
Understanding the Phases of an Investigation

When an accident occurs in the Bahamas, it is investigated by the AAID on behalf of the Government of the Bahamas who has jurisdiction over the area where a plane goes down. The sole objective of the investigation of an accident or incident is the prevention of accidents and incidents. It is not the purpose to apportion blame or liability. Investigations are conducted in accordance with the international standards and recommended practices as described in ICAO Annex 13 Aircraft Accident and Incident Investigation. While the initial phase of an accident investigation can be concluded within weeks or even days, the investigators' final report and recommendations often takes years to complete. The final report consist of factual information about the accident, analysis, conclusions (probable cause) and also includes safety recommendations.

Initiating an Investigation

Each year the AAID receives numerous notifications of aviation incidents and accidents. To prevent future aviation safety occurrences—especially those with the potential for a large-scale loss of life or serious injury to the traveling public—the AAID directs its investigation resources to those incidents and accidents with the greatest potential of identifying systemic issues in aviation operations. This is consistent with the function of the AAID, as stipulated in the Accident Investigation Authority Act 2019.

The size and scope of an investigation also impacts its expected time frame. Time frames for the completion of an investigation are an estimate, based the initial facts of the occurrence. Time frames can change as the investigation progresses and its level of complexity is revealed.

Occurrence Brief

If an aviation occurrence doesn't warrant an investigation under the AAIA (Act), the AAID can produce an Occurrence Brief. Occurrence Briefs are a one-page factual summary of the event that provides an opportunity for aviation operators and participants to learn from aviation safety occurrences in the absence of an investigation. Occurrence Briefs are published on the AAID website.

Safety Studies

The AAID also produces Safety Studies. Safety Studies use AAID aviation information over a longer time frame often up to ten years, to provide insights into current and future trends in

aviation safety. Safety Studies can be used by industry, manufacturers, policy makers and the general public to understand more about aviation safety.

Evidence Collection Phase

The evidence collection phase of an investigation helps investigators build a detailed picture of the aviation safety occurrence or safety issue being investigated. During this phase, the primary task of investigators is to gather the initial evidence from or related to the occurrence or safety issue. This may include:

- site observations (including wreckage distribution, witness marks on ground, parts and components and line-of-sight measurements)
- gathering relevant wreckage, materials and recorded data (including on-board flight, voyage and event recorders, GPS, images, video, system equipment data, and voice recorders)
- gathering human performance related information such as work and rest patterns and time awake, workload, perceptual limitations, communications, and social norms
- undertaking or procuring test and examination reports (such as fuel quality-tests, toxicology, functional tests, manufacturer's test procedures, simulation studies, meteorological analyses)
- interviewing involved parties, witnesses and subject matter experts
- obtaining operational records (such as log books, technical logs, maps or charts, trip reports, weather observations, job sheets, repair records, training records and performance checks, audit reports)
- obtaining technical documentation (such as procedures and manuals, training manuals, maintenance manuals, troubleshooting guides, design drawings and system safety assessments), and
- obtain data on similar occurrences in the Bahamas and overseas and other occurrence data.

Examination and Analysis Phase

The cause of an aviation safety occurrence or safety issue is often multilayered and complex. AAID investigators aim to use the collected evidence to build a detailed understanding of the circumstances surrounding an aviation safety occurrence or issue.

During this phase, evidence is reviewed and evaluated to determine its relevance, validity, credibility and relationship to other evidence and to the occurrence. AAID investigators may:

- undertake detailed data analysis
- create simulations and reconstruct events
- examine company, vehicle, government and other records
- examine selected wreckage in the laboratory and test selected components and system
- research scientific literature related to human factors associated with the evidence
- review specialist reports (such as meteorology, component examination, post-mortem report and toxicology reports)
- conduct further interviews, and

- determine the sequence of events.

Examination and analysis requires reviewing complex sets of data, and available evidence can be vague, incomplete and or contradictory. This may prompt the collection of more evidence, which in turn needs to be analyzed and examined, potentially adding to the length of an investigation.

Once the examination of the evidence is complete, the investigation team will test a series of hypotheses to arrive at a number of safety factors that could have contributed to the aviation safety occurrence or issue, or otherwise increased safety risk.

The investigation team then convenes a Safety Factor Review with AAID management. This is a rigorous internal review of the progress of the investigation, its preliminary findings and focus. The Safety Factor Review involves the investigation team presenting their evidence and analysis to reach consensus on the investigation findings. Once consensus is achieved, the report drafting phase of the investigation can begin.

Final Investigation Report

The AAID produces a final report for all of its investigations. Reports communicate important safety issues, actions and information, and provide transparency into the AAID investigation process.

Through web updates and the release of preliminary and interim reports, the AAID can make information publicly available during an active investigation. This can only be done where appropriate. For example, preliminary reports are only released for those investigations that are expected to take at least 12 months due to their level of complexity.

Interim reports are released if it is deemed necessary by the AAID to provide an update during an investigation.

The AAID publishes its investigation reports as quickly as possible, but also takes the time it needs to conduct a thorough investigation and produce a report that enhances aviation safety and meets the expectations of the aviation industry and the Bahamian public. If a critical safety issue is identified during the course of an investigation, the AAID will immediately communicate it to relevant parties so that appropriate safety action can be taken.

Final Report: Drafting Phase

Most AAID reports contain the following sections:

- Safety summary—a one-page summary of the aviation safety occurrence, the findings and any safety action taken as a result, as well as any broader safety messages.
- The occurrence—a description of the sequence of events related to the occurrence and, if relevant, the consequences in terms of injuries and damage.

- Context—of evidence collected as part of the investigation that is necessary to help the reader understand the occurrence and safety analyses, or the broader safety issues for research purposes.
- Safety analysis—a demonstration of how the evidence justifies the investigation findings
- Findings—a list of contributing factors and other safety factors identified during the safety analysis.
- Safety issues and actions—a summary of safety issues that were identified during the investigation and details of what safety action has been taken, or is planned to be taken by relevant parties to address those issues.

The dynamic and complex nature of investigations means that during the drafting of the report it may be necessary to return to the evidence collection or examination and analysis phases of an investigation. There will often be significant overlap in time between the evidence collection, examination and analysis and final report drafting phases.

Final Report: Internal Review

Final AAID investigation reports undergo a rigorous internal review process to ensure the report adequately and accurately reflects the evidence collected, analysis, and agreed findings of the Safety Factor Review. Final investigation reports also undergo other technical and administrative reviews to ensure the reports meet national and international standards for aviation safety investigations.

If a review identifies any issues with a report, such as information that needs to be expanded or findings that need to be modified, investigators will look to collect new evidence or conduct additional examination and analysis of existing evidence.

Final Report: External Review Phase

To check factual accuracy and ensure natural justice, Directly Involved Parties (DIPs) are given the opportunity to comment on the final report before it is approved to ensure their input has been accurately reflected.

DIPs are individuals or organizations outside the AAID who possess direct knowledge of the circumstances surrounding the incident or accident. DIPs can only comment on the factual accuracy of an investigation, not its analysis and findings.

This process is consistent with international aviation safety investigation conventions, including those published by the International Civil Aviation Organization. DIPs are provided 60 days to provide their comment and present evidence in support of their comments. This time frame can be extended to allow DIPs based overseas to provide comment.

Feedback from the DIPs could prompt an investigation to return to the evidence collection, examination and analysis, and report drafting phases of an investigation.

Final Report: Approval Phase

Following the DIPs process, the report is reviewed by the Safety Review Board before being sent to the AAID Chief Investigator for final approval. Once approved, the final report is prepared for publication and dissemination.

Final Report: Dissemination Phase

Once an AAID report is approved, it is released to DIPs prior to its public release and approved safety issues and recommendations are formally communicated to the relevant parties. The report is then released publicly on the AAID website and communicated on social media channels. The progress of safety action to address AAID recommendations is tracked and communicated, on an ongoing basis, via the AAID website.

It is important to note that the AAID does not wait until its investigations are complete or the final report is published to address critical safety issues. If a critical safety issue is identified during the course of an investigation, it is brought to the attention of the relevant parties immediately so that safety action can be taken.