did you receive from management when the FMS was first implemented?

Pilot: We had communication from our people at ... because this is a very small industry offshore, most of us know all the guys from Canadian Helicopters obviously, so we had communication from them that this was coming, they’d been in discussion with this person for a year, we’ve heard nothing.

Interviewer: From Canadian Helicopters?

Pilot: Canadian helicopters.

Interviewer: ???

Pilot: No ???. Its because they won’t accept it. So they’re still fiddling around with it. So they haven’t still got it yet. They’ll be going for a while won’t they? Basically we got a bit of notice but it was au fait accompli, bang! And then we got told all about it.

Interviewer: So were you sat down and spoken to, or did you just receive a copy of the FMS in the post or...

Pilot: We were spoken to, we were give lectures. We were given a lecture brief on how it worked and what happened, and bang, bang, bang and that started the...

Interviewer: Have you had any opportunity for feedback to management about that?

Pilot: Yes, they’ve been told in no uncertain terms their approach to it all and the way they introduced it was a disgrace, that’s why we’re back to the industrial system. I don’t think it was introduced very well at all.

Interviewer: How could they have done it better?

Pilot: Like they should do with everything, pre-negotiate before they start introducing. I mean the problem with this industry is you’re dealing with pilots, working with this professionals ??? I mean we have a totally different industry to most, I mean if you look at most industry you have half a dozen professionals and 200 unprofessional staff, in this business we have the opposite, everybody’s professional ??? pilot with professional qualifications, they’re the majority not the minority, and the group of pilots, they’re pretty volable when they get going.
Interviewer: If it had have been pre-negotiated do you think it would've been quite a substantially different document?

Pilot: Yes.

Interviewer: What sort of things do you think would have ??? from talking to pilots?

Pilot: I think they’d probably require some sort of risk assessment, whether that was available or not I don’t know

Pilot 8

Interviewer: What sort of communication did you receive from management when the FMS was first implemented?

Pilot: We had a meeting, ??? at a document.

Interviewer: How did you find the document to read?

Pilot: Yeah, fine. On that ??? it was pretty useful. Helps you get a good sleep pattern.

Interviewer: Have you received any training or education about the FMS or fatigue?

Pilot: Only here. Only that workbook.

Interviewer: The Practical Living ???

Pilot: I don’t know if you saw but we’ve got that laminated card next to the computer so that we know how to use it.

Interviewer: So, instruction card. Did you get taken through the program formally? Yes?

Pilot: [the manager] did. A couple of us, sitting around the computer ???

Interviewer: And how did you find the training program?

Pilot: The ??? Yeah, it was good.

Interviewer: How was it delivered? Were you just given it for you to read?

Pilot: Rod read bits of it out.

Interviewer: Was there any discussion on it?

Pilot: No.

Interviewer: How did you find the questionnaire?

Pilot: It was all right. Some questions were not relevant but others…obviously having a family and that...

Interviewer: Might be in the future, you never know! So how would you rate the overall usefulness and effectiveness of the training program?

Pilot: Good.

Interviewer: Good? Was there anything included that you don’t think was necessary?

Pilot: No, because what was necessary for me wouldn’t have been applicable for a lot of other people so, it’s a general workbook thing, it covered the basics.

Interviewer: Was there anything not covered that you would have liked to have seen?

Pilot: No.

Interviewer: Do you think training and education is an essential part of an FMS?

Pilot: Yeah, but on different levels for different sort of work. Because we don’t go from night to day shifts, and because we’re not a on a regular roster, well then we obviously need something
for that. I mean you don’t get trained about using CAO48 or working hours - we’re all pilots, everyone does a similar sort of work, it just means we can push it a bit further and do a bit longer day.

Interviewer: So given that training and education could be an essential part, how often or how regularly do you think the training should be? In an ideal world?

Pilot: Maybe after 12 months. Or when your ??? company gets ??? with the program. Or if you have to. Just reminding you that it is up to you to make that decision if your tired, make sure you get good rest.

Pilot 9

Interviewer: OK, who was responsible for developing and administering the education program?

Pilot: I guess that’s me, but we’re still – that’s still evolving.

Interviewer: So, what have you done?

Pilot: We got them to do the workbook

Interviewer: Practical Living for Shiftworkers?

Pilot: Yep, and got them to read different literature, or had it accessible to them. Whether they’ve read it in depth, I can’t answer for them.

Interviewer: Did you make sure they read Practical Living for Shiftworkers?

Pilot: Yep, got them to take it home and do a bit of questionnaire. We had the answer book, but I said look take it home. It says in the policy that they should take it home and discuss it with their spouse, wife, family or whatever. Most of the guys are married and have got children. So there are issues there with like kids and noise and stuff like that.

Interviewer: So, is that all they’ve done – have you talked about it?

Pilot: Yeah, we’ve talked about it a number of different times, but you’re probably getting back to have we documented it? And that’s one of the faults that CASA picked up with our audit. We’re not documenting enough and at our ops meetings, we’re not making it formal. So, in our ops meetings, we have a separate part for safety – safety meetings. And CASA are really wanting us to have an FMS meeting and document it.

Interviewer: What sort of communications did you give to flight crew when you first implemented the FMS?

Pilot: Got them to read it. Ah, sat down and had a chat to them all.

Interviewer: Individually or in a group?

Pilot: As a group and then individually. You’re with a guy for 48 hours, and not all of that time is idol, so when you’re working with different guys, and I think I asked [the chief pilot] to be swapped around a bit so I could work with different people. Yeah, just chatted about it and again listened, and got a bit of feedback.

Interviewer: Great – did you send out any memo’s or e-mails?

Pilot: I sent out a couple of e-mails, but probably no. Again, you’re chasing documentation. I had a number of different drafts of the policy, and I put it in their pigeon holes where their mail goes, and ‘read this’ you know - ‘put any comments on it’ sort of thing.

Interviewer: Next question on your sheet: How would you rate the overall usefulness & effectiveness of the training program?

Pilot: Well it’s all a bit black magic taboo. I’d say good – well, average is a bit harsh, but I’ll say average. And the reason I’d say average, is because it’s not aviation orientated. And I think that’s one of the things that – there wasn’t enough work whenever they decided to go down
this road. It took me a fair bit of digging when I went on the internet to find that NASA stuff, and that wasn’t readily available. And I also got in touch with CASA and basically asked them. I wanted to go to a fatigue management course, and I wrote to the UK. They’re going into JARS. I wrote to the UK, and I wrote to CASA - not [the CASA representative], the other girl -

Interviewer: [the other CASA representative]?

Pilot: [the other CASA representative]- and I wanted to know - is there any seminar - and if so, I wanted to go to it. And they didn’t know of it.

Interviewer: There’s one in Freemantle in March

Pilot: That’s interesting. There’s a guy called Mark Hoffen in ATSB, and he organized this seminar at [location] just recently. And there was a bit of fatigue stuff discussed there. And there was a representative from CASA - [FMS project manager]. And, I e-mailed him after that. I know him anyway from when I worked in Perth. And I said, is there any such thing - can you give me some information? And he’s not associated with CASA, but he understands that this fatigue is going to be - you know, it’s going to overlap into a lot of different areas, and obviously safety is one of them.

Interviewer: So what sort of stuff was included in that seminar as far as fatigue goes?

Pilot: There was a lot of discussion, and a lot of people were asking [FMS project manager] questions, and I picked up from it that they were really - again it comes over to the 48 - they were thinking you know CAO 48, but you’ve got to understand that this is different.

Interviewer: OK, so I’ll send you details about the Freemantle conference

Pilot: That would be good; I’ll give you a card. So yeah, I was a bit disappointed that CASA couldn’t come up with any - like they’re implementing this policy - or wanting people to implement this fatigue policy. You would have thought they would have searched around the place. And I asked them if there was anything world wide that I could go to

Interviewer: OK, so you want more?

Pilot: As an industry, I think they should be trying to give us as much guff as possible.

Interviewer: What other sort of stuff would you have liked to see included in the training program that wasn’t included in the training program? What do you mean by more industry - specific stuff?

Pilot: I think they should try and highlight a bit more in the training why they come up with the scores that they do. And again, that would come back to; they’ve got no stuff, so. Um yeah, and obviously through your work, they’re going to use that to produce something. But yeah, I think they should have done a lot more of what you’re doing now before they developed it. But often you can’t talk about something before you’ve got a system in place. And I’ll be interested to see how they came up with how operators will have a fatigue policy. Did they decide on QANTAS, the EMS operator, or - how did they do it? Because from what I can gather, they just decided to withdraw all exemptions, and then you had to fight tooth and nail to get any sort of exemption. And they didn’t give any sort of reason why they withdrew the exemptions. Obviously they had some sort of reason for this fatigue policy. And from what [consultant] said to me, it came back to someone from CASA went to the states to this conference, and he came back and said ‘this is a great way to go - this is the way we’ve got to go’. I understand that we’re leading the world.

Interviewer: Was anything included in the training that you think wasn’t necessary?

Pilot: No not really, I think you can’t get enough training. And, as I said, a pilot will read someone, and interpret it differently from you, or [pilot], or [chief pilot], so

Interviewer: training helps to consolidate that a bit more

Pilot: Yeah. I think consultation and communication in other words, feedback and being able to listen to someone, and listen to what they’re saying- not listen to what you think they’re saying.
Interviewer: Sure. Do you consider training and education as an essential part of the FMS?

Pilot: Certainly in the early stages of it – you’ve got to educate people all about it. I don’t know whether they’re going to produce a CD on it, or what they’re going to do. But I think [fatigue consultant] – he was very good, because I rang him up and thanked him for it. And he got to the point where he was getting very frustrated with CASA, and more to the point with [CASA representative], because of his attitude.

Interviewer: How often do you think the training and education needs to be done once it’s implemented?

Pilot: Well, it’s obviously got to be ongoing. CASA have mentioned to us every 3 months. I think that’s probably a fair call. As you have the policy – I think you could probably stretch that out to 6 months or 12 months. No, 12 months is probably too long. Say 6 months. Once it’s up and running, it just ticks along.

Pilot 10

Interviewer: What sort of communication did you receive from management when the FMS was first being implemented?

Pilot: We had meetings every week or so when the FMS was being developed so...

Interviewer: Did you have a lot of input into...

Pilot: Yes, all of us were offered input into the development process, so yes, they were very open about it.

Interviewer: Did you get any paper copies of anything? Any letters?

Pilot: Yes it’s all been written down, and I've got it in files, any correspondence that was between us about it.

Interviewer: Have you received any training or education regarding the FMS?

Pilot: We all went through the booklet, Practical Living, and we did a test on that.

Interviewer: How was that administered? Did you just get given a book to take home and read or did you do it in a group format or...?

Pilot: No we didn’t do it in a group format, we did it individually and then one by one we went to the Chief Pilot, and asked any questions we had

Interviewer: How would you rate the overall usefulness of the training program

Pilot: I still haven’t put any thing down here. I think its about 60 km...

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?

Pilot: Excellent.

Interviewer: Was there anything not included that you would have liked to have seen in the training program?

Pilot: I can’t think of anything at the moment, if it comes up then I’d just go and mention it.

Interviewer: Was there anything in the training program that you don’t think was necessary?

Pilot: Looking back on it, it was a little while ago, but no.

Interviewer: Do you think that training and education is an essential part of the FMS?

Pilot: It’d have to be, yes.
Pilot 11

Interviewer: What sort of communications did you receive from Steve when the FMS was first coming about?

Pilot: I wasn’t here.

Interviewer: Oh, you weren’t here.

Pilot: I was working for [another company] at the time...

Interviewer: Because they were the first one’s to get their FMS in place. Had they already begun when you were still there?

Pilot: Yes, very much so. In actual fact it was when they were doing fatigue management, I mean I did it all in getting my commercial pilot’s licence and I was aware of you know studies of human factors, that was what it was called, which went in to fatigue and all that sort of stuff. And when they were doing it they were coming up with all sorts of things that they were trying to incorporate. I think we’re barking up the wrong tree here, I think they’re asking about circadian rhythms and that kind of stuff and one of the other pilots says no, no, no he’s talking about human factors and I was really slapped down about it and there was a very public ??? I think you’ll find the document you’ve come up with is not what they’re after and it got canned. It got completely ??? and re-started but no one came back and apologised because it was exactly what I had said and I have been through the same system and process because I had to do it in the UK. But there you go.

Interviewer: Its all so political.

Pilot: It was, but ??? that kind of situation.

Interviewer: So when you got here to [the operation] this FMS was already up and running and in place?

Pilot: Yes.

Interviewer: Fair enough! Have you received any training or education about the FMS?

Pilot: Only the Practical Living for Shift Workers. And there have been a few email websites we looked at that have given us some ???

Interviewer: What sort of websites are they?

Pilot: I can’t remember, it’s been a while since I looked at them to be perfectly honest I’ve got enough on my plate. I shouldn’t say that, but I mean one of the things from the audit is that I am going to look at some of these websites and print them off so that everybody else has got them as well. The education process is still ongoing, during this busy period, I haven’t had the opportunity, nor has [the chief pilot] really, to have any what we call admin days, because of the amount of work that we now have to do outside of flying we try and give ourselves one or two days a week if we can just to keep the paperwork side of things sorted, so that’s getting a little bit behind, so it’s a case of the urgent stuff gets done first and not so urgent can wait a while.

Interviewer: Have you received any training prior to the FMS?

Pilot: No. Not in fatigue management.

Interviewer: So when you did the Practical Living for Shift Workers book, how was that delivered, did you take them away and read them yourselves or…?

Pilot: Yes, just took them away and read them in our own time. We were given a month to read it.

Interviewer: How did you find them?

Pilot: I actually found it quite useful. It’s quite an education.

Interviewer: How would you rate the overall usefulness and effectiveness of the training program?

Pilot: Very good.
Interviewer: Do you see training and education as an essential part of the FMS?

Pilot: Yes.

Interviewer: Was there anything not included that you would have liked to have seen?

Pilot: It was a while since I’ve done it. I think I would have liked it to have gone into a little bit more detail actually.

Interviewer: In what specific areas?

Pilot: Well, the medical side of things. There were a lot of examples in it, you know Janet and Jane and Jack and Jill, you know that sort of thing which was interesting but not so relevant because we do actually have a very specific knowledge of job that we do and reading about somebody who works in a café or something or other, or goes down to the pub on a regular basis in the evening, well, drinking and flying doesn’t go hand-in-hand, so the relevance of that was not so effective.

Interviewer: So you’d like something a bit more relevant to ???

Pilot: Yeah, I’d like to see something more relevant. I was very interested in the repercussions of the sleep deprivation, the psychological effects it has on friends and family and the rest of it, and giving pointers as to, in a little bit more detail as to how you can get around remedying this, because I remember it said in one part let your friends and family know when you’re ??? well, it’s a bit of a sweeping statement really, what do you do, do you ??? I did this with my wife so we both had the same sort of information and we both found it very useful, I’m not knocking the book at all, but I personally would have liked a bit more detail on perhaps time management a little bit more because there wasn’t an awful lot of that, in broad terms these things that can happen, and when I see something in broad terms I like a little bit more information behind it, I’m not really one for ??? I like to have the background information, so personally I’d have liked ???

Interviewer: Was there anything included that was a bit of an overkill in the training?

Pilot: Not really.

Interviewer: What sort of communications did you receive from management re. FMS? What forms?

Pilot: Basically that we were taking it on, and that was it. A statement with no education or background. We went on to the net – a lot of information – a site in Canada that was specific for pilots; uni SA had some information; FAA discussion papers. We had some training, which was more on how to manage rest periods at home. It actually raised a lot more questions than answers I supposed – went back to CASA and asked for FMS to be withdrawn.

Interviewer: Have you received any training/education re. Fatigue/ FMS?

Pilot: Only in strategies at home.

Interviewer: Did you receive any training prior to FMS implementation?

Pilot: no

Interviewer: How was the training delivered?

Pilot: Classroom setting – also received Practical Living For Shiftworkers

Interviewer: How would you rate the overall usefulness & effectiveness of the training program?

Pilot: poor

Interviewer: Do you consider training and education as an essential part of the FMS?

Pilot: Yes.
Interviewer: Was there anything not covered that you would have liked to be included?

Pilot: Liked to see more info on type of operation we conduct - it's a little bit unique. A little more on the background of the FMS, and what sort of aspects we need to look for when we start to get fatigued.

Pilot 13

Interviewer: What sort of communication did you receive from management when the FMS was first introduced?

Pilot: The company has been very good in approaching people about FMS and sort of keeping them informed about the progress of any concerns that they've got. So I think the company's been good.

Interviewer: How were you told about it? Were you given memos or sat down in meetings or...?

Pilot: Well because working here is different to being out on the base ??? people during its development so I guess there was a reasonable amount of talk around the office, I'm trying to remember now. I think we had a few meetings about it and so on.

Interviewer: Have you received any training and education specifically for the FMS?

Pilot: ??? the work book, we had...I'm trying to remember who it was who came around here...

Interviewer: [fatigue consultant]?

Pilot: [fatigue consultant], yeah. Came around a while ago now and talked to us about it and gave us the workbook and so on.

Interviewer: And how did you find that?

Pilot: I'd have to say the training was when I first started to really take notice of FMS and have alarm bells start to ring about whether it was suitable or not.

Interviewer: So if you turn over the page, we’ll skip a lot of them, this question here, how would you rate the overall usefulness and effectiveness of the training program?

Pilot: Oh, I’ll sit on the fence and put average. The training program as I said alerted me more to what FMS was about and raised the concerns in my mind about applying them as it was. Whether it really enhanced my knowledge of fatigue, I don’t really think so.

Interviewer: Had you received any training prior to that on the FMS?

Pilot: I was aware of FMS and what it was all about I suppose. I did the Human Factors for the Aviation Regulator Course with CASA earlier last year in which fatigue management was certainly a unit within that.

Interviewer: Is that run within CASA?

Pilot: Yeah, I’m trying to remember his name. [CASA human factors representative]

Interviewer: Did he run it?

Pilot: I remember he took the fatigue element.

Interviewer: Had you received any education prior to the FMS on fatigue????

Pilot: Yeah. That’s really it.

Interviewer: Do you see training and education as a necessary part of an FMS?

Pilot: Yeah. I think so. People need to understand what it's all about. It wouldn't be a good thing to put it in place without explaining it, what the scores meant and what sort of things influenced it.
Pilot 14

Interviewer: When you were first introduced to FMS what sort of communications from management did you receive?

Pilot: It was just explained to me what the process was. I think [the chief pilot] went through it, not in too much detail. He explained what the whole situation was in the Australian environment really and how we were maybe considered one of the test beds and it was an early trial period. So I've been pretty keen on the whole idea because I find having looked at the old CAO48 and it would have been hectic to try and work, specially in our works where we need to split the duty.

Interviewer: So it was mainly verbal?

Pilot: Oh, no well it was mainly verbal initially and then as I was introduced to the system I was shown the system on the computer, the FAID aid is a spreadsheet package that I was shown, [CASA representative] was here at one stage and I was included in that process as well. I just what I needed, not too much into the nitty gritty. Then as the system became more formalised we had the time sheets to do, so we had the formal training in-house - the practical living shift workers book - so [the chief pilot] put together the same questions that are in that book, but he put those together in a quiz form so you go through the book and then the quiz. There is formal text / manuals floating around, but I haven't needed that.

Interviewer: Have you ever received any training or education re: Fatigue/FMS?

Pilot: Being involved and included in some of the talks and discussion that have gone on, as well as going through that workplace workbook.

Interviewer: Did you receive any training before the FMS?

Pilot: Not really formal training as such, part of it might have been included in the CRM courses that I've attended, because that's got to do with using resources, and then my exposure to the FMS. I was responsible for running the roster in South Africa and I had the hassles of dealing with a similar thing to CAO48 and having a few pilots report to me and having the problem that they had their time off and so on.

Interviewer: How was the practical shift worker's workbook delivered to you?

Pilot: I was given the book, it's not difficult to follow. But most of the time, [the chief pilot] was there and a couple of things we discussed and had a chuckle about and thought they were quite amusing. It was really working through it on my own and then go through the questionnaire.

Interviewer: How would you rate the overall usefulness of effectiveness of the training program?

Pilot: Good

Interviewer: Do you consider training and education an essential part of the FMS?

Pilot: More formalised type of training do you mean?

Interviewer: About fatigue and its effects

Pilot: Not more than I've been exposed to already. I have quite an awareness of the problems of fatigue.

Interviewer: ????

Pilot: Yes it is, and I've been in this environment quite a few years now, I'm well aware of these things and the impact of fatigue etc. and you could just go totally overkill on training ??? knows its not good to get tired. If you start going into the deep psychological inroads of it, its just getting too much.

Interviewer: So what do you think the major topics should be?

Pilot: It's got to have some form of focus on the awareness of it, and the symptoms and the ways of identifying fatigue.
Interviewer: What about lifestyle factors, such as diet, or...

Pilot: Well, maybe I’ve been luckier than others, but even in airport training we went through aviation medicine, we went through these sort of things, in the air force we went through that sort of thing of dietary. Certainly in aviation medicine which includes things like your teeth and hypoglycaemia and fatigue and... The training should encompass everything on a basic level, you don’t need to go into great depth. If you start telling a guy about his circadian rhythms and how they when others sleep and stuff like that, its completely over the top.

Pilot 15

Interviewer: OK, what sort of information did you receive from management regarding the FMS?

Pilot: What sort of information?

Interviewer: Communications from [the company]

Pilot: Well, that was [the chief pilot's] baby and he sort of went through the whole thing with us -

Interviewer: In a meeting or -

Pilot: Yeah, yeah. He explained it to us, showed us what he had done, what he had worked out on the computer and all our roster formats and that sort of thing.

Interviewer: Did he give you any written information about it?

Pilot: Yeah, yeah.

Interviewer: What sort?

Pilot: Oh, just a memo explaining it and pretty much went through it

Interviewer: And that was just from [the chief pilot]?

Pilot: Yeah, well [the chief pilot] organised it yeah, yeah. He was very efficient

Interviewer: Have you ever received any fatigue training?

Pilot: Fatigue training? No.

Interviewer: Yeah like education booklets, or so on.

Pilot: Oh, yeah, yeah, yeah, we had that. Shiftworkers

Interviewer: Practical Living for shiftworkers?

Pilot: Yep - that's the one.

Interviewer: Did you receive any training prior to the FMS?

Pilot: No, I think that's the first time we've had anything.

Interviewer: How was the training delivered? Did you get given the book to read through, or did you do it in a group or...

Pilot: Yeah, we went through it in a group and then did all the exercises.

Interviewer: Did you do that as you were going through it in a group or afterwards?

Pilot: Well, [the chief pilot] gave it to us in a book to read before hand, then we all went through it together.

Interviewer: And it was done in a discussion format?

Pilot: Yeah.

Interviewer: OK, if you read the next question - how would you rate the overall usefulness and effectiveness of the training program?
Pilot: excellent

Interviewer: Do you think it's an essential part of the FMS?

Pilot: I think definitely - there are different things that are good to know and be aware of.

Interviewer: What were the major topics that were covered?

Pilot: Well mainly, the effects of the amount of sleep you have, the time that you sleep you have, alcohol and different things like that - chemicals that effect your body and different things like that. Yeah - that's it.

Interviewer: Was there anything that wasn't covered that you would have liked to be included?

Pilot: No.

Interviewer: Was there anything included that you don't think was necessary?

Pilot: Oh, if I looked through it I probably would, but - no.

Pilot 16

Interviewer: What sort of communications did you receive from management regarding the FMS when it first came about?

Pilot: I had a lot to do with it from the very start before it even came about so I knew a lot about it before we were actually given a presentation, and we received close to a three or four hour presentation, I was fatigued by the end of it, but it was good.

Interviewer: Was that a PowerPoint presentation?

Pilot: Or was it overheads? It was done up on Island with a consultant and the Chief Pilot. It was very informative and everyone received their own FMS manual so basically they know the guidelines. Are we going to get to the manual? Good. I'll tell you about that later.

Interviewer: Have you received any training or education regarding the FMS or just fatigue?

Pilot: Yes, that 4 hour session.

Interviewer: Did you receive anything prior to that? Prior to the FMS?

Pilot: No.

Interviewer: How was the training delivered?

Pilot: In the form of a presentation.

Interviewer: Did you get any hand-outs or...?


Interviewer: How would you rate the overall usefulness and effectiveness of the training program?

Pilot: ???

Interviewer: Do you consider training to be an essential part of an FMS?

Pilot: Yes, you couldn't use it without the training. Yes, it's too daunting the first time. The system itself, more the application...

Interviewer: So you just think training in FAID? Or...

Pilot: Yep.

Interviewer: What about training in the effects of fatigue and the nature of fatigue?

Pilot: Yeah, I guess so, it needs to be covered.
Interviewer: What were the major topics that were covered in your training? Just what you can remember the most. Do remember something that stood out?

Pilot: Circadian cycle.

Interviewer: Circadian cycle?

Pilot: Yep, the types of good rest and bad rest. Some of the types of work which was very ???. The do's and don'ts of rest and drinking too much coffee and that sort of thing. The actual FAID system. No! Actually I don’t think the FAID system was covered, I think I had to instruct that myself. It was just the manual itself, the manual didn’t go into the FAID application.

Interviewer: Was there anything not included in the training that you would like to have been included?

Pilot: No. Maybe the FAID system itself.

Interviewer: Were there anything included in the training that you don’t think was necessary?

Pilot: No, I think it was all relevant.

Pilot 17

Interviewer: What sort of communications did you receive from management re. FMS? What forms?

Pilot: There was a lot of memo’s going around – quite detailed documentation on it. That was followed up by various meetings with management at all the different bases. There was a lot of fear involved from the employees here that they were going to be overworked, but the meetings cleared that up.

Interviewer: Have you received any training/education re. Fatigue/FMS?

Pilot: Apart from the managers visits, and the documentation, no.

Interviewer: Did you receive any training prior to FMS implementation?

Pilot: We do a lot of CRM courses, and they go quite a bit into fatigue – approx every 12 months.

Interviewer: How would you rate the overall usefulness & effectiveness of the training program?

Pilot: The written documentation was average, but discussion on it with managers was excellent - memos

Interviewer: Do you consider training and education as an essential part of the FMS?

Pilot: Absolutely

Interviewer: Was there anything not covered that you would have liked to be included?

Pilot: Visits from managers is good, but I think some sort of booklet explaining how it’s going to effect us - video is good.
APPENDIX O: FLIGHT CREW MEMBERS’ PERCEPTIONS OF PERSONAL RESPONSIBILITY IN CONTROLLING FATIGUE (TRANSCRIPTS)

Pilot 1

Interviewer: OK, next question on your sheet: In approaching management about fatigue/FMS/safety concerns, how comfortable do you feel?

Pilot: I feel fairly comfortable yeah

Interviewer: So there’s no hesitation in going to them?

Pilot: I don’t have any problems. I think the mentality that you don’t want to let your mates down. I think if you go flying, and you’ve probably if you’ve been flying all night, there are times when I’ve done that, and you, you do feel tired. And ah, then yeah, you might not want to call in your standby crew. And you know, once or twice but other than that, no real problems at all.

Interviewer: How much sleep do you try to get per 24-hour period?

Pilot: Probably try to get about 8-9 hours. I sleep quite a bit. Because I’m sort of accustomed to shiftwork, I sleep really well during the day.

Interviewer: Do you feel personally responsible to ensure you sleep in the times you’re supposed to?

Pilot: Do you feel personally responsible for sleeping in the times allocated?

Interviewer: For example, when you have time off, do you make sure that you’re sleeping in those times if required. So, in the middle of the night, if you’ve got a stop over at a hospital and you’ve got a bed, do you make sure you go and sleep in that time, or

Pilot: Well, yes. Yeah.

Pilot 2

Interviewer: How much sleep do you generally try to get per 24 hour period?

Pilot: At least 8 hours – particularly if I know I’m working the next day

Interviewer: How comfortable would you feel in approaching management about fatigue or /FMS safety concerns?

Pilot: Yeah, that’s no problem.

Pilot 3

Interviewer: In approaching management about fatigue related or general safety concerns, how comfortable do you feel?

Pilot: That depends which part of the management, part of the management that introduced...

Interviewer: And what side of the management was that?

Pilot: The standard management side. The Chief Pilot is who I’m talking about when it was introduced. Are we talking about now or when it was introduced?

Interviewer: How about both. So you weren’t comfortable when it was...

Pilot: We were not comfortable at all when it was introduced.

Interviewer: In talking to them?
Pilot: They didn’t want to know. ‘That’s it, that’s it, thanks’ that was the attitude.  

Interviewer: And has there been any change now?

Pilot: There has been change now because senior management has come into it.

Interviewer: Senior management from the UK or from ???

Pilot: Bit of both. The basic senior manager here is responsible to the UK, the general manager here... I mean they’re both responsible to the UK in many areas, but he was not comfortable with the pilots, and I was in the meeting when he agreed it was the aircrew and not the relevant managers that brought it in.

Interviewer: He agreed with how it was implemented?

Pilot: ???So he was not comfortable with it at all, we went to ??? So that’s where it started... not a good start, and it’s really not developed since then and people are not comfortable with the fact that they believe that sections of the company just got to put it over everybody, it hasn’t worked.

Interviewer: As a general rule, in general safety is that the same?

Pilot: Oh no. Totally the opposite. Normally very, very good. Don’t have a problem. From this office I can bypass all the managers in Perth and go to the UK. I don’t because we don’t have a problem, the managing pilot is my boss, generally if I think it’s a problem he thinks it’s a problem, so in general ‘very comfortable’ attitude towards general safety and everything, they’re very, very good, but the way they brought this in.

Pilot 4

Interviewer: In approaching management about fatigue, FMS or just general safety concerns, how comfortable do you feel?

Pilot: Very comfortable. They’re very good here.

Interviewer: Do you think that these guys are better than average? Or that mostly in aviation that’s the case?

Pilot: I think mostly in aviation that’s the case, everyone is quite approachable; the key to the answer is what do they do about it? And here they actually look into it and want to do something about it whereas some of the other companies say well yes we understand what you are saying but...and the bottom line is that you can’t do anything.

Interviewer: How much sleep do you try to get per 24 hour period.

Pilot: Per 24 hours, minimum of seven. Preferably 8.5 hours

Interviewer: Do you feel personally responsible to ensure you are sleeping in the times you are supposed to?

Pilot: Yes.

Pilot 5

Interviewer: In approaching management about fatigue or FMS or just general safety concerns, how comfortable do you feel?

Pilot: Very comfortable.

Interviewer: They’re quite responsive and take it seriously if you come in

Pilot: Yeah, [the manager's] always backing us up. The guys in the other office always want us working as hard as they can, if they could they'd have the planes flying 24 hours a day, seven days a week. But that job I did to [location], [the manager] didn’t want me to go on that, he said that’s ridiculous, a 19-hour day. I said look I feel fine within the limits, and that’s
what we’ve got the limits there for, so we can work to them. That’s why he wants to put all these restrictions in place which again ??? not really interested in any of that. I’m sure there has to be something in place but if you put restrictions in, CASA’s just going to monitor them. I mean, that’s what CAO48 was, a bunch of restrictions. Just because half the world works nine to five, Monday to Friday, ??? especially when you’re casual. They were working five days a week, six days a week, sometimes seven a week, they’ve really cut back a lot of my work.

Pilot 6

Interviewer: How much sleep do you try and get per 24 hour period?
Pilot: Well I try to get twelve
Interviewer: You try to get twelve hours sleep and how much in reality do you get.
Pilot: Six or seven
Interviewer: That’s about half of what you like.
Pilot: I wouldn’t say twelve, if you tried to get twelve, you’d never get twelve hours sleep. You would be so tired after twelve hours sleep. I generally try to get eight.

Interviewer: Eight
Pilot: Sometimes you get eight, depending on how many beers you’ve had.

Interviewer: Do you feel personally responsible to ensure you are sleeping in the times you are suppose to, that it is a priority?
Pilot: Oh yeah. Turn the phone off, make the room quiet and things like that.

Interviewer: The next question: In approaching management about fatigue or FMS or safety related concern, how comfortable do you feel?
Pilot: Very comfortable.

Pilot 7

Interviewer: So on average how many hours sleep do you get per 24 hour period?
Pilot: Me? I’m pretty strict with my sleep, I generally get to bed about 8:30 or 9 o’clock, and I’ll be getting up at 4 o’clock.

Interviewer: That’s a pretty decent sleep.
Pilot: I manage about seven hours sleep, and I’ll generally catch an hour during the day, more just napping, but if my phone ??? then my day’s not mucked up. I was in bed last night at 8:30 pm.

Interviewer: A lot of discipline!
Pilot: You have to be, you have to be really disciplined with yourself, you really do, and I’ve been doing it for years now so my family, if I go out for dinner with my family they’ll all be sending me home, or if they come for dinner, they’ll be going ‘8 o’clock, see you later’. You have to be really disciplined. I think as my kids get older it’ll become more difficult, at the moment they go to bed at the same time as me so we all go to bed at the same time. Once they’re teenagers they’re going to find ???
Pilot 8

Interviewer: In approaching management about fatigue or FMS or safety concerns how comfortable do you feel?

Pilot: Very comfortable.

Interviewer: How much sleep do you try to get per 24 hour period?

Pilot: Eight hours.

Interviewer: Do you receive that most of the time?

Pilot: Yes. I’d like to get eleven.

Interviewer: Do you feel personally responsible to ensure that you sleep in the times that you’re supposed to?

Pilot: Yes.

Pilot 9

Interviewer: Do you feel comfortable approaching management with issues or questions, ideas about the fatigue management system

Pilot A: Um, no, not necessarily

Interviewer: No? Is that because you don’t think it would make a difference, or something else?

Pilot A: In that, I’ve already approached management on one matter, and received communication. And I guess, nothing changed as a result.

Pilot B: I don’t have a problem in dealing with management because I’m dealing with them the whole time.

Interviewer: Do you see it as a beneficial thing to communicate this sort of thing – like ideas or…

Pilot B: I think it’s great – as far as I’m concerned, if anything can be done to better the system, put it down on paper, and send it off. That’s my advice.

Pilot 10

Interviewer: When approaching management about fatigue or FMS safety concerns how comfortable do you feel?

Pilot: Comfortable. Its always difficult, because of the work environment, everyone pulls each other’s leg around, I have had one incident when [the chief pilot] was away on leave and going in on the system, it was starting to get a bit close. I went to [the manager] and I said its just border line, and we got [the chief pilot] in and he did the work. I mean I was quite comfortable with doing it. I don’t mind going and saying look this just getting too much, but I don’t really foresee it happening too much unless we double our workload or something.

Interviewer: If you, for e.g. were 40 on the the FAID score, so really low, but you hadn’t had any sleep the night before, would you feel comfortable putting your hand up and saying look I’m really too tired to work.

Pilot: Well fortunately I don’t have problems sleeping, but yeah, that goes without saying. It’s a pilot’s responsibility and it’s probably in the small print somewhere along the line. Like the law that says you can’t have alcohol 8 hrs before flying, but you can’t fly when you’re drunk, so it doesn’t mean you can drink a bottle of scotch 10 hrs before and still fly drunk, thinking you’re above the law, you’re not. So it goes without saying. If I don’t think I’m physically in a position to fly the shift then its up to me to do something about it. No I wouldn’t have a problem doing that with these guys.
Interviewer: How much sleep do you try to get per 24 hrs?

Pilot: Probably about 6 or 7.

Interviewer: Is that how much you do achieve normally?

Pilot: Oh, probably a bit more, like 7-7.5 hrs, it just depends what's on telly.

Interviewer: Do you feel personally responsible to ensure you sleep in the times you're supposed to?

Pilot: I enjoy my sleep, when I get the opportunity, it is a responsibility ?? in our work you can't, or else you are going to get fatigued.

Pilot 11

Interviewer: In approaching management about fatigue concerns or concerns about policy or general safety concerns, how comfortable do you feel?

Pilot: Very comfortable. I’d just go straight to the Chief Pilot.

Pilot 12

Interviewer: In approaching management, how comfortable are you about approaching management with fatigue, FMS or safety concerns?

Pilot: This has already been raised once before. They obviously weren’t comfortable because they brought it to the attention of the Chief Pilot and the CEO, they had a meeting...

Interviewer: They being the pilots?

Pilot: Yeah, three or four of the pilots. And you probably won’t hear that from anyone here, so that’s why I bring it up. They had problems with their scores and the type of work that management considered as work and rest.

Interviewer: They thought the scores were too high...?

Pilot: Not so much the scores, it was the type of work, and that was why I was going to mention the manual. It’s the definition of work.

Interviewer: What is the definition of work?

Pilot: Well, my definition of work is the minute they leave their unit and the guidelines are air conditioned unit, must have this, must have that, so basically the minute they leave that unit to proceed to the hanger to do anything in the hanger with their duties, I consider that work.

Interviewer: Until they get back?

Pilot: Until they get back. And then they must have that minimum four-hour break. And I run that stringently, basically when they first leave the unit, that’s when they start work. However there’s a different interpretation through management. It’s a very grey area in the book where it says something to the effect that daily’s on aircraft and anything to do with pre-flight checks such as obtaining weathers and putting flight groups in and that sort of things isn’t considered work. However, my biggest bone of contention is, you can get on the aircraft over here, because its positioning, sit in an air conditioned aircraft all the way up there, that’s considered work because its positioning. But to leave your unit, go down the hanger, ??? the aircraft, its not considered work. Go figure. That’s where I think it needs to be tightened up, that’s where it needs to be black and white. When you leave the unit, its considered work.

Interviewer: And that’d be pretty easy to run wouldn’t it?

Pilot: It would. And that’s where I think it needs tightening up, however I’m sure that the management won’t look favourably on that. With the Coastwatch crews, because they only fly the air work or SAR it would be OK, it would be quite simple and work. But because the other 206 pilots,
the smaller aircraft, because one’s for charter, one’s for Coastwatch work, and one’s for EMS medical emergencies, because they’re interchangeable, and the pilots change around so much, their hours are difficult to keep below that level, and the biggest problem is, with those three, because they’re basically transporting people around, they may sit on the ground for five or six hours. They’re therefore out of their unit, their rest area, so they’re gathering work hours. So they may go out, sit on an island for eight hours of the day, and they clock up 12 hours work, and they’ve slept for most of that time, but that’s not taken into consideration. And that’s the biggest problem with the system at the moment for us.

Interviewer: Definition.

Pilot: Well, definition, but the only way around that is to employ more people to keep the levels down, but we could work basically all year every day.

Interviewer: It’s not very likely to happen though! Hopefully not! So answering this question, how comfortable do you think you are in approaching management?

Pilot: They were comfortable, I think now they’re no longer comfortable because they...

Interviewer: They didn’t get any feedback from them.

Pilot: Well they did and then they said no it doesn’t. This is work, and this is not work. So they didn’t get what they wanted and it wasn’t as per the book so I guess they wouldn’t be comfortable anymore.

Pilot 13

Interviewer: With regard to fatigue and safety concerns, how comfortable do you feel approaching management?

Pilot: Oh, very comfortable. Yeah, yeah. It’s the nature of the business in aviation. If you’re not honest about safety, then – I mean, it’s detrimental to everyone. If anyone crashes, in this industry, because it’s a very small industry, and it’s a high profile industry. If we have one balloon, or one passenger accident in the world right – there was one in New Zealand where they drowned a J Japanese tourist in the sea right – we lost thousands and thousands of dollars because of that. If we had one here, there’d be ambulances, and all the media would be here – the media networks would be here within 10 minutes or something like that. So, yeah, it effects every body, so yeah, we have no issues with dealing with danger, or dangerous conditions that effect everybody.

Interviewer: How much sleep do you try to get per 24-hour period

Pilot: 5-6 hours per night

Interviewer: Do you tend to have a doze during the day as well?

Pilot: Not usually, no.

Interviewer: Do you feel personally responsible to ensure you sleep in the times you’re supposed to? – Like to make sure you get 5 hours sleep – 4 hours sleep or whatever before you start – or do you just work it around whatever you’re doing?

Pilot: I mean – yeah, if I’m working the next day then I try to get that sleep in. It’s not much fun coming to work if you’re hung over or you’ve only had an hours sleep or something. I know that I’ve done that a couple of times when I’ve been crewing, and I’ve thought ‘oh, I really don’t want to be here’
Pilot 14

Interviewer: How comfortable do you feel approaching management with fatigue or FMS or general safety concerns?

Pilot: I have absolutely no problems whatsoever. I’m very comfortable with that and not just in relation to the pilots but in general, even with [other employees], [the chief pilot] and I have implemented fatigue related issues with the [other employees] as well. I have to say I think I was very instrumental in that. [The chief pilot] and I have a very, very good work relationship, we really do and I’m very comfortable with that, he and I both recognise that, and we bounce ideas off each other all the time which is really good, and I’m really happy with that. And talking to [the General manager], we present our case as a case study, and more and more everything is being left to Steve and I.

Interviewer: How much sleep do you try to get per 24 hour period?

Pilot: I try to get six.

Interviewer: Try to get six? And that’s taken into lots of four hours and...

Pilot: I try very hard to…my wife tries very hard to get me into bed by 8:30pm so that I have a decent night’s sleep. I actually would prefer to maybe have an hour or two hours sleep in the afternoon and then stay up a little bit later so that we can watch a film or something rather than go to bed like a child at 8:30, and my wife appreciates that, she ??? a battle as well.

Pilot 15

Interviewer: In approaching management about fatigue/FMS/safety concerns, how comfortable do you feel?

Pilot: Very comfortable, although junior staff members less comfortable

Interviewer: How much sleep do you try to get per 24-hour period?

Pilot: Set a minimum of 6 hours – try to get more, but sort of limited from experience

Interviewer: Do you feel personally responsible to ensure you sleep in the times you’re supposed to?

Pilot: Yes, definitely

Pilot 16

Interviewer: In approaching management about fatigue/FMS/safety concerns, how comfortable do you feel?

Pilot: Average. With safety concerns, I am very comfortable; for fatigue specifically, they are still learning, and management are still very military in their approach

Interviewer: How much sleep do you try to get per 24-hour period?

Pilot: Try to get about 8 hours

Interviewer: Do you feel personally responsible to ensure you sleep in the times you’re supposed to?

Pilot: Yeah, I guess so.

Pilot 17

Interviewer: In approaching management about safety or fatigue or rostering concerns, how comfortable are you?

Pilot: I’d probably say very comfortable. Management is...

Interviewer: They seem to be pretty open.

Pilot: Yeah, yeah. Its certainly a good thing.
APPENDIX P: MANAGEMENT PERCEPTIONS OF FMS OPERATIONAL EFFECTS (TRANSCRIPTS)

Management 1

Interviewer: OK, next question on your sheet: In your opinion, does the FMS have a positive or negative impact on general work life?

Manager: Oh, definitely positive

Interviewer: Yeah? All the guys have taken it on board OK?

Manager: Oh yeah, yeah. No one’s said anything ill of it. And, um, talking about manufacturing the hours in February, March or whenever it was, the only thing that came back was well hang on, are we covering it between the dark hours at night. Maybe we should leave that at 8 hours, but that was the only thing that really got said.

Interviewer: So that decision came out of pilot discussion?

Manager: Yeah, yeah. Well, the whole thing - before we went to the ah – before the rules were put in, all the pilots agreed to it. So that’s the thing that we trialed. So we basically, we discussed it – what was going to be our rules. We trialed it, we were happy with it and then we flipped it off to CASA and they said ‘yeah, that’s fine’. And that was all quantified by the FAID.

Interviewer: Has the FMS lead to any major company changes in operations?

Manager: Any major? Well, extending the duty time or whatever, the nominated duty time. So yeah, it has – that’s probably pretty major because the guys – they get more flying rather than ‘well I haven’t really done much today’. Because the duty time builds up on the short flights because you’ve always got a set up, stop, start, stop, start, stop. Whereas they want to get out there and fly. That’s the nature of pilots.

Interviewer: Yeah, they love it. Is there any more or less administrative work involved?

Manager: Well, we’re working towards having less administrative work. Because you’ve put – you have the papers that you fill out while you’re out on the job, and you have the papers that you fill-you know your duty times to keep your score, what you’re doing and how many hours you’re up to. Then you go and plug it into the computer, hopefully eventually we’ll be able to minimize it where you’ve just got your paper work, fill it out, come back, start up the computer and say by the way, I’m up to 8.6 already. And we’re slowly getting towards that. We try to minimize the paper work. Pilots don’t like paperwork.

Interviewer: Have you ever met anyone that likes paperwork?

Manager: Oh, there’s some people that are out there and they just love it –

Interviewer: Accountants

Manager: Yeah – that would be one, and the tax man

Management 2

Interviewer: In your opinion, does the FMS have a positive or negative impact on general worklife?

Manager: Definitely negative.

Interviewer: Have you noticed any major changes in the company’s operations since the implementation of the FMS?

Manager: None at all.

Interviewer: None at all. That was an easy one.
Interviewer: In your opinion does the FMS have a positive or negative impact on general work life?

Rod: I think it's had a positive impact and that's from both sides of the equation, in terms of the employer and employee because another company we own runs on the old 48.

Interviewer: Is that the medical company?

Rod: Yeah. And I've heard pilots say "yeah we need to do this job, but look, if that ambulance takes an extra 20 minutes to deliver the patient, that will put us outside duty, so we'll just have to stop there and stay overnight," but if you'd started, you could go to 11 hours, once you've started you can go to 12, or whatever, "Oh no, no, no, I don't want to do that because tomorrow I might have ..." ??? It's absolute bullshit, it really is. So in terms of introducing a positive, practical effect on what's happening at work, Yeah, very, very positive.

Interviewer: So then you're still operating under the FMS for that work. Have you noticed any major changes in the company's operations since the implementation of the FMS?

Rod: Yes, I think they have. Each pilot has been doing a lot more work because of the relaxation in the restrictions on duty hours.

Interviewer: So, increase in workload?

Rod: In work.

Interviewer: In workload or the amount of flying?

Manager: I wouldn't have said workload, just the amount of flying. There's a lot of jobs that people are doing that just wouldn't have been done.

Interviewer: Sure. So you've also been able to take on more work? Or more jobs?

Manager: Mm.

Interviewer: Yeah? Work's a bad word isn't it?

Manager: Yeah, that's also offset by we've got a big list of pilots we can utilise from as well. Otherwise we'd be sending a fellow out for a full days work, it might be a fairly long day, he might start early in the morning and go right through until late at night. We can then leave him until 2 o'clock the following afternoon before he starts again to give him a good rest, and we've got enough pilots to use another pilot in the morning, because it's just so flexible, that's the beauty of it I think.

Interviewer: So in your opinion does the FMS have a positive or negative effect on general worklife? This is as opposed to CAO48.

Manager: Again it would come back to management but that would allow unscrupulous operators to work their guys more that CAO48, because it isn't just us, if you work in daylight hours you don't have your flight and duty times limitations and you don't have your flight limitations, you only have whatever you step, and again that comes back to CASA, how serious are they going to get about what they let people do. So if you're working for someone out in the scrub, I could say you would probably be working a lot harder, because they're going to say 'hey look what I can do now' instead of going 'oh no shouldn't be doing that so, we're not going to do it'. So if you're working in the bush you'll end up potentially being able to work a lot harder but mostly if you're out there you're treated like a ringer anyway so they ???, when the sun goes up the sun goes down, if you're not flying you're in the yard, this is going to change nothing.

Interviewer: So positive or negative or none?
Manager: It'll have positive and negative effects. If you're working for a company that takes this sort of stuff seriously then the guys will be able to look at it and go 'yes', we don't have to feel bad about knocking off after five because we're there, we're at our limit. That's life. If the company goes that way then that's fine, so it'll be positive that way because the guys will know exactly where they stand as far as the imaginary piece of paper goes but it doesn't take any responsibility off the management or off the pilot to go 'hey I'm not up to this' or 'I am up to this'. Responsibility has got to be put back onto the people. I don't put a line under both of them, it's two way, its negative if you work in the bush, positive if you work for a company like [ours]. But, again with [our company] it doesn't really change anything because we have company procedures.

Interviewer: You probably already answered my next question by that. How have you noticed any major changes in the companies operations since the implementation of the FMS?

Manager: No. We have our own procedures so nothing changes. But the guys didn't understand that truly until that bloke came. Probably really I didn't understand the whole thing. I ran through the thing when we were doing it all and went through the whole procedure in getting it in place, but you will always get tired people, that are just tired people, born tired, takes them an hour and a half to recover after working a few minutes, that's the way they are. You know, nothing changes.

Management 5

Interviewer: Great, next question: In your opinion, does the FMS have a positive or negative impact on general work life?

Manager: I think it's definitely a positive impact. Because it's controlling whether I'm on a fatigue maximum. And that's - it's hard but it's - one of the problems, well when I say one of the problems is - what's the difference between pilots and people doing a job? It's the number of sick days. Very few pilots take sick days. Why do they take very few sick days? Because they enjoy what they're doing. My father's a farmer. He could work 7 days a week because he absolutely loves it, and he's not working. And most pilots are like that. Flying is not work to them. Flying is something they enjoy. So, yeah, it's a bit different from shiftworkers in a factory or whatever. Most of our guys actually enjoy going to work. Before fatigue management came in, I enjoyed going to work. So, it really hasn't changed that. And it is nice to know that you have more control over it.

Interviewer: Great. Have you noticed any major changes in the company's operations since the implementation of the FMS?

Manager: Um, well the answer would have to be yes. Because it is just such a different operating style to, the previous operation under CAO 48- or the CAO 48 exemption. But do we still do the same sort of stuff? Yes we do. Are we able to do it better? Yes, I think we do it better. In terms of being able to give the guys a better run for what they do. It's all tied up in dollars. And with the previous set up, they were only able to work 2 nights a week because most of us go 4 nights. But they could only do every second night. And then they'd have to pick up another day flying on the weekend to earn a reasonable living. But now they can do 2 or three nights straight, and they are a little bit more secure in the earning capacity. But they're still doing basically the same job. They're just a little more certain and a little more happy with what they're doing.

Interviewer: Has it changed the shift structures?

Manager: In terms of rostering, yes. Because when they changed the exemption requirements, because you used to get credit for 5 hours sleep in a hotel. Your duty time, you used to be able to subtract half that time. But they took that away when they went to the industry standard exemptions, which were a bit different. The integrated system we were running was with 5 pilots. When they came with the exemption requirement, we had to go up to 10 I think it was - to do the work. But we didn’t have any more work, it just took 10 pilots to do it.
So they weren't earning as much because they weren't able to fly as often. And that didn't make the pilots very happy. And now I'd say we are half way between the two. So now we might be using 7 to do that – it's better for the company that we would use 7. The number of pilots – but the extra flying hours are still the same.

Interviewer: So is it more financially viable for the company?

Manager: Well yes, it is more financially viable for the company. And yeah, it is more financially viable for the pilots. And training costs, ah, you know there's a whole myriad of behind the scenes charges that apply. I've got to have an Apex card to get up to the airport. They're $65 each. And that's $1000 bucks worth of Apex cards just for those runs you do. So yeah, they're quite substantially potential costs.

Interviewer: And the FMS requires less pilots?

Manager: Well, yes, if you were doing that same amount of work, yes. You can now have a smaller number of pilots. We have increased the overall amount of work we're doing by acquiring other runs. So we've gone to 7 or 8 hundred or a thousand hours a year to at the moment we'd be churning out around about, oh I would hazard somewhere around about 6 thousand hours.

Interviewer: That's fantastic.

Manager: That includes the paper runs, but they run 6 nights a week. So something like this is effective in managing crews within the boundaries of what they can do.

Management 6

Interviewer: In your opinion does the FMS have a positive or negative effect on general work life?

Manager: Positive.

Interviewer: Have you noticed any major changes in the company's operations since the implementation of the FMS?

Manager: Yeah, I have actually. More structured meetings. We do a fatigue meeting once a month religiously, but fatigue at the end of the day is only a line item in the meeting.

Interviewer: Do you often get items underneath that item?

Manager: Under fatigue? Yeah we get a whole range of things, but what's it's done is its made us have regular monthly meetings. That's myself, the pilots, [and a manager] if he's around, he'll attend as well. At the moment he's in the States for three weeks travelling. So yeah, monthly meetings, and the line items, fatigue related and then any occurrence reports, and then there's a whole range of other stuff as well. Its certainly structured things better, its allowed the pilots the ability to have an opinion if they want, they know that they are able to bring up issues and they'll be dealt with, whereas in the past, when you're going from 400 to 22 there's a huge difference, so we've just gone... mostly things have ??? around, some haven't, staffing levels we all worked a lot of hours when we were first starting.

Interviewer: So you've increased numbers of staff?

Manager: Absolutely, by five times.

Interviewer: Is that because of company growth?

Manager: The growth is one, yes. And freeing up of key people like myself and [manager], we've got two admin staff now whereas three years ago we didn't have any. We've got a full time accounts person, we didn't have one we had a casual, so its freed it up to concentrate more on FMS. Safety systems. Safer operations.
Management 7

Interviewer: How has the impact of fatigue monitoring or the new FMS impacted the operations? You said that the pilots – well, some of them were a bit edgy because you changed operations so much with it all

Manager: For them personally, it’s not a big deal. I mean, they’ve got a copy of the FAID system on all of the bases. Some people have it individually as well.

Management 8

Interviewer: In your opinion, does the FMS have a positive or negative impact on general work life?

Manager: It depends on how you look at it. Its positive in the fact that it’ll achieve something in the long term. People are saying OK, its going to be a reasonable system, once the issues are sorted out, but at the moment because we’re only talking short term, six months basically, there’s a negative impact with regard to that and the way it was instigated and they still believe that we’ll give it a trial.

Interviewer: So at the moment its got negative but it has the potential to be positive?

Manager: Yes.

Interviewer: You said that you pretty much haven’t changed operations since the FMS has been implemented ???

Manager: nope

Management 9

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life?

Manager: Pretty positive.

Interviewer: Have you noticed any major company changes since it was implemented?

Manager: Company?

Interviewer: Company — operational changes.

Manager: Yeah, the flexibility.

Interviewer: How’s the flexibility changed?

Manager: It lets you utilise the manpower. Utilise the manpower more effectively.

Interviewer: So you’ve changed the roster structures?

Manager: So the roster structure’s changed, as I said to you earlier, under CAO48 we required 11 pilots to do one of our contracts, we can now do with six. You still have fill in pilots but you can quite comfortably roster six pilots to do it.

Interviewer: So how many were you rostering beforehand?

Manager: 11 or 12. And that was complicated in dead air flying and ?? airines picking them up and bringing them home, just to satisfy CAO48.
Management 10

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life?

Manager: Positive all round. Absolutely all round. Night freight can be a deadly game because people... you'll see tonight, blokes going to work at 11 o'clock at night, be knocking off at 6am tomorrow morning.

Manager: ??? flying, it allows them to do that. The old exemption under CAO48 allowed four days night freight in a row. We will allow four days night freight in a row, under conditions of the work block being suitably small. We won't per say allow four days, which was what the old exemption would do, and that's hellishly dangerous. I know on that old exemption, people would get points scores of 130 and pilots have got their eyes hanging out and they just hate it. They're the ones who are going to drive into the pole when they're going home at 6 o'clock in the morning, they won't necessarily have an aeroplane crash.

Interviewer: Have you seen any changes in the companies operations since the implementation of the FMS?

Manager: Yes, we employ less people more effectively. So overall efficiency gain. That means where our livelihood almost certainly in this current environment would have been threatened, its actually growing. Where we could have gone out the back door, we're actually growing. Surprising, but clearly positive.

Interviewer: And that's the only change?

Manager: I would suggest also that the communication across the company is much better. I think its increased the trust. Where any employee can have the cold 'you're being paid so go and do your work' type thing, its more than that, its recognised that the pilots have rights, its not the best terminology but the pilots must be heard. So it's that awareness of communication, uninhibited ability to speak.

Management 11

Interviewer: In your opinion, does the FMS have a positive or negative impact on general work hours?

Manager: It's positive as far as helicopters are concerned. That's what we do. Most helicopter operators do ??? a bloke will be gone up to the bush for 30 days or 14 days or whenever he comes back and that will be quite a disruption to home life. With this one, its fairly easy because we're here all of the time. And you can manage the hours. So if there's a problem with the kids at school you can get home and sort it out, its quite good. Purely because we have a good bit of planning ahead. We know a week, 10 days in advance; we have the flexibility to make those adjustments. It's quite a unique type situation we have as opposed to a regular public transport operator or an on going rostered type operator.

Interviewer: Have you noticed any major changes in the company operations since the implementation of the FMS?

Manager: It's been a lot easier on me. Putting the manuals and things together and that part of it, but that's something you have to do. CASA have us re-writing so many rules and things these days, they just load us up with paper work and think it's the norm. This is a paperwork exercise that is good for us, so we see it as a benefit to the company and the operation, so we put the time in to do it. As far as using the program to log on and off, you get quite familiar with it after a while. It takes up not time to do that and at the end of the month its just a case of just print out the forms, make a hard copy, stick it in the file, done.

Kristy: So there have been no real changes at all? Have operations increased?

Manager: Oh yeah, but its not a function of the FMS, that's part of the shipment schedule. You couldn't put that down to the FMS.
Management 12

Interviewer: In your opinion does the FMS have a positive or a negative impact on general work life?

Manager: I’d have to say positive. I think we’re doing it in a bit more scientific way, you know, at least we’ve got some benchmarks. Whereas these were figures plucked out of the air, that’s all they were. And as I said [an ex-CASA employee] knows the full history of it, but we basically went to CASA, it changed a bit in the initial stages but eventually it got to the stage where it didn’t change at all for years and years and years, and we said this is a problem, we need to do this, lets pluck some figures out of the air that we can all agree on, and that’s what they did. So its not scientifically based, based on anything really, except how do we legally achieve the aim.

Interviewer: Have you noticed any changes or significant changes in the company's operations since the implementation of the FMS?

Manager: No, virtually none; it's been so seamless.

Management 13

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life? Compared from CAO48 or the exemption under which you were operating?

Manager: Probably as far as the pilots are concerned I don’t think it would affect them very much, because they would go out and do an eight-hour shift whether it’s the same or not. Its hard to say really, there’s so many different answers to it, it depends on the way that you tackle it. From our point of view I like the FMS system. And everybody's aware of it, curtains are blacked out and the whole place lives around that system, and god help anybody that makes a noise early in the morning...

Interviewer: And that's all just come about because of the FMS?

Manager: Yes.

Interviewer: Well, that’s certainly got to be a good thing.

Manager: That’s the case, I’d say yes, it’s a positive outcome. For instance if you ring one of your staff and he doesn’t answer the phone normally you would say I wonder why they aren’t answering the phone, where have they been? And you would try and chase them up. But in this case you’ll ring them up, and the fact they don’t answer the phone is good. I’ve told them and they know that if they don’t want to be disturbed they take the phone off the hook, that’s it. You don’t say oh, the phone’s not ringing. So for me, I don’t have to look at everyone’s roster and say should I ring him or not, did he fly the night before, I ring him, and if the phone’s off the hook I’ll go, he must have flown the night before. And if he does it too many times I can go back and check what he’s up to anyway. It’s had a positive effect around our place, yeah.

Interviewer: Have you noticed any major company changes, operationally wise since the implementation of the FMS?

Manager: Probably not. No I don’t know that you could say that as a major change, I think we do it a bit more as a punitive or something like that.

Interviewer: What do you mean by that?

Manager: We’re still operating like we did before anyway, nothing really has changed. Maybe I’m a bit wrong because that also came in about the same time as our new aircraft came in. We find it a lot easier to manage than the old 48 system.

Interviewer: Just because of flexibility or...?

Manager: The flexibility. Because the guys know that they’ve got a busy period coming up and knock off a few days before...so the question is? Oh, sorry...
Management 14

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life? As it is now.

Manager: I’d say its positive.

Interviewer: Have you noticed any major company changes operationally since the implementation of the FMS?

Manager: I guess that crew reduction in that one contract with the one operational change, I don’t really believe its affected the operation overall.

Interviewer: Has it affected staffing levels or…?

Manager: That's what I mean. That one crew, that was a crew that it was ridiculous to have because as I said 15 hours in 12 months, but apart from that its not changed staffing levels, except the tremendous increase in time spent in administration here.

Management 15

Interviewer: So do you think its as good as it could be?

Manager: Yeah, I think it is. It hasn’t really changed what we do in our operation at all, it just legalised what we do in our operation. So before we had the FMS we were operating the same way for eight years until it suddenly dawned on everyone that we were actually in contravention of the CAO48, which everyone had been misleading and so when we tried to operate to that it was extremely restrictive on the operation because of our hours. So we changed, the FMS really to legalise what we did for years and years and years. So it wasn’t like the FMS came in and suddenly our whole work thing altered, all it did was make it CASA approved.

Interviewer: In your opinion has the FMS had a positive or negative impact on general work life? Have you noticed any major changes in the company’s operations since the implementation of the FMS?

Manager: Have I noticed any changes in the company’s operations, in terms of operating the FMS, or…?

Interviewer: Anything. It could be a change in attitude; it could be a change in…

Manager: It’s a hard one because it’s run by us. I’m the one who runs it, for me to judge that… it’s better for my pilots to judge that. [the general manager] would have no…the company owners don’t have any say in what we work or don’t work.

Interviewer: They know the FMS...

Manager: They know it exists, [the general manager] has signed it, he’s probably ??? and its more me sitting down with him going ‘[General manager], this is what we can and can’t do’ and he’s said you manage it and run it, and if they want to know whether someone can work or not they would just simply ring me and say, look we’ve got 30 people we want to book on tomorrow, and I would say I’ll get back to you, I’d have a look and say yes or no. They never come back and say ‘well why can’t you?’, its like fine, thank you very much. Probably because they’re confident…historically I do everything I can to get as many balloons and people in the sky as I can, so if I’ve looked at it and said no they know I’ve said no for a good reason, and that’s no, but I’ll do everything I can to make it work if I physically can. But has it changed the company attitude to… it probably has in terms of the way we used to work before and the way we work now, whether that would have happened just because of the growing of the company and the size of it, this has probably brought it about quicker and made it legal so that the company owners could question it all. When we started running under CAO48 they lost enormous amounts of money, so when we got this in and managed to get it back to being able to fly six days a week...
Interviewer: So its increased flexibility as far as that goes?

Manager: Its increased flexibility from the CAO48. Because we were running under CAO48, basically under CAO48 a pilot could only work five and had to have two off. Five days, two off. And you couldn’t flex any one, because if someone was on five days and two off, and you gave them this day off they then had to have this day off, otherwise just one day off on its own didn’t count, so someone could be Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday off, if you gave them that off because it was quiet, they then had to have Wednesday, Thursday off which meant they could then work Saturday, Sunday, but it meant that Wednesday, Thursday were someone else’s days off, so next week you’ve just created a problem. So it became totally inflexible, the company could never change anything. So when we got it back to the FAID thing, when we got it to this, it was such a benefit over CAO48 that they’ve never really complained about any of the restrictions that it brought in. We increased our pilot capacity because of the five day on, two day off rule, so once it got changed we just stayed with them, and everyone’s rostered five on and two off, five on and two off, with one on standby. Interviewer: wants to see if she can do it another day.

Interviewer: What did he say?

Manager: He said he’s a bit tired.

Management 16

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life?

Manager 1: It depends on how you measure that, because I tell you, if you start asking our workforce what they’re doing in their time off, it has a very negative impact. Very strong reaction. Very strong resentment. How dare you? No other job do I bloody have to come along and have you prying into what I do outside of the time...

Interviewer: Will they take that kind of advice as guidance or…?

Manager 1: No. When you’ve got people who are in emergency fire service or St Johns Ambulance or any other number of voluntary type... they do it out of work, they do it in support of the community and they do it for no pay. That’s work, and that counts against your fatigue score and I’m sorry, if that has a negative impact on your fatigue score I’ve got to ask you to stop doing it if you want to work for me. It would be interesting to see the first time ??? as whether ??? right or reasonable.

Interviewer: So if they have been out fighting fires all night...

Manager 1: Even if they’ve just gone along to a meeting... it says anything that can reasonably described as work...

Interviewer: So you don’t think that can be counted or...?

Manager 1: It has to be. Under the definition of the FMS it has to be. When there are people getting paid to do the same job that these people are volunteering to do, in other words, they are giving their time freely to the community to do a job of work which involves training, training under the definition of FMS is work.

Interviewer: But outside of the FMS, just in your opinion, do you think that that should be...

Manager 1: No I don’t think it should be. Well, if you end up out there in the bush and you’re fighting a fire, absolutely yes, but if you’re attending training its like a hobby, its relaxing, where do you draw the line? The laws as we understand them in an FMS don’t allow us to draw the line.

Manager 2: ??? people raised the issue about counting, like an out-crewer took some friends up for flying on the weekend on his days off, that would count, but if you go and drive a race car...

Interviewer: But that counts under normal flight hours as well doesn’t it?
Manager 1: No it doesn’t. Its recreational Its relaxing. It’s a hobby. Now under an FMS, if [a pilot] was to take you for a joy flight on the weekend and enjoy doing it, that’s work.

Manager 2: You can do a lot of other stuff that’d be more fatiguing on the weekend that isn’t considered, so its incongruous that you can do one thing for enjoyment, but you can go and water the garden and its more fatiguing...

Manager 1: I’m actually a builder, I’m building my own home, is that work? Yes it is.

Interviewer: Even going out partying all weekend.

Manager 2: Well, that could be work!

Interviewer: Come back more fatigued on the Monday than... !

Manager 1: For those reasons you’d have to say negative. Do you think that’s fair?

Interviewer: Perhaps.

Manager 1: Its not looking good. It looks like we’re setting out to bloody sink it; its not the case.

Interviewer: Have you noticed any major company changes in operations since the FMS was brought about?

Manager 1: No, but we haven’t actually implemented an FMS.

Interviewer: So you haven’t changed anything around it?

Manager 1: No.
APPENDIX Q: FLIGHT CREW MEMBERS’ PERCEPTIONS OF FMS OPERATIONAL EFFECTS (TRANSCRIPTS)

Pilot 1

Interviewer: How does the FMS impact on your operations? What sort of things do you have to do?

Pilot: It doesn’t impact upon it at all, as far as we’re concerned, because it allows us to work, like I say. No it doesn’t impact on us at all at the moment. With the hours we doing, I mean if you were doing bigger hours it would probably, might, impact then, but it is a lot less restrictive than flight for duty times and I suppose really that is not a good thing in some cases, but in our situation it seems to be working fine.

Interviewer: In your opinion, this is another question, does the FMS have a positive or a negative impact on general worklife.

Pilot: Don’t think it is one way or the other. I don’t think so, no. Probably because like I say even with flight duty times with the other thing we used to travel with was a seventh day and this has done away with that so that is not an issue. So positive really. As far as I am concerned, a lot of pilots probably wouldn't mention it that way because they would say "We don’t like working seven days" but I ??? So I reckon positive, yeah I’ll go with positive.

Interviewer: Have you noticed any major company changes the implementation has ???

Pilot: Not really

Interviewer: Have you noticed any changes in your alertness at work, has it had any effect on that?

Pilot: Not really, I can still go to sleep.

Interviewer: At work?

Pilot: No not really. I don’t think, no.

Interviewer: How about the hours of work that you’re working.

Pilot: Hasn’t changed.

Interviewer: This is the next sheet, you will have to turn over probably. To what degree FMS impacted upon your work duties.

Pilot: None really.

Interviewer: None. Doesn’t include any administrative work or

Pilot: Well no. Not apart from phoning in but like I said ???

Pilot 2

Interviewer: Great. OK. Next question on your sheet again: In your opinion, does the FMS have a positive / negative impact on general work life?

Pilot: Oh, it has a positive, yeah, it definitely has a positive.

Interviewer: Have you noticed any major company changes in operations since the implementation of the FMS?

Pilot: Ah, no, but I guess the main one is that you don’t get called in from your standby shifts as much anymore. Which is a good thing. And when you’re at work, sometimes you have to work a little bit longer, but I think the overriding factor is that if you are tired, you’d speak up and ah call your - I don’t think there’d be any hesitation in calling in your standby crew. I think – the guys, and we were saying this at the meeting the other day, that if you are feeling a little tired, that you do speak up, and that you’re not being a wimp - and this is coming from [the chief pilot] - this is coming from our safety officer. So, that’s a good thing for him to say that. The only other thing. I would say is again the paperwork. I think the paperwork.
Interviewer: OK, next question on your sheet – you’ll have to turn over: To what degree has the FMS impacted upon your work duties?

Pilot: Oh, to some degree it has.

Interviewer: How? Extra paperwork?

Pilot: Yeah, that's the main thing

Interviewer: Is that it, so there's nothing else?

Pilot: No

Pilot 3

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot A: It's more that rostering has become more flexible. The pilots let it to become flexible. Just remember that the onus is back on the pilots - not the onus, but the ball is put back into the pilots' hands - whether he wants to do the extra or not.

Interviewer: How about yourself?

Pilot B: What was the question again?

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot B: Well, obviously a huge impact. We didn’t have reserves, and we used to do a 10 hour day, and a 13 hour night, where as now we do a 24 hour day. So Yeah, it's been a big change.

Pilot 4

Interviewer: In your opinion, does the FMS have a positive or negative impact on general work life?

Pilot: Yeah, I think positive. I guess it takes into account fatigue at home as well as work and everything doesn’t. I mean you sort of take in the whole picture rather than, even when you’ve got your week off your still not really having a week off until the middle and then you think about going back. So it takes all that into account.

Interviewer: Have you noticed any major company changes since the FMS was implemented?

Pilot: No.

Interviewer: To what degree has the FMS impacted upon your work duties?

Pilot: It hasn’t really.

Interviewer: Anymore administrative than you would have under CAO48?

Pilot: Definitely a lot less.

Interviewer: is that because you had to do a lot of paperwork before?

Pilot: yep.

Pilot 5

Interviewer: Alright, next question which you’ve already started to answer, in your opinion, does the FMS have a positive or negative impact on general work life?

Pilot: Yeah, it's got a positive.

Interviewer: Have you noticed any major company changes in operations since the implementation of the FMS?
Pilot: No, I would say no, but having the computer program, which I guess I pushed as well, has made it a lot easier. People want to have data, or graphs or scores – whatever you want to call it. With the program, we can produce information. Initially, we were cutting and pasting it, putting it into the FAID program, but we can produce graphs and scores or whatever for people like yourself to look at and study.

Interviewer: Great. Are the pilots pretty interested in that as well?

Pilot: Some of the are, some of them aren’t. At the end of the day, they just want to be left alone to get on with the job.

Interviewer: I’m sure I’d probably be pretty similar!

Pilot: Yep. And I think, when they designed the FAID – as [the chief pilot] said – we might know a little bit about computers, but it’s not really I don’t know – there’s a real market out there for someone that’s good at software, that can combine both. I mean, I’m not computer literate, but I’ve got a compute log book – and I find that quite easy to do.

Interviewer: Does the FMS have a positive or negative impact on general work life?

Pilot: Its hard to say. Aviation in general has a negative impact on…oh, sorry, on work life…positive, yeah, it works well for us.

Interviewer: We will talk about social life in a minute. Have you noticed any major company changes in operations since the implementation of the FMS?

Pilot: Yes and no. There’s two companies here, [company names].

Interviewer: Do you fly for both?

Pilot: Yeah. Fly for both. Because its owned by the same guy and just get different names. Sometimes on Wingaway you can get really long days because you’d just be out picking up and dropping off patients, and never see [location] for a whole day. Sometimes you have to put your foot down, and say ‘look, I’ve had enough’. ???

Interviewer: So what’s the changes you’ve seen in it? J ust more flying?

Pilot: Yeah. They’ll give you longer days, they won’t push it, they know they’ve got it there that they can go to it if they want. There hasn’t been a whole lot of changes or big changes, we still do fairly similar work, but it just means that…especially [company]…there’s still two chief pilots, [the chief pilot] the chief pilot of [operation]and there’s another chief pilot of [operation], so I work under [operation]. [Operation’s] not on the FMS, they’re not interested in it at all. Only because of personal opinion I mean, he just doesn’t want to work that hard. For [operation] pilots we can work as hard as we like and as long as we like, and its good, I like it, ??? I can’t account for circumstances, but they might specifically send an [operation] pilot on a [operation] job because they know it could be a long day ???

Interviewer: To what degree has the FMS impacted on you work duties?

Pilot: It hasn’t really changed. I’m still doing the same work.
Pilot 7

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life?

Pilot: On general work life. I’d say it should be positive, I’d say its positive. I think there’s people out there in the organisation who think its maybe negative. I think some people out there would view FMS as a way that management can screw them around, but when the FMS was first on the cards there were a lot of people who thought that FMS was a way that management are going to get to us, and I think that a lot of those hard-liners have started to come around and see that its not quite as bad as they first thought. In fact, maybe there are some positives to it.

Pilot 8

Interviewer: In your opinion does the FMS have a positive or negative impact on general work duties?

Pilot: It would be positive.

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot: Its been pretty well the same as it was previously.

Interviewer: Just an extra day a week...

Pilot: In the sense that I’ve got a regular day off a week as well, plus there’s a lot less that I do at home these days, so I just check it out on the computer and do some minor stuff there as well as duty manager on my duty so doing less there which is good, you can concentrate on your flying.

Interviewer: Have your hours of work changed?

Pilot: ??? CAO48 have increased, but no, about the same. In fact, probably less because I don’t do the duty managing stuff at home anymore.

Interviewer: Less.

Pilot: This is pre the CAO48.

Interviewer: Do you have any extra time off, or less time off generally?

Pilot: I’m getting more time off really, because I get the set day off a week and I occasionally get a second day which seems to be occurring a lot more.

Interviewer: Have you had any changes in salary?

Pilot: I’ve negotiated another... not because of the FMS, in fact I think while the FMS was being negotiated last year and rostered on five days, salary I’ve negotiated another two year contract and increased the salary.

Interviewer: Good for you. To what degree has the FMS impacted on your work duties?

Pilot: Just more aware of the reasons why you feel fatigued...

Interviewer: Has it made any more work for you paperwork wise...

Pilot: No, actually less.

Interviewer: So, slightly?

Pilot: Yeah, slightly.

Interviewer: So no extra paperwork involved?

Pilot: No.
Pilot 9

Interviewer: In your opinion does the FMS have a positive or negative impact on general work life?

Pilot: ??? With CAO48 you always consistent with watching what your times were so it was a bit more work in that area. FMS ???

Interviewer: ??? workload??? Have you noticed any major company changes since the implementation of the FMS? In operations? Longer hours?

Pilot: Yeah, there can be longer hours in some runs, but with the runs I’ve been doing ??? every two to three weeks I’ve been able to have a couple of days off, with the FMS you’d get ???

Interviewer: Have you noticed any changes relative to before the FMS started as far as your alertness at work goes?

Pilot: No, not really.

Interviewer: Hours of work?

Pilot: With my previous run when I was living out in [location] yes, I wasn’t required to take any days off, with the run that I’m doing now, ???

Interviewer: To what degree has the FMS impacted on your work duties?

Pilot: I’d say slightly, on my current work duties.

Interviewer: Just in the admin, or…?

Pilot: Admin, yeah. Its really ???

Pilot 10

Interviewer: In your opinion, does the FMS have a positive or negative impact on general work life?

Pilot: positive

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot: Nope, nope – any...?

Interviewer: major company changes

Pilot: No, probably not. I mean, just with rostering and crew as well. Just because pilots are limited to the system, it means they can’t really do crew work before we implemented this system. I mean, if we weren’t flying, we’d probably crew – or we’d drive a bus. But I mean, now that impacts on the whole duty time. Yeah, so we don’t do that anymore – I don’t drive buses

Interviewer: So, they had to hire more people?

Pilot: Yeah, it’s actually good, because it gives our crew more work. Most of them would have in the past – crew work was unreliable right – and some guys would get work for 3 weeks in a row, and then not get anything for a couple of weeks. So yeah, they don’t tend to hang around a lot when they’re working under those sorts of conditions. So yeah, it’s pretty hard to keep...

Interviewer: there’s a bit staff turn over

Pilot: Yeah, yeah – but people are getting regular work now, and pilots are just sticking to the roster.

Interviewer: Let’s go to the next circle answer. To what extent had the FMS impacted on your work duties? Has it increased your duties, decreased, not impacted at all?

Pilot: Well, it’s probably slightly. I mean, I’ve got to do 15 minutes paper work instead of 13 minutes paperwork. So...
Interviewer: Did you have to keep a log of work hours before the FMS?

Pilot: Yeah – that’s always been the case.

Interviewer: So what extra stuff do you have to do?

Pilot: Um, probably don’t actually, because we still fill in the same forms – the flight and duty times, so it’s pretty much the same. We’ve got um – there isn’t much actually. We do have the other form, which has got to do with the roster – but it doesn’t really mean I have to do anymore paperwork – I have to fill in the same flight and duty times. Same thing – oh yeah – there’s just the one on the computer. That’s pretty much just a double up of the one I have to do in my folder.

Interviewer: In your opinion, does the FMS have a positive/negative impact on general work life?

Pilot: Positive. But, it’s running along the old exemptions at the moment

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot: No, nothing major - if we were running solely under it, we’d have some changes. I’d expect to see no changes initially, but it would be hard to say - I can’t speak for management.

Interviewer: To what degree has the FMS impacted your work duties?

Pilot: Not at all

Interviewer: In your opinion does the FMS have a positive or negative effect on general work life?

Pilot: Very positive.

Interviewer: Have you noticed any major changes since the implementation of the FMS?

Pilot: Probably not qualified to answer that, I was certainly... I think there have been some changes but I don’t think I’m as qualified as the others to answer that.
Interviewer: To what degree has the FMS impacted on your work?

Pilot: Yeah, it's definitely had some impact. I wouldn't say it's completely altered everything because I still have work to do after I leave here, so it hasn't altered that... impacted... I have to be very careful about when I finish, so yes there is an impact and I don't work the entire day, so yeah alright.

Interviewer: And that's just because you're not working as much?

Pilot: Yeah.

Interviewer: Do you find that you get the work done that you need to?

Pilot: Yeah, I do. But I take stuff home, it's a case of having to be very vigilant in time management, whereas previously I might have got home, lounged around for an hour or so, and then done some, whereas now I'm making sure my day is well and truly broken down into OK, I'm going to do this now, I'm going to get such and such, sleep between this time and such and such, and then from then on the time is my own, so its made us a lot more aware. And that's had benefits as far as our families as concerned as well. I'll change that to... I'm going to circle that as well...

Interviewer: Some?

Pilot: Yeah. And the reason I'll say that is because the phone still rings. I can't tell the office that works nine to five, don't phone me, the phone is going to ring, if someone gets a problem they need it answered, but if its anything that turns into a lengthy something or other, I'll say well I'll have to deal with that tomorrow. And put it off until then. It doesn't happen very often but they don't like that. So yeah, it has impacted on work duties to a certain extent but not completely.

Pilot 14

Interviewer: In your opinion, does the FMS have a positive/negative impact on general work life? Please circle one:

Pilot: Negative. And that's because of both lack of understanding, and poor implementation

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot: If the FMS had been implemented, there would have been changes to the rostering protocol - longer shifts and more of them.

Pilot 15

Interviewer: In your opinion does the FMS that you are currently working to have a positive or negative impact general work life compared to CAO48?

Pilot: I guess it would be positive.

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot: Yes.


Pilot: OK. Well it does relate to it or not... two pilots were laid off...

Interviewer: They were then marked... they were then marked as the people who were working the night shift?

Pilot: That's right. That's the other issue that complicates that. Those three pilots are the smaller aircraft. Its because EMS is a 24 hour contract, so we have to keep someone on there 24
hours a day, and it was simpler under 48, well not 48 of course, it was simpler when we had two pilots because they just split the shift, but now he's on there for 24 hours a day. So you can imagine if he gets a call out, well, it's a minimum two hour shift but he has to go and sit on an island for four hours while he waits for someone, with snakebite, he comes back, he must have four hours break to help his score along and then he goes out and does a flight at two in the morning which is the most dangerous time for FMS, he's extreme, and the very next day you know you may have to put him onto charter if he's had enough rest, so give him a break.

Interviewer: So there's been pilots laid off, have there been any other major company changes? Operationally maybe?

Pilot: Yeah, operationally. It's become more difficult because the same problems with those.

Interviewer: What's become more difficult?

Pilot: The management of those three pilots. It takes constant management.

Interviewer: Where are those ones based at [location]?

Pilot: Yes.

Interviewer: Have you found there's been more administration duties as well? Has it increase your workload a lot?

Pilot: Yeah.

Interviewer: How much time would you spend on FMS related activities?

Pilot: I guess 48 versus FMS, probably double the amount of administration. Basically because the application itself, because it's such a long winded application so at the end of the month I put all those figures together, I keep a copy of the sheets up there month by month by month, and then I email the other ones to Barry. It could be simplified, I mean we could put it on a network then that would take the email side of things out but it's the actual calculating of the numbers and copy, paste.

Interviewer: To what degree has the FMS impacted on your work duties?

Pilot: Some.

Interviewer: How?

Pilot: Again it makes you more vigilant. From my point of view in administration I normally do, I know I have to get it done but if I have to fly then I know I need to rest, to sleep before I fly.

Interviewer: So more responsibility?

Pilot: Yeah, it makes you more vigilant I think.

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Interviewer: In your opinion, does the FMS have a positive or negative impact on general work life?

Pilot: I'm in two minds. Positive and negative.

Interviewer: How so?

Pilot: You look at the shift work, what it does to families and work and that, and you know you might do 48 hours on but if you fly in the wee hours of the last 48 hour period and you've got to have two days off and then come back on for standby you can lose one of your days off, so you really only have a night and a day off and then you're on standby, and on standby you can't really have quality time at home even though you're at home because you always listening out for the phone to ring to come in to work. And yet it is positive because you're paid appropriately for the shift work.
Interviewer: So the FMS itself, as opposed to the last dispensation?

Pilot: I think its got to be positive. It outweighs the negative by the positive.

Interviewer: Have you noticed any major company changes since the implementation of the FMS?

Pilot: Not so much in my time here, I've only been here eight months.

Interviewer: So it was in place when you got here?

Pilot: Yes, but knowing the dispensation they were working under was a general contract provider, so countrywide dispensation, yeah, big changes, as in, again, even though its here they still go back to the old dispensation of flying hours and such, so it works in good with each other. I think for the positive as well.

Interviewer: To what degree has the FMS impacted on your work duties? Has it created any more or less work?

Pilot: Slightly.

Interviewer: How?

Pilot: I suppose slightly only because its new to me in that you get so used to one thing and then when change comes it just takes a little bit longer.

Interviewer: So its really mental processing of it?

Pilot: Yeah, exactly.

Interviewer: Has it increased your administrative work?

Pilot: No.

Interviewer: No more paperwork?

Pilot: No.
**APPENDIX R: POLICY STATEMENTS:** PERCENTAGE FREQUENCY COLLABORATION WITH COMPANY SKY ONE SECTIONS (1 = SAME; 2 = SIMILAR; 3 = INDIVIDUAL; 4 = OMITTED)

| COMPANY SKY ONE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| Page dimensions: | 595.0x841.0 | | [114x664] | APPENDIX R: POLICY STATEMENTS: PERCENTAGE FREQUENCY COLLABORATION WITH COMPANY SKY ONE SECTIONS (1 = SAME; 2 = SIMILAR; 3 = INDIVIDUAL; 4 = OMITTED) |
### APPENDIX S: PERCENTAGE FREQUENCY TABLE.

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<tr>
<th>Fatigue Score</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
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<td>0</td>
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<tr>
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Appendix S: Percentage Frequency Table. Shows the FAID fatigue score along the horizontal lines, and the percentage fatigue score frequency for each operation along the vertical lines. That is, the percentage frequency of shifts that occur at each fatigue score.