Night Vision Imaging Systems – Trial Monitoring & Evaluation Project
Draft Meeting Notes

Date: Wednesday 19th & Thursday 20th November 2008
Time: 0900 - 1700
Location: Wrest Point Casino, Hobart

Attendees:

Yvette Lutze  Civil Aviation Safety Authority
John Beasy  Civil Aviation Safety Authority
Matthew Wallace  Civil Aviation Safety Authority
Charles Lenarcic  Civil Aviation Safety Authority
Bill Cox  Civil Aviation Safety Authority
Julian Smibert  Civil Aviation Safety Authority
Leanne Graham  Civil Aviation Safety Authority - Secretariat
Olivia Clark  Civil Aviation Safety Authority – Event Co-ordinator
Mike Becker  Becker Helicopter Services Pty Ltd
Lynton Beggs  Northern Region SLSA Helicopter Rescue Service Pty Ltd
David Donaldson  Independent Consultant with CASA
Roger Corbin  Skyplan Australia trading as Rotor-lift Aviation
Terry Summers  Skyplan Australia trading as Rotor-lift Aviation
John Boag  Skyplan Australia trading as Rotor-lift Aviation
Rohan Armstrong  State of Western Australia trading as Commissioner of Police
Mike De Winton  Southern Region SLSA Helicopter Rescue Service Pty Ltd
Chris Jameson  State of Victoria trading as Victoria Police Air Wing
Mike Tavcar  State of Victoria trading as Victoria Police Air Wing
Brent Hall  Sunshine Coast Helicopter Rescue Service Ltd
Andrew Caton  Sunshine Coast Helicopter Rescue Service Ltd
Creagh Mecham  Sunshine Coast Helicopter Rescue Service Ltd
Tony Preston  Sunshine Coast Helicopter Rescue Service Ltd
Matthew Fryer  Australian Helicopters Pty Ltd
Ross Birch  Australian Helicopters Pty Ltd
Scott Wetherall  State of NSW trading as NSW Police
John Hurley  State of NSW trading as NSW Police
Steve Piech  CHC Helicopters
Richard Blackwell  AMSA Search and Rescue
Jeff Martin  State of QLD trading as Department of Emergency Services
Peter Johnson  Australian Helicopters Pty Ltd
Jeff Konemann  Careflight NSW Ltd
David Mann  Careflight NSW Ltd
Bo Conneryd  Norwegian Air Ambulance Service
Steve Kern  NZ CAA
Scott Laing  NZ CAA
John Fogden  NZ CAA
Rod Newnham  ATSB
Observers:
Paul Casley  AVINCORP
Neal Fennell  EIR Engineering
Grant Withers  Garden City Helicopters NZ
Peter McKenzie  Australian Aerospace
Steve Archer  TAS Search and Rescue
Andrew Riches  Careflight
David Bashir  Careflight
Darrin Smith  Greenlip Enterprises Pty Ltd

Apologies:
John Grima  CASA
Greg Vaughan  CASA
Mike Atwood  Aviation Specialities Unlimited
Christine Atwood  Aviation Specialities Unlimited
Kim Harris  Aviation Specialities Unlimited
Roger de Souza  Helicorp Pty Ltd
Steve Graham  Helicorp Pty Ltd
Wayne Herman  Helicorp Pty Ltd
Tim Morgan  Australian Federal Police
Chris Shaw  CHC
Graeme Gale  Helicopters Otago (NZ)
Dave Kershaw  Heliworks NZ
Richard Hayes  Southern Lakes Helicopters NZ
Simon Duncan  Garden City Helicopters NZ
Paul Steane  TAS Search and Rescue
Day 1: 19 November 2008, 09:10 start.

1. Welcome, Housekeeping and Apologies. – Yvette Lutze CASA

Yvette Lutze welcomed attendees particularly those from overseas. Yvette introduced a new member of the CASA team, Matt Wallace who is assisting with flying operations. She then introduced other CASA persons in attendance. The NVG Trial is nearing completion with a number of operators using NVG and a number preparing applications for CASA approval to use NVG. The trial concludes at the end of December 2008 with charging commencing for any applications received on or after 01 January 2009. She advised that this is the last meeting scheduled for the trial; however there is the possibility of future CASA / Industry meetings regarding NVG. Yvette asked that all give support to Dave Donaldson for the CASR 133 and 138 projects he’s working on. The future and frequency of NVG meetings will be discussed during this meeting with the possibility of having the NVG meetings directly after any future CASR Parts 133 and 138 meetings.

Yvette handed over to John Beasy who once again thanked attendees for their involvement and presence and looking forward to talking about the significant changes to be discussed over next two days. John advised industry that at the conclusion of the trial, the team will still be in place in CASA to assist industry and facilitate approvals etc.

2. NVG Post Trial Process Brief – John Beasy CASA

John Beasy briefly outlined where the legislation is up to and advised that the working group will be given the opportunity to provide input to changes relating to CAO 82.6 and CAAP 174-1 during the meeting.

John advised that in the terms of reference for the NVG trial, consideration was to be given to the possibility of expanding operational use of NVG into limited private operations, charter and aeroplanes. This process will be driven by industry demand and also whether CASA will have the resources to put into this process.

3. CAA NZ Presentation – John Fogden NZ CAA

No presentation was given as such. John introduced the other members of the team and gave a brief update of what New Zealand are doing with NVG operations. He also advised that New Zealand CAA has taken great interest in what has been happening in this project.

John advised that the NZ CAA was obliged to take a different direction to CASA, relying heavily on industry adherence to the published Advisory Circular, while legislation is amended to account for NVG Ops. This process has worked well to date but there are still small issues to be resolved. New Zealand currently has 12 EMS operators operating 20 aircraft who have had
exposure to NVG operations. Approximately 14 of these operators are using NVG on a regular basis.

New Zealand have concentrated on getting exposure in the flying operations side of things but not as much on airworthiness side of things as yet such as cockpit lighting, STC’s and general airworthiness. This is now the focus of attention.

One operator has logged 800hrs on civilian time with NVG so far.

New Zealand has been fortunate with no incidences occurring so far, relying on the AC and the rules program but are still waiting for legislation to go through.

NZCAA and CASA have been working together to provide input on some issues. Charles Lenarcic from CASA has assisted NZ on the airworthiness side which has assisted some operators.

NZ have a restricted 145 certificated organisation to carry out maintenance on the ITT goggles.

Some organisations mentioned they have experienced issues with obtaining parts and there is an international embargo on obtaining parts which is becoming an issue. Roger Corbin from Rotorlift advised they have limited supplies and are happy to help out where they can.

4. CASR Part 133 update – Dave Donaldson

David Donaldson provided a presentation of progress on the rotorcraft regulations project. CASR Parts for Rotorcraft will be split into the following:

- Part 133 – Passenger Transport Services;
- Part 134 – addressing participant flights; and
- Part 138 – Aerial Work activities.

The CASR Part 133 project team is allocating priority to developing Drafting Instructions and an NPRM for CASR Part 133 Passenger Transport Services – Rotorcraft. The development of standards for this Part is being progressed through a documented Risk Assessment process in accordance with CASA's Risk Management Framework. A similar Risk Assessment process will be conducted for aerial work activities, to identify the baseline risk levels and establish appropriate risk treatment strategies for these operations. These risk treatment strategies will form the basis of the standards to be established in Part 138. Detailed work on Part 134 will commence once Drafting Instructions and an NPRM for Part 138 have been completed.

5. Human Factors debrief – Bill Cox
Bill gave a brief overview of fatigue covering both the mental and physical aspects and how this is associated with night operations generally.

NVG could lead to:

a. Mental Fatigue – exposure to doing more night ops, and

b. Physical Fatigue – cognitive requirement and physical attributes of the technology

Upcoming changes to CAO 82.6 from a Human Factors / Fatigue perspective include the following:

• No more reporting – Operators should have their own internal reporting system. CASA will audit against practices in document

• The introduction of FRMS is expected mid next year. There is a two (2) year rollout planned before it becomes mandatory. It is expected that there will be no change to operators that have contemporary FRMS existing systems

• With the introduction of FRMS, Operators conducting late night operations will be required to have a FRMS program

• The CAAP 174-1 has been revised to include FRMS and associated guidance material

6. NVG Flying schools lessons learnt – Roger Corbin

Roger welcomed everyone to Hobart and advised that he was looking to hosting dinner at Rotor-lift which would give everyone the opportunity to have a look at the Rotor-lift facility. Roger also thanked CASA for supporting having the meeting in Hobart.

Rodger advised that in running an operation requiring DVFR, NVFR and IFR operations, NVG have proven to be the biggest safety mitigator in their safety management system. Pre-NVG operations in mountainous areas were dangerous. Workload and stress levels for pilots have been reduced using NVG.

Rotor-Lift fully supports CASA’s implementation of FRMS.

Several CASA people have attended NVG training at Rotor-Lift Helicopters and assisting in developing procedures and input into what Rotor-Lift Helicopters are doing with NVG.

Rotor-Lift has also had the opportunity to meet with New Zealand operators to see what they are doing with NVG.
A number of Issues have been identified and lessons learnt in NVG training so far including:

- 5 hrs in 4 flights – pertinent that they go through goggles for 5 hrs but not necessarily in 4 flights. Need adequate time to do cross country training to really use navigation skills.

- Modern technology such as GPS makes navigation easy. However when a pilot is required to conduct a NVG flight without GPS the workload increases substantially. Prior to commencing NVG training pilots need to be proficient with basic navigation skills.

- Making sure pilots are still using white light when using goggles. Below 300ft light use is mandatory with Rotor-Lift for safety purposes.

- Have an extra currency check for multi engine pilots not flying on single engine aircraft for a while to keep up to date when using NVG.

- Focus on emergencies – battery pack failure was the biggest one. (Pilots need at least 10 hrs helicopter instrument flying skills if goggles are not working- IFR currency is very important).

- Landing when one tube has failed and the other is still serviceable. When emergency training is conducted it is important to teach candidates how to land on a single tube.

- Lighting aircraft issues:
  - Need to ensure setup of backup lighting for cockpit.
  - Landing lights – have been getting only 50/60hrs out of standard lights.
  - Anti-collision light is off with goggle operations with Rotor-Lift as company procedure. Nitesun is useful and still used, especially in SAR operations.

- Keep operational procedures the same especially when goggles fail – It is important to keep standards.

- Night VFR rating currency is essential.

- FRMS – protection of night vision of pilots and general fatigue management is essential.

7. **NVG Airworthiness issues – Charles Lenarcic**

Charles gave an overview of airworthiness issues that have been of concern to date.

CASA has looked at the airworthiness side of NVG and has always been of the view that the systems installed on aircraft need to be adequate for the operations being performed. This has meant that an outcomes based was
preferred as a prescriptive approach to the design and implementation was not appropriate.

*Aircraft modification standards:*

The standard described in RTCA/DO-275, supplemented with MIL-STD 3009, described what was required to achieve cockpit compatibility for the use of NVG. Each organisation has a different operational need as well as economic constraints that will affect the modification design. The decision has been left to designers, in consultation with both the aircrew and CASA as required, to enable a cost effective solution that meets the needs of the organisation and is compliant with the standards identified.

*Continuing airworthiness of aircraft:*

All aircraft must be modified under either a STC or CAR 35 approved Engineering Order. Explicit statements need to be included in the organisations Operations manual to ensure that minor changes, such as replacement of light globes or other light sources, may change the aircraft configuration to non-NVG compatible. This is a modification and therefore must be approved under CAR 35/36. Maintenance personnel need to be aware that quick fixes implemented to facilitate an urgent mission may effect the NVG operational approval.

*Equipment being used with Aircraft:*

At present ITT, a US based equipment manufacturer, is the only NVG that has been accepted for use in Australia. As this equipment meets the specification detailed in CAO 82.6 and is in relatively common use in Australia, it is being used as the base-line standard for evaluation of other candidate equipment. There have been applications by other vendors for the use of other NVG in Australia. To enable NVG utilising different technology to the US sourced items, the evaluation is based on a comparative overall performance assessment. To date no other NVG equipment has been approved. Ongoing evaluation will continue pending applications from prospective vendors and this may will include flight and ground tests to make sure equipment can be assessed as equivalent.

Charles asked that any operators report any findings with modifications not being satisfactory for any reason. This would provide a history of common errors/design decisions that could be used to assist other operators/designers in the future.

8. **Presentation WAPAW**

Rohan gave a presentation of what WA Police Air Wing have been doing with NVG.
The FLIR / NVG Project commenced in February of 2005 and funding was received from the Government for equipment at the end of 2005. The first two sets of NVG's arrived in November 2007. Training commenced in March 2008 once CASA approval had been granted.

To date, WA Police Air Wing has done 150 hrs with NVG.

Training was conducted with Rotor-Lift for 3 pilots and 6 aircrewman. Outcomes from training – line qualified for law enforcement, SAR (including winching) straight away. Currency requirements for WAPAW include:

- HLS basic once a month
- NVG winch once/month
- Fast roping as required

WA Police have found that NVG work well over metropolitan areas. NVG also combines well with FLIR/Moving map and laser illuminator. Benefits of NVG include:

- Dark areas no longer dark i.e. parks, golf courses - good for searching for persons
- Gives better light of people wearing reflective vests
- Clouds are visual and easily avoided
- Aircraft easily seen (traffic avoidance)
- Operational flexibility
- Better vision for rain showers and can avoid
- Fatigue hasn’t been an issue as they are used to flying up to 4 hrs night as the norm, so NVG making less tiresome and stressful

Rohan then gave a video presentation of actual operation using FLIR and NVG for law enforcement operation.

9. Presentation — Bo Conneryd Careflight (Norwegian Air Ambulance Service)

Bo Conneryd gave a presentation of the Norwegian Air Ambulance Service summarised as follows:

- Bo advised the group that had 6500 hrs with NVG and have done 8000 EMS/SAR missions with NVG.
- All SAR helicopters in Norway are military aircraft; winching operations are performed by military only.
- Norwegian Air Ambulance does underslung missions, over water close to shore and over land in terrain where access to patient is difficult (forest, mountains etc.). They are conducted with a fixed rope connected to the paramedic and can do lift with patients in a pick up harness or a stretcher.
- Paramedics are also taught PPL theory so they become a crew member on missions.
• NVG started in Norway in 1996 after fatal accident with EMS operation.
• Safety committee working group was set up and looked at safety plan incorporating Moving map, simulator, NVG, training, RNAV and improved CRM measures.

• No time limitations on using NVG operations – normal flight duty times

Main challenges found were with distances, terrain and weather.

Personal experiences with NVG:
• Improves safety
• NVG operations are conducted using old Night VFR procedures
• Individual training
• Human perception remain the limitation
• Training as well as missions – also training forums on missions experienced

10. Issues Register and evolution of final legislative framework

10.1 Issues Register Review

Discussed open issues within register and updated accordingly (refer attached Issues Register).

Day 1 meeting closed: 1700

Day 2: 20 November 2008, Start: 09:00

1. Continuation of Issues Register

1.1 Issues Register Review

Discussed open issues within register and updated accordingly.

1.2 Meeting Closure – John Beasy & Yvette Lutze CASA:

John Beasy closed the meeting.

NVG has been an ongoing issue for people internally and externally from CASA for many years. In late 2006, CASA’s NVG project halted and was forced to look at CASA’s resources to do this project. Yvette then volunteered to take on the project and has contributed to the success so far.

Yvette thanked all for their support over last few years on the project.

Meeting closed 1400