# CLASSIFICATION OF AVIATION EVENT – UNCREWED AIRCRAFT SYSTEM (UAS) OPERATIONS

## OVERVIEW:

The classification of an aviation event is a five-step process in which **actual** and **potential** consequences of the event are considered. Minimum classifications (from CLASS A to CLASS D) are assigned at steps 1 to 3 for the Personal Injury Level (1), Aircraft Damage Level (2) and Perceived Risk Level (3). Step 4 involves selecting the highest classification from steps 1-3. This is the overall classification for the event. Step 5 prompts users to review the event classification should additional information become available.

**AVIATION SAFETY EVENT – UNCREWED AIRCRAFT SYSTEM OPERATIONS**

**Use this fact sheet to classify an aviation safety event that relates to Specific Category and Open Category Uncrewed Aircraft System Operations. This includes:**

- Uncrewed Aircraft System Operations – Specific Type A Category (DASR UAS)
- Uncrewed Aircraft System Operations – Specific Type B Category (DASR UAS)
- Uncrewed Aircraft System Operations – Open Category (DASR UAS).

**NOTE:**

- The classification of Specific or Open category UAS aviation safety events is to be principally based on PIL and PRL – ADL is not a required consideration.
- For aviation safety events that relate to Certified Category UAS Operations, use the 'Classification of Aviation Event – Flight Operations' factsheet.

## 1 PERSONAL INJURY LEVEL (PIL)

**PIL indicates the actual injuries that are the outcome of an aviation safety event. Using the descriptors below, identify the most severe injury sustained by an individual as a direct outcome of the aviation event.**

| | FATAL | SERIOUS | MINOR* | NO INJURY |
|---|---|---|---|---|
| PIL description | The highest level of injury was fatal. | The highest level of injury was a serious injury or illness as defined under the WHS Act. | The highest level of injury/exposure was minor. | No injuries were sustained. |
| Minimum Event Classification | CLASS A | CLASS B | CLASS C | CLASS D |

**NOTE:**

If an injury was sustained as a direct consequence of an aviation event, ensure the Sentinel WHS stream within the ASR has been activated.

***Minor injury/illness:** As a direct result of the aviation safety event, a person(s) was injured or exposed to a hazardous substance/material, but does not meet the serious definition.

## 2 AIRCRAFT DAMAGE LEVEL (ADL) (if required, see Notes)

**ADL indicates the actual damage that an aircraft experienced as an outcome of an aviation safety event. Using the descriptors below, identify the highest level of damage the aircraft sustained as a direct outcome of the aviation event.**

| | DESTROYED | SUBSTANTIAL DAMAGE | MODERATE DAMAGE | NO DAMAGE OR MINOR DAMAGE |
|---|---|---|---|---|
| ADL description | Aircraft destroyed, missing, unrecoverable or sustained damage to such an extent that it is unrepairable or uneconomical to repair. | Aircraft sustained substantial damage or structural failure that requires extensive inspection but is economically repairable. | Aircraft sustained moderate damage that is repairable without extensive inspection, including engine change. | Aircraft sustained either:<br>1. no damage; or<br>2. minor damage that is repairable within two days. |
| Minimum event classification | CLASS B | CLASS B | CLASS C | CLASS D |

**NOTE:**

- Unless explicitly specified in the individual UAS Operating Permit, ADL is not a required consideration for Specific or Open category UAS event classification.
  - In the case where Specific Type A category UAS is DESTROYED **and** requires ADL assessment, turn off the Sentinel Event Classification 'Auto Calculate' feature and manually select Class B.
  - If the Specific or Open category UAS **does not** require ADL assessment, use Sentinel ADL selection 'Unknown - Class D'.
- Where multiple aircraft are assigned to a single event, ADL identifies the highest level of damage.
- In the case where Specific or Open category UAS operation damages crewed aircraft, Certified category uncrewed aircraft or critical infrastructure*, contact DFSB for ADL determination – (02) 6144 9199 or DFSB.investigations@defence.gov.au

## 3 PERCEIVED RISK LEVEL (PRL)

**The PRL describes the potential consequences of an event by providing an indication of the risk that the event poses to aviation safety. The PRL is a subjective judgement determined by answering two questions in the provided matrix regarding the most negative credible consequence and the effectiveness of the remaining risk controls.**

**QUESTION 1:**

**If the aviation safety event had escalated, what would have been the most negative credible consequence?**

**NOTE:**

- Each event takes place in a unique context with various factors interacting to cause its outcome.
- Thoroughly consider the factors/circumstances that existed at the time of the event and how these could have interacted and escalated the consequence.
- The escalation could be due to actions by the people involved or how the event sequence could have developed in different ways.
- Determine the credible/plausible consequence(s) that could have happened if the event had escalated.
- Do not worry about the probability of the consequence(s) at this stage. Question 2 will take probability into account by considering the effectiveness of remaining risk controls.
- If you identify more than one negative credible consequence, select the one that is considered to be the most negative.
- If it was extremely unlikely that the event could have escalated into a negative consequence, then select 'No Consequence'.

**QUESTION 2:**

**How effective were the remaining risk controls in preventing the aviation safety event from escalating to the most negative credible consequence?**

**NOTE:**

- Some risk controls try to **prevent** an undesirable operational state and others try to **recover** the system into a safe state.
- Consider both the number and robustness of the remaining risk controls between this event and the most negative credible consequence identified in Question 1. Ignore risk controls which have already failed.

**Select the corresponding column using the below descriptors.**

**Select the corresponding row using the below descriptors.**

| Q1. MOST NEGATIVE CREDIBLE CONSEQUENCE | | Q2. EFFECTIVENESS OF REMAINING RISK CONTROLS | | | |
|---|---|---|---|---|---|
| | | HIGHLY EFFECTIVE | MOSTLY EFFECTIVE | BARELY EFFECTIVE | NOT EFFECTIVE |
| | | The remaining risk controls were highly effective typically consisting of several good safety barriers. | The remaining risk controls were mostly effective with a considerable safety margin remaining. It is improbable that the event could have escalated into the most credible consequence. | Some risk controls were still in place, but their total effectiveness was minimal. | The only thing separating the event from the negative credible consequence was luck or exceptional skill, which is not trained or expected. |
| • Collision with crewed aircraft or Certified Category uncrewed aircraft.<br>• Collision with ground or water based personnel.<br>• Fatality.<br>• Critical infrastructure* destroyed. | CATASTROPHIC | Class C (Medium) | Class C (Medium) | Class B (High) | Class B (Very High) |
| • Incapacitation to UAS crew.<br>• Near collision with crewed aircraft or Certified category uncrewed aircraft requiring avoiding actions.<br>• Serious injury or illness, or immediate or imminent exposure.<br>• Uncrewed aircraft destroyed, or substantial damage (see ADL description).<br>• Substantial damage sustained to critical infrastructure*. | MAJOR | Class D (Low) | Class C (Medium) | Class C (Medium) | Class B (High) |
| • A reduced ability of the UAS crew to cope with adverse operating conditions to the extent that there would be a significant reduction in safety margins.<br>• Loss of separation with crewed aircraft or Certified category uncrewed aircraft not requiring avoiding action.<br>• Minor injury or exposure.<br>• Moderate aircraft damage (see ADL description).<br>• Minor to moderate damage sustained to critical infrastructure* | MINOR | Class D (Very Low) | Class D (Low) | Class C (Medium) | Class C (Medium) |
| • Negligible or no effect on ability of the UAS crew to cope with adverse operating conditions.<br>• Negligible or no effect on air separation.<br>• No injury.<br>• No aircraft damage or minor damage (see ADL description).<br>• No damage sustained to critical infrastructure* | NO CONSEQUENCE | Class D (Very Low) | Class D (Very Low) | Class D (Low) | Class D (Low) |

* Critical infrastructure: A facility that, if damaged by an uncrewed aircraft, may have an immediate and adverse effect on the health and safety of mission essential personnel or general public. Examples may include damage to chemical plants, armament storage and fuel storage facilities.

## 4 FIND THE OVERALL EVENT CLASSIFICATION

Event classifications range from CLASS A to CLASS D. After establishing the event classification for the PIL, ADL and PRL, **select the highest of the three values**. This is the overall event classification.

**NOTE:** If Class A or B, contact the DFSB Duty Officer on (02) 6144 9199 or DFSB.investigations@defence.gov.au

## 5 REVIEW

Changes should be made to the PIL, ADL and PRL (and subsequent event classification) if more information becomes available. This ensures that an accurate classification is recorded and key learnings are captured.

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