

## **CHAPTER 1 - DND/CAF AIRWORTHINESS PROGRAM**

### **GENERAL**

1. The *Aeronautics Act* governs aviation activities in Canada. This legislation applies to two federal ministers; the Minister of Transport and the Minister of National Defence (MND). The *Aeronautics Act* charges the respective Ministers with responsibility “for development and regulation of aeronautics and supervision of all matters connected with aeronautics” with the scope that applies to “all aeronautical products and other things in Canada, to all persons outside Canada who hold Canadian aviation documents and to all Canadian aircraft and passengers and crew members thereon outside Canada.” Further, the MND is charged with these responsibilities for “military personnel or a military aircraft, military aerodrome or military facility of Canada or a foreign state (while operating in Canada)”. In order to fulfill the MND’s obligations with respect to this responsibility, the Department of National Defence and the Canadian Armed Forces (DND/CAF) established an Airworthiness Program. The objective of this chapter is to briefly outline the DND/CAF Airworthiness Program.

### **BACKGROUND**

2. Prior to the DND/CAF Airworthiness Program, an internal 1993 audit by the Chief of Review Services identified deficiencies that showed the need for the creation of a more structured DND/CAF Airworthiness Program. Some of the specific concerns were:

- a. the MND's national and international airworthiness obligations for military aviation were not being met;
- b. the MND had not delegated any of his airworthiness responsibilities;
- c. there was no airworthiness management accountability framework; and
- d. DND/CAF airworthiness rules and standards were not harmonized with Transport Canada (TC) and the manner in which civilian contractors, who were supporting CAF flying operations, could perform various airworthiness activities was unclear.

3. In response to these concerns, the MND directed that a structured DND/CAF Airworthiness Program be developed and the Concept Paper for a DND/CAF Airworthiness Program was approved on 16 September 1998.

### **DND/CAF AIRWORTHINESS PROGRAM**

4. The DND/CAF Airworthiness Program is based upon airworthiness management concepts used world wide by military and civil airworthiness authorities, while being tailored to meet the unique needs of the DND and the CAF. It is based on the fundamental principles that airworthiness-related activities are completed to accepted standards, performed by authorized individuals, accomplished within accredited organizations, and done using approved procedures.
5. The objective of the DND/CAF Airworthiness Program is to achieve and maintain an acceptable level of safety for military aviation.
6. The concepts that govern the DND/CAF Airworthiness Program are that it must:
  - a. document formally and control assignment of authority, including the associated responsibilities and accountabilities;
  - b. establish independence between the Regulator (the individual responsible for making the rules) and the Implementer (the individual who conducts the activity);
  - c. control the design, manufacture, maintenance, materiel support and operational usage of aeronautical products;
  - d. ensure the airworthiness of an aeronautical product prior to its service use;
  - e. maintain, once established, the initial state of airworthiness of an aeronautical product throughout its entire operational service use;
  - f. conduct all airworthiness-related activities involving aeronautical products within an effective quality system framework; and
  - g. achieve the applicable objectives of the *Aeronautics Act*.

#### **AIRWORTHINESS PROGRAM ROLES**

7. Within the CAF, the operational staffs are responsible for flying operations, aerospace control and operator training and qualification. Similarly, the technical staffs are responsible for the design, manufacture, maintenance and materiel support of aeronautical products, as well as for the training and qualification of technical personnel. To accommodate these responsibilities, the Airworthiness Program elements have been split into operational and technical areas. This division of responsibility has given rise to the Operational and Technical Airworthiness Programs. The Airworthiness Investigative Program has been added to monitor the Airworthiness Program and to investigate aviation safety-related issues and occurrences.

8. There are three distinct roles present in the Airworthiness Program. They are Regulator, Implementer and Investigator:

- a. the Regulator develops airworthiness instruments for design, manufacture, maintenance, material support and operation of aeronautical products and ensures their compliance;
- b. the Implementer conducts the activities for the associated aeronautical products as directed by the regulator. This role is assumed by the organizations, employees, and members of the DND/CAF as they conduct airworthiness related tasks; and
- c. the Investigator ensures that airworthiness related safety occurrences and safety issues are investigated “independently” of the Regulator and Implementer.

#### **OVERVIEW OF PROGRAM AUTHORITIES**

9. The DND/CAF Airworthiness Program established a management accountability framework of four Airworthiness Authorities, with clear delegation of authority from the MND to the specified positions in DND/CAF. The MND directed the CDS (in 2005) to delegate to these Authorities, under section 4.3(1) of the *Aeronautics Act*, the powers, duties and functions necessary for the Airworthiness Program. Further assignment of the authorities permits the application of the Airworthiness concepts and principles to be utilized at the lowest possible levels in the Department and supporting organizations. The tasks that are to be performed by the specific airworthiness authorities are outlined in individual CDS (delegation) Orders. The four Authorities are:

- a. the Airworthiness Authority (AA);
- b. the Technical Airworthiness Authority (TAA), regulator;
- c. the Operational Airworthiness Authority (OAA), regulator; and
- d. the Airworthiness Investigative Authority (AIA), investigator.

10. The AA has the authority to approve airworthiness-related policy and is responsible for the development, promotion, supervision and management of the DND/CAF Airworthiness Program. The Chief of the Air Force Staff (C Air Force), who is also the Commander Royal Canadian Air Force (RCAF), is normally the AA. Significantly, for the investigative portion of the program, the AA must ensure “that the Airworthiness Investigative Authority is not impeded in any way in the investigation of matters concerning aviation safety conducted under paragraph 4.2(n) of the *Aeronautics Act*.”

11. The TAA is responsible for the regulation of the technical airworthiness aspects of the design, manufacture, maintenance and material support of

aeronautical products and the determination of the airworthiness acceptability of those products prior to granting them Technical Airworthiness Clearance (TAC). The person holding the position of Director General Aerospace Equipment Program Management (DGAEPM) or, in the event of the absence or incapacity of the Director General, the person holding the position of Director Technical Airworthiness and Engineering Support (DTAES), or in the event of the absence or incapacity of the Director General and the Director, the person holding the position of Director Aerospace Equipment Business Management is the TAA for DND and the CAF.

12. The OAA is responsible for the regulation of all flying operations. This includes responsibility for the regulation of operational procedures, flight standards, operator training, qualification and licensing, aerospace control operations and the determination of the airworthiness acceptability of aeronautical products prior to granting them Operational Airworthiness Clearance (OAC). The CDS has designated the officer holding the position of the Commander, 1 Canadian Air Division (1 Cdn Air Div) or, in the event of the absence or incapacity of the Commander or, if the position is vacant, the officer performing the duties and functions of the Deputy Commander Force Generation, as the OAA for DND and the CAF.

13. The AIA is responsible for the regulation of the airworthiness aspects of the Flight Safety (FS) Program. The AIA is also responsible for the independent investigation of airworthiness-related occurrences and for the monitoring of the DND/CAF Airworthiness Program to identify deficiencies. The CDS has designated the officer holding the position of Director Flight Safety (DFS) or, in the event of the absence or incapacity of DFS, or if the position is vacant, the officer performing the duties and functions of DFS, as the AIA for DND and the CAF.

14. In addition to the four airworthiness authorities that comprise the DND/CAF Airworthiness Program management accountability framework, there are two additional authorities associated with the program. These are the Flight Test Authority (FTA) and the Aerospace Medical Authority (AMA).

15. The C Air Force and Assistant Deputy Minister (Materiel) (ADM (Mat)) have designated the Commanding Officer Aerospace Engineering Test Establishment (AETE) as the CAF Flight Test Authority (FTA). Amongst other duties, the FTA is to assist the Airworthiness Authorities in their responsibilities within the airworthiness program and to ensure that Flight Test activities conducted in support of the program are conducted in a safe manner by qualified and authorized personnel. The flight testing conducted must ensure the FS concerns based on the intended operational usage of aeronautical products outlined in the Statement of Operational Intent (SOI) are properly addressed prior to operational flight evaluation.

16. The C Air Force and Chief of Military Personnel (CMP) have designated the person holding the position as Medical Adviser to the C Air Force, or the person performing this duty as the AMA who is also appointed the MND's Medical Adviser for the purposes of section 6.5(1) of the *Aeronautics Act*. This section of the *Aeronautics Act* requires that the MND designate a contact point to receive personal medical information about persons involved with aeronautical activities or products and that might compromise safety by the nature of the medical condition. Separate from the MND's Medical Adviser, the AMA has duties that involve a large number of airworthiness issues that have a medical nexus and the mandate of the AMA is to provide any required medical advice to the Airworthiness Authorities. One such duty is the responsibility to ensure the fitness of all aircrew who are either in direct control of CAF aircraft, or who are performing essential tasks onboard an aircraft.

17. A full description of the DND/CAF Airworthiness Program can be found in A-GA-005-000/AG-001, DND/CAF Airworthiness Program.

#### **AIRWORTHINESS INVESTIGATIVE AUTHORITY MANDATE**

18. The AIA mandate is outlined in a CDS Order, which is signed by the CDS upon direction of the MND. This Order designates as the AIA for the DND/CAF, the officer holding the position of DFS or in the event of the absence or incapacity of the Director or if the position is vacant, the officer performing the duties and functions of the Director. In addition, under subsection 4.3(1) of the *Aeronautics Act*, this letter further delegates to the AIA, certain powers, duties and functions:

- a. the power to convene a Board of Inquiry (BOI) under section 6.3 of the *Aeronautics Act*;
- b. independently investigating matters concerning aviation safety under paragraph 4.2(n) of the *Aeronautics Act* and informing the MND, through the Airworthiness Authority and the Chief of the Defence Staff, of any apparent, potential or real interference with the execution of the powers, duties or functions delegated to the AIA;
- c. issuing airworthiness instructions and standards respecting the investigation of aviation-safety-related occurrences and issues that will satisfy the aviation safety requirements of the *Aeronautics Act*;
- d. assigning investigative authority to organizations and individuals involved in the investigation of aviation-safety-related occurrences and issues;
- e. taking immediate appropriate action if any circumstance, practice or procedure causes any doubt as to the airworthiness of a military aeronautical product;

- f. monitoring airworthiness activities and functions to ensure they comply with established regulations, standards and orders to identify any deficiencies in the DND/CAF Airworthiness Program, and reporting them to the Airworthiness Authority;
- g. conducting audits of processes and procedures with a view to recommending preventive measures (PM) to correct deficiencies if identified in the DND/CAF Airworthiness Program or if aviation safety is suspected of being compromised;
- h. informing the MND, through the AA and CDS, of any significant airworthiness matter concerning military aviation;
- i. preparing draft aeronautical regulations and orders relating to airworthiness investigative matters for submission to the Governor in Council and the MND, as appropriate; and
- j. acting as the investigative member of the Airworthiness Review Board (ARB) and of the Airworthiness Advisory Board (AAB).

#### **OBJECTIVE**

19. The objective of this Airworthiness Investigation Manual (AIM) is to issue airworthiness policies, instructions and standards respecting the investigation of aviation-safety-related occurrences, airworthiness program monitoring functions and other issues that will satisfy the AIA's roles in the Airworthiness Program and the investigation-associated safety requirements of the *Aeronautics Act*. It also outlines the AIA's policies, procedures and means of compliance with applicable sections of the *Canadian Transportation Accident Investigations Safety Board Act (CTAISB) Act*.

#### **APPLICABILITY**

20. This document is produced by the AIA under the authority of the AA. As indicated in the A-GA-005, "new airworthiness instructions...are issued with a statement of applicability, means of compliance...and time. Compliance...shall be mandatory...unless an exemption or compliance extension (is issued)." As such, this publication is effective within 60 days of the date of publishing and any exemption or compliance extension must be applied for within that timeframe (see Chapter 5, paras 10 & 11).

#### **AIRWORTHINESS AND FLIGHT SAFETY**

21. It is important to understand the relationship between the DND/CAF Airworthiness Program and the FS Program. As stated in the A-GA-005, "the CAF Flight Safety Program performs the vital role of providing an independent review and assessment of the suitability and effectiveness of the Airworthiness Program, including its policies, standards and procedures." As outlined in the

preceding paragraphs, one of the objectives of the Airworthiness Program is to establish and maintain an acceptable level of safety for military aviation, which is predicated on weighing the safety level desired against cost and operational capability of the various aircraft fleets. The acceptable level of safety varies for the fleet types and roles the aircraft assume because some safety levels for civilian aircraft types and roles are impractical for military operations. The As Low as Reasonably Practical Principle (ALARP) for risk is primary in the pursuit of these levels of safety; meaning risk reduction is pursued but must be weighed against financial and operational impacts of the implementation of initiatives.

22. The objective of the CAF FS Program is to prevent the accidental loss of aviation resources through a program of safe behaviour, promotion, education and the investigation and analysis of matters concerning safety. A comparison of the two programs reveals that the Investigative Authority's portion of the DND/CAF Airworthiness Program closely matches the long-standing and very effective investigation and analysis segment of the FS Program. Consequently the investigation and associated segments of the CAF FS Program now form the Airworthiness Investigation Program.

23. In keeping with this concept, this manual and the A-GA-135 -001/AA-001 and A-GA-135-002/AA-001 (Flight Safety for the Canadian Armed Forces – Parts I & II) are designed to complement one another. The latter two documents outline the entire FS Program for the CAF whereas the AIM outlines the DND/CAF Airworthiness Program policy for the AIA's investigation standards, authorities and processes.