Aviation Safety

Reporting and Investigation

DEFENCE FLIGHT SAFETY BUREAU

DFSB

GUIDEBOOK – EDITION 3.1

USE OF THIS GUIDEBOOK

This Guidebook has been designed to assist individuals involved in the initial review and investigation of Aviation Safety Reports (ASRs). To assist readers in navigating its contents, the Guidebook has been divided into three parts.

Part One provides general information on ASRs, including an overview of safety events and issues, report categories and the ASR in Sentinel software application.

Part Two focuses on the role of the Aviation Reviewer and steps the user through the process for reviewing an ASR that has been submitted via Sentinel, from confirming the event details to its classification and the decision on whether or not to conduct an investigation.

Part Three steps the user through the process for conducting a Command-led safety investigation, including the input of investigation information, safety actions and recommendations into Sentinel.

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11 Feb 21	2.1	Updated Table 1– Appointing Authority by Classification of Event
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30 Jun 23	3.0	Major additions – Part 1 Overview of Aviation Safety Reporting and Part 2 The role of the Aviation Reviewer
24 Oct 23	3.01	Minor update – Positive Findings and Actions & Recommendations tip

CONTENTS

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IMPORTANT. This guide is not a manual for the conduct of Defence Flight Safety Bureau (DFSB) independent investigations. Any questions regarding the content of this guide should be directed to your senior aviation safety representative in the first instance or, if necessary, the DFSB. Any suggested changes to this guidebook should be directed through DFSB Reporting, Intelligence and Research sub-directorate.

PART ONE:

Overview of Aviation Safety Reporting

What is the purpose of Aviation Safety Reporting?

Aviation safety reporting exists for the sole purpose of improving aviation safety through the identification of system vulnerabilities. It focuses on the risk to people arising from aircraft operations and encompasses both the manner in which aircraft are flown, and the tasks, activities and management systems whose primary purpose is to enable safe flight

Collectively, everyone involved in Defence Aviation represents a critical source of safety information from which safety lessons can be extracted. Full, open, timely and accurate reporting of information related to aviation safety events and issues allows the organisation to respond to information received and apply corrections to the system. Safety reporting is also essential in building a repository that facilitates information sharing and identification of systemic vulnerabilities.

If you don't measure it, you can't manage it.

ATTRIBUTION: VARIOUS

The quality and quantity of Aviation Safety Reports (ASRs) facilitates analysis, which provides tangible evidence to facilitate improvement and serves a secondary function of meeting regulatory requirements for reporting certain occurrences to the ADF aviation authority as described in DASR.GR.40 AMC. An ASR fulfils reporting requirements for Sections 1 and 4.

Why is it important to have a Just Culture?

Valuable safety reporting is made possible when people are willing to report observations and errors because the organisation guarantees an objective, fair, accountable and learned response.

A just and fair safety culture must exist within an organisation that strives for or displays a generative safety culture. It is recognised that while the majority of individual or team actions should not incur remedial or punitive action, there will be some situations where such action is necessary. Importantly, the safety investigation and any disciplinary or administrative action are to be managed as separate organisational processes.

If during an internal aviation safety investigation it becomes apparent that a DFDA or civilian offence is likely to have been committed, the investigation is to

be immediately suspended and the chain-of-command advised prior to recommencing (when appropriate).

Aviation safety investigations are to focus on the performance of the aviation system. Accordingly, safety actions and recommendations are to focus on implementing or improving controls that will eliminate or minimise the safety hazard or risk and therefore preventing a recurrence of the event. Safety actions and recommendations must not recommend disciplinary or administrative action.

Separate to the safety investigation, commanders should use the Safety Behaviour Management Tool to determine acceptable and unacceptable behaviour outcomes and commensurate action.

What is difference between a 'safety event' and 'safety issue'?

Aviation Safety Event. An aviation safety event is defined as any event where an aviation system (including the human element) fails to perform[1] in the expected manner[2] and adversely affects, or could have adversely affected at the time, the safety or airworthiness of an aviation system or third party.

Aviation Safety Issues. A safety issue is a characteristic of an organisation or a system that can reasonably be regarded as having the potential to adversely affect the safe operation of an aircraft, aviation-related equipment or products and services. Safety issues will usually refer to problems with an organisation's risk controls, or a variety of internal and external organisational influences that impact on the effectiveness of its risk controls. They can also relate to a specific part of the safety system or a series of aviation safety events that suggest an area of vulnerability. A safety issue can be raised as an Operational Hazard (OPHAZ) Report.

Who can submit an Aviation Safety Report (ASR)?

Anyone in Defence Aviation who is involved in, witnesses, or is notified of a safety event or issue may initiate an ASR. Usually, the reporter of an ASR will be an involved individual or supervisor.

1 'Fails to perform' means that something happened at a specific point in time, or something did not happen at a time when it would have been appropriate or relevant to do so.

2 For example, in a maintenance context, if a defect was found during a targeted inspection, the maintenance system had worked as expected. As the system performed as expected, an ASR is not required.

What must be reported?

There is currently no prescribed list of specific occurrences that are required to be reported through the ASR system[3]. An Accountable Manager, Hazard Tracking Authority, or relevant commander may prescribe particular or specific occurrences that must be reported.

Defence organisations may be a part of an aviation safety event that involve civil aircraft or facilities. Defence organisations need to be aware of and satisfy their reporting requirements outside of Defence.

What should be reported?

The ASR framework is based on a general requirement to report all safety events and issues which have (or could have) significance in the context of aviation safety. The range of issues subject to a safety report is very broad and will rest largely on individuals, supervisors and commanders exercising their best judgement.

For practical purposes, individuals are encouraged to report safety-related information which they perceive as having safety significance — an actual or potential hazard to aviation safety.
As a general guide, if there is doubt as to whether an ASR is required, a report is to be raised.

What are the different types of Aviation Safety Events?

Aviation safety events are categorised as either Flight Operations, Maintenance, or Other Support Systems (see descriptions below). The categorisation of the event does not infer a level of precedence or importance. The category selected is based on the circumstances of the event and how the lessons learned can best be collected for later analysis.

Flight Operations events are those aviation safety events that have, or could have, a direct safety impact on an aircraft, that occur during activities associated with flight.

When determining if the activities are associated with flight, the following factors must be considered:

- Events that impact the aircraft system during the period of time from authorised aircrew or UAS operators taking control of an aircraft to commence a specific mission, to their relinquishing control at the cessation of that mission

3 An ASR meets the regulatory reporting requirements for DASR.GR.40 AMC Sections 1 and 4.

- Events involving air traffic controllers performing controlling duties
- Events involving cargo that is loaded, or being loaded/unloaded on an aircraft or UAS
- Events involving aerodrome facilities, systems or services affecting an aircraft or UAS
- Events involving external environment and meteorological factors such as wildlife strikes, lighting strikes and hail encounters.

Maintenance events are those aviation safety events that occur during the conduct of maintenance activities, but did not manifest during the conduct of 'flight operations'.

Note:
An event that manifests as a technical malfunction during the conduct of 'flight operations' is to be reported as a Flight Operations event. Where appropriate, the investigation will consider the contribution of associated maintenance activities.

Other Support Systems events are those aviation safety events involving systems or services that functionally and/or physically support the conduct of safe flying operations (eg systems or services from DASR-defined organisations), but did not occur during the conduct of 'flight operations' or 'maintenance activities'.

Note:
Other Support Systems are viewed from a functional perspective, both technically and operationally, rather than being directly linked to the organisational structure to which the service or system belongs.

When should an OPHAZ Report be raised?

The reporting of potential aviation safety issues, known as operational hazards (OPHAZ), provides an additional proactive mechanism for capturing safety information not necessarily associated with an aviation safety event. Safety issues will usually refer to problems with an organisation's risk controls, or a variety of internal and external organisational influences that impact on the effectiveness of its risk controls. They can also relate to a specific part of the safety system or a series of aviation safety events that suggest an area of vulnerability.

Safety issues may be identified through many internal sources including safety data analysis, audits and inspections, safety meetings, data monitoring programs, and operational experience. Safety issues can also be identified in the review of information from external sources such as the aircraft manufacturer, engineering organisations, external investigation reports, civil aviation and foreign militaries.

While the reporting of safety events and issues are two distinct processes, once reported, the procedures for investigating, tracking and monitoring are similar.

What is Sentinel?

The Sentinel software application is the ADF's mandated method of reporting all aviation safety events and issues. Sentinel provides a single mechanism to support the reporting, management and analysis of all aviation safety reporting activities. Sentinel is available to all Defence aviation personnel with access to the Defence Protected Network. The following ASRs are available in Sentinel:

- Flight Operations Event Report
- Maintenance Event Report
- Other Support Systems Event Report
- Operational Hazard Report (OPHAZ)
- Fatigue Report*
- Duty Limit Variation Report*

Refer to the *Defence Aviation Fatigue Management Guidebook* for information on Fatigue and Duty Limit Variation Reporting.

Within Sentinel, the Flight Operations, Maintenance, Other Support Systems Event Reports and the OPHAZ Report are processed using a common workflow (Figure 1). For each stage the Sentinel User is aided with a checklist that lists the tasks to be completed to progress the ASR.

Figure 1: ASR in Sentinel Workflow

DRAFTER

Drafter — Reports the initial details of the event/ safety issue via the Sentinel Defence Kiosk. This role can be performed by anyone with access to the Aviation module in Sentinel.

AVIATION REVIEWER

Aviation Reviewer — Reviews, updates and supplements the ASR details entered by the Drafter; includes completing the Event Risk Classification (Assessment tile) and nominates the investigator(s) and the Approving Authority. Conducts a review of what happened in the event and may seek to clarify information to inform the event classification and the decision whether to formally investigate or bypass the investigation. A safety representative (e.g. Aviation Safety Officer or Maintenance Aviation Safety Officer) typically performs this role.

INVESTIGATOR

Investigator — Confirms the ASR details, reviews and updates (if appropriate) the Assessment tile, conducts the investigation, logs the results of the investigation into the Analysis tile, and may also raise actions and recommendations. This role is typically performed by a safety representative (e.g. Aviation Safety Officer or Maintenance Aviation Safety Officer).

REVIEWER (S1 Review)

Reviewer (S1 Review) — Reviews all information in the ASR, including the investigation, and may also create actions and recommendations. This role is typically performed by an a safety representative (e.g. Aviation Safety Officer or Maintenance Aviation Safety Officer).

APPROVING AUTHORITY (S2 Review)

Approving Authority (AA) (S2 Review) — Reviews all information in the ASR, including the investigation and actions and recommendations (if investigated). If satisfied, the AA then releases the actions and recommendations and signs off the ASR. If required, the AA can send the ASR back to the Aviation Reviewer for further review or reopen the investigation if it is found unsatisfactory. This role is typically performed by the CO or delegate.

HTA

Hazard Tracking Authority (HTA) – Reviews all ASRs generated under the HTA, may create and release actions and recommendations, may reopen the ASR, or closes the ASR (if satisfied) with outcomes and residual risk. ASR cannot be closed until all actions have been marked completed in Sentinel.

The ASR Support and Resources webpage provides guidance and tools to assist the User with completing each of the stages in the ASR workflow.

PART 2:

The Role of the Aviation Reviewer

This section of the Guidebook steps the user through the role of the Aviation Reviewer in processing an ASR. It is the role of Aviation Reviewer to oversee initial review into the event, and oversee the initial processing of an ASR in Sentinel. An ASR must be submitted in Sentinel and progressed to the completion of First Release within seven calendar days. The review timeframe requirement starts from when the event took place or from the time when the reporter becomes aware that an aviation safety event has occurred. The intent of this timeframe is to enable the timely communication of basic information of the safety event to be disseminated to the aviation community and preservation of perishable safety data.

The role of Aviation Reviewer is typically performed by a safety representative (e.g. Aviation Safety Officer or Maintenance Aviation Safety Officer). Alternatively, should an ASO-trained reviewer not be available, a member who is briefed and/or mentored by an ASO may be appointed.

Aviation Reviewer Checklist

The Reviewer Checklist is shown in Figure 2 and lists the tasks to be completed to progress the ASR onto either commencing an Investigation or using the Data Capture Only path. Each step can be selected and will direct the Reviewer automatically to the corresponding area of the Sentinel event. The relevant areas of the checklist can also be accessed via the Sentinel tiles on the right hand side of the page.

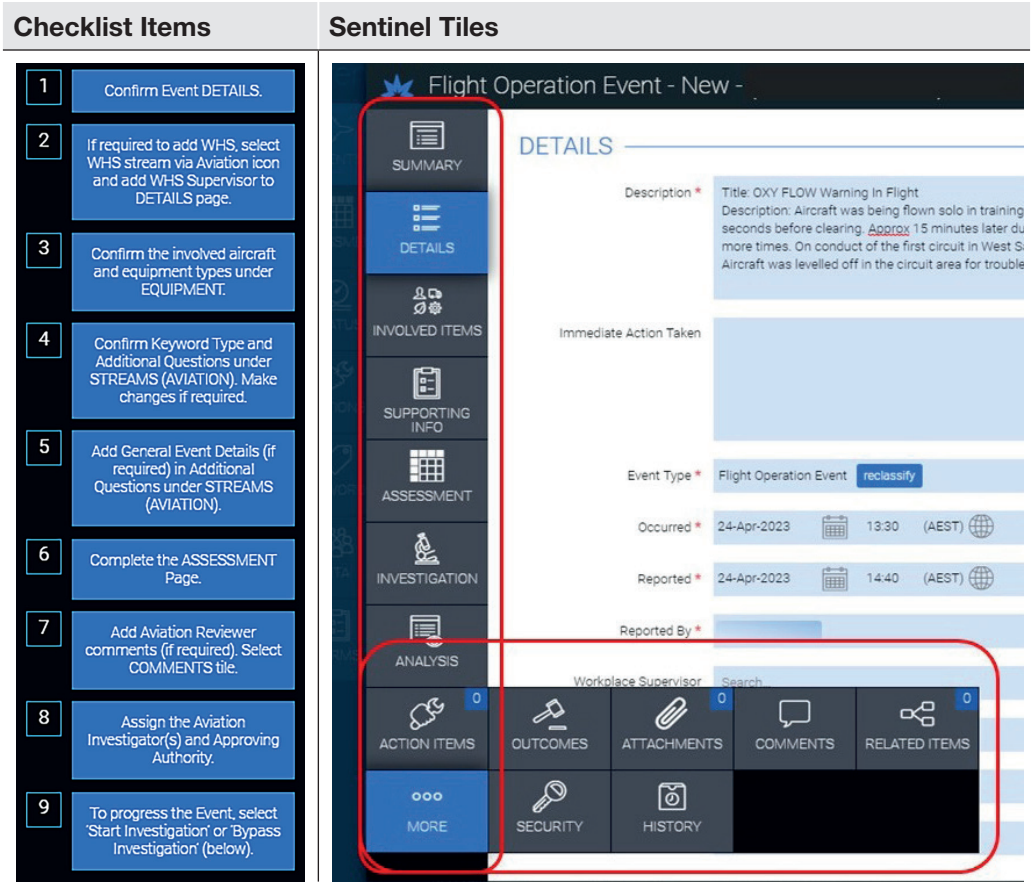


Figure 2: Aviation Reviewer Checklist and Sentinel Tiles

IMPORTANT:

All mandatory tasks in the Aviation Reviewer checklist must be completed before the ASR can progress the next stage of the ASR lifecycle.

If mandatory tasks are not completed, and an Aviation Reviewer attempts to progress the ASR, and error message will be displayed. By clicking on the error message, the Aviation Reviewer will be taken to the relevant area to be completed.

Confirm DETAILS (checklist item 1)

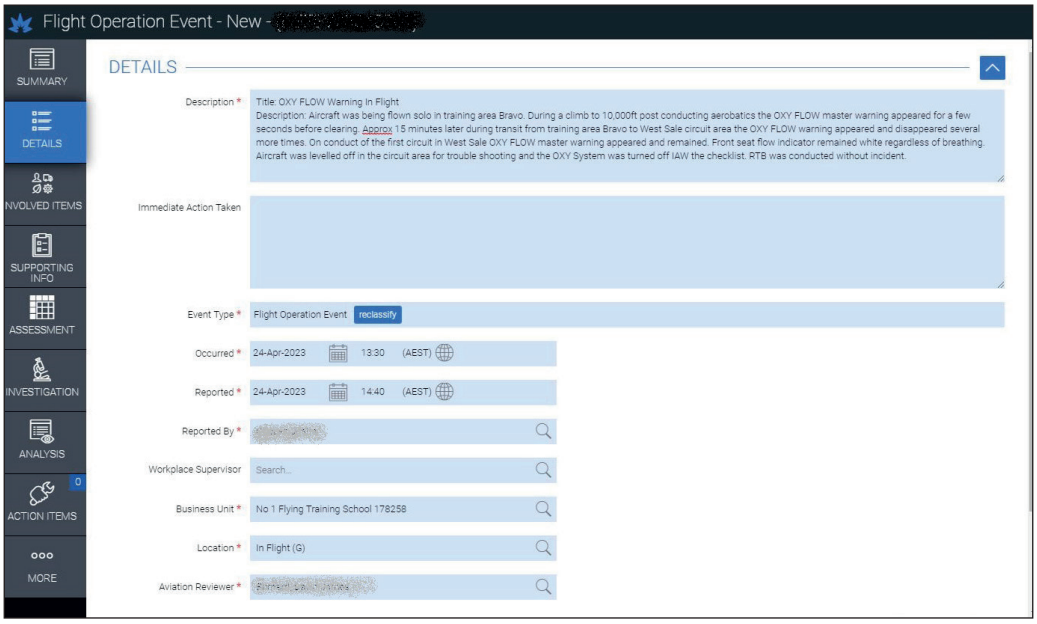


Figure 3: Details Page

The Details page contains most of the factual information about the event. It is important that the details are as accurate as possible at the time that the event is reported into Sentinel, and updated when further information becomes available.

One of the key roles of the Aviation Reviewer is to ensure that event details are as complete and up to date as possible so as to suitably inform the classification of the event. If there is a gap in event details, the Aviation Reviewer should seek additional information, such as form involved persons, before classifying the event. Having completed these steps, the Aviation Reviewer then makes an informed decision on whether or not an investigation is required.

In order to effectively complete the checklist tasks, the Aviation Reviewer may need to seek additional information, including from involved persons, and/or discuss the event with others. This enables the Aviation Reviewer to confirm the event details and its classification. The Aviation Reviewer is then able to make an informed decision on whether or not a safety investigation is required.

If the event does not qualify as an ASR, the report was raised in error, or a duplicate report was raised, the Aviation Reviewer should reject the ASR. See section: How to reject an ASR?

Below is guidance on each of the sections of the Details page.

Title: Short, concise and accurate with no spelling / grammatical errors.

What happened description:

- Short description describing where it happened, what happened and the result.
- The description should contain:
  - **Where.** State where it happened (ie the context).
  - **What.** Briefly describe what happened, including any individual actions or technical failures/ malfunctions (eg "a hydraulic system warning was displayed").
  - **Result.** Briefly state the outcome (eg "the engine was shut down and the aircraft diverted to Amberley").
  - The description may include additional factual circumstances known at the time of raising the report (eg "the fuel was found to be contaminated with water").
- Remember to check for spelling/grammatical errors.
- The description should **not** contain:
  - **Speculation** as to why the event happened.
  - **Personal details** of any involved persons.
  - **Sensitive operational information.**
  - **Emotive language.**
  - **Unnecessary text** regarding issues that did not occur (eg "The aircraft was not damaged").
- **Acronyms.** The use of acronyms is to be limited to commonly used terms and other acronyms spelt out initially (ie Environmental Control System (ECS)).

Immediate Action Taken:

- Description of any immediate action taken is clear, concise and accurate
- Does not include personal details of any involved person
- No spelling / grammatical errors.

Event Type:

- Correct Event Type is selected, i.e. Flight Ops, Maintenance, Other Support Systems, OPHAZ. For more information on the event types, see Part1: Overview of Aviation Safety Reporting.
- It is important that the correct Event Type is selected is correct as changing this after the ASR is released will result in the deletion of related information.

Date reported:

- The date reported is the date the event is entered into Sentinel.
- Dates & times are accurate.
- Correct time zone. (Note that the default time zone in Sentinel is AEST)

Date occurred:

- The date occurred is the date that the event occurred or when the reporter becomes aware that an aviation safety event has occurred. For Maintenance events, the date occurred is the date that the maintenance issue was discovered.

- Dates & times are accurate.
- Correct time zone. (Note that the default time zone in Sentinel is AEST)

Business unit:

- Correct business unit is selected. Ensure contractors & deployed units report their business unit correctly.
- If raising an ASR on behalf of another unit, the default business unit should be changed to that unit.

Guidance for Contracting Companies and Deployed Units:

- Contractors and deployed units can use the business unit identifier of either:
  1. the unit which the aircraft is operated by, eg BAE in Perth is using the 79SQN business unit identifier.
  2. the SPO or equivalent which controls the contract under which they do business,
  3. the Wing or equivalent where the platform HTA resides.
- Contractors that are contracted to a unit should select that unit as the business unit.
- Deployed units should use the business unit identifier of the unit which is the designated MAO for that type of aircraft, eg an ASR raised for a C130J aircraft, force assigned to the MEAO, would be raised under 37SQN, and not the Operation or Exercise designator.
- Both the contracting company and the operation or exercise are to be recorded in General Event Details in Additional Questions (described later).

TIP: Changing Business Units
The business unit can be changed if it is incorrect, by either typing the new business unit name or clicking on the Search icon  and using the Business Unit search functionality.

Location. Location is reported correctly & consistently.

Guidance for Entering Location:

- Select the 'lowest' level location
  - eg. NSW rather than Australia
  - eg. Amberley YAMB rather than QLD
- Note that the vast majority of Australian aerodromes can found via the ICAO code.
- If the event is a bird/bat strike and the location of where the strike occurred is not in the vicinity of an aerodrome or is unknown, select **In Flight**.
- For aircraft operating from ships at sea or for a Ship's location, select the body of water from the **At Sea** category selection options, noting any OPSEC restrictions in which you were operating when the event occurred. If the appropriate body of water cannot be found or is OPSEC restricted, select "At Sea".

Add WHS Stream (checklist item 2)

WHS consequences of an aviation safety event or issue need to be considered and reported separately in accordance with the relevant Single Service WHS requirements. To add a WHS stream, select 'Aviation' in the top right corner of the page and click on 'WHS' (Figure 4).

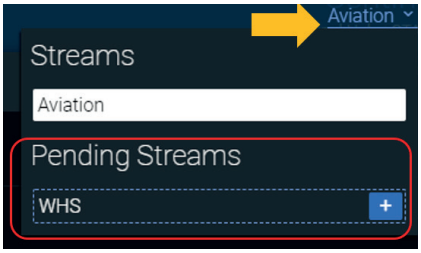


Figure 4: Adding a WHS Stream in Sentinel

A workplace supervisor must be appointed (entered in the Workplace Supervisor field) to investigate/review the WHS component of the event. Note that if you do not enter a workplace supervisor for a dual stream event you will not be able to progress the event (both ASR and WHS streams) to the investigation phase.

The ASR Drafter may have included a WHS stream to the ASR. If this is the case, you will be able to toggle between the Aviation and WHS streams when you select 'Aviation' from the top right hand corner of the page.

Alternatively, the Drafter may have raised a separate WHS report. If this is the case, ensure the WHS report is linked to the ASR via the Related Items Tile functionality (Figure 5).

Note:
The use of the dual stream functionality is the preferred method of reporting an event with both ASR and WHS aspects.

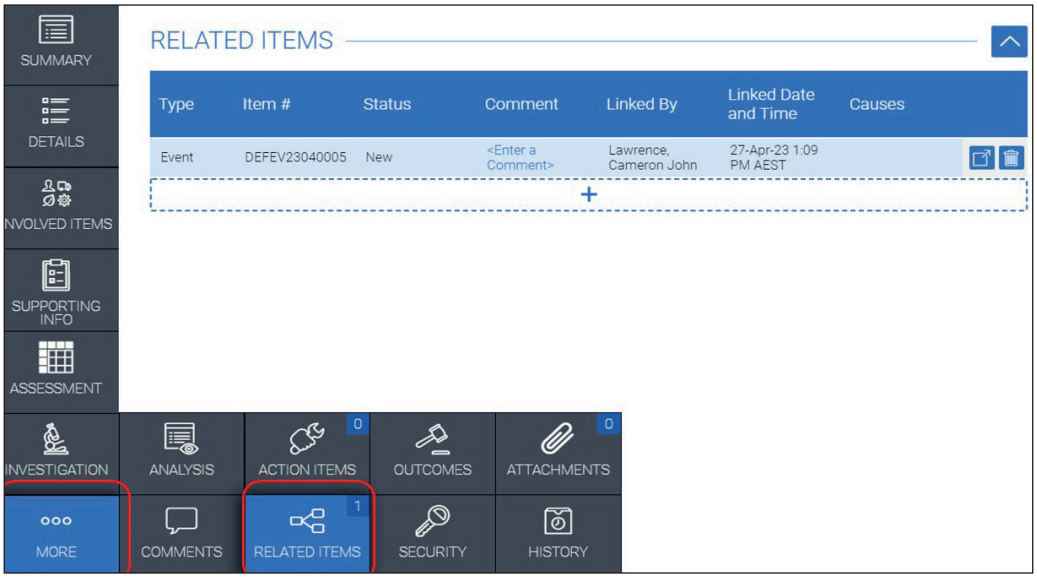


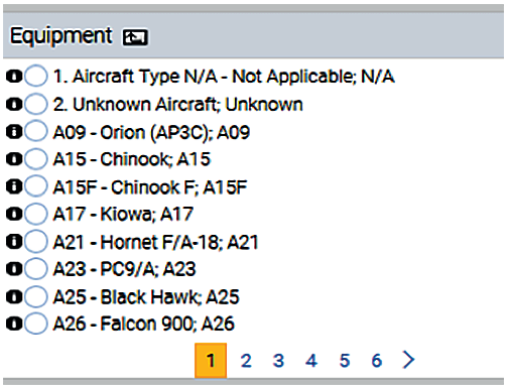
Figure 5: Relating an Item

Important:
Any personnel injury including Minor Injury, Exposure, or Near Miss **must** be reported and investigated separately using a WHS Sentinel Report (dual stream event).

Confirm Equipment (checklist item 3)

Ensure all involved aircraft are included (there may be multiple aircraft involved). If there is a need to amend the equipment/ aircraft entered, see below guidance.

Guidance for Entering Aircraft and Other Equipment:



- For all ASRs, select from the '1. Aircraft Type' list to access a list of aircraft types.
- If a civilian aircraft or civilian UAS was involved, ensure that you select the 'Civil Aircraft' or 'Civil UAS; Civil RPAS' aircraft type to support Defence's reporting responsibilities of civilian aircraft.
- If there are no aircraft involved in the ASR event, select "1. Aircraft Type N/A — Not Applicable; N/A".
- If the aircraft type is unknown, select "2. Unknown Aircraft; Unknown"
- If other aviation related equipment is involved (not an aircraft), you can also add the additional equipment. For example, Parachute/Aerial Delivery Equipment can be found under 8. Specialist Equipment.
- If the Event involved Explosive Ordnance (EO) in the Aviation Domain, then the involved EO should also be recorded in the ASR. The EO equipment can be found in the Equipment Page under the Munitions and Explosive Ordnance category. Ensure EO details are accurate & correct. Refer to EO/ASR report selection guidance when deciding whether EO should be reported via an ASR.
- Ensure that you **Finalise** the Aircraft Details Supporting Information Form (SIF) in order to progress the ASR.

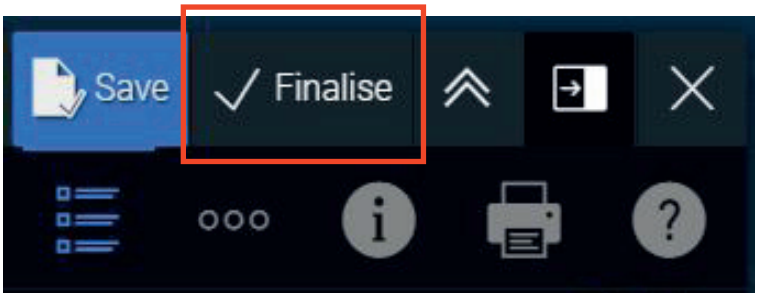


Figure 6: Finalising a Supporting Information Form

Confirm Keyword and Additional Questions (checklist item 4 and 5)

Keywords

Keywords are used to both succinctly describe what happened in the event and for analytic purposes. It is essential that the Events are coded consistently so that data analysis is accurate and is not contaminated with poor quality data.

Only the Flight Operations event type allows for the coding of more than one keyword.

General Principles:

- Describe the essential elements of what happened.
- **Selected consistently** across Units, Squadrons, Regiments, e.g. nose wheel steering failures coded with same keyword.
- "Other" only used by exception, and if used, is adequately described in the 'If other, please specify' text box.
- Only the Flight Operations event type allows for the coding of a Primary keyword and a Secondary keyword(s).

For the Flight Operations event type:

The Primary Keyword

- In an event where multiple safety incidents occur, the Primary Keyword is not necessarily the first occurrence in the sequence of events, eg. Hydraulic Failure leading to a **Wheels Up Landing** (Wheels Up Landing = Primary Keyword). In this case the most significant event has the Primary Keyword assigned. Hydraulic Failure may be assigned a secondary keyword (see guidance below).
- Consequential category keywords are **not** selected as Primary Keyword.

Secondary Keywords

- Secondary keywords selection is **not mandatory**.
- Consequential category keywords are **ALWAYS** coded as a secondary keyword.
- Used to provide additional description of what happened in the safety event.
- Selected consistently per local requirements.

Note:
While this guidebook aims to provide detailed guidance regarding keyword coding, it may not cover all scenarios & situations. There will be scenarios that may be best defined by senior safety representatives (eg. GASOs/WASOs) for their span of control. For example, events that involve the combined oxygen / crew communications umbilical connector may require local guidance on how to code the keyword (oxygen or communications system?).

Additional Questions

These additional questions are not mandatory[4] but does add to our understanding of the safety event.

- Contractor Company (if selected) is correct.
- Operation / Exercise / Flying Display / Flypast / Flight Test (if selected) is correct.
- Keyword specific additional questions:
  - Data collected consistently according to local requirements.
  - Note that changing the keyword will discard the data entered into the additional keyword specific questions.

Note:
Once a radio button is selected, it must contain an item.

Ensure that you Finalise the Supporting Information Form (SIF) in order to progress the ASR.

It is important to review and, if required, update the keyword(s) and additional questions once more information is known about the event.

Complete Assessment Page (checklist item 6)

Classification of Aviation Safety Events

An aviation safety event is classified according to the potential consequences in addition to the realised consequences of the event. The event classification is an alphabetical designation from Class A (highest) to Class D (lowest) based on assessment of the personnel injury level (PIL), aircraft damage level (ADL) and the perceived risk level (PRL).

There are several Classification of Aviation Safety Events Fact Sheets on the DFSB website which contains more detailed information and must be used to classify an event correctly. There are three factsheets – Flight Operations events, Maintenance and Other Support System events, and flight operation events for UAS.

4 There are some mandatory additional questions for Airspace related keywords.

In Sentinel, the event classification is automated based on the assessments to PIL, ADL and PRL. However, the classification can be manually selected in Sentinel by turning off the Auto Calculate function in the Assessment Tile in Sentinel (Figure 7). The option to change the automatic classification was developed for UAS system's requirement to classify their events in accordance with their event classification policy. Other users must not change the automatic classification for their event.

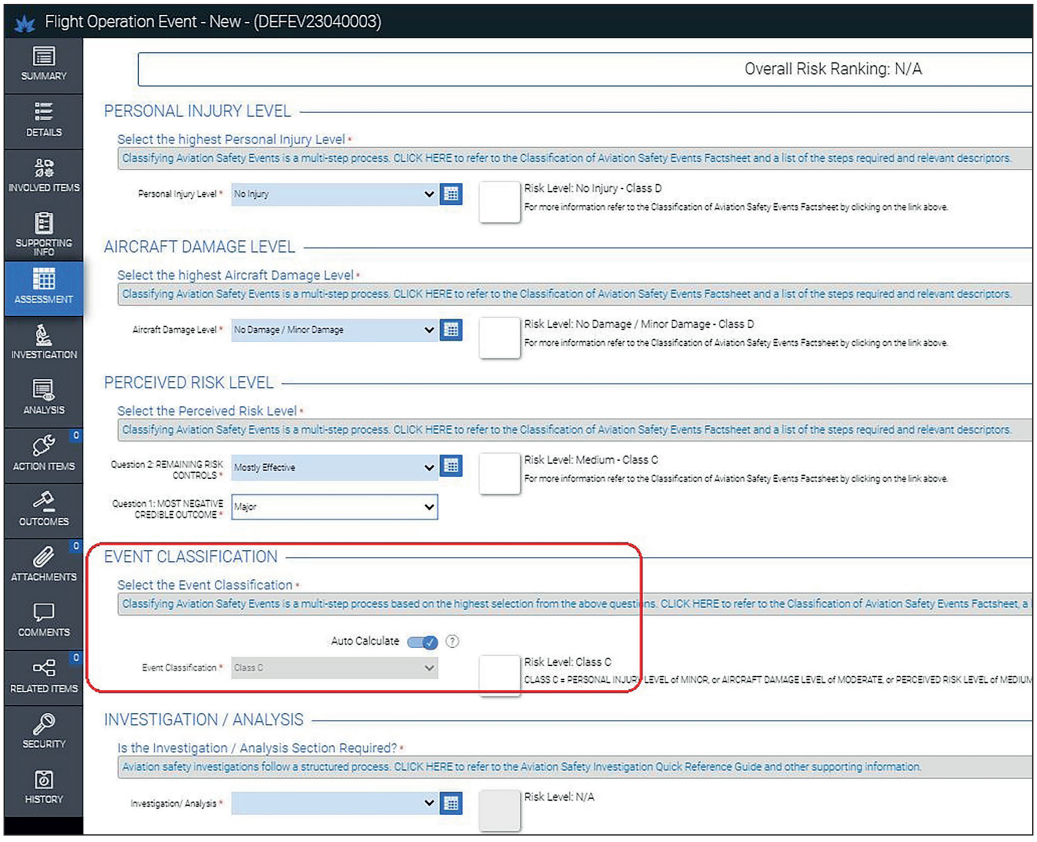


Figure 7: Auto-calculate Event Classification in Sentinel — Assessment Page

Classification of Aviation Safety Issues

The classification of aviation safety issues is made under the OPHAZ report type and must be identical to the Risk Management process. Specifically, the 'personnel' and 'capability' dimensions must be used to estimate the risk level using the risk matrix.

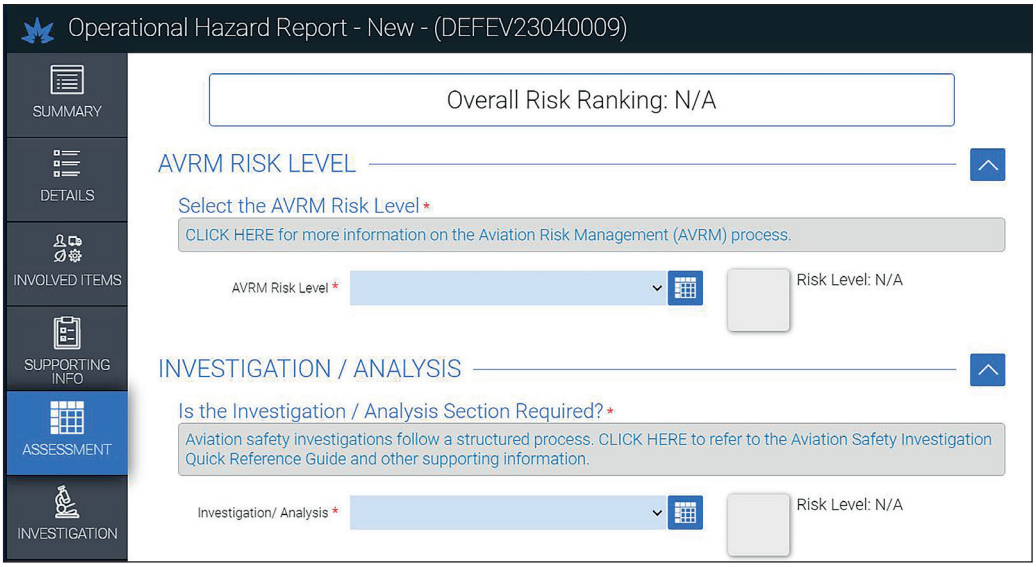


Figure 8: Assessment of OPHAZ in Sentinel

Deciding to investigate (or not)

Every event is reviewed. Not all safety events require investigation. The role of the Aviation Reviewer is to oversee the initial processing of an ASR in Sentinel. This may involve seeking additional information, including from involved persons, to clarify the event details and to inform its classification. Having completed these steps, the Aviation Reviewer then makes an informed decision on whether or not an investigation is required.

While the investigation of every safety report may provide an opportunity to learn, in reality the situation is more complicated — investigations require resources to collect and analyse information as well as to document, track and implement their outcomes. This is a particular challenge for organisations with mature reporting cultures as they can be faced with large numbers of safety reports. In such cases, an organisation must prioritise its investigations and learning effort.

The complexity of an internal aviation safety investigation may vary considerably depending upon the circumstances – from the conduct of a brief desktop investigation to a full, in-depth investigation.

For safety events, the decision to conduct an investigation and its depth depends on the actual or potential consequences of the event. Events considered to have a high-risk potential are more likely to be investigated and should be in greater depth than those with lower risk potential.

ASR Event Classification considers both the actual and potential consequences of an event and serves as a framework to guide the decision to investigate (see Table 1).

For safety issues, the decision to investigate the individual OPHAZ rests upon its risk level. Safety issues carrying medium risk or higher should be investigated.

The Perceived Risk Level (PRL) is an assessment of whether an event posed a Very Low, Low, Medium, High, or Very High risk to aviation safety. The PRL is assessed using the appropriate report type Event Classification fact sheet found on the ASR Support and Resources web page.

Table 1: ASR Event Classification and Investigation Decision

Classification	Description	Default Investigation Decision
Class A	PIL of Fatal ADL of Destroyed	Notify DFSB
Class B	PIL of Serious ADL of Substantial PRL of High or Very High	Notify DFSB
Class C	PIL of Minor ADL of Moderate PRL of Medium	Investigate
Class D	PIL of No Injury ADL of No damage/ minor damage **PRL of Low**	Possibly investigate
Class D	PIL of No Injury ADL of No damage/ minor damage **PRL of Very Low**	Data capture only

All Class A events and select Class B events are independently investigated by DFSB. Class B events not investigated by DFSB become the responsibility of the command chain. For command-led investigations, DFSB is to be engaged to determine the complexity of the investigation and the level of DFSB involvement.

In addition to the severity or potential severity of the outcome, there are additional factors that may influence the decision to conduct an investigation or not. These include:

- Safety value to be gained
- Opportunity for safety action to be taken
- Whether the event is novel (eg not seen before)
- Whether similar events have been recently investigated
- Contribution to targeted safety programmes
- Training benefit
- Resource availability.

A cumulative trend in lower perceived risk level events may also contribute to the decision to investigate as either an individual event or via an OPHAZ (preferred method).

For those events that are not investigated, they are recorded as 'Data capture only' in Sentinel allowing the investigation workflow to be 'Bypassed'. As shown in Figure 12, upon selecting 'Investigation' or 'Data Capture Only' on the Assessment page the User is presented with the option to 'Start Investigation' or 'Bypass Investigation'.

The investigative decision relies on the best judgement of the Aviation Reviewer. If in doubt, discuss with your command chain and senior aviation safety representative in the first instance or, if necessary, DFSB via the ASR Service Desk (ASR.Servicedesk@defence.gov.au).

Important: If the investigative decision or not is outside the guidance given in the table: ASR Event Classification and Investigation Decision, then a comment in the Comments Tile in Sentinel **must** be made to explain why this decision was made. See Add Comment checklist item 7 below.

The Bypass Investigation workflow

Figure 9 illustrates the ASR workflow for an event that is data capture only (investigation is bypassed). Once the Aviation Reviewer selects 'Bypass Investigation', the ASR progresses to the Approving Authority (S2 review) and the ASR is considered to have passed First Release[5].

- At the S2 review stage, the Approving Authority can either:
- Sign off on the ASR or
- Initiate an investigation for the ASR. The ASR will be sent to the nominated investigator. This is why an investigator must be initially appointed regardless of whether the ASR is to be investigated or not.

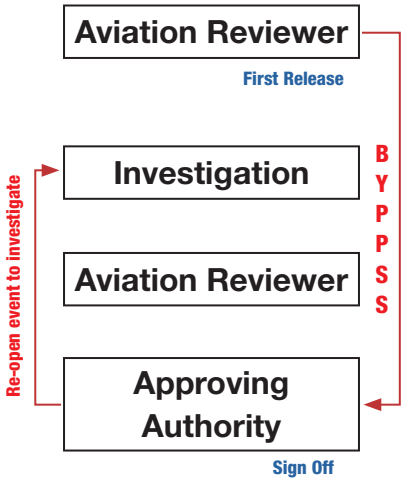


Figure 9: The Bypass Investigation workflow in Sentinel

5 Data contained in an ASR that has passed First Release will be accessible to users who have access to ASR Sentinel and SALUS.

What about OPHAZ Reports?

An OPHAZ can be raised for a variety of reasons and provides a flexible mechanism to support the reporting, tracking and investigation (as required) of safety issues. The decision to conduct an investigation for an OPHAZ is largely dependent on the circumstances of each report. As a general rule, safety issues that pose a medium or higher risk should be investigated.

Monitoring of 'Data Capture Only' Events

It is necessary to periodically monitor 'data capture only' events to identify common issues or trends that might warrant further investigation. This may trigger the raising of an OPHAZ report to investigate a series of events that suggest an area of vulnerability. The requirement to review events that have been assessed 'data capture only' is to be integrated within the organisations hazard review processes.

Add Comment (checklist item 7)

- A comment must be made if the investigative decision for the ASR is outside the guidance in Table 1: ASR Event Classification and Investigation Decision. A comment will assist others in understanding and reviewing the ASR event and the investigative decision.
- The comments section also provides the Aviation Reviewer the opportunity to comment about the event, provide context to the ASR event classification, or provide guidance to the investigative complexity, etc.

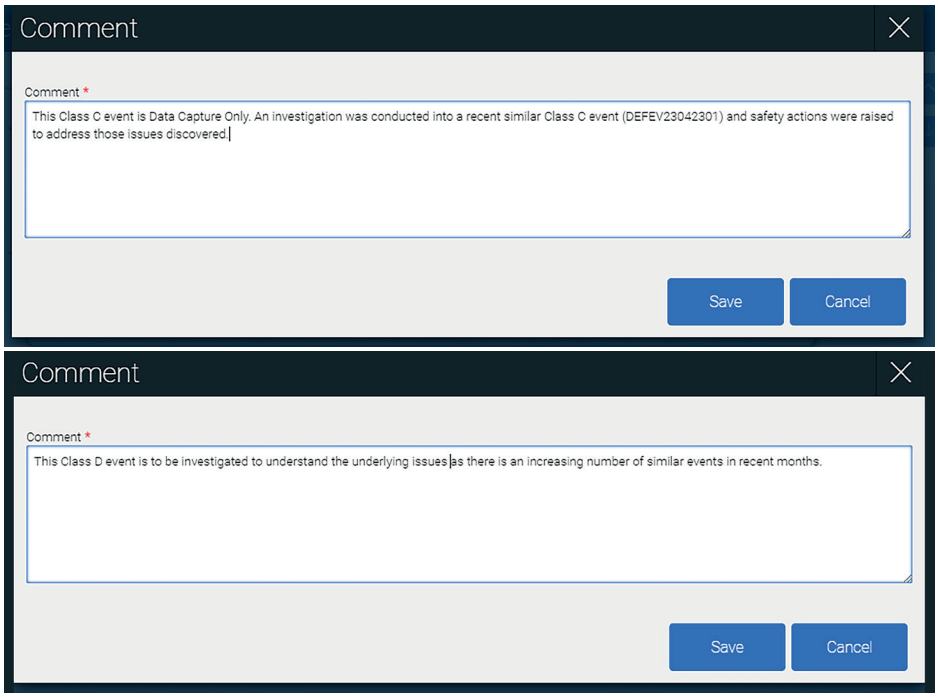
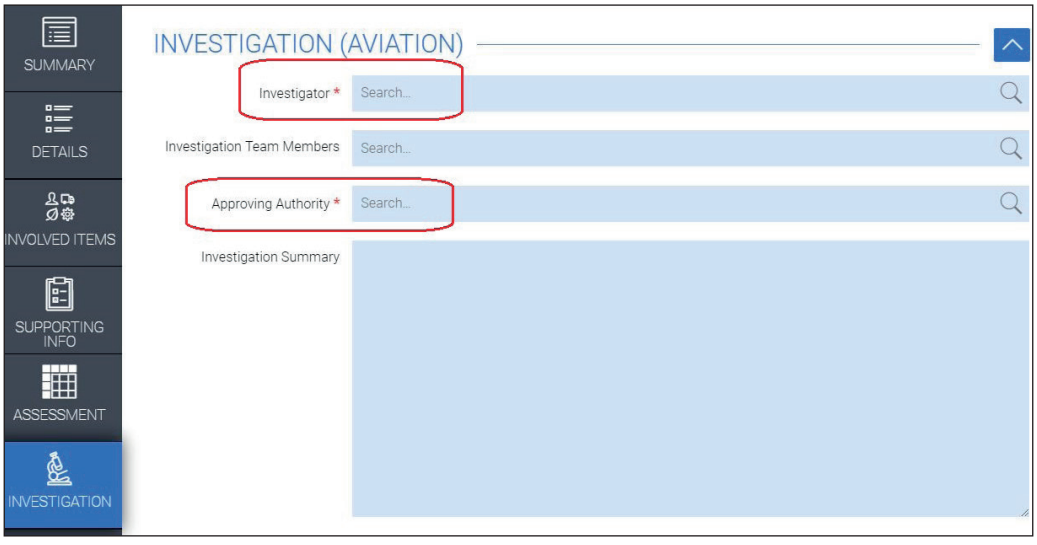


Figure 10: Example Aviation Reviewer comments in Sentinel

Assign Investigator(s) and Approving Authority (checklist item 8)

- Both an investigator and an Approving Authority must be selected before the ASR workflow can be progressed (Figure 11).
- An investigator must be selected in the Investigator field even if the ASR is not to be investigated. An investigator is still required in the event that the Approving Authority decides an investigation is warranted during the review process and initiates an investigation.
- Additional investigators can be appointed by utilising the Investigation Team Members field.
- The role of investigator is typically performed by an ASO trained individual. Should an ASO-trained investigator not be available, then as an alternative, a member who is briefed and/or mentored by an ASO-trained individual on the investigation process/ methodology, may be appointed.
- Select the Approving Authority. The Approving Authority is usually CO (or delegate)
- Note that the Approving Authority is a role within Sentinel whilst the Appointing Authority acts outside Sentinel to appoint the investigation. For Class C and D investigations, the Approving Authority and the Appointing Authority is usually the same person (CO or delegate).
- If a WHS stream has been activated (dual stream), an Investigator and Approving Authority in the WHS Investigation tile must be selected. Failure to do so will prevent progression of the ASR. The WHS stream can be accessed by control located top right hand corner of the screen (as per Add WHS Stream checklist item 2).
- Ensure that you Save this page in order to progress the ASR.

Figure 11: Adding Investigator and Approving Authority in Sentinel



Progress the Event (checklist item 9)

This is the final checklist item for the Aviation Reviewer.
Select the Bypass Investigation or Start Investigation button (see Figure 12).

Figure 12: Bypass Investigation and Start Investigation buttons

Once either Bypass Investigation or Start Investigation is selected, the Send Mercury Message will appear. Aviation Reviewers should consult with their senior aviation safety representative on the requirement to send the Mercury Message. If a message is to be sent, a default address list will be pre-populated based on organisational requirements (see below). You can add or remove message addressees if required. Contact the senior aviation safety representative if you believe the pre-populated address list is incorrect. If an update is required the senior aviation safety representative will send a request for amendment to the ASR Service Desk.

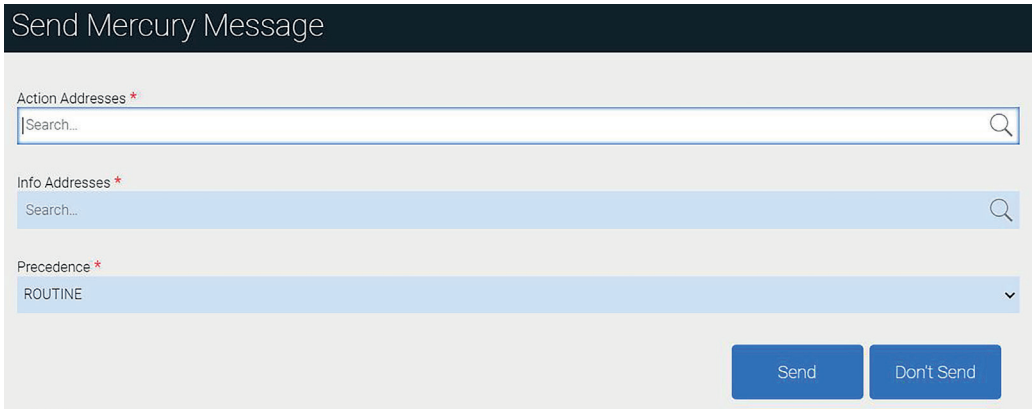


Figure 13: Mercury Messaging in Sentinel

Once this step is completed, the ASR has passed First Release. Data contained in an ASR that has passed First Release will be accessible to users who have access to ASR Sentinel and SALUS.

How to reject an ASR?

There are three main reasons why an ASR might be rejected:

1. The ASR was entered in error.
2. The ASR is a duplicate of a previously raised ASR.
3. The ASR posed no actual or potential hazard to aviation safety. The Details page (Checklist item 1) contains the description of the event or safety issue for review.

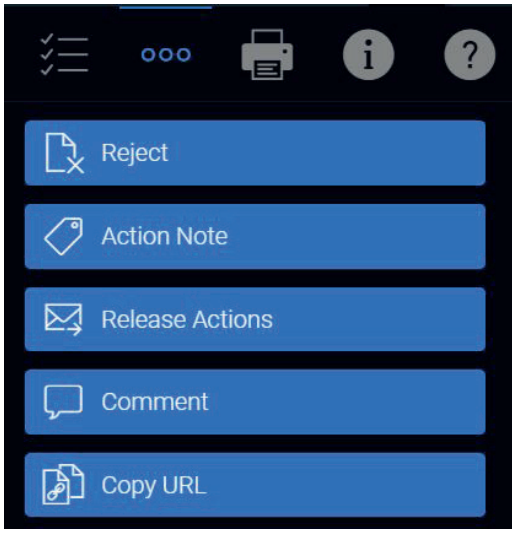


Figure 14: Rejecting an ASR in Sentinel

If an ASR has been raised as the incorrect event type (eg. a Maintenance event when it should be a Flight Operation event), you can change the Event type at the review stage. This is done in the Details Tile – Event Type field by clicking on the 'reclassify' option. Be aware that when you change the Event type the keyword will be dropped and you must select a new keyword before exiting the ASR. Failure to select a new keyword will cause the ASR to not be visible via the Aviation Safety Dashboard and you will only be able to open it via a link. If this occurs, contact the ASR Service Desk for assistance.

To reject an ASR, select the 'More' [ooo] button on the top right hand of the page, select 'Reject' and follow the prompts (Figure 14).

PART THREE:

Aviation Safety Investigations

Why investigate?

At a basic level we investigate aviation safety events and issues to identify and eliminate system deficiencies and to improve system controls in order to prevent recurrence in the case of an event) or to prevent a risk or hazard from being realised (in the case of a safety issue).

How to determine the complexity of a safety investigation?

The complexity of an command-led aviation safety investigation may vary considerably depending upon the circumstances – from the conduct of a brief desktop investigation to a full, in-depth investigation.

The complexity of a safety investigation refer to the scope and depth with which the investigation is conducted.

The **scope** of a safety investigation refers to the range of issues and factors that are examined during the investigation. It encompasses the boundaries of the investigation and the specific areas that will be covered (i.e. the number of lines of inquiry).

The **depth** of a safety investigation refers to the extent to which the investigation delves into each issue and factor that is examined. It involves the level of detail that is pursued, the thoroughness of the examination, and the precision of the analysis. The depth of a safety investigation may also refer to the organisational span of the investigation. For example, a less complex investigation may limit its depth to areas within a single business unit. In contrast, a more complex investigation may examine the role and influence of higher-level and external organisations.

The complexity of the safety investigation is established as soon as possible during Step 1: Gathering Information of the investigation process. Refines to the scope and depth of the investigation may occur as more information becomes available.

The same factors that influence the decision to investigate also inform the complexity of the safety investigation. Generally speaking, the higher the safety risk or actual consequences of the safety event, the more complex the investigation will be. However, the expected safety value of an investigation, including the likelihood of furthering the understanding of the scope and impact of any safety system failures, should also be taken into account when determining the complexity of the investigation. Be mindful that the more complex the investigation, the more time and resources that need to be devoted to it.

What about safety events that are not investigated?

Safety events that are not investigated are said to be 'data capture only' and the investigation module is 'bypassed' in Sentinel. This simply means that the safety report contains a short factual summary detailing the circumstances surrounding the safety event using the information gathered during the initial notification, and from any follow- up information with relevant parties.

See Complete Assessment Page (checklist item 6) section for instructions on how to bypass the investigation in Sentinel.

Command-Led Safety Investigations

Where the aviation safety investigation process requires an investigation to be conducted, a report with investigation information, findings, actions and recommendations is to be submitted for consideration and action by an appropriate Appointing Authority (AA). The AA is the designated member authorised to convene and close an aviation safety investigation. The circumstances and classification of the event will determine the AA as indicated in Table 2.

Table 2: ASR Event Classification and Minimum Appointing Authority

Event Class	Minimum Appointing Authority	Required Consultation
Class A	Environmental Commander (COMAUSFLT, COMD FORCOMD, and ACAUST)	The Defence AA and DFSB
Class B	HTA	Environmental Commander (or delegate) and DFSB
Class C	Unit commander or delegate	HTA (as appropriate, dependent upon the circumstances)
Class D	Unit commander or delegate	Nil

Who can investigate?

Individuals conducting aviation safety investigations must have completed ASO training or remain under the supervision of the appointed ASO/MASO in the conduct of command-led aviation safety investigations.

Are OPHAZ investigations different?

Although safety investigations are generally conducted in relation to a specific aviation safety event, the same principles may also be applied to the investigation of safety issues identified through OPHAZ reports.

Principles of aviation safety investigations

The principles that underpin aviation safety investigations have been developed over many years of aviation accident investigation. In order to achieve the best safety outcomes and ensure consistency of approach, standardisation of reports and facilitation of trend and statistical analysis, the following principles apply:

- The intent of a safety investigation is to establish the contributing factors that increase safety risk, and to ascertain actions that can be taken to prevent recurrence (in the case of an event) or to prevent a risk or hazard from being realised (in the case of a safety issue).
- The investigation should commence as soon as practicable to ensure all perishable information is collected and protected.
- The size and scope of the investigation, and the resources expended, should be commensurate with the classification and scale of the event and the anticipated safety outcomes.
- The investigation follows a structured process.

- Investigations should determine the systemic factors that contributed to the event to enable formulation of appropriate and effective action that can be taken to improve the safety system.
- Contributing safety factors should be categorised in accordance with the Defence aviation Safety Analysis Model (DSAM).
- Safety actions and recommendations should be focused on implementing or improving controls that will eliminate or minimise the safety hazard or risk and thus prevent a recurrence of the event. Safety actions and recommendations must not recommend punitive action.
- Safety actions and recommendations should be recorded in Sentinel, and their implementation and effectiveness monitored.
- Appropriate personnel de-identification measures are to be applied.
- There should be no apportioning of blame or liability – the aim is to identify and remediate system deficiencies so as to eliminate or control risks to be SFARP.

Requirement to participate in investigations

There is a general requirement for all Defence aviation personnel to participate openly in safety investigations including the conduct of interviews and making available for inspection all documents, recordings, equipment, and anything else relevant to the determination of contributory factors of the investigation. The information gathered is to be used solely for the purposes of the safety investigation, with the prime objective being to prevent recurrence. Accordingly, service personnel providing such information should do so freely and without fear of adverse consequences. If during an investigation it becomes apparent that an individual is not openly participating in the investigation process, the investigation is to be paused and the chain-of-command advised prior to recommencing (when appropriate).

Standards of proof in aviation safety investigations

The sole purpose of a safety investigation is to improve the safety of the organisation, not to apportion blame or liability. As such, the legal standards of proof such as beyond reasonable doubt or on the balance of probabilities are neither necessary nor appropriate. An excessively high standard of proof may impose an unnecessary burden when establishing likely contributing factors or other circumstances relating to a safety event, and may impede organisational learning.

Findings, actions and recommendations resulting from the investigation of an aviation safety event are to be based upon the best judgement of the investigating team carrying out an impartial and objective analysis of the available information.

The Investigation Process

The conduct of an investigation is to follow a structured process. The investigation is to be conducted outside of the reporting system (Sentinel) with the results of the investigation entered into the reporting system once finalised. The investigative process is applicable to investigating both safety events and safety issues. Figure 15 below illustrates the investigation process.

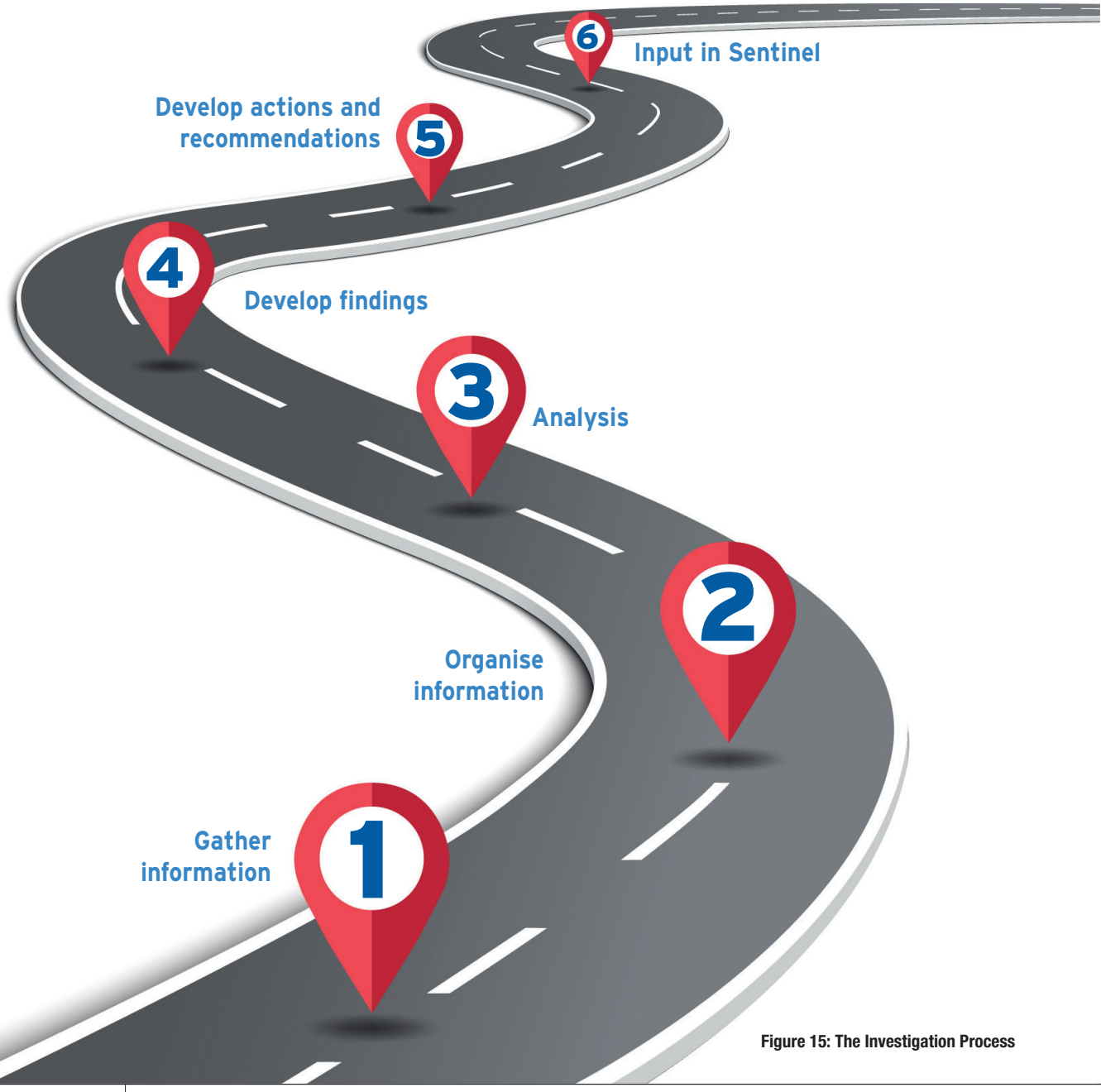


Figure 15: The Investigation Process

Step 1: Gather information

There are many models that can help the investigator to determine what areas of a system may require investigation and where to look for information to inform the investigation.

The C-SHELL Model

The C-SHELL model Figure 16 is a good place to start— it helps to identify sources of information, and may help the investigator appreciate the overall situation.

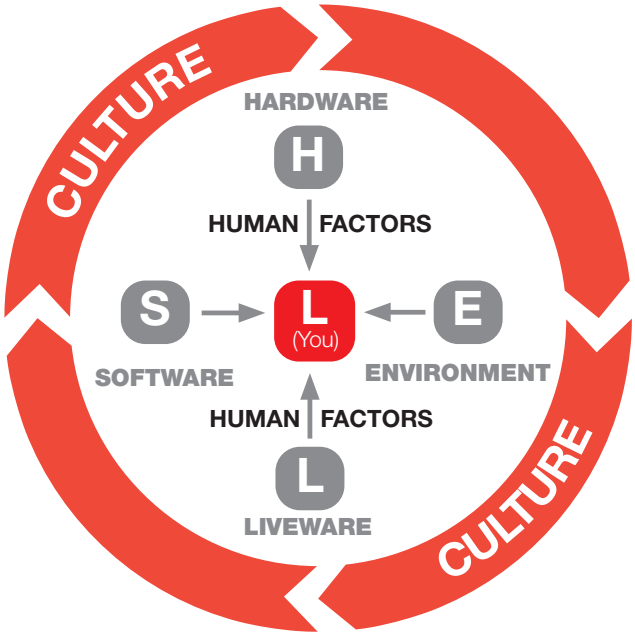


Figure 16. C-SHELL Model for gathering information

CULTURE:

Individuals and groups develop shared beliefs, values and norms to make sense of the organisation in which they work. An organisation's culture exerts a powerful influence on the way members think, feel and behave.

- What is the safety culture in the unit, trade/ mustering, crew, service?
- How did the culture influence the task being performed?
- Were there any undesirable group norms?

SOFTWARE:

This category includes documentation such as maps, charts, standard operating procedures, checklists, OIPs, standing instructions (SIs) and aircraft flight manuals.

- Was the documentation up to date, fit for purpose?
- Was the information readily available to the personnel?

HARDWARE:

All physical aspects of the aircraft and associated equipment.

- Was the equipment serviceable, suitable?
- Were tools/spares available/authorised/appropriate for use?
- Did the work place constrain access to, or operation of, the equipment?

ENVIRONMENT:

How did aspects of the environment including weather, terrain, navigation aids, aircraft cockpit, lighting, noise, vibrations, temperature etc. affect the event?

LIVEWARE (crew and other personnel):

The liveware components consist of the crew/ team actions as well as their interaction with others.

- Actions before, during and after the event
- Non-technical skills within the crew and with each other
- Training, skills and experience, authorisations
- Attitudes and beliefs
- Medically fit for duty
- Types of information
- Recorded information

There are several sources of recorded evidence that may be available to the investigator. Some of this is perishable and may be erased through normal maintenance or operational activities (maintenance downloads or simply removing aircraft power). Immediate steps must be taken to preserve this evidence. Sources include:

- Flight data recorders (FDR) and Cockpit voice recorders (CVR). Note: These sources of data are strictly controlled. Contact DFSB for further information on releasing authorities.
- Mission or maintenance data recorders. What is on your platform?
- Head up devices (HUD)/helmet/radar/EW recordings
- Other recordings such as those made by personal devices.
- Air traffic control voice and/or radar tapes/records (access approval required through 44WG).
- Access swipe cards log work start and finish times.
- GPS data.
- Briefing boards/notes or partial procedures trainers.
- Any photos or video taken by witnesses/ bystanders.

Conducting interviews

Interviews are an important part of safety investigations as they elicits information from those individuals who are directly or indirectly involved with the event. Additionally, Interviews provide an opportunity to gather relevant information to reconstruct an event and to understand why it happened. Effective interviewing is an essential skill that takes time, practice and motivation, to both develop and maintain. A poor interview may undermine the outcome of an investigation, but a good interview can reveal critical information.

People to consider when conducting interviews include:

- those involved in the event
- the peers of those involved in the event
- those who saw the event
- subject matter experts
- commanders/managers

For more information refer to the Interviewing Techniques factsheet for guidance on conducting a good interview. The factsheet can be found on the DFSB website (https://objective/id:AB27176975) or on Attachment 1— INTERVIEWING TECHNIQUES.

Gathering existing documentation

Collecting information also includes gathering other relevant documentation, such as procedures, training records, risk management plans and hazard registers.

Step 2: Organise information

Once you have collected all the information relevant to the investigation, it is important to put it into some sort of order so you can understand what happened and analyse the event. Organising the information assists in ensuring the investigation follows a logical path, identifying and resolving conflicting information and the identification of missing data, and providing a visual display of the investigative process for chain of command and unit briefings.

The recommended tool to organise information collected is the event timeline, supported by the concept of 5-whys.

Constructing the event timeline

One approach to organising information is to start with constructing an event timeline, which shows key details of the event sequence (what happened leading up to the event, the event itself, and what happened after the event until control was regained).
Event timelines are easy to construct and are an excellent way of depicting complex events in a logical manner. The timeline should include when the event started, what constituted the start, and include information on the activities prior to and after the incident, and any information that may be relevant. Refer to Figure 17 below for a simple event timeline example.

Figure 17. Simple Event Timeline Example

At this stage, it is better to include too much detail risk of leaving something out that could be relevant. For example, many events have multiple factors, each of which would not necessarily lead to an event, but together make an event very likely. Ideally, each part of the timeline should include the time it happened, but even a relative time in relation to other components may be useful. If more than one string of incidents occurred leading up to the event, draw separate event timelines, showing where the strings converged to create the event. Figure 18 below illustrates an event with two strings of incidents leading to the event.

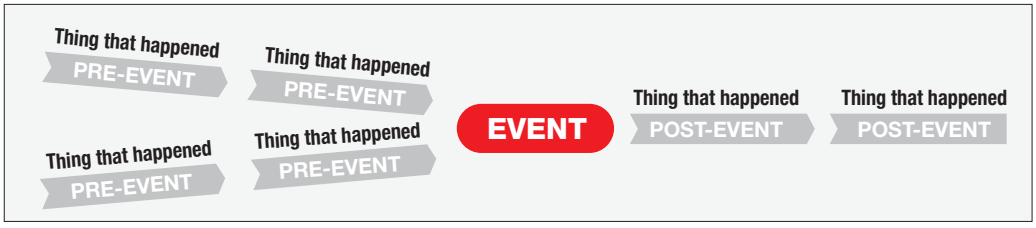


Figure 18. Example timeline with two event strings

The event timeline should only include components that had an immediate effect on the event. For example, poor organisational planning that occurred two months ago may be identified during the investigation as a contributing factor but not as a part of the timeline. At this stage, do not speculate on possible causes. Speculation could lead to inappropriate conclusions.

A Flowchart or Excel spreadsheet is recommended to record the event timeline.

The concept of 5-Whys

The 5-Whys is a basic methodology or tool to discover the probable underlying factors that contributed to an event. More often than not, people fix a problem by dealing with issues that are immediately apparent. While it may provide a quick fix, the problem tends to rear its ugly head in the same form or with a different face later on. Fixing the problem by addressing the underlying safety issues is the ultimate aim of any investigation. The concept of 5-whys is as follows:

- Ask why an event happened or a condition was present.
- Continue asking why until the question can no longer be answered.
- When why can no longer be answered you have reached:
  - a control point (risk control)
  - a point that is beyond organisational control
  - a point where more data needs to be collected to answer why.

Example Event

Taxi — Tow Confliction

What happened?

Black Cat Maintenance was cleared to tow a P8 aircraft to the engine run facility by Controller A. A short time later, an AP3C aircraft was cleared to taxi from the main apron to holding point Charlie RWY 36 by Controller B. Upon turning onto TWY B, the P3 crew observed a P8 aircraft under tow proceeding in the opposite direction on TWY B. The AP3C came to a stop and advised surface movement control of the confliction.

Interviews with air traffic controllers were conducted. It was found that HO/TO procedures played a role in the event. See Fig 19 for an event timeline.

Some risk control questions ask include:

- What prevented the event from being worse?
- Which controls were effective and why?
- Which controls failed and why?
- What should have stopped it but didn't?
- What was absent altogether?

Note:
It is not always necessary to ask "Why"" five times. While asking "Why" 5 times is generally sufficient; it may be also more or less. The real key is to avoid making any assumptions and keep asking "Why" until all the potential contributing factors and safety issues have been identified.

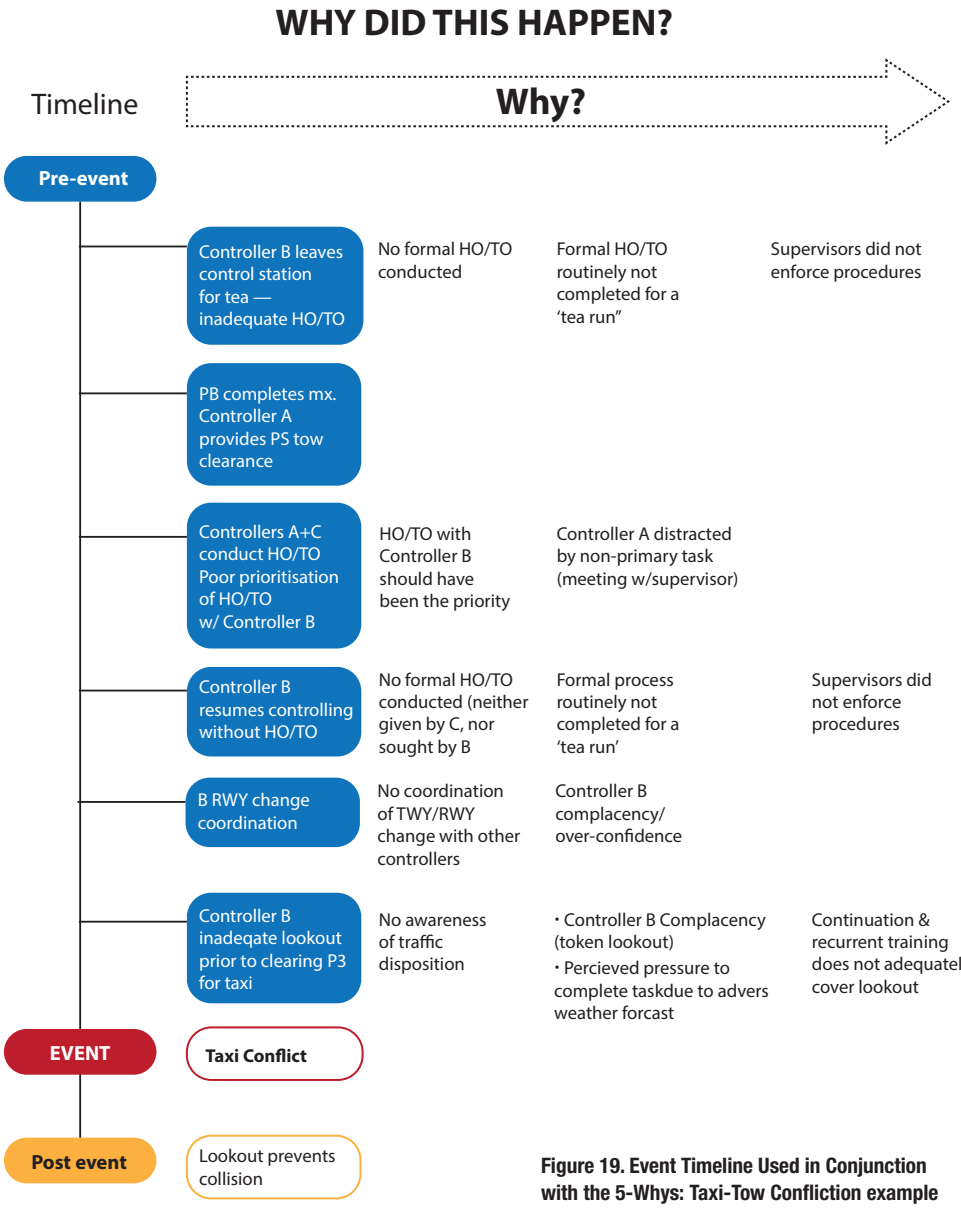


Figure 19. Event Timeline Used in Conjunction with the 5-Whys: Taxi-Tow Confliction example

Finalising the organisation of information

Once the investigator(s) has agreed on the timeline and actions and conditions relating to the critical component(s), those personnel directly involved with the event should be consulted to verify that these are correct. This step is vital to ensure the later investigation findings are accurate and credible.

Using the 5-whys analysis along with the event timeline is the best way to organise the information collected. However, timelines alone do not identify the contributing factors of the events, and they should be used in conjunction with the analysis of information.

Step 3: Analyse information

The analysis of information that has been gathered (Step 1) and organised (Step 2) is the most time consuming but worthwhile step in the investigation process as it answers the question – "why did the event happen?"

The analysis stage involves analysing the data gathered and organised using the Defence aviation Safety Analysis Model (DSAM). This technique is designed to ensure that the investigation is not restricted to the errors and violations of people. DSAM identifies the workplace factors that contributed to the event, the deficient risk controls and the organisational influences within the system that act as forerunners to an aviation safety event. In the processes of applying the DSAM, investigators also check the information that has been gathered and organised to determine whether there are any gaps in the investigation.

Background on DSAM — the Reason Model

The DSAM draws on the work of the organisational psychologist and human error expert Professor James Reason (Reason's Organisational Accident Model) and the Australian Safety Transport Bureau (ATSB).

According to the Reason model, widely known as the Swiss cheese model, accidents rarely result solely from the actions of operational personnel (such as pilots, drivers, masters, engineers, or controllers). Rather, most accidents are due to a combination of problems originating at all levels of the organisation.

In simple terms, the accident sequence begins with the negative consequences of organisational processes (for example, management decisions associated with planning, scheduling, designing, specifying, communicating, and regulating). These organisational conditions are transmitted to the workplace in which the relevant operational tasks are performed. They can result in or manifest through local conditions (such as fatigue, high workload, lack of skills) that have a negative impact on an individual's performance and set the conditions for 'unsafe acts' (errors and violations).

According to the Reason model, these unsafe acts can have consequences that are not identified or controlled by the defences or safety net built into the system (for example, warnings and emergency procedures).

Therefore, local conditions and inadequate defences can facilitate or not adequately control unsafe acts, and these local conditions and inadequate defences can be symptoms of wider systemic issues or organisational conditions, such as poor risk management, poor supervision, and inadequate training systems.

In other words, the system's defences (or barriers, safety guards or controls) can be absent or have limitations (that is, they can have gaps or holes). These limitations can result from unsafe acts of operational personnel (sometimes termed active failures). Alternatively, they

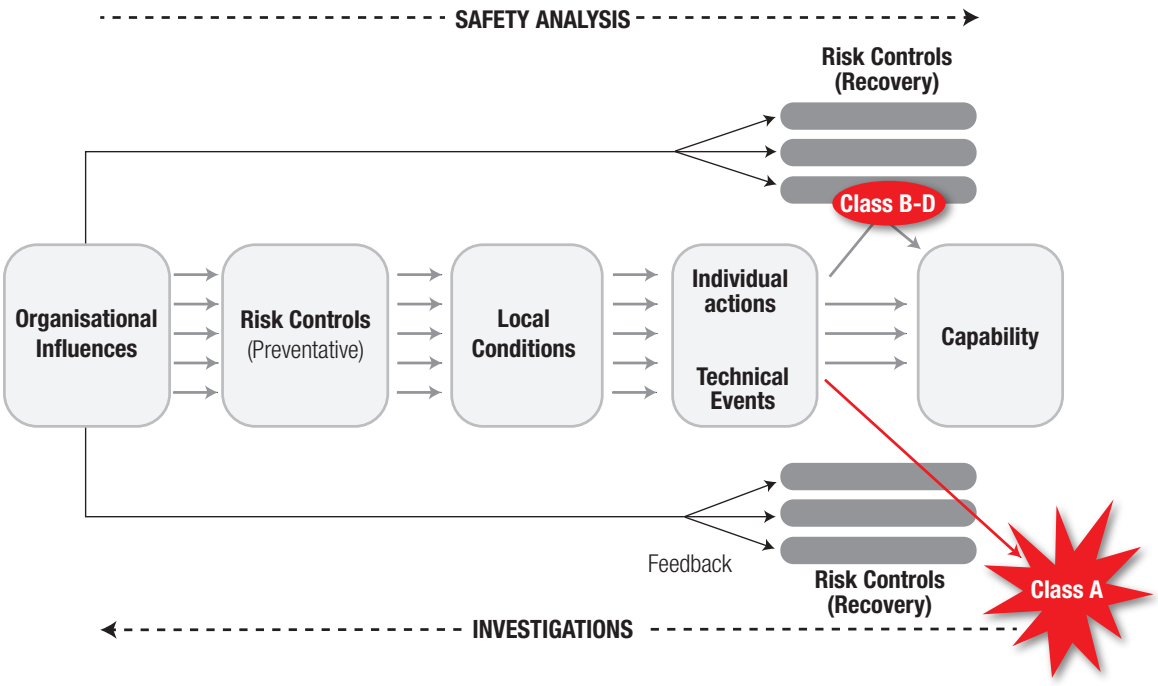


Figure 20. Defence aviation Safety Analysis Model (DSAM)

can originate from management decisions and organisational processes. These longer lasting gaps in the defences have been termed latent failures or latent conditions.

In summary, the Reason model emphasises that unsafe acts have a key role to play in the development of accidents. However, the origins of unsafe acts often lie in management systems, not within the individuals who made the unsafe acts. In other words, the model emphasises a whole of system approach to improving safety rather than an approach focussing on the individuals who initiate or undertake unsafe acts.

Updating the Reason Model – the DSAM

Reason's Organisational Accident Model has been adopted as the model or investigation in many industries. In recent years, however, practitioners have become aware of its various limitations.

The ATSB, for example, was concerned that the model did not deal with technical problems. An example of a technical problem would be a component that failed to perform according to its specifications. In order to provide a more generic model that would be more applicable to a wider range of investigations, and better fulfil the role of identifying potential safety factors, the ATSB modified some aspects of the Reason model. The DSAM is based on the ATSB model and is illustrated in Figure 20.

How to use the DSAM

The DSAM allows the investigator(s) to review the organised data and identify the individual/team actions or technical failures that directly contributed to the event. From here, ask "why did this happen?" to identify the subsequent factors according to the five 'contributing' levels of the DSAM:

- absent, partially failed, or failed recovery risk controls
- individual / team actions and technical failure
- local conditions
- absent, partially failed, or failed preventative risk controls
- organisational Influences

The Safety Analysis worksheet helps investigators to apply the DSAM and conduct their analysis.

At the end of the analysis, the investigator will have answered "why did the event happen?" through the identification and classification of contributing factors using the DSAM.

The Defence Safety Analysis Worksheet is available in Attachment 2 and on the DFSB website (https://objective/id:BO3541567).

The Defence aviation Safety Analysis Model – Contributing Factors Taxonomy is available in Attachment 3 and on the DFSB website (https://objective/id:AB34289436).

Individual/team actions and technical failure/malfunction

Individual/Team Actions. Individual/team actions are always committed actively (someone did or did not do something) and have a direct relation with the event. They are observable behaviours performed by operational personnel. Although individual actions can both reduce or increase risk, when the term is used it can be taken to refer to individual/team actions that increase risk.

It is important that the analysis phase of an investigation clearly identifies the individual/team actions and uses them as a platform to identify any underlying safety issues that may exist. A fundamental principle of safety investigation and human factors is to encourage the organisation to look beyond the individuals and examine the system and the underlying reasons for the individual actions.

Some investigators may find it useful to consider that individual actions explain how rather than why some of the events happened. For example, problems associated with preparation and planning activities, including briefings conducted as part of planning for a particular task is considered an individual or team action. When considering the actions of individuals, it is useful to consider whether, if a similar situation arose again, it would be desirable for the individual's actions to be different.

Table 3 below contain coded contributing factor types for individual/ team actions or technical failures/malfunction that investigators may wish to incorporate into their analysis as prompts. The codes are not designed to be used as check-lists, but are particularly valuable for trend analysis and data entry (step 6: Entering Investigation Results into Sentinel).

Table 3: Coded contributing factor types for individual/team actions or technical failures/malfunction

Individual/Team Actions	Technical Failure/Malfunction
• Planning/Preparation • Equipment/Information Utillsation • Internal Communication • External Communication • Monitoring • Coordination/Teamwork • Inspecting • Record keeping • Workload Management	• System/component Failure or Malfunction

Once the role of the individual or team action in the event is identified, consider whether the action or inaction was an error or a violation.

Errors are defined as an action or inaction that leads to deviations from organisational or the operational person's intentions or expectations. This includes errors resulting from perceiving something incorrectly or not understanding the situation correctly, inadvertently deviating from what was planned, and performing the wrong action for the situation.

Violations are defined as an action/inaction that represents an intentional deviation from procedures or standards or requirements associated with task completion.

The conceptual boundaries between errors and violations are not always clear as both involve a deviation of action from some required standard of performance. The question of intentionality is what differentiates errors and violations and it is what makes them more dangerous than errors.

The drivers behind an error or violation can be determined by looking at the local conditions and the underlying systemic issues uncovered during the investigation. For example, an operator followed the wrong checklist (error in individual action: equipment / information utilisation) because they were under pressure to complete the task (local condition: task completion pressure) and was unfamiliar with the task (local condition: experience/recency

for task). In turn, the pressure to complete the task and lack of task familiarity were found to have been brought about by poor supervision (risk control: active supervision/control).

By looking past the type of error, the local conditions and risk controls provide a richer explanation for why the error occurred.

Note:
In the context of an aviation safety investigation, a violation typically involves an intentional individual or team action that results in unanticipated adverse consequences. Most violations are well-intentioned, targeting desired outcomes such as task completion and simplification. As a general rule, individual/team violations that achieve the desired outcome and do not contribute to an undesired safety outcome are not reported as an aviation safety event.

Where a violation involves an act of serious carelessness (serious disregard of an obvious risk or profound failure of professional responsibility) or sabotage (intended harm to individual, asset, workplace or organisation) the investigation is to be immediately suspended and the chain-of-command advised.

Separate to the aviation safety investigation, the DFSB Safety Behaviour Management Tool (SBMT) provides commanders with a method of determining acceptable and unacceptable safety behaviour and commensurate action. The SBMT can be found on the DFSB webpage (https://objective/id:AB27737139).

Technical Failure/Malfunction. In many ways, technical failures can be considered as being similar to individual / team actions that increase safety risk, as they are both describing components which occur at an operational level. Similarly, they can both be influenced by a range of local conditions and risk controls. In addition, they are often considered at an earlier stage than individual/team actions in the investigation analysis process as more often than not, it is the technical problems that operational crew react to (and hence, sometimes triggering individual/team actions or inactions).

Local conditions

Local conditions are those conditions that exist in the immediate context or environment in which individual /team actions or technical failures occur, and can have an influence on the individual/ team actions or technical failures. Local conditions include characteristics of the individuals (e.g. knowledge, skills of the individual or the team, team interactions, and personal factors), the equipment involved, as well as the nature of the task and the environment (e.g. the workspace, the physical environment, and weather).

Check:

Does this contributing factor describe something about the task demands, work environment, individual capabilities or human factors that promoted the individual/ team actions or technical failures or undermined the effectiveness of the system's defences?

Local conditions can increase the likelihood of individual/team actions which increase safety risk (for example, fatigue, insufficient knowledge, high workload). Local conditions can also increase the likelihood of technical failures, which increase safety risk (for example, local conditions that can be associated with an engine failure could include pre-existing material defects or high operating temperatures).

Most local conditions also stem from deficient risk controls (preventative) or organisational influences, so it is important that the investigation also considers how the identified local conditions were influenced by these systemic factors.

Table 4 contains coded contributing factor types for local conditions that investigators may wish to incorporate into their analysis as prompts. The codes are not designed to be used as check-lists, but are particularly valuable for trend analysis and data entry (step 6: Entering Investigation Results into Sentinel).

Table 4: Coded contributing factor types for local conditions

Local Conditions	Examples:
Knowledge, Skills and Experience	Knowledge/Skills with Task, Reliance on Undocumented Knowledge
Personal Factors	Physical/Mental Limitations, Faitgue/Alertness, Attention
Task/Job Factors	Distractions, High Workload, Incorrect Task Information
Social/Group Factors	Communication Barriers, Team Interaction, Group Norms
Environmental Conditions	Weather, Visibility
Workspace Environment	Lighting, Noise, Temperature, Air Quality
Physical Environment	Infrastructure

Absent, partially failed, or failed risk controls

Check:

Does this contributing factor describe the equipment, work process, control measure, detection system, procedure, or attribute which normally prevents this safety event or limits the consequences?

Risk controls are the measures put in place by an organisation to facilitate and assure safe performance of the operational components of the system (that is, operational personnel and equipment). They can be viewed as the outputs of the organisation's safety management system. Risk controls can be either recovery or preventative:

- Recovery risk controls are put in place to detect and correct or otherwise minimise the adverse effects of local conditions, individual/team actions and technical failures. They can be viewed as the outputs of the organisation's safety management system. Such last-line controls include equipment or procedures for detection, warning, recovery, containment, escape and evacuation, as well as individual awareness and protective equipment. On occasions, these recovery risk controls will be breached and a safety event will result, or the consequences associated with a safety event will become more severe.
- Preventive risk controls are put in place to minimise the likelihood of undesirable local conditions, individual/ team actions and/or technical failures. Preventative risk controls facilitate and guide performance at the operational level to ensure individual/team actions and technical events are conducted effectively, efficiently and safely. Such controls include procedures, training, equipment design and work rosters.

At any particular time in any safety system, there will be weaknesses in some risk controls, and these weaknesses will change over time. These holes or weaknesses can occasionally align, leading to serious consequences.

Absent or failed preventative and recovery risk controls can be viewed as holes in an organisation's safety management system. It is important that the investigation identifies an absent, partially failed, or failed risk control so that organisational deficiencies can also be identified.

Table 5 contain coded contributing factor types for risk controls that investigators may wish to incorporate into their analysis as prompts. The codes are not designed to be used as check-lists, but are particularly valuable for trend analysis and data entry (step 6: Entering Investigation Results into Sentinel).

Questions to ask:

- **What risk controls were there?**
- **What could have been there?**
- **What made the risk controls ineffective?**
- **Did the risk controls not work at all? (Failed?)**
- **Did the risk control work only partially as intended? (Partially failed?)**
- **What controls could have been in place to (Absent?)**

Table 5: Coded contributing factor types for risk controls

Risk Controls	Examples:
Systems and Equipment	Display/Control Systems, Equipment, Tools and Materials, Warning/Detection Systems
Facilities/Infrastructure	Design of building
Procedures/Processes/Practices/ Data	Technical Manuals/Publications, Workplace Instructions/Orders/Procedures
Training/Assessment	Initial Employment Training, Continuation/ Promotion/Recurrent Training
People Management/Supervision	Active Supervision/Control, People Management
Authorisation/Categorisation	Management and/or process of authorisation/ categorisation
Technical Failure Controls	Design/Engineering, Manufacture, Maintenance, Operation

Organisational influences

Organisational influences are those conditions that establish, maintain or otherwise influence the effectiveness of an organisation's risk controls. There are two main types of organisational influences — organisational conditions and external influences.

Check:

Does this contributing factor identify an organisational influence present before the event and which undermined or removed the risk controls?

Organisational conditions are the safety management processes and other characteristics of an organisation which influence the effectiveness of its risk controls. Safety management processes and organisational characteristics include hazard identification, risk assessment, safety assurance, organisational resources, planning and communication.

Organisational conditions can exist at all levels of the organisation – from the unit all the way through to the ADF. The higher the level of organisational conditions that is looked at, the more complex the investigation becomes.

External influences are the processes and characteristics of external organisations which influence the effectiveness of an organisation's risk controls and organisational conditions. These influences include the regulatory standards and assurance provided by regulatory agency.

Table 6 below contain coded contributing factor types for organisational influences that investigators may wish to incorporate into their analysis as prompts. The codes are not designed to be used as check-lists, but are particularly valuable for trend analysis and data entry (step 6: Entering Investigation Results into Sentinel).

Table 6: Coded contributing factor types for organisational influences

Organisational Influences	Examples:
Organisational Characteristics	Communication/Consultation, Organisational Resources, Organisational Structure
Safety Management Processes	Safety Assurance, Safety Policy/Objectives, Safety Risk Management
Regulatory Influences	Issues with regulatory material and compliance monitoring

Step 4: Develop findings

A safety investigation produces a series of findings. Findings can be thought of as the conclusions that are drawn from the analysis of the information gathered: findings succinctly summarise the outcomes of the investigation. There are three types of findings – contributing, positive, and indirect findings.

Contributing finding.

Contributing findings directly and negatively relate to the circumstances of the event. Specifically, each contributory finding targets an element of the event (such as individual action, local condition, risk control, organisational influence), if it had not occurred or existed at the relevant time, then either:

- the event would probably not have occurred, or
- adverse consequences associated with the event would probably not have occurred or have been as serious, or
- another contributing element would probably not have occurred or existed.

Contributing findings address the individual/team action(s) (or technical failure/ malfunction), the associated contributing local condition(s), risk control(s) and organisational influence(s) (if any). These separate findings can be written as components

of the DSAM entered into Sentinel (Step 6) as separate findings. For example, findings 1-3 from the taxi-tow confliction example earlier can be written separately as below:

- Finding 1: Controller C and B did not conduct a HO/TO prior to controller B resuming control duties after leaving their control station. (Individual /team actions)
- Finding 2: Non-adherence to the published HO/TO procedures for tea runs at YPED has normalised over time. (Local condition)
- Finding 3: HO/TO requirements are defined in [XXX publication]; however, procedural compliance had not been routinely enforced by supervisors. (Risk controls).

Contributory findings can also be written as a single statement that address those relevant aspects of the DSAM. An example of a finding taken from an event timeline is at Figure 21 below:

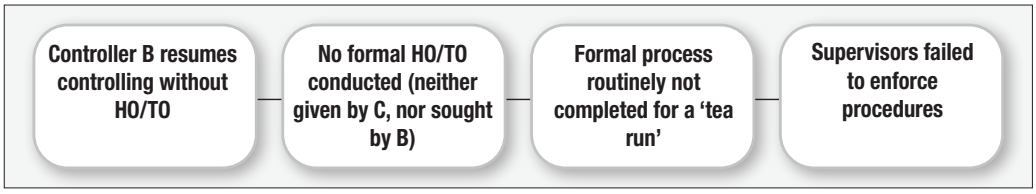


Figure 21: A finding from Event Timeline.

Using the example from Figure 21, the finding may be written and entered into Sentinel (Step 6) as:

Finding 1: Controller B resumes controlling without a HO/TO as Controller A did not provide one and Controller B did not seek one. Interviews revealed that formal HO/TO procedures were not routinely completed for tea runs and supervisors did not enforce these procedures.

Positive finding:

Positive findings directly and positively relate to the circumstances of the event. Positive findings can be the individual / team actions that played a substantial role in reducing risk, and were beyond normal expectations. Examples can include exceptional leadership or displays of non-technical skills. Positive findings can also be any situation where the design or provision of equipment, systems or other risk controls has significantly reduced safety risk, and the reduction was beyond normal expectations or requirements. They can also include situations where the effective functioning of a recovery risk controls is worth noting. Examples may include ACAS/TCAS resolution advisories and GPWS alerts that prevent collisions (that is, a collision was likely to have occurred if the alert had not been provided).

Put simply, positive findings are the actions or risk controls that 'saved the day' or played an important role in reducing the risk associated with the event.

When considering positive findings, ask:

- What actions or risk controls had a significant influence on reducing the risk associated with this occurrence?
- Were there any individual or team actions that detected or corrected a risky situation, and were beyond what was intended or could reasonably be expected?
- What risk controls detected or corrected a risky situation?

Indirect finding.

There may be other findings that did not directly or negatively contribute to the event, but are worth noting. An investigation may need to make findings that concern the credibility or relevance of the available information, whereas others deal with the content of the information. For example, the investigation may need to make findings to answer questions such as the following:

- What was the aircraft configuration at the time of the event?
- What was the speed?
- Who was the handling pilot?
- Was the maintainer appropriately qualified?
- When was the last maintenance of the engine performed?
- What was the workplace/environmental conditions at the time?

Other indirect findings that may be considered relevant to include in the findings include:

- Findings to resolve significant ambiguity or controversy that occurred during the investigation which was not addressed by the contributory findings.
- Findings about possible scenarios or safety factors when firm contributing findings were not able to be made.
- Positive factors, events or conditions that saved the day or played an important role in reducing the risk associated with an event.

Indirect findings are worth noting as collectively they provide a more comprehensive picture of the event and assures Command that the key aspects of the investigation have been considered.

It is important to remember that a safety investigation is not a broad audit or examination of an organisation or safety system with unlimited resources. Although all safety issues that are identified during an investigation should be raised, regardless of whether they were contributory or indirect, the search for potential safety issues needs to be pragmatically focused in areas which are related to the circumstances of the event. In other words, to be efficient and timely, safety investigations should not stray too far from the paths of contribution when searching for potential safety issues.

Note:
Findings must be derived from the investigation information collected and the analysis of the information (Steps 1 to Step 3). Findings should be supported by information collected during the investigation, such as interviews, log books and photographs. Each finding description should be substantiated with a rationale.

The rationale provides a short summary of the investigation analysis relevant to the specific finding. The rationale gives readers the context and justification to support the finding.

For more information, see Step 6 on how to enter findings into Sentinel.

Step 5: Raise effective safety actions and recommendations

Once all safety issues have been identified (to a reasonable extent) and investigation findings have been formed, effective safety actions and recommendations should logically link to the investigation findings and are raised in order to prevent recurrence.

Safety actions are those activities assigned by the Approving Authority to an individual within the span of their command/management authority. For example, if the Approving Authority is the Commanding Officer, safety actions are only to be assigned to personnel within the unit. Safety recommendations are safety outcomes that need to be completed by agencies outside the unit and should be assigned to the HTA. All safety actions and recommendations are to be entered into Sentinel (Step 6). The principles of effective safety actions and recommendations are as follows:

- **Balanced and considered.** Through team discussion and consultation with the organisation involved. Can this safety action or recommendation be achieved? Is this realistic given the context, resourcing and culture of the organisation? Only the organisation involved can decide this.
- **Evidence based.** The safety action or recommendation must be able to be traced back to the investigation findings.
- **Address safety issues.** Not just the errors and violations (behaviours) that we see. We need to get to the causes of these behaviours.
- **Written and targeted carefully.** The aim of an investigation is to identify the safety issues that contributed to the event, and to come up with effective safety actions and recommendations to prevent recurrence. Without well written safety actions and recommendations to prevent recurrence, the investigation may be wasted.

How to write effective safety actions and recommendations

The SMARTER concept ensures that actions and recommendations are achievable, traceable, relevant, have a deadline, and can be evaluated and revised (if necessary). Refer to Figure 22 on the following page, for the outline of the SMARTER concept.

S	**Specific**	What is it that you actually want to achieve?
M	**Measureable**	How will you show that the action or recommendation has been met?
A	**Achievable**	You may want to break the action or recommendation down into sizeable, achievable chunks
R	**Relevant**	How does the action or recommendation address the safety issue?
T	**Time-bound**	Provide a time to guide when the action or recommendation should be met
E	**Evaluate**	Evaluate the effect on existing safety issues/risk controls
R	**Review**	Review te effectiveness of actions and recommendations

Figure 22: SMARTER Safety Actions and Recommendations

Points to consider when formulating effective safety actions and recommendations:

- Use the hierarchy of controls to identify better, more effective risk controls.
- Can the safety issue be eliminated – such as changing the time of day of the activity or using simulation to train in an aircraft manoeuvre.
- Another procedure – additional procedures do not always work. Why did the existing procedure fail and will an additional procedure fix the problem?
- Briefing a unit on an event can be useful but is not a solution in itself. Enduring solutions to prevent recurrence are required.
- Units should consider Risk Management processes when implementing actions or suggesting recommendations in order to reduce risk of recurrence SFARP.

Step 6: Enter investigation results into Sentinel

Step 6 is where the outputs from Steps 1 through to 5 are entered into Sentinel. Step 6 is the process of inputting the outputs from steps 1 through to 5 into Sentinel. Figure 23 illustrates how the investigation steps are recorded in the Sentinel Investigator checklist (Figure 24).

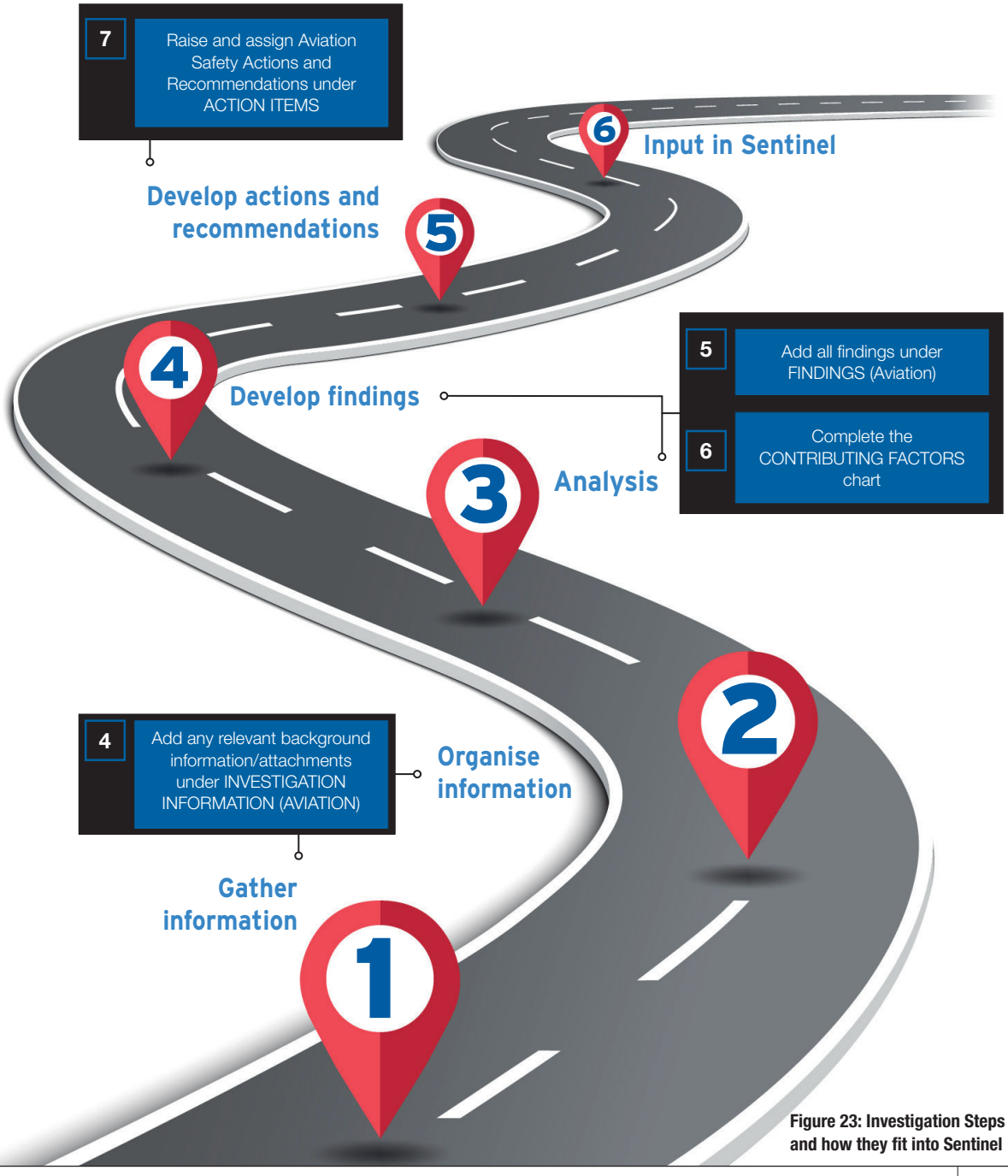


Figure 23: Investigation Steps and how they fit into Sentinel

Sentinel Investigator Checklist

The investigator will be presented with a checklist which lists the tasks to be completed to progress the ASR onto the Under Review stage. Each step can be selected and will direct the investigator automatically to the corresponding area of the Sentinel event. Refer to Figure 24.

Note: All the mandatory tasks in the Sentinel Investigator checklist must be completed before the investigation can be marked as complete and progress to the next stage of the ASR lifecycle. An error message will display if the investigator attempts to progress the ASR past investigation if one or more mandatory task is not completed. By clicking on the error message, the investigator will be taken to the relevant area to be completed.

The checklist tasks 1-3 direct the investigator to review areas of the event which detail the description, time, location, involved aircraft, other equipment information and supporting information such as the aviation keyword taxonomy.

The title of the event should be short and succinct (limited to 100 characters).

The 'What Happened' description should provide a brief summary of the event. Specifically, it is to describe where the event happened (the context), what happened (including any associated individual actions or technical failures/malfunctions) and the result. The description is not to include any unnecessary information, conjecture as to what caused the event, personal details of involved persons, sensitive operational information or abbreviations/ acronyms. The keyword(s) selected should be what most succinctly describes 'what' happened in the event.

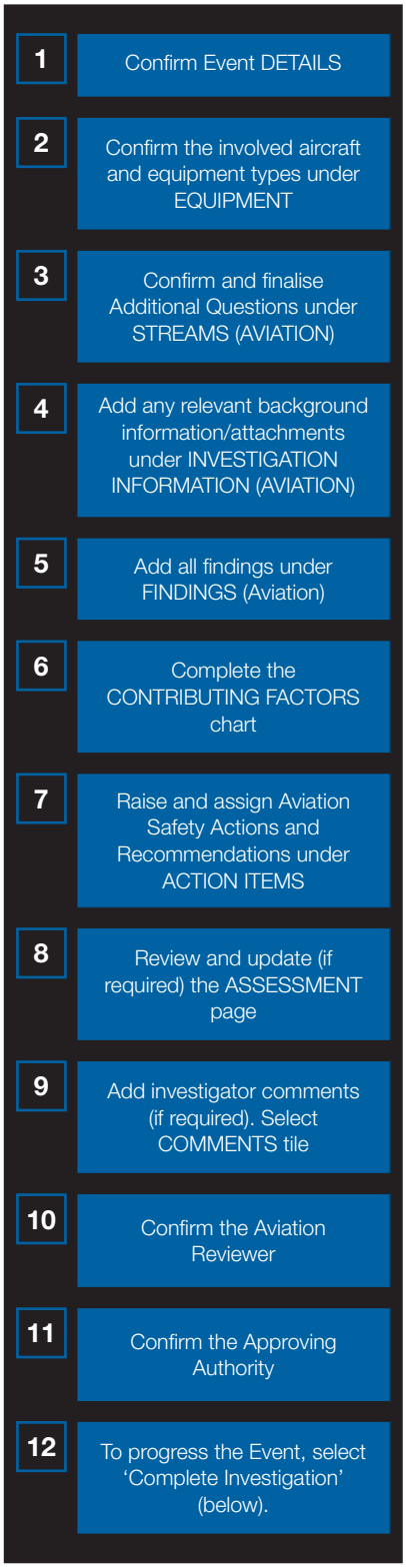


Figure 24. Sentinel Investigator checklist

It is not the intention of keywords to list all factors that may have been present, nor to pre-emptively record the investigation findings. There are four types of keywords to select from:

1. Flight Operations (https://objective/id:BP26604559)
2. Maintenance (https://objective/id:BP26604561)
3. Other Support Systems (https://objective/id:BP26604564)
4. Operational Hazard (OPHAZ) (https://objective/id:BP26604562)

Attachment 4 provides the keyword taxonomies and their definitions.

The checklist tasks 4 to 6 are specific to the Analysis page which is the area where the investigation results must be populated. Tasks 7 and 8 direct the investigator to add the actions and recommendations to the event and to check the assessment of the event. The Classification of Aviation Safety Events factsheet is available in Attachment 5 and on the DFSB website (https://objective/id:AB34286014).

Checklist task 9 allows the investigator to add in any comments to the ASR. Checklist tasks 10 and 11 require the investigator to assign the Aviation Reviewer and Approving Authority prior to the investigation being completed and progressed at task 12.

The below sections provide detailed information on checklists items 4 to 9.

Investigation Information (AVIATION) (checklist item 4)

The Investigation Information (AVIATION) section within the Analysis area (Figure 25) provides the investigator a place to record any information collected during the investigation (Step 1: Gather Information and Step 2: Organise Information of the investigation process).

The Investigation Information area can be accessed through either checklist item 4 or via the tiles on the left (Figure 25).

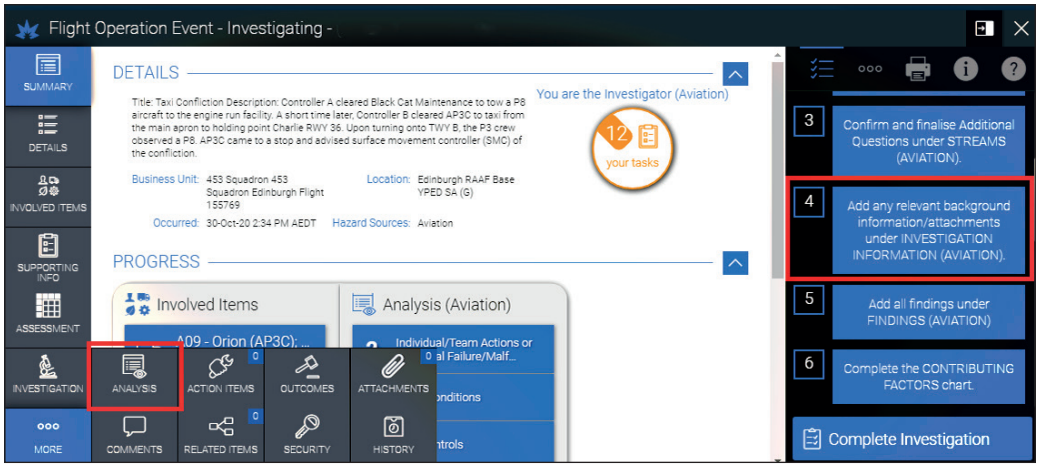


Figure 25. Accessing Investigation Information

The information stored in this area should include any supporting material related to the investigation – these supporting materials should help the reader understand the context of the investigation and these materials may or may not be related to a finding or a set of findings (Figure 26). For example, the event timeline can be added to the Investigation Information area as it supports the understanding of the investigation, but is not necessarily related to any finding.

Other supporting material such as the DSAM worksheet, a summary of witness statements, photos, reference material, and maps can be included into Investigation Information to support the investigation as a whole.

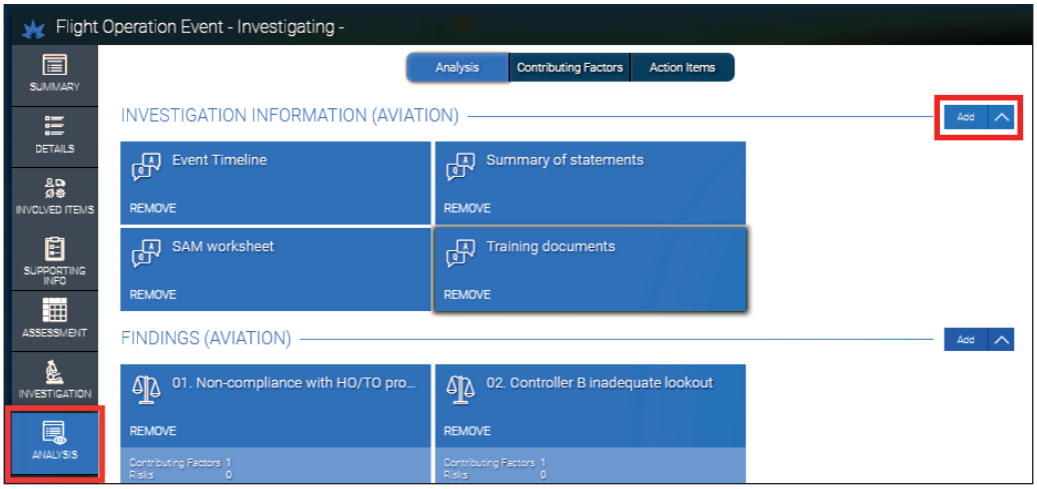


Figure 26. Investigation Information overview

Material that supports the claims made in a finding or a set of findings can also be added here. For example, the controllers' training documents can be attached to Investigation information and summarised in the description field. The training documents stored under Investigation Information should be referred to in the Rationale section of the Findings tab to support the claims made about both controllers' training currency (Figure 27).

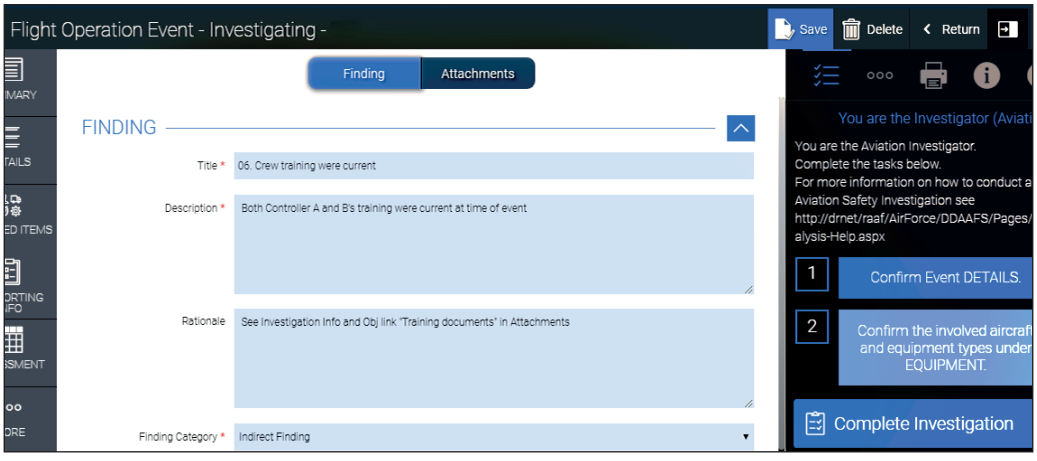


Figure 27. Aviation Findings

Attachments added to Investigation Information

As the Investigation Information area only allows text to be added, it is strongly encouraged that large documents such as photos, word or PDF documents be stored in Objective, the Objective link attached to the ASR as a URL via the Attachments tab at the top of the page, and referred to in the Investigation Information (Figure 28). This will not only reduce the file size of the ASR but will also allow the document access control afforded by Objective. Files can also be attached to the ASR (Figure 29).

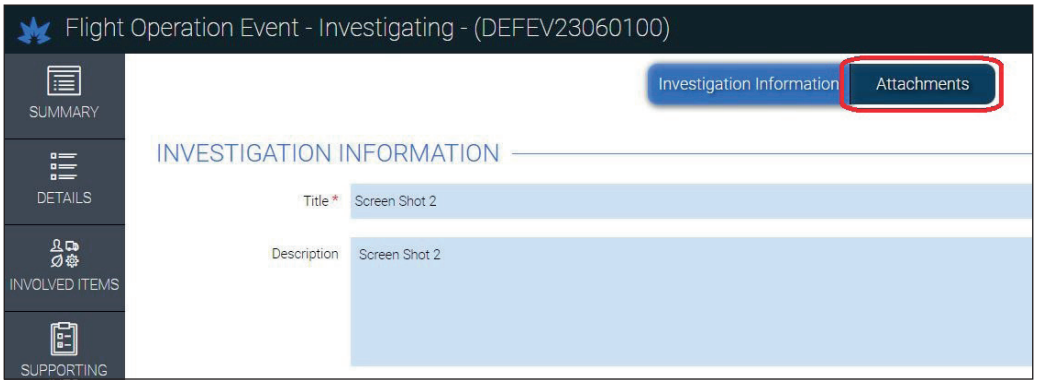


Figure 28. Investigation Information — Adding attachments

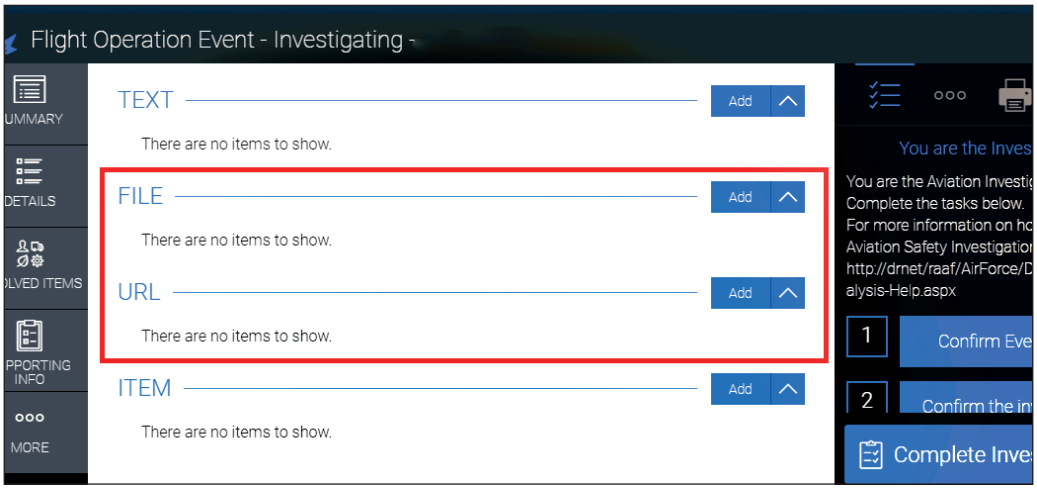


Figure 29. Attachments — Adding Files and URLs

Findings (AVIATION) (checklist item 5)

Investigation findings are entered into the Findings (AVIATION) area on the Analysis page of Sentinel. The Findings tab allows the investigator to record the analysis of the information (Step 3: Analyse Information) and to record the findings developed as result of the analysis (Step 4: Develop Findings).

The Findings area can be accessed through either checklist item 5 or via the Analysis tile below (Figure 30).

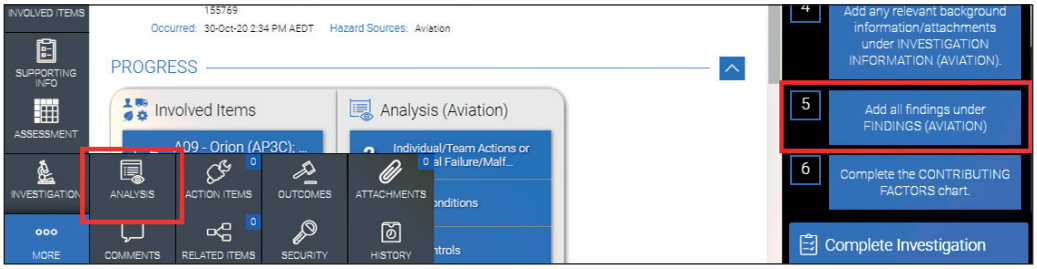


Figure 30. Accessing Findings area

There are two ways to create a finding.

1. All findings can be entered through the Findings (AVIATION) area (Figure 31).
2. Only contributory findings can be entered through the Contributing Factors tab.

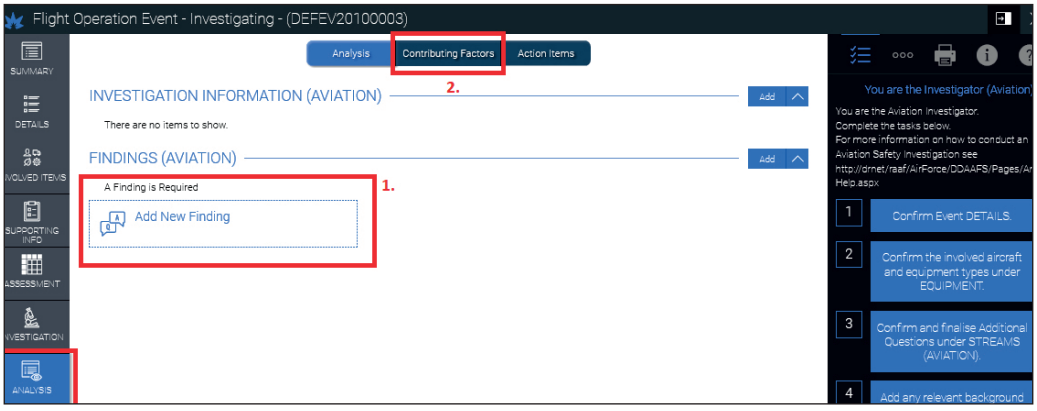


Figure 31. Enter findings through the Findings (AVIATION) area

To add a new finding though the Contributing factors tab, select “Add finding” at the top right hand corner (Figure 32).

For descriptions of contributory findings, positive findings, and indirect findings, refer to Step 4: Develop Findings.

Figure 32. Add new finding through Contributing Factors tab

Both ways of entering findings will present the Findings tab (Figure 33).
Finding title and description. The finding should describe the conclusions drawn from the analysis of the information gathered (See Step 4: Develop findings).

The title of the finding should be a short summary of the finding. To assist with the readability and formatting of the Sentinel report, **the title for each finding is to include a numerical reference (e.g. 01, 02, 03) as per the Title in Figure 33**.

Rationale. A hallmark of a thorough and robust investigation is that the finding or findings are supported by a rationale and / or supporting material. In the Rationale field (Figure 33) provide a short summary of any relevant factual information and associated judgments or justification for your finding. The rationale can be thought of as the analysis of the information you have collected. The rationale gives readers the necessary context and justification to understand the finding. When providing a rationale, you may make reference to more detailed information that has been entered into the Investigation Information (AVIATION) section within the Analysis area of Sentinel or to the supporting material in Attachments (see section Findings – Attachments).

Finding Category. Select whether the finding is a contributory finding, positive finding, or an indirect finding as described in Step 4: Develop findings

Functional Area. Select which functional area the finding applies to. If the finding applies to more than one functional area, select the functional area with the greatest influence on the finding. Note that the functional area is only available for contributing findings.

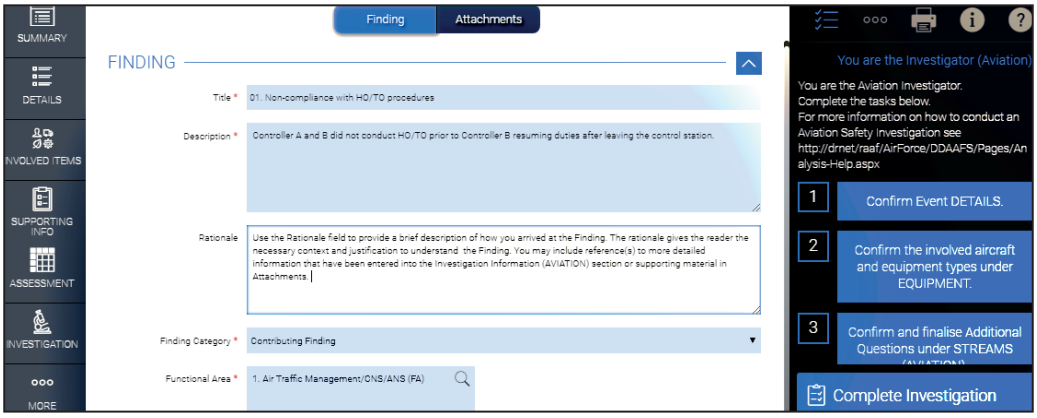


Figure 33: Finding tab — Title, Description, Rationale, Finding Category and Functional Area

Indirect Findings. Indirect findings are investigation findings are other findings that did not directly contribute to the event. See Step 4: Develop findings for more detailed discussion of indirect findings.

For example, in the course of investigating the taxi confliction event, the aerodrome lighting was found to have failed on a few occasions. While the lighting issue did not contribute to the event under investigation, it nevertheless needs to be addressed to improve safety.

Alternatively, consider raising an Operational Hazard report under Other Aviation Safety Report to report an indirect finding that warrants separate investigation and management as an aviation safety issue.

Indirect findings should be entered into the Findings area and Indirect Findings selected (Figure 34).

Positive Finding Positive findings directly and positively relate to the circumstances of the event. Put simply, positive findings are the actions or risk controls that 'saved the day' or played an important role in reducing the risk associated with the event. See Step 4: Develop findings for more detailed discussion of positive findings.

Positive findings should be entered into the Findings area and Positive Findings selected (Figure 34).

Figure 34. Finding tab — entering positive and indirect findings

Contributing factors (checklist item 6)

Contributing factors are to be coded once all findings have been entered. Contributing factors are only available for contributory findings.

To access the Contributing Factors area, select either checklist item 6 or the Analysis tile on the left and then the Contributing Factors tab at the top of the page (Figure 35).

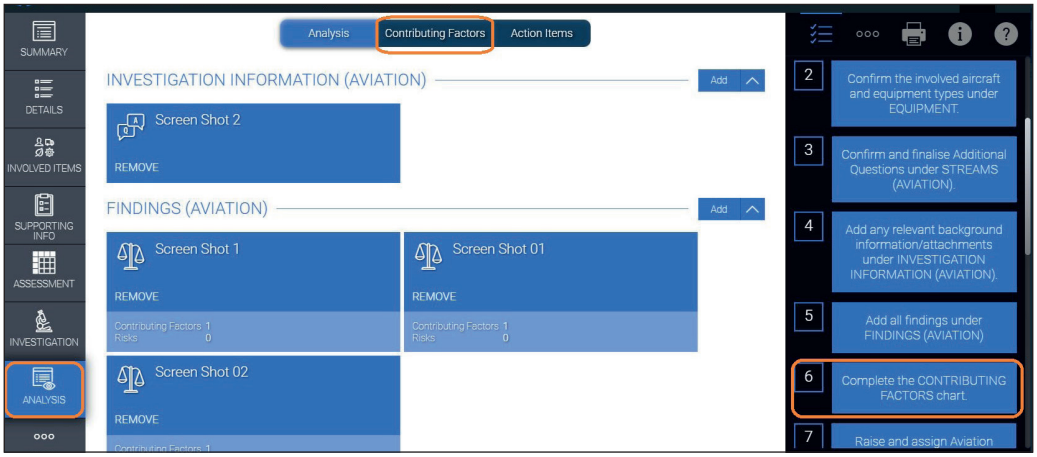


Figure 35. Accessing Contributing Factors

Code each contributory finding using the contributing factors in the Defence aviation Safety Analysis Model (DSAM). The DSAM is available in Attachment 3 and on the DFSB website (https://objective/id:AB34289436).

Key considerations when coding contributing factors include:

- Contributing factors must have a related contributory finding(s).
- Identify key contributing factors and avoid selecting multiple similar factors which could lead to an unduly complex graphical view and the double counting of contributing factors. For example, there is no need to code 'Active Supervision/ Control' twice if it was found that the supervisor did not enforce HO/TO procedures in two instances. The contributing factors coding essentially describes the 'gist' of the findings in a few key words.
- Contributing factor identification enables formulation of appropriate and effective actions and recommendations to prevent recurrence.

Individual/Team Action or Technical Failure/Malfunction

Select the individual/team action or technical failure/malfunction code as per the DSAM by clicking on "Individual/Team Action or Technical Failure/Malfunction".

The contributing factor can either be typed into the bar or can be search for via the search icon (Figure 36).

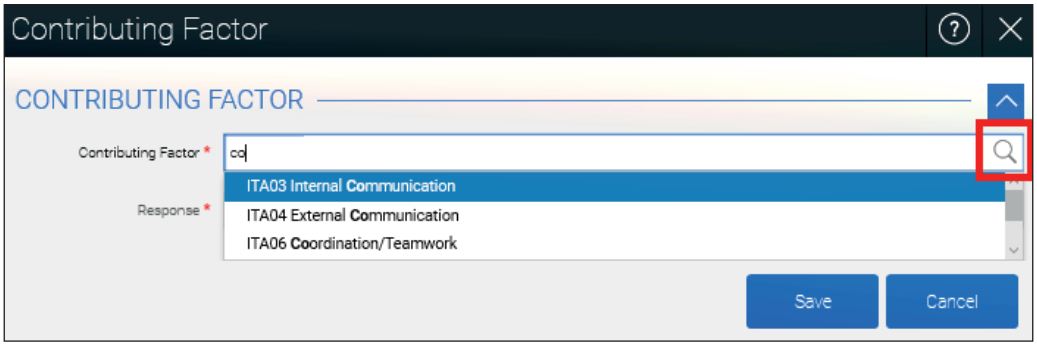


Figure 36: Entering and searching for contributing factors

Definitions for contributing factors can be accessed by selecting the info icon (Figure 37).

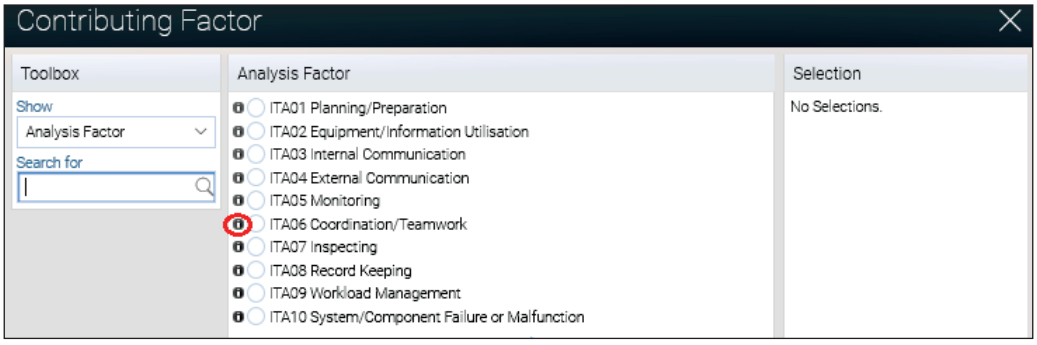


Figure 37: Contributing factors definition via info icon

Select whether the individual or team action was an error or a violation (under the response field) (Figure 38). Select Not Applicable for technical failure/malfunction contributing factors.

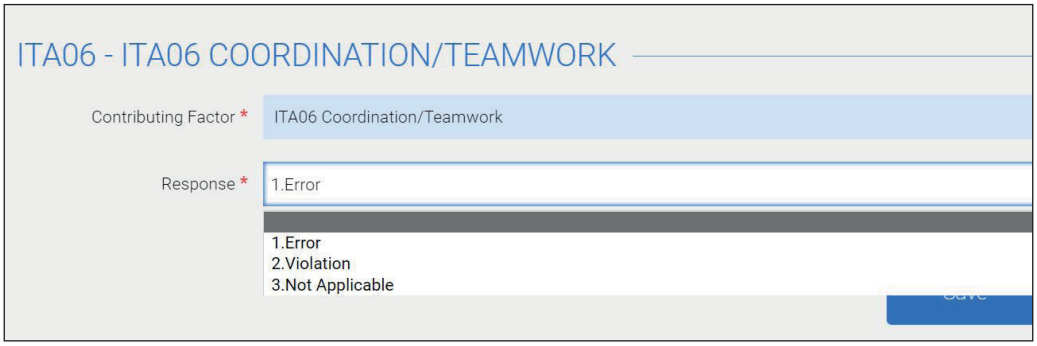


Figure 38: Response field for individual / team action or technical failure / malfunction

Local Conditions

Code the relevant local condition contributing factors as per the DSAM. Local condition contributing factors and the corresponding definitions can be accessed as per Figure 36 and Figure 37.

Risk controls

Code the relevant deficient risk control contributing factors as per the DSAM. Risk control contributing factors and the corresponding definitions can be accessed as per Figure 36 and Figure 37.

Select a response as to whether the risk control was preventative or recovery and whether the risk control was absent, partially failed, or completely failed (Figure 39).

Figure 39: Response field for risk controls

Organisational influences

Code the relevant organisational influence contributing factors as per the DSAM. Organisational influence contributing factors and the corresponding definitions can be accessed as per Figure 36 and Figure 37.

Graph overview

Once all contributory factors for the event are coded, a graphical overview can be generated by selecting Contributing Factors tab in the Analysis tile (Figure 40). This overview displays contributory findings and the contributing factors. The overview can be printed by selecting the printer icon on the top right hand side of the screen.

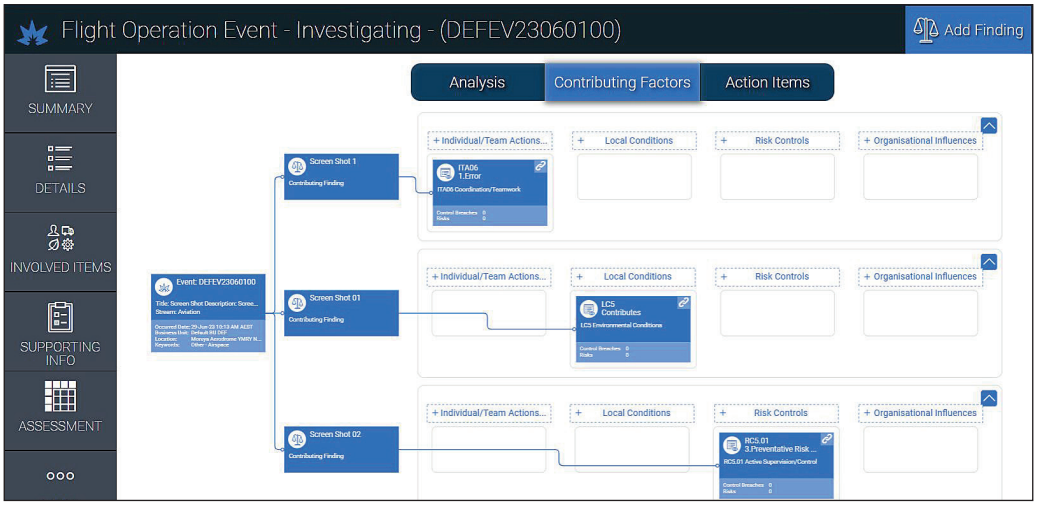


Figure 40: Graphical overview of contributing factors

Actions and Recommendations (checklist item 7)

Checklist item Step 7 navigates the user to the Actions area of an event. This is where the user can raise new aviation safety actions or recommendations and assign them to recipients as well as recording safety actions already completed.

Raising new aviation actions and recommendations

Aviation safety actions and recommendations must be derived from the investigation findings (contributory or indirect findings).

Aviation safety actions are those activities assigned by the Approving Authority to an individual within the span of their command/management authority. For example, if the Approving Authority is the Commanding Officer, safety actions are only to be assigned to personnel within the unit.

Aviation safety recommendations are any activities that fall outside the responsibility/command authority of the event unit that are deemed appropriate to prevent a recurrence. All safety recommendations must be assigned to the Hazard Tracking Authority (HTA) representative (WASO for Air Force units; Navy and Army have dedicated administrators to carry out this process).

To access the actions area of Sentinel, select the Action Items tile either through checklist item 7 or via the tiles on the left (Figure 41).

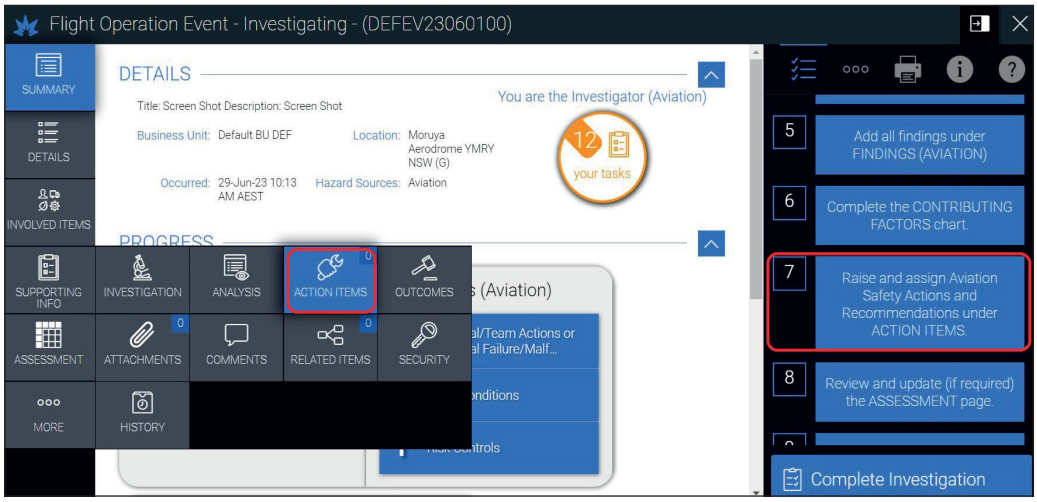


Figure 41: Accessing the Action Items

To raise new aviation safety actions or recommendations, select either an aviation safety action ('ASR Action') or aviation safety recommendation ('ASR recommendation') (Figure 42 below).

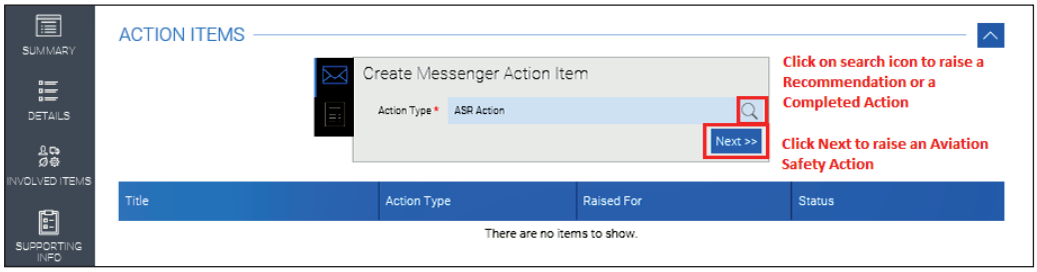


Figure 42: Creation of an Aviation Safety Action Safety Recommendation, or Completed Action

The search icon allows the selection of other ASR action types — ASR Recommendation and ASR Completed Action. The information icon provides a description of each of the ASR actions types (Figure 43).

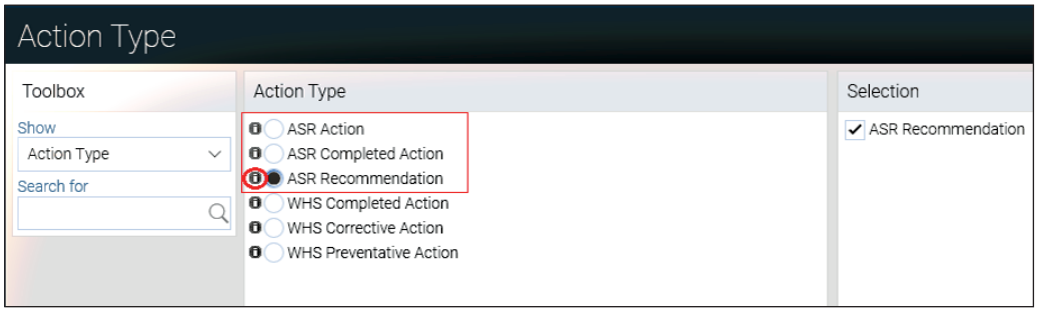


Figure 43: ASR action types and descriptions

Enter the recipient(s) of the action or recommendation item. The recipient(s) of the "To" fields are to **complete** the action or recommendation. For a recommendation, the "To" recipient should be the HTA representative — WASO for Air Force units; Navy and Army have dedicated administrators to carry out this process.

Note:
It is strongly encouraged that only a single recipient be used for Actions or Recommendations to prevent processing delays. If more than one 'To' recipient is added, the system will default to 'All must complete' — a state where all the recipients must mark the action as 'Complete' before the ASR can be progressed. It is strongly encouraged the 'All must complete' button is deactivated (Figure 46) to avoid the scenario where the ASR is held up if one or more of the 'To' recipients has not marked the action as complete.
The recipients of the 'CC' field are to not required to complete the action, but it is also strongly encouraged that the 'All must complete' button is also deactivated. This is because of a known glitch in the system where the 'CC' recipient(s) is also required to mark the action as complete before the ASR can progress.

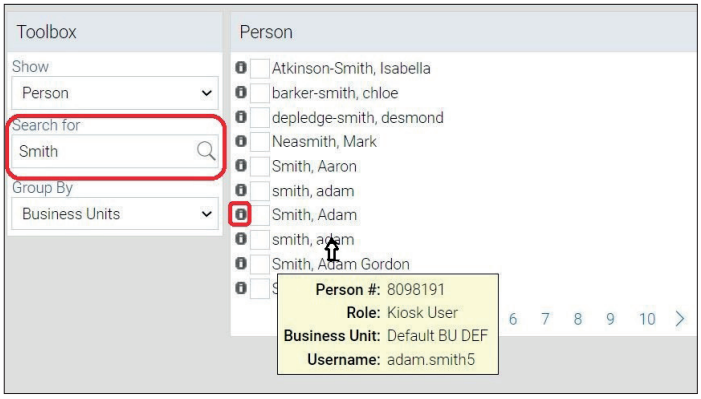


Figure 44: Searching for a recipient

Recipients are added by selecting the 'Add Recipient' button.
A recipient can be searched for in the search field on the left hand side of the page (Figure 44). The information icon gives you more details about the person (e.g. business unit) to assist with the selection of the right person (Figure 45).

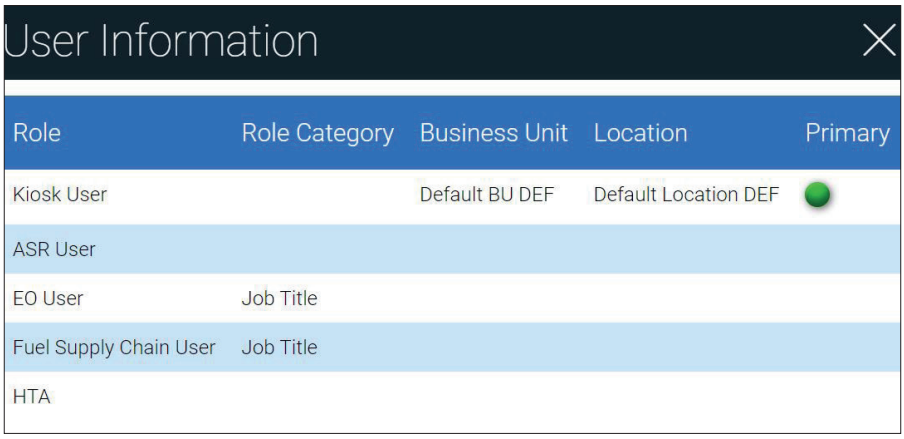


Figure 45: Person details

Add a title (topic) and a brief description (content) of the safety action or recommendation. When describing the action or recommendation, keep in mind the principles of effective safety actions and recommendations outlined in Step 5.

For aviation safety actions, enter the number of days the recipient has to complete the action once the action is approved by the Approving Authority. The maximum number of days is 365.

Leave the 'Sign Off Required By' and the 'Days to Sign Off' sections BLANK (Figure 46 below). Unless specified as part of a local business process, DO NOT add a Sign Off Authority as it may delay processing of the report through Sentinel.

For aviation safety recommendations, enter the number of days to accept or reject the recommendation. The maximum number of days is 999.

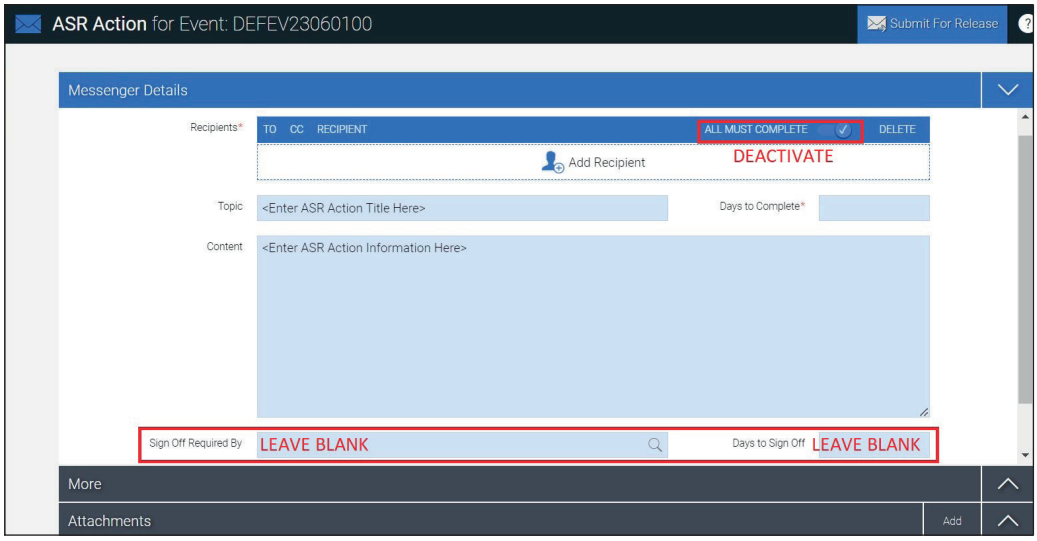


Figure 46: Raising Aviation Safety Action or Aviation Recommendation

Next, code the category of aviation action or recommendation in the Aviation Safety Category section. The coding of safety actions and recommendations will allow the later analysis of the types of actions or recommendations that are raised as a result of safety investigations, and the types of actions and recommendations related to event types (keywords). Refer to Attachment 6 or the DFSB website (https://objective/id:BP16196284) for a list of the Aviation Action Categories and their definitions.

Attachments can be added at the bottom of the page. Note that attachments added here will not be visible via the Attachment tile but will only be available through the associated action or recommendation.

Click on 'Submit For Release' button on the top left of the page. The safety action or recommendation will be sent to the Approving Authority to progress.

Recording ASR Completed Actions

To record an aviation action or recommendation already completed, select 'Completed Action' using the search icon (Figure 46).

This selection allows you to record the description of the completed action as well as who it was actioned by. You can search for a person as per Figure 47 and Figure 48.

Next, code the Aviation Safety Category for the ASR Completed Action. The coding of safety actions will allow the later analysis of the types of actions that are raised or completed as a result of safety investigations, and the types of actions related event types (keywords). Refer to Attachment 6 or the DFSB website (https://objective/id:BP26604557) for a list of the Aviation Action Categories and their definitions.

Attachments can be added at the bottom of the page. Note that attachments added here will not be visible via the Attachment tile but will only be available through the associated action or recommendation

Leave the Sign off Required By and Days to Sign off BLANK, and click 'Mark as Complete' at the top right corner of the screen (Figure 47).

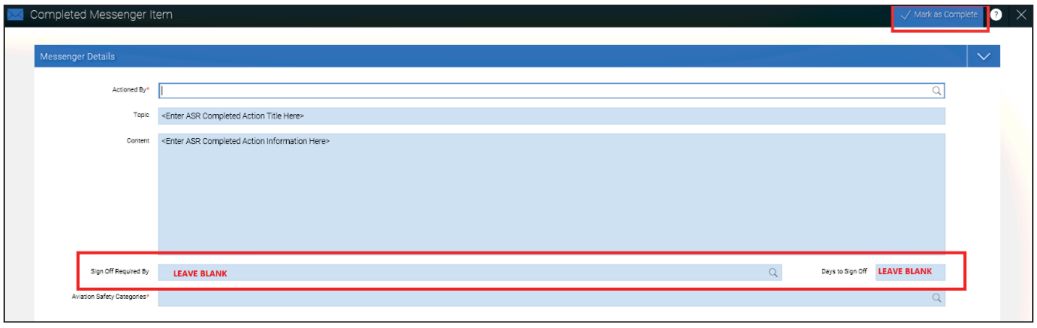


Figure 47: Recording ASR Completed Actions

Investigation summary

If appropriate, enter a summary of the investigation. Click on the Investigation tile on the left hand side (Figure 48).
A summary of the findings and the actions or recommendations raised may be useful to the reader/ Approving Authority if the investigation was complex. The investigation summary area should only be used to summarise the investigation and should not be the only area where the findings and contributing factors are recorded. Ensure that all findings and contributing factors are recorded into the Analysis area of Sentinel.

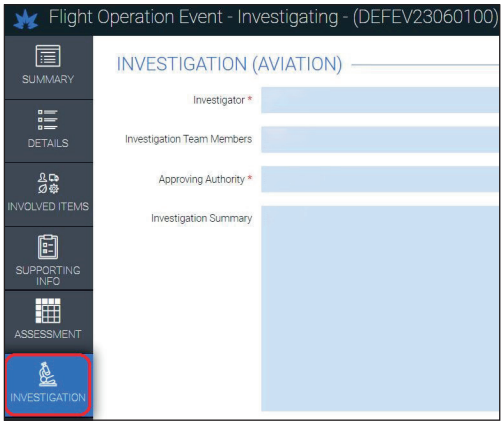


Figure 48: Investigation Summary

Investigator Comments (checklist item 9)

The investigator(s) can add a comment about the investigation and any actions or recommendations if required. Select the MORE tile at the bottom left hand corner of the page then the COMMENTS tile (Figure 49), or click on checklist item 9. Note that any comments added here will be included in the full report (generated via Salus and Sentinel).

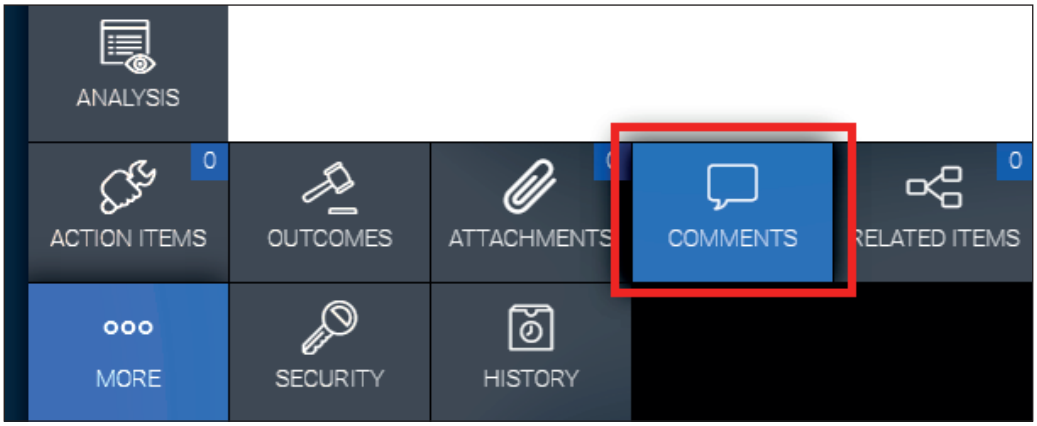


Figure 49: Investigator Comments

Complete Investigation (checklist item 12)

Once all the checklist items are completed, select 'Complete Investigation' at the bottom of the checklist. The ASR has now been sent to the Aviation Reviewer to review the ASR and the investigation, actions and any recommendations.

An error message will appear if all mandatory tasks have not been completed (Figure 50) and clicking on the error message will take the investigator to the area that is to be completed.

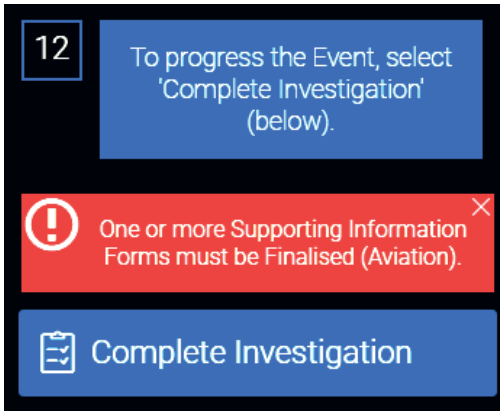


Figure 50: Complete Investigation

List of Attachments

Attachment	Title
Attachment 1	Interviewing Techniques — Guide to Investigators
Attachment 2	Safety Analysis Worksheet
Attachment 3	Defence aviation Safety Analysis Model — Contributing Factors
Attachment 4	ASR Keywords
Attachment 5	Classification of Aviation Safety Events
Attachment 6	Actions and Recommendations

All attachments are embedded within the e-copy of this Guidebook. Use the keyboard shortcut F4 to view and open the attachments. The attachments may also be downloaded seperately from the DFSB website (DPN only) — http://drnet.defence.gov.au/raaf/DDAAFS/Pages/Analysis-Help.aspx

Resources Available

For further assistance, refer to the ASR Support and Resources page on the DFSB website (http://drnet.defence.gov.au/raaf/DDAAFS/Pages/Analysis-Help.aspx) where there are a number of resources to assist unit level investigators.

Please utilise your ASO network in the first instance and contact the ASR Service Desk (ASR.Servicedesk@defence.gov.au) for further assistance.

Aviation Safety Reporting (ASR) Support

ASR.Servicedesk@defence.gov.au

OR

02 6128 7476