Australian Government
Civil Aviation Safety Authority

ANNEX B TO AC 138-05 V3.0

Sample risk assessment process - aerial work certificate holder

July 2025

Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

Contents

Sample risk assessment process - aerial work certificate holder

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

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

Scenario

The sample below considers an operator intending to conduct a powerline survey operation for a commercial client. This operation requires an aerial work certificate and the operator has previously carried out this type of operation.

The operation is conducted in a single engine helicopter (an AS350B3 but the scenario could be modified as appropriate for fixed wing operation) carrying a crew consisting of one pilot and one task specialist to observe the powerline condition. No powerline washing will occur, simply a survey at 200' AGL to identify damaged areas and report the information to ground repair teams.

The survey is to be conducted in a remote area of the Snowy Mountains region of New South Wales part of the Snowy Mountains Hydro-electric scheme.

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. This process is reproduced at Figure 1.

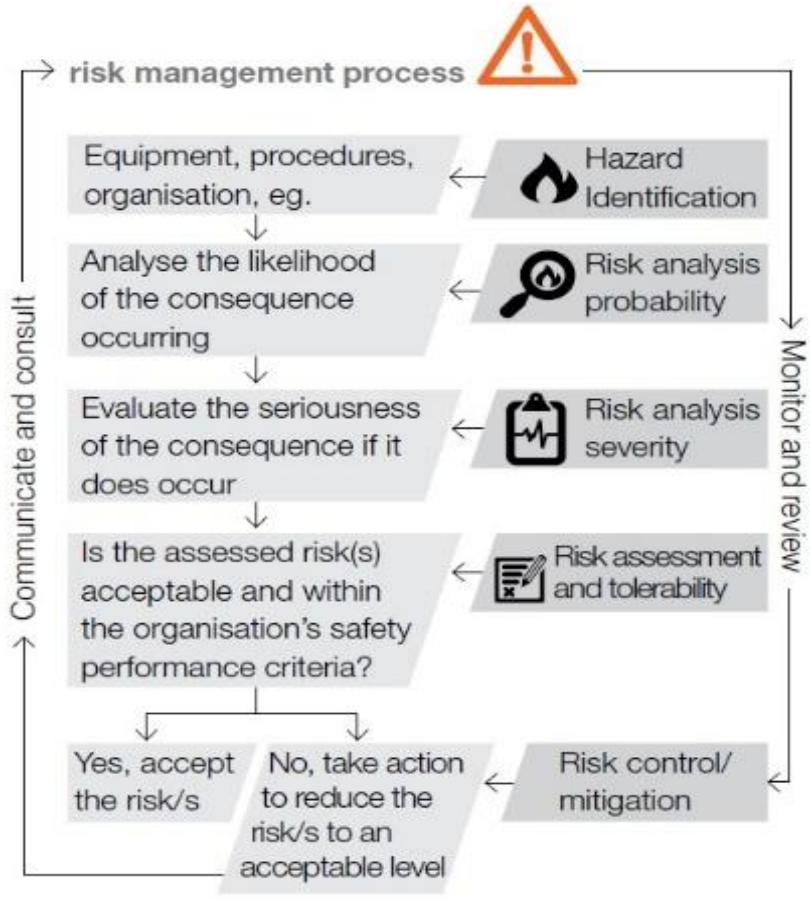

Figure 1: Risk assessment process

Risk assessment and mitigation process flow chart

The risk assessment and mitigation process is represented by flow chart at Figure 2 and is a replica of the process in the operations manual:

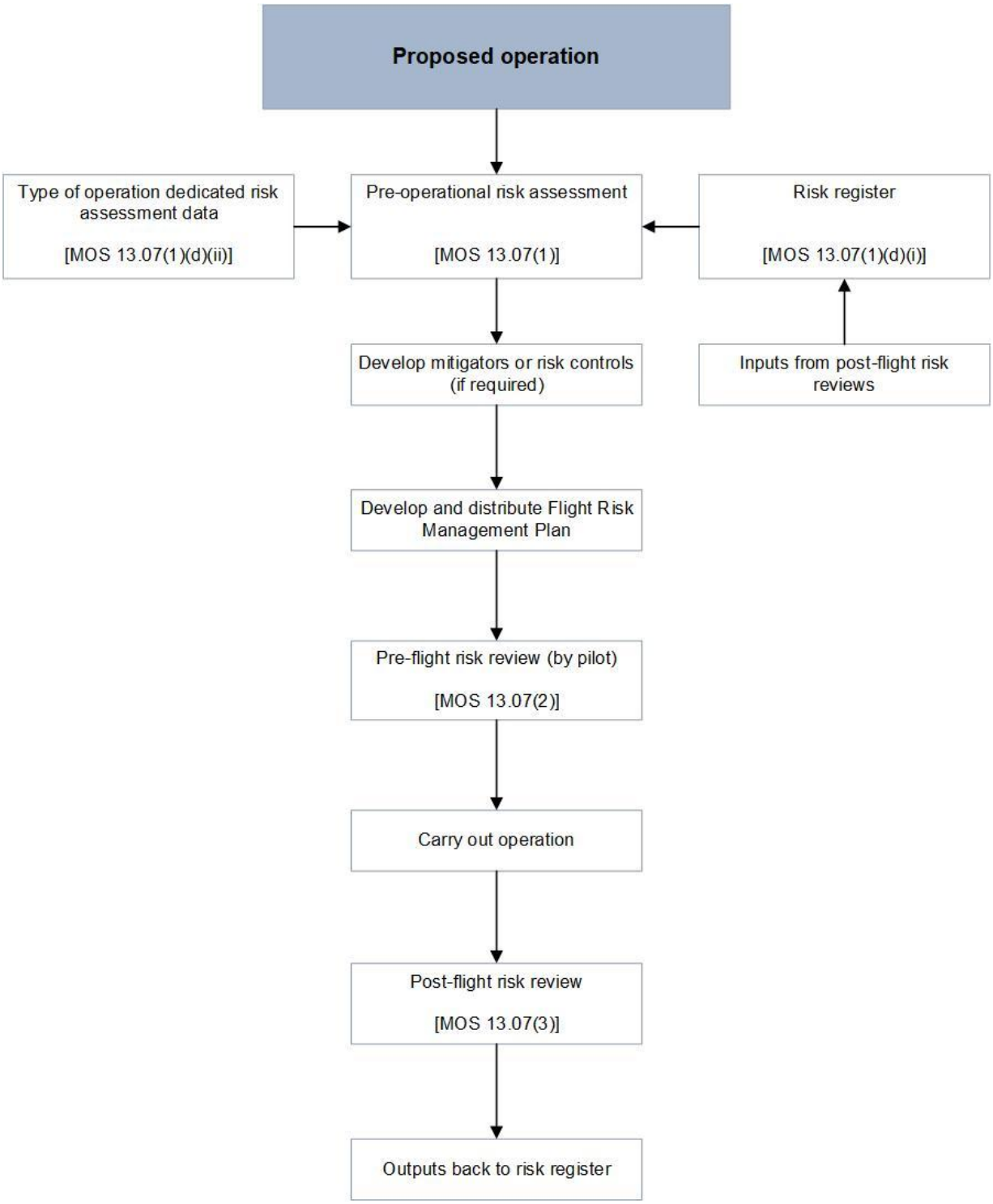

Figure 2: Risk assessment and mitigation process flow chart

Risk assessment and mitigation process steps in detail

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

This operator captures data and generates a separate risk register using the sample form described on page 20 of Booklet 3 of the SMS toolkit. The operations manual details the process for operating this register. The processes and methodologies to identify safety hazards and how to rank and assess them, based on likelihood and consequence, are derived from Booklet 3 of the SMS toolkit. The HOO actions these methodologies when required and actively manages the register and also updates the type of aerial work operation pre-operational risk assessment with its data. It is available to all personnel.

Type of aerial work operation pre-operational risk assessment - Part 138 MOS section 13.06 and 13.07

A pre-operational risk assessment focuses on the specific type of aerial work operation conducted. In this example the operator has carried out the type of operation before, so this assessment has been updated to include the latest operational experiences and circumstances of the operator.

Some risk factors are always particular to any new operational deployment. In this instance pilot experience and qualifications and aircraft performance and serviceability factors will have changed. The pre-operational risk assessment is reviewed for the purposes of establishing baseline risk assessment criteria for this new this task. The HOO is in control of this process.

For this operator, the details are captured in initial evaluation in the form at Table 1 and additional items added specific to this task as required.

This form may be designed as an extension of the pre-operational risk assessment proforma and be pre-populated with the pre-operational risk assessment data and just simply have the additional information added for the specific task as required.

They HOO will then determine if any of these specific circumstances of the new operation may result in an unacceptable risk.

Mitigation and risk controls

If the HOO 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.

A sample document with a pre-operational risk assessment, new task specific data, mitigation and risk controls and final risk evaluation is provided at Table 1.

Flight risk management plan

The HOO prepares this plan using an operations manual template. It clearly outlines the risk controls that are to be employed during the proposed operation. The 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 continuously monitors the conduct of the operation and acts accordingly to mitigate any risks that may reduce the level of safety of the operation. A sample is provided at Table 2.

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

Prior to commencing the operation, the pilot refers to the risk assessment proforma and the flight risk management plan and carries out a pre-flight risk review on behalf of the operator. The pilot must be

satisfied that the flight risk management plan will eliminate, reduce or mitigate risks and hazards under the current and expected operational conditions of the proposed operation.

If a circumstance is present at the pre-flight review stage that increases the proposed operation's risk profile to the unacceptable level, then the pilot does not commence the operation until an additional risk control is developed and actioned. In many cases, this may require additional feedback from the HOO or supervising pilot for the operation.

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.

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

After the operation is completed, the pilot(s) 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 pilot(s) to conduct a post flight review and sending safety reports.

The HOO uses these reports to update the risk register and the type or aerial work operation pre-operational risk assessment as required.

Table 1: Risk assessment and mitigation process flow chart

Title:

Powerline Survey Operations:

Assessor: **Date:**

Proposed operation: Conduct low level powerline condition survey operations utilising B206L and AS350 aircraft whilst carrying 1 task specialist.

Hazard	Initial evaluation Likelihood	Initial evaluation Consequence	Initial evaluation Initial risk score	ALARP?	Accept or treat?	Risk control	Final evaluation Likelihood	Final evaluation Consequence	Final Risk score
1. Pilot not sufficiently trained in low level operations leading to collision with wire/tower or terrain leading to loss of aircraft and crew.	Occasional	Hazardous	4B	No	Treat	Pilots to hold low level endorsement and a minimum of 500 hours in low level operations prior to being approved to conduct the operation. Pilots to have completed company line training for powerline survey operations. Pilots to have completed wire awareness course prior to commencement of the operation	Remote	Hazardous	3B
2. Selected aircraft is not suitable for continuous low-level operations in remote mountainous environment leading to major structural failure and loss of aircraft and crew.	Occasional	Hazardous	4B	No	Treat	Selected primary aircraft to have fully articulated rotor head. Back-up aircraft turbine only preference is for B206L or similar. Selected aircraft to be no older than 10 years with less than 5000 hours total time.	Remote	Hazardous	3B
3. Incident or accident occurs and crew unable to contact operations or emergency services	Remote	Hazardous	3B	No	Treat	All aircraft to be fitted with satellite tracking with a maximum of 2 minute “pings”. Ops cell to monitor flight progress and hold SAR as necessary. Ops cell to ensure recovery option is available either internally or through emergency services.	Improbable	Hazardous	2B
4. High level of pilot fatigue due to hot environment operations leading to incident/accident and loss of aircraft and crew	Occasional	Hazardous	4B	No	Treat	All contracted aircraft to be fitted with environmental control system.	Remote	Hazardous	3B

Hazard	Initial evaluation Likelihood	Initial evaluation Consequence	Initial evaluation Initial risk score	ALARP?	Accept or treat?	Risk control	Final evaluation Likelihood	Final evaluation Consequence	Final Risk score
						Pilot and Task Specialist to carry “camel back” or similar personal water bladder system. Minimum of 10 litres of water to be carried in aircraft esky.			
Any other hazards						Risk controls as appropriate			

Compiled by:	Senior Pilot	Date:
Reviewed by:	Head of Operations (HOO)	Date:
Generic task	Conduct low level powerline survey operations over non-populous remote areas	
Regulatory	Part 138 of CASR, Part 138 MOS Chapter 13	
Task details	The survey is to be conducted in a remote area of the Snowy Mountains region of New South Wales part of the Snowy Mountains Hydro-electric scheme. An AS350B3 aircraft carrying a crew of one company pilot and 1 task specialist to observe the powerline condition. Survey will be conducted between 500' and 200' AGL.	

Table 2: Flight risk management plan

Powerline Survey Operations - Version 1.0

Issue	Risk control
1. Pilot training insufficient	Assigned pilot holds low level endorsement and a minimum of 500 hours in low level operations. Assigned pilot has more than 500 hours on type. Assigned pilot has completed company line training for powerline survey operations. Assigned pilot has current wire awareness course. Assigned pilot has completed company line flying for mountain operations.
2. Unsuitable aircraft	Assigned aircraft is an AS350B3.
3. Remote Area	Aircraft fitted with satellite tracking with a maximum of 2 minute 'pings'. Ops cell to monitor flight progress and hold SAR as necessary. Ops cell to ensure recovery option is available either internally or through emergency services.
4. Fatigue	All contracted aircraft to be fitted with environmental control system. Pilot and Task Specialist to carry Camelbak® or similar personal water bladder system. Minimum of 10 litres of water to be carried in aircraft esky.
5. High Density Altitude	Assigned pilot has completed company line flying for mountain operations. Operations to cease when wind greater than 15 kts.