ANNEX C TO AC 138-05 V2.2

Sample risk assessment process - aerial work certificate holder operating in an aerial work zone (AWZ)

Sample risk assessment process - aerial work certificate holder operating in an aerial work zone (AWZ)

This sample presumes that the operator has followed the guidance in the AC in constructing their risk assessment and mitigation process and has appropriate operations manual content to support the process. They are also assumed to have a relevant type of aerial work operation pre-operational risk assessment which has been populated with dedicated risk assessment data for this type of operation and a separate risk register.

This example will demonstrate one method of how an operator can carry out the AWZ-RA process. This example includes sample forms used by the operator.

Scenario

The sample below considers an operator intending to conduct a sling load (air conditioner) operation to the rooftop of a shopping centre, located in a residential and commercial area in a capital city suburb. The air conditioner will be lifted from the back of a truck in the shopping centre carpark and moved into position on the roof.

The aircraft will land in the carpark to attach the sling and commence the lift. Personnel on the ground in the parking lot and on the roof will assist in positioning and placement of the load. These personnel are a mix of contract riggers and operator employees.

Operations Manual processes

The operator's operations manual has a Risk Assessment and Management process conforming to the RA process overview as outlined on page 5 of the CASA SMS-3 booklet.

There is a supplemental section for conducting the AWZ-RA process. This annex deals with the specific AWZ-RA processes.

Portion of the operation not covered by the AWZ-RA

The transit to and from the helicopter base of operations to the carpark is not covered by the AWZ-RA as no aerial work is being conducted on the positioning flight. The approach and landing at the carpark can be conducted in accordance with the requirements of paragraph 91.265(4)(a) of CASR and section 12.01 of the Part 91 MOS.

AWZ-RA process steps in detail

Risk Register (Part 138 MOS subparagraph 13.07(1)(d)(i))

This operator is assumed to have carried out operations of this type previously and has pertinent data from these previous operations and has updated their pre-operational risk assessment as necessary.

Type of operation pre-operational risk assessment - Part 138 MOS sections 13.06 and 13.07

In this example the operator has carried out the type of operation before, so this assessment has been updated for the current operational circumstances.

Operations in an AWZ introduce new dimensions to the hazards that need to be identified and the risks they pose. Possible matters for consideration for any AWZ operation include but are not limited to:

- Transit and approach and landing over a populous area to an AWZ.
- Likely confined areas with urban obstacles.
- Security of landing site including persons and items that could cause foreign object damage (FOD.)
- Possible spectators.
- Buildings generating unexpected wind effects, glare, shadows etc.
- Any other hazards.

Task specific risk assessment requirements

The HOO or their delegated risk assessor reviews the data in the risk register, refers to the pre-operational risk assessment and then considers the specific circumstances of the proposed operation. In this example, the type of operation may be the same, however many circumstances will be different or unique to the task.

In relation to this example, possible new factors relating to this operation may be, but not limited to:

- The specific details of the site in relation to the proximity of persons, infrastructure, and the suburban location of the carpark.
- Security in a busy area.
- Aircraft type and performance characteristics particularly in relation to engine failure scenarios in relation to the load.
- Pilot qualifications, training and experience in relation to heavy loads.
- Behaviour of ground crew not under the direct control of the operator.
- Any other factors.

In this instance it is assumed that at least some of these factors are particular to this sample task and are new to the operator. Identification of and assessing these risks will be more complex considering the expanded hazard dimension for a task in such a location.

Subsequently, the HOO will determine if any of the risks identified in the specific circumstances of the operation result in unacceptable risk.

Mitigation and risk controls

If the HOO or their delegated risk assessor determines that any element of the intended operation may pose an unacceptable risk, a mitigation strategy and appropriate risk controls are developed in accordance with operations manual processes. These risk controls are then used to generate the flight risk management plan.

Dependant on operator policy, any unacceptable risk identified will require operational safety management peer review to confirm the effectiveness of mitigation strategies and risk controls.

A sample document with a combined pre-populated pre-operational risk assessment and task specific risk assessment data and mitigation and risk controls is provided at Table 1.

Flight risk management plan

The HOO or their delegated risk assessor prepares this plan using an operations manual template. It clearly outlines the risk controls that are to be employed during the proposed operation. The flight crew refer to the plan at the pre-flight risk review stage and whilst conducting the operation.

Since the flight risk management plan cannot anticipate all hazards and their corresponding risks that may emerge during the operation, the pilot(s) and other crew members continuously monitor the conduct of the operation and act accordingly to mitigate any risks that may reduce the level of safety of the operation.

Due to the nature of the AWZ activity, it is likely that the plan would be more elaborate than a basic plan designed for a simple aerial work activity. Additional preparation time should be provided for the pilot and ground personnel become thoroughly familiar with the plan and their respective role in the operation.

Pre-flight risk review –(pilot) - Part 138 MOS subsection 13.07(2)

Prior to commencing the operation, the pilot refers to the task's risk assessment and the flight risk management plan and carries out a pre-flight risk review on behalf of the operator.

For the AWZ case in this sample, the circumstances at the site of the operation could be quite dynamic due to the public nature of the carpark and shopping centre, coupled with the urban setting. As the aircraft needs to position to the site, inputs from on-site personnel may be required to inform the pilot of an up-to-date situation and changing conditions. Examples of what may change rapidly include, but is not limited to:

- local wind conditions
- vehicular and human traffic conditions
- security of the site
- any other dynamic factor.

In this instance, direct communication with an appropriate person at the site would be essential to ensure timely transfer of critical information.

The operator should establish in their risk assessment processes, a policy where the pilot and crews are able to easily obtain additional safety advice from the operator's operational safety management personnel during this phase of the risk review.

It may be prudent to set limits for physical and environmental conditions so that abort decisions can be actioned efficiently as required. This may take the form of wind velocity/temperature limit, fuel state etc.

In this case the sample operator utilises a free web-based app available from the aircraft manufacturer for their pilots to conduct pre-flight risk review. The app has been customised

to the operator’s operation to set certain limits with operational parameters to the pilot to assist in a go/no-go decision whilst on-site.

Post flight review - Part 138 MOS subsection 13.07(3)

After the operation is completed, the pilots conduct a post-flight review of the operation. This is to determine the effectiveness of the risk controls that were implemented and to identify and record any new or recurrent hazards and risks.

In this case the sample operator utilises the same free web-based app for their pilots to conduct this post flight review for incorporation into the risk register of any new hazards as required.

This information is entered into the risk register by the HOO and the type of aerial work operation risk assessment is updated as necessary.

Submission to CASA

Many operations of this nature require CASA approval of the AWZ-RA. CASA may require supporting documentation to determine if the operator’s risk assessment and mitigation process as described in their operations manual has been carried out correctly. This documentation may include, but is not limited to:

- Sufficient task details to allow CASA to gain context about the AWZ.
- Aerial maps of the AWZ showing locations of obstacles, inbound and exit routes and emergency landing areas if applicable.
- Aircraft performance information if relevant.
- Forms and documents required to be completed by the operations manual.
- A copy of the operator's combined pre-operational and task specific risk assessment with updated data for this task.
- Completed flight risk management plan.
- Communications from the operator to the flight crew concerning risk controls.
- An accident or incident plan.

A CASA assessor would not normally undertake their own separate risk assessment of the hazards and risks, nor would they approve or disapprove of the risk controls that an operator has chosen to incorporate in a plan. The CASA assessor will review the documented processes submitted, the proposed risk controls in the context of the likely hazards to determine if the operator’s rigour around the process is commensurate with the risks and that safety can be reasonably maintained during the conduct of the operation. Therefore, it is reasonable for the operator's submission for an AWZ-RA assessment to be quite detailed regarding these items.

Table 1: Risk assessment form – risk assessment and risk controls

Sheet 1 – sling operation to and from carpark and shopping centre roof

TITLE:	**Sling load at shopping centre**					**Assessor:**	**Date:**		
Proposed operation: Lift an air conditioner from a carpark onto an adjacent shopping centre roof utilising AS350 aircraft									
Hazard	**Initial evaluation**			**ALARP?**	**Accept or treat?**	**Risk control**	**Final evaluation**		
	Likelihood	**Consequence**	**Initial Risk score**				**Likelihood**	**Consequence**	**Final Risk score**
1. Local wind or weather conditions may limit available take-off and positioning flight path and aircraft performance leading to reduction in safety margins during the lift.	Occasional	Hazardous	4B	No	Treat	• Experienced observer to communicate with pilot on changing conditions. • Pilot familiar with pre-determined acceptable flight paths and go/no go criteria.	Remote	Hazardous	3B
2. Selected aircraft cannot maintain height with the load in the event of an engine failure - loss of aircraft and crew and possible serious injury or damage to persons or property.	Occasional	Hazardous	4B	No	Treat	• Limitations on wind/density altitude to be applied. • Fuel load to be minimum. • Emergency landing area and work site quarantined during lift and limited to essential persons. • Load jettison system functionally checked prior to lift.	Remote	Hazardous	3B
3. Ground crew not under control of operator unfamiliar with aircraft operations with possible rotor strike and possible serious injury.	Remote	Hazardous	3B	No	Treat	• Ground crew provided with CASA safety around helicopter information. • Ground crew quarantined from landing site prior to safety briefing. • Pilot to brief ground crew at the aircraft to ensure appropriate awareness.	Improbable	Hazardous	2B
4. The helicopter approach and landing causes serious distraction to vehicle drivers on the surrounding roads and a major traffic accident occurs leading to injury or fatality.	Occasional	Hazardous	4B	No	Treat	• Gradient wind dependent, the approach and departure direction is to avoid Victoria St and Burnley St. • Should wind direction require approach over major roads, traffic control procedures to be implemented for approach and departure from AWZ. • Steep approach angle to be used to minimise distraction to drivers. • Approach and departure times to avoid peak hour traffic.	Remote	Hazardous	3B
The helicopter landing area is not protected and an individual approaches the turning aircraft (main and tail rotor) leading to serious injury or fatality.	Occasional	Hazardous	4B	No	Treat	• Appropriately trained persons to be located at LZ to ensure landing area is clear of persons and remains clear during aircraft approach and departure. • LZ controller to establish radio communications with aircraft prior to arrival and departure.	Remote	Hazardous	3B

TITLE:	**Sling load at shopping centre**					**Assessor:**	**Date:**		
Proposed operation: Lift an air conditioner from a carpark onto an adjacent shopping centre roof utilising AS350 aircraft									
Hazard	Initial evaluation			ALARP?	Accept or treat?	Risk control	Final evaluation		
	Likelihood	**Consequence**	**Initial Risk score**				**Likelihood**	**Consequence**	Final Risk score
The helicopter landing area is not cleared prior to landing and loose objects on the ground are blown into structures or persons leading to property damage or serious injury to persons.	Occasional	Hazardous	4B	No	Treat	• LZ and surrounds to be checked and cleared of loose objects as necessary prior to aircraft arrival and departure.	Remote	Hazardous	3B
Aircraft performance does not allow OGE hover at maximum continuous power and the aircraft transmission is “over torqued” during the operation.	Remote	Moderate	3C	No	Treat	• Aircraft performance with sling load computed and loaded to allow OGE at maximum continuous power. • On load pickup, power check to confirm computed performance is available.	Improbable	Moderate	2C
Lack of communication at the DZ leads to incorrect set down procedures and damage occurs to the building and/or air conditioner.	Remote	Moderate	3C	No	Treat	• Only trained riggers to be used. • Prior to commencement of task a briefing is to be held with ground personnel and PIC to ensure all procedures are covered.	Improbable	Moderate	2C
Engine failure occurs during load delivery leading to impact with the building and injury/fatality to crew and/or persons on the ground.	Remote	Catastrophic	3B	No	Treat	• Load delivery to occur at a time when carpark and shopping centre is clear of all persons in the AWZ. • AWZ to be secure to essential personnel.	Improbable	Hazardous	2B
Aircraft hits obstacle during load delivery leading to loss of aircraft, significant damage to property and injury/fatality to crew and/or persons on the ground.	Remote	Catastrophic	3A	No	Treat	• AWZ to be surveyed from the ground prior to operation. • Infringing obstacles to be noted in Risk Assessment.	Improbable	Catastrophic	2A
Any other hazards						**Risk controls as appropriate**			

Table 2: Flight risk management plan

Flight Risk Management Plan	Sling load at shopping centre	Version 1.0

COMPILED BY:	Senior Pilot	DATE:
REVIEWED BY:	Head of Operations (HOO)	DATE:

Generic task	Sling load in an AWZ
Regulatory	Part 138 of CASR, Part 138 MOS Chapter 13
Task details	Position a sling load (air conditioner) from the carpark to the rooftop of a shopping centre, located in a residential and commercial area in a capital city suburb.

Issue	**Risk Control**
1. Local conditions unfavourable	On-site observer. Pilot to utilise flight risk review app customised for aerial work within an AWZ.
2. Aircraft has no OEI capability	Emergency Landing Area (ELA) available. Site and shopping center to be secured to essential ground personnel only.
3. Ground crew unfamiliar	Ground crew information and training prior to operation
4. Driver distraction	Approach and departure to avoid Victoria and Burnley St. Wind direction and strength to limit operation accordingly. Operation scheduled to be conducted outside of peak hour traffic.
5. Complex obstacle environment	AWZ surveyed from ground in planning phase. Light poles in north eastern corner of carpark noted. Wires running down river boulevard noted on approach and departure path. Do not cross River Boulevard below 100ft AGL.