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FLIGHT SAFETY FOR THE CANADIAN ARMED FORCES

6 July 2015

Change #1-December 15, 2015



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ENDORSEMENT BY THE CHIEF OF THE DEFENCE STAFF

The Defence Administrative Orders and Directives mandate commanding officers to “conduct their own general and specialist safety programs in accordance with the General Safety Program and specialist safety programs.” One vital specialist program that is well recognized nationally and internationally is the Canadian Armed Forces (CAF) Flight Safety Program.

The Flight Safety Program, which I strongly champion and support without reservation, reaches all elements of the CAF. Within the CAF, the Commander Royal Canadian Air Force is responsible for flight safety policy while the Director Flight Safety (DFS) administers the program as a whole on his behalf.

A capital element of the program stems from the Minister of National Defence designating DFS as the Airworthiness Investigative Authority (AIA) as required by the Aeronautics Act. With this designation comes the authority and responsibility to investigate all matters concerning aviation safety, independently of the chain of command. Moreover, on Ministerial Direction, I have issued a CDS Order to the AIA delegating additional responsibilities to carry out this function within the Flight Safety and Airworthiness Programs.

With the introduction of unmanned aerial vehicles in different organizations of the CAF and the contracting out of many aircraft maintenance and support activities, a vigorous Flight Safety Program that spans to all elements of our organization is critical. Aviation assets, including aircraft and unmanned aerial vehicles, are expensive and hard to replace. Also, our personnel are critical to mission success. It is vital that our resources be well preserved through a proactive flight safety program to ensure the operational viability of the CAF, at home and abroad. The program is a key component to support any operational deployment where aviation assets are involved.

I expect commanding officers involved with operating or supporting aviation assets to allocate the right balance of resources to have in place an effective Flight Safety Program. Furthermore, commanding officers have to demonstrate leadership and engagement in the program so our aviation assets are well protected.

A handwritten signature in blue ink, appearing to read 'J. Vance', located below the main text.

General J.H. Vance, CMM, MSC, CD
Chief of the Defence Staff

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FOREWORD

1. The A-GA-135-001/AA-001 *Flight Safety for the Canadian Armed Forces* (CAF) is issued by the Chief of the Air Staff on the authority of the Chief of the Defence Staff. A suitable number of up to date copies of this publication shall be available to personnel of units of the CAF in conducting or supporting air operations, including UAS.
2. The OPI for the publication is DFS 3 Promotion and Information. Any suggestions for amendments are to be forwarded through normal channels to the Director of Flight Safety, attention: dfs.dsv@forces.gc.ca.
3. The A-GA-135-002/AA-001 *Occurrence Investigation Techniques* is issued as a separate publication with limited distribution. DFS 2 is the OPI for this publication.
4. The A-GA-135-003/AG-001 *Airworthiness Investigation Manual* delineates the Airworthiness Investigative Authority's policies with details regarding standards, procedures and instructions for investigation interaction within the Department of National Defence and with persons, agencies, companies or authorities outside of the Department. It is issued electronically as a separate publication. DFS 2 is the OPI for this publication.

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LIST OF AMENDMENTS

This publication supersedes A-GA-135-001/AA-001 dated March 20, 2007. The official and most current version of this publication is available electronically on the DFS Intranet website or from the Pubs Depot. Any amendment will be advertised electronically via a CANFORGEN and details published on the FS Intranet website.

NOTE

Any amended page from the original of 6 July 2015 will show the change number and the date of the amendment in the footer of the page.
A vertical line in the margin shows where the publication was amended from the previous version.

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CHAPTER 1 – PROGRAM DESCRIPTION

References: A. 1016-17 (DFS), Service Level Agreement between DFS and DAER, 11 October 2013

B. B-GA-297-001/TS-000 *Safety Orders for CF Air Weapons Systems*

C. D-09-002-011/SG-000 *Standard, Assessment of Ammunition Containers, Packages, and Palletized Unit Loads*

GENERAL

1. The Flight Safety Program (FSP) is a force multiplier for the Canadian Armed Forces (CAF). The FSP contributes to mission accomplishment in the DND/CAF through the elimination of the accidental loss of aviation resources.
2. Orders and standards for operational and support personnel are, for the most part, developed out of concern for the safety of people and equipment. These standards represent levels of risk which are considered acceptable and practical for the full spectrum of DND/CAF activities from peacetime training to wartime operations. It is understood that Commanders (Comds) in high intensity wartime action are likely to accept higher levels of risk than those considered acceptable in peacetime force generation activities. Risk management in the planning and execution of the DND/CAF mission is fundamental to safe operations.

GOVERNANCE

3. The Commander of the Royal Canadian Air Force (Comd RCAF), who is also the Chief of the Air Force (C Air Force), has been designated as the Airworthiness Authority (AA) for DND/CAF. C Air Force retains as a residual responsibility the oversight of the FSP across the full spectrum of DND/CAF operations, at home or abroad. Therefore, the FSP is applicable to:
 - a. all DND/CAF units conducting flying operations or supporting flying operations;
 - b. any contracted organizations conducting or supporting flying operations, be it for maintenance support, logistics support or any other support role; and
 - c. independent airworthiness investigation activities as detailed in the A-GA-135-003/AG-001 *Airworthiness Investigation Manual (AIM)* and authorized by the AIA.
4. The Director Flight Safety (DFS), as the Airworthiness Investigation Authority (AIA), monitors matters concerning aviation safety of all foreign military aircraft operating in Canada.

DEFINITIONS

FLIGHT SAFETY (FS)

5. The state in which risks associated with flight activities, as well as those related to, or in direct support of the operation of the aircraft, are reduced and controlled to an accepted level (NATO).

FS PROGRAM (FSP)

6. The FSP is a program of safe behavior, education, independent airworthiness investigation, promotion and analysis of matters concerning aviation safety. It is directed at military and civilian personnel involved in CAF aviation and its contracted support elements.

NOTE

The FSP is responsible for the Air Weapons Safety Program (AWSP) as described at para 24.

FS OCCURRENCE

7. Any event that involved the operation of a CAF and/or a military conveyance aircraft or activities in support to flying operations where safety of flight was compromised. To constitute an occurrence, the event may not necessarily have caused injuries to personnel or damage to materiel or property but had the potential to do so.

FS UNIT

8. A FS Unit is any unit/formation within the CAF or contracted by the CAF that is conducting flying or aircraft maintenance activities, or is coordinating closely or remotely flying or maintenance activities.

NOTE

A FS Unit includes RCAF HQs, wings, squadrons and units, HMCS Ships with an MH HELAIRDET or UAS DET embarked, land forces garrisons that support flying operations, contracted flying training establishments, National Defence Quality Assurance Regions' (NDQAR) and work centres at all contractor facilities where CF aircraft are manufactured, overhauled, inspected or repaired. For the FS unit, it implies that the Comd/executive manager and its supervisor will ensure proper oversight of flying operations within their area of responsibilities.

SAFETY OF FLIGHT (SoF)

9. SoF is a desired mode of operation whereby the preparation of and conduct of a flight is done by following best possible maintenance and operational practices as well as approved procedures. Doing so will minimize, to the maximum extent possible, risks associated with flight operations.

FS HAZARD

10. An existing condition whereby there is possibility of adverse effect on health, property or SoF.

FS Risk

11. A FS risk is the projected likelihood and severity of the consequences or outcome from an existing hazard or situation associated with flight activities (NATO).

MILITARY CONVEYANCE AIRCRAFT

12. A military conveyance aircraft is any aircraft, including civilian registered aircraft, that is operated by or on behalf of the DND, the CAF, or a visiting force.

OPERATING UNIT

13. This term refers to the unit under whose authority a flight has been authorized in accordance with B-GA-100-001/AA-000, *National Defence Flying Orders*.

AIR WEAPONS CAPABLE WING/UNIT

14. A wing/unit which uses ammunition, explosives and/or pyrotechnics in support of its role.

AIR WEAPONS SYSTEM (AWS)

15. A system containing armament computers, mechanical, electromechanical and electronic components, that is part of an aircraft's permanent equipment or installed as a mission kit and is used to suspend, launch, release or fire ammunition/explosives and/or pyrotechnics in support of the mission being flown.

AIR WEAPONS

16. Air Weapons are any ammunition, explosives and/or pyrotechnics suspended, launched, released or fired from an aircraft; it includes any aircraft store, that interfaces with the AWS including bombs, missiles, torpedoes, flares, pyrotechnics, survival kit air droppable (SKAD) (excluding the SKAD dropped as cargo), chaff and flares, from the time the load starts to the time it is unloaded from the aircraft, sonobuoys, airborne targets and banners, etc. This shall apply to both live and training weapons.

AIRCRAFT STORE

17. An aircraft store is any device carried internally or externally and mounted on aircraft suspension and release equipment, whether or not the item is intended to be separated in flight from the aircraft. Aircraft stores are classified in two categories as follow:

- a. Expendable Store. Expendable store is an aircraft store normally separated from the aircraft in flight such as a missile, rocket, bomb, mine, torpedo, pyrotechnic device, sonobuoy, signal underwater sound device, SKAD) or other similar item; and
- b. Non-expendable Store. Non-expendable store is an aircraft store that is not normally separated from the aircraft in flight such as a tank (fuel or spray), pod (refuelling, thrust augmentation, gun, electronic countermeasures, target

designator, etc), multiple racks, target, cargo drop container, luggage/equipment carrier, drone or other similar item.

NOTE

Aircraft fire detection and extinguishing systems, ejection and escape explosive charges, shielded mild detonating cord (SMDC) lines and aircraft hoisting systems are not considered Air Weapons. Although they all contain explosives, they do not interface with the armament system and are not considered Air Weapons; therefore, no armament implications.

PYROTECHNICS

18. A chemical mixture of oxidizing and reducing agent capable of reacting exothermically. Such mixtures are used to produce light, heat, smoke or gas and may also be used to introduce delays into explosive trains.

AMMUNITION CONTAINER

19. A container specifically designed to facilitate the carriage of a specific class of ammunition required by one or more means of transport without intermediate reloading (ref C).

READY-USE MAGAZINE

20. A building or fenced area used for storage of assembled and fuzed ammunition held ready for use (ref B). It used to be called ready-use facility.

UNIT AMMUNITION AND EXPLOSIVE (A&E) LOCK-UP

21. A licensed storage for a limited quantity of small arms ammunition, pyrotechnics or other explosives required for a specific operational or training use (reference B). It used to be called ready-use lock-up.

AIM OF FSP

22. The aim of the FSP is to prevent accidental loss of aviation resources while accomplishing the mission at an acceptable level of risk.

SCOPE OF FSP

23. The CAF shall conduct flying operations and related support operations in accordance with this publication. A FS program consistent with the roles and missions of the DND/CAF shall be established at each level of command where flying operations are supervised or supported. Personnel at every level are required to participate in and support the program. The FS program is a program of safe behavior, education, independent airworthiness investigation, promotion and analysis of matters concerning aviation safety. The program is directed at military and civilian personnel involved in CAF aviation and its contracted support elements.

Since understanding why safety occurrences happen is the key to an effective accident prevention program, accidents and incidents representing a risk to aviation, or which could lead to the implementation of preventive measures (PMs), should be investigated.

AIR WEAPONS SAFETY

24. Every unit with an air weapon capability shall ensure that their FSP encompasses a vibrant Air Weapons Safety Program (AWSP). Ref B publication remains the primary reference for air weapons related issues. As per reference A, DFS has accepted the oversight of air weapon safety occurrences as part of the FSP in that it will capture through the Flight Safety Occurrence Management System (FSOMS) every weapon safety related occurrence involving operational air weapon activity from the moment that an air weapon is removed from a ready-use magazine or a unit A&E lock-up for operational use until its safe separation from the aircraft or return into either a ready-use magazine or a unit A&E lock-up.

25. Chapter 7 para 40 and 41 detail what weapon occurrences are FS related and reportable in FSOMS and explain how the other types of weapon safety occurrences with no safety implication shall be reported.

AIRWORTHINESS PROGRAM

26. The aim of the DND/CAF Airworthiness Program is to establish and maintain an acceptable level of aviation safety. This compares favourably with the FSP stated goal of preventing the accidental loss of aviation resources. While not integral to the FSP, the Airworthiness Program is intended to provide a framework for the regulation of military aviation. In fact, the two programs collaborate on many fronts and share best practices for enhancing SoF. One of the primary objectives of the Airworthiness Program is to establish and maintain an acceptable level of safety for military aviation. When the roles of DFS and the AIA and the associated investigation aspects of these programs were compared, the close match allowed the overlap of the investigation responsibilities to become a single DND/CAF activity.

FUNDAMENTAL PRINCIPLES

27. The FSP is based on the following five fundamental principles:
- a. the main principle is the prevention of occurrences. Although cause factors are assigned to occurrences, this is only done to assist in the development of effective PMs;
 - b. personnel involved in conducting and supporting flying operations are expected to freely and openly report all FS occurrences and FS concerns;
 - c. in order to determine the cause of occurrences such that appropriate, effective PMs can be developed and implemented, personnel involved in conducting and supporting flying operations are expected to voluntarily acknowledge their own errors and omissions;
 - d. in order to facilitate free and open reporting and voluntary acknowledgement of errors and omissions, the FSP does not assign blame. Personnel involved in a FS occurrence are de-identified in the final report and the report itself cannot be used for legal, administrative, disciplinary or other proceedings; and

- e. the whole FSP is based on the primacy of having a “just culture.” A “just culture” lies between a non-punitive culture and one of sanction and punishment. Free and open sharing of critical safety information between managers and operational personnel, without the threat of punitive action, represents the basis of a reporting culture. Personnel are able to report occurrences, hazards or safety concerns as they become aware of them, without fear of sanction or embarrassment. However, while a non-punitive environment is fundamental for a good reporting culture, the workforce must know and agree on what is acceptable and what is unacceptable behavior. Negligence or wilful, deliberate deviations must not be tolerated by leadership. A “just culture” recognizes that, in certain circumstances, there may be a need for punitive action and defines the line between acceptable and unacceptable actions or activities.

RESPONSIBILITY FOR FSP

OVERALL RESPONSIBILITIES

28. A large portion of the FSP is based on the continuous monitoring of hazards, appropriate and independent investigation of aviation safety occurrences and thorough analysis of investigation findings so that the risk of recurrence can be reduced. The complete program involves pre-occurrence activities like education and promotion for the safe behavior activity, risk management techniques designed to reduce the chances of an occurrence, post-occurrence activities including occurrence response procedures, investigations, occurrence analysis, formulation of PMs and feedback. Early involvement in capital acquisitions is essential to ensure FS issues are adequately considered.

29. C Air Force is responsible for FS policy in DND/CAF. FS policy is implemented by the chain of command at wings, bases and units. This policy also applies to NDQAR contracted facilities where CAF aircraft are being manufactured, overhauled, inspected or repaired. Supervisors at all levels are responsible for establishing their own FSPs.

INDIVIDUAL RESPONSIBILITIES

30. The success of the FSP is reliant upon a commitment to it by all personnel associated with DND/CAF flying operations. This commitment can only materialize if all personnel believe in the value of the program and understand that they have a responsibility to actively participate. In order to facilitate this, the individual shall be able to report any flight activity concerns and occurrences or propose better ways of doing business without fear of retribution.

31. Personnel are responsible for:

- a. immediately ceasing unsafe activities under one’s direct control;
- a. notifying their supervisor and the FSO of the unsafe activity; and
- b. formally identifying and reporting hazards and occurrences.

NOTE

It is the responsibility of each individual to cease unsafe activities, regardless of rank or position in the organization.

UNIT RESPONSIBILITIES

32. The FSP is designed to ensure that DND/CAF flying activities remain safe while remaining operationally focused. The scope of the FSP shall be such that individuals belonging to an organization conducting or supporting air operations will have a structured FSP in place. Every unit conducting or supporting air operations shall have a flight safety program.

MANAGEMENT RESPONSIBILITIES

33. Management responsibilities are as follow:
- a. immediately ceasing activities that are deemed unsafe or where an unacceptable risk exists;
 - b. notifying higher authorities of unacceptable risks and the actions taken to mitigate them or of the need to seek additional resources to mitigate them;
 - c. reviewing and accepting/rejecting the risk as per the authority delegated from the Airworthiness Authority (AA), the Operational Airworthiness Authority (OAA) and the Technical Airworthiness Authority (TAA);
 - d. establishing the unit's risk control strategy;
 - e. measuring and reporting on the effectiveness of risk management activities within the unit; and
 - f. promoting risk management activities at the unit and formation level.

FSO RESPONSIBILITIES

34. The FSO is responsible for:
- a. consulting and being aware of the unit's risk assessment criteria;
 - a. immediately notifying the CO of any unsafe activities and unacceptable risks. In these cases the FSO must seek an order from an appropriate authority to cease the activity until the problem can be assessed and either resolved or mitigated to an acceptable level; and
 - b. carrying out independent airworthiness investigation activities as detailed in the AIM and authorized by the AIA.

TRAINING RESPONSIBILITIES

35. All organizations and training establishments for which personnel will be exposed or involved with flying operations must ensure that appropriate training and exposure to the FS Program be provided to their personnel. The training provided shall be proportional to

the degree of projected exposure to flight operations but shall cover as a minimum the key principles of Just Culture and the requirement to report FS hazards and occurrences to a FSO or CoC.

AIRWORTHINESS AND FS POLICY

GENERAL

36. Within the Airworthiness Program, DFS is named as the AIA and charged with independently investigating all matters concerning aviation safety. Details of the powers delegated from the MND, using powers within the Aeronautics Act, to the AIA and then onward to all airworthiness investigations are laid out in the AIM. Of note, all activities carried out for flight safety airworthiness investigations are carried out on behalf of the AIA/DFS. The FSP integrates the investigation portion of the DND/CAF Airworthiness Program within its activities which are detailed in Chapters 7-11 of this manual and with the occurrence investigation techniques outlined in the A-GA-135-002/AA-001 *Occurrence Investigation Techniques for the Canadian Forces*.

37. The Airworthiness Program contributes to aviation safety by influencing areas related to aeronautical products and their operation. The DND/CAF Airworthiness Program is mandated by the Minister of National Defence (MND) as detailed in DAOD 2015-0 and DAOD 2015-1 and amplified in A-GA-005-000/AG-001 *DND/CAF Airworthiness Program*. The elements of an effective airworthiness program consist of a full range of aviation activities including design, manufacture, maintenance, materiel support, facilities, personnel and operations.

AIRWORTHINESS PROGRAM AUTHORITIES

AIRWORTHINESS AUTHORITY

38. The AA is responsible for the development, promotion, supervision and management of an Airworthiness Program for the DND/CAF. This includes the appointment of competent individuals to fill the positions of OAA and AIA as described below, and in consultation with the Assistant Deputy Minister (Materiel) (ADM (Mat)), the appointment of a competent individual as Technical Airworthiness Authority. C Air Force is the AA for DND/CAF. Of note, the AA is charged with ensuring the AIA is not impeded in any way in its' investigation of matters concerning aviation safety.

TECHNICAL AIRWORTHINESS AUTHORITY

39. The TAA is responsible for the regulation of the technical airworthiness aspects of the design, manufacture, maintenance and materiel support of aeronautical products and the determination of the airworthiness acceptability of those products prior to operational service. The Director General of Aerospace Equipment and Program Management (DGAEPM) is the TAA for DND/CAF.

OPERATIONAL AIRWORTHINESS AUTHORITY

40. The OAA is responsible for the regulation of all flying operations. This includes

responsibility for operational procedures; flight standards; operator training, qualification and licensing; aerospace control operations; and operational airworthiness clearance of aeronautical products prior to operational service. The Comd of 1 Canadian Air Division (Comd 1 Cdn Air Div) is the OAA for DND/CAF.

AIRWORTHINESS INVESTIGATIVE AUTHORITY

41. The AIA is responsible for regulating the airworthiness investigation aspects of the FSP. The AIA is responsible for investigations. The AIA is also responsible for monitoring the Technical and Operational Airworthiness Programs to identify deficiencies. DFS is the AIA for DND/CAF. Of note, the AA is charged with ensuring the AIA is not impeded in any way in the investigation of matters concerning aviation safety.

AIRWORTHINESS PROGRAM PRINCIPLES

42. The DND/CAF Airworthiness Program is based on the fundamental principles that airworthiness-related activities are:

- a. completed to accepted standards;
- b. performed by authorized individuals;
- c. accomplished within accredited organizations; and
- d. performed using approved procedures.

AIRWORTHINESS PROGRAM ROLES

43. A regulatory approach is the most common method employed to implement the concepts and principles of any airworthiness program. A regulatory approach means to control by rule and involves using regulations, orders, directives and standards to control airworthiness-related activities. A regulatory approach for controlling airworthiness activities has the following three distinct roles:

- a. Regulator. The regulator develops the airworthiness instrument (rules and standards) for the engineering, manufacture, maintenance, materiel support and operation of aeronautical products and ensures compliance (e.g. Transport Canada for civil aviation);
- b. Implementer. The implementer conducts the aviation activities associated with the engineering, manufacture, maintenance, materiel support and operation of aeronautical products (e.g. airlines, manufacturers and maintenance organizations for civil aviation); and
- c. Investigator. The investigator investigates airworthiness-related safety occurrences and aviation safety issues. The investigator is normally independent from the regulator and implementer. The investigator is also empowered to investigate the role that the regulator and implementer may have had in any aviation occurrence (e.g. Transportation Safety Board (TSB) for civil aviation). DFS is the designated AIA for this program and fulfils the investigator role as described.

44. Unlike civil aviation, where the airworthiness regulator, implementer and investigator are totally independent, the Aeronautics Act has assigned DND a self-regulating and self-investigating responsibility for airworthiness.

RISK MANAGEMENT

45. The Airworthiness Risk Management (ARM) process ensures that conflicts between aviation safety, mission accomplishment and resource expenditures are balanced. As promulgated in A-GA-005-000/AG-001 DND/CAF Airworthiness Program overall responsibility for managing risks rests with COs, DND / CAF managers at all levels, and designated contractor representatives. The identification/recognition of hazards is a responsibility shared by all DND/CAF personnel or supporting personnel.

46. Due to the inherent dangers associated with operating military aircraft, a certain acceptance of risk to safety is often required. The decision to accept risk must be controlled, balanced and approved at the appropriate level. The ARM process provides a logical and systematic means of identifying and controlling safety risks in the decision-making process.

47. Aviation safety-related risk is a primary concern of the Airworthiness Program and the FSP. Other forms of risk, such as operational, financial and legal, may also be factors in any decision-making process and may at times conflict with aviation safety goals. The ARM process provides a means to assess and pro actively balance airworthiness risk against both mission accomplishment and available financial resources. All personnel associated with aviation, from the pilot-in-command (PIC) of an aircraft to the technician troubleshooting an unserviceability on the hangar floor, will be required to make a decision, at some point, involving some degree of airworthiness risk assessment. Adoption of a standardized ARM methodology enhances the quality of these decisions.

FS STRATEGIC PROCESSES

48. A strategic level conceptual model of FS-related processes for the FSP is provided at Annex A. It describes in a comprehensive manner all the FS processes irrespective of the organizations responsible to execute them. Many organizations or activities contribute directly or indirectly to the processes described in the model's three management pillars in the form of Resilience Management, Risk Management and FSP Management. DFS is the champion of the FSP for the DND/CAF, and maintains close liaison with the organizations carrying out the strategic FS processes. DFS, as the AIA, is responsible to the Minister of National Defence (MND) for FS investigations.

49. Resilience and Risk Management represent the pillars to which most of the critical FS processes and activities gravitate. Resilience Management is considered a proactive form of accident prevention because it reduces the potential or severity of threats to air operations. Risk Management on the other hand is more reactive in that the associated activities are in response to newly identified hazards.

Annex A
Chapter 1
A-GA-135-001/AA-001

ANNEX A – FS STRATEGIC BUSINESS MODEL

INTRODUCTION

1. The strategic FS model provides a high level framework and describes the processes involved in the flight safety program. Accident prevention processes can be derived by inverting Reason’s Swiss Cheese model of Accident Causation. Accidents occur because weaknesses or “windows of opportunity” open and align in all levels of the operation, allowing a chain of events to cause an accident. Accidents can be prevented by adding layers of defences through resilience management and patching holes in these defences through risk/hazard management.



FS BUSINESS PROCESSES

2. Appendix 1 to this annex is a graphical depiction of the FS business processes. They are regrouped as follows:
- a. Resilience Management. Resilience management is the process of making the equipment, procedures and personnel resilient to accident-causing conditions, and thus protect operations from unknown hazards.
 - (1) Equipment Resilience Activities. CF airworthiness organizations employ tools and methods to ensure aircraft and related equipment are acceptable for the operations and flying environment. FS data is provided to improve Design, Modification, and Maintenance airworthiness on current and new aircraft so that the flying operations can better withstand unknown hazards.
 - (2) Procedures Resilience Activities. CF flying procedures are monitored to ensure that air operations are being conducted in a safe manner. FS surveys are conducted, rules and regulations are reviewed, and periodic inspections are performed in order to continually improve all associated procedures.
 - (3) Personnel Resilience Activities. Personnel are trained to be capable of dealing with known and unknown threats to flight safety. Occurrences, hazards, trends, and many other forms of flight safety data are disseminated to all personnel involved with the support or conduct of air operations so they can better understand the situations and circumstances that can compromise flight safety. This is supported by a comprehensive awards program to encourage safe behaviour throughout the organization.

- b. Program Management. The FSP provides the administrative framework for the Resilience and Risk Management processes. Program Management includes development of the FS Program, policies and procedures, relevant training and education, and activities that provide feedback to the chain of command. Program Management does not directly prevent accidents, but supports Resilience and Risk Management in doing so.
- c. Risk Management. Risk management is the systematic process of identifying risks, assessing their implications, deciding on a course of action, and evaluating the results. Known risks are those that have been identified and analyzed. Unknown risks, by their nature, cannot be managed, and thus are addressed through resilience management.
 - (1) Identify Hazards. The principle means of identifying hazards is through occurrence investigation, hazard reporting, and trend analysis. A comprehensive reporting system is required to track hazards from initial identification until resolution of any preventive measures.
 - (2) Investigate Hazards. Based on the preliminary information captured when the hazard or occurrence was reported, the nature of the hazard and its severity will be used to determine the level of the investigation and resources that should be employed.
 - (3) Analyze Risk. All available information is systematically reviewed to determine how often specified events may occur and the magnitude of their consequences. Commanders at all levels review investigations within their sphere of responsibility, the associated proposed PM, then make documented decisions on how they will address the hazards.
 - (4) Mitigate Risk. Hazards, whenever possible, are corrected by implementing one or more FS PM. It is critical that the various stages and levels of implementation be tracked and monitored to ensure complete staffing, either full implementation, partial implementation or no implementation (refusal). The latter two options must be endorsed at the proper level in the chain of command and supported by an appropriate record of Airworthiness Risk Management.

FS INFORMATION FLOW

- 3. Appendix 2 describes the interrelationship between the individuals involved in FS and the FS information flow. It represents the major types of information used for flight safety management (Hazards, Risk, PM, etc.) and the relationships that the entities have with each other as the data / information flows through the FS system.
- 4. The information model descriptors are:
 - a. Persons Involved in Air Operations. These personnel include aircrew, groundcrew, maintainers, air traffic personnel, contractors, as well as any other Air Force, Navy, or Army personnel involved with flying operations. They are responsible for identifying and reporting any hazard to flight safety that they find.

- b. FS Staff. FS Staff include Unit Flight Safety Officers (UFSOs), Wing Flight Safety Officers (WFSOs), Division Flight Safety Officers (Div FSOs), DFS Flight Safety Officers, and deputies at all levels. They are responsible for validating and investigating reported hazards, for analyzing the hazard risk potential and for proposing possible PM. FSOs and their assistants (FS Non-Commissioned Members, FSO Specialist (Weapons) (FSOS (W), etc.) operate within a FS functional chain of command. As advisors to their respective supervisors, all tiers of FS (deployments, unit, wing, air div, contracted unit and DFS) work in a cooperative and functional Chain of Command IAW direction set in this publication.
- c. Chain of Command. Chain of command include unit commanding officers, wing commanders, division commander, and supervisors at all levels. These persons are responsible for evaluating the hazards within their organizations, and either formally accepting the risk, or mitigating the risk by implementing PM. By extension, the senior management of contracted organizations have an equivalent chain of command.
- d. Action Agencies. Once the Chain of Command has confirmed the risks associated with certain hazards, they will task Action Agencies to complete PM. These Action Agencies will notify FS Staff when their assigned PM have been completed, as well as provide status reports along the way.

FS BUSINESS MODEL AND FSOMS

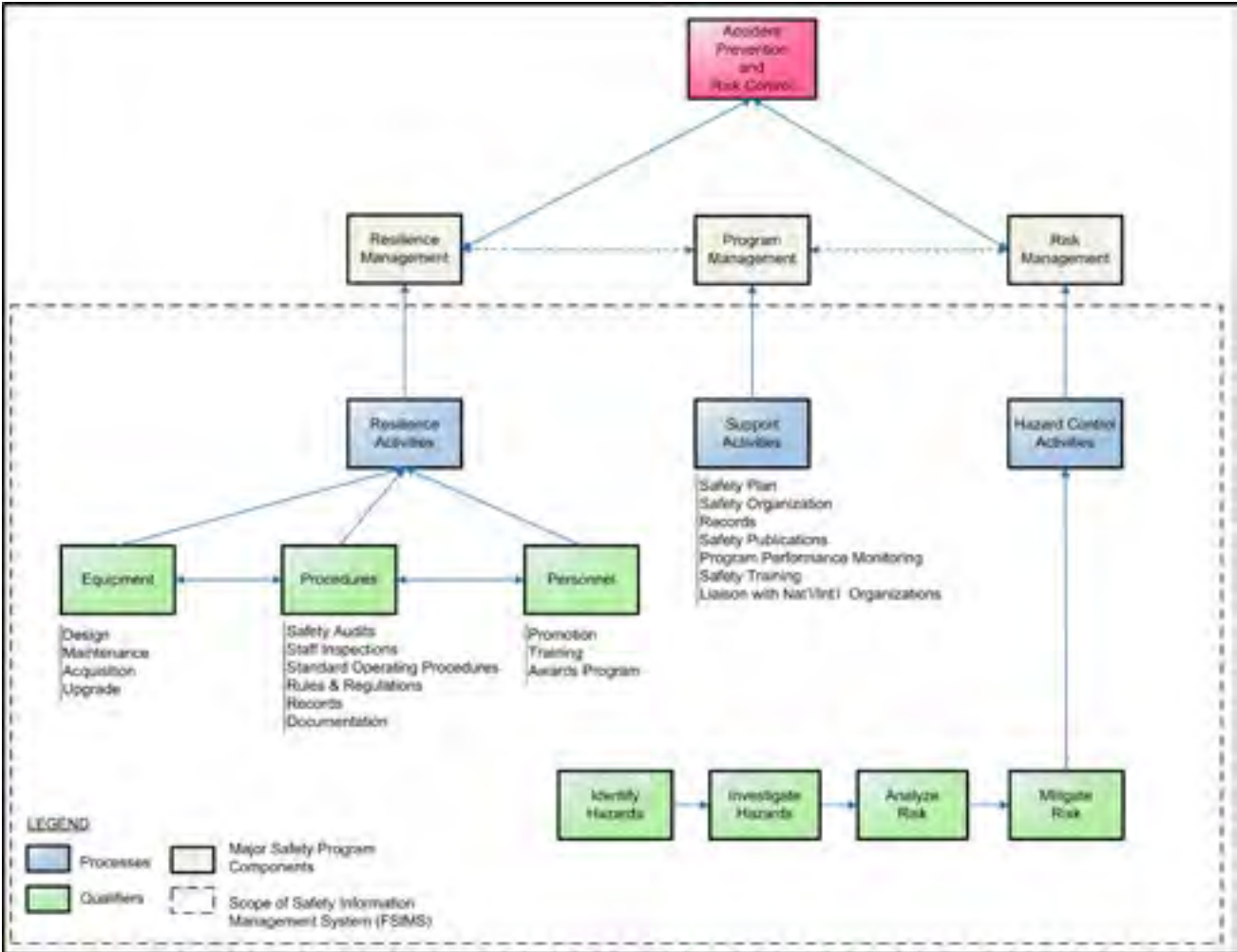
5. The FS Program achieves the aim of preventing accidental loss of aviation resources while accomplishing the mission at an acceptable level of risk. This is done by managing the risks associated with air operations, and by making the organization resilient to unknown hazards. Some of the FS processes in the FS business model are the direct responsibility of the Airworthiness Investigative Authority while others are the responsibility of organizations and personnel directly and indirectly supporting air operations.

6. The FS Occurrence Management System (FSOMS) supports the FS Program by recording all factual data related to FS occurrences and hazards. It details investigation results including assigned cause factors, recommended PM and disposition of these PM. The collection of data and its systematic analysis helps in the prevention of accidents and the control of risk in a manner that is measurable.

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Appendix 1
 Annex A
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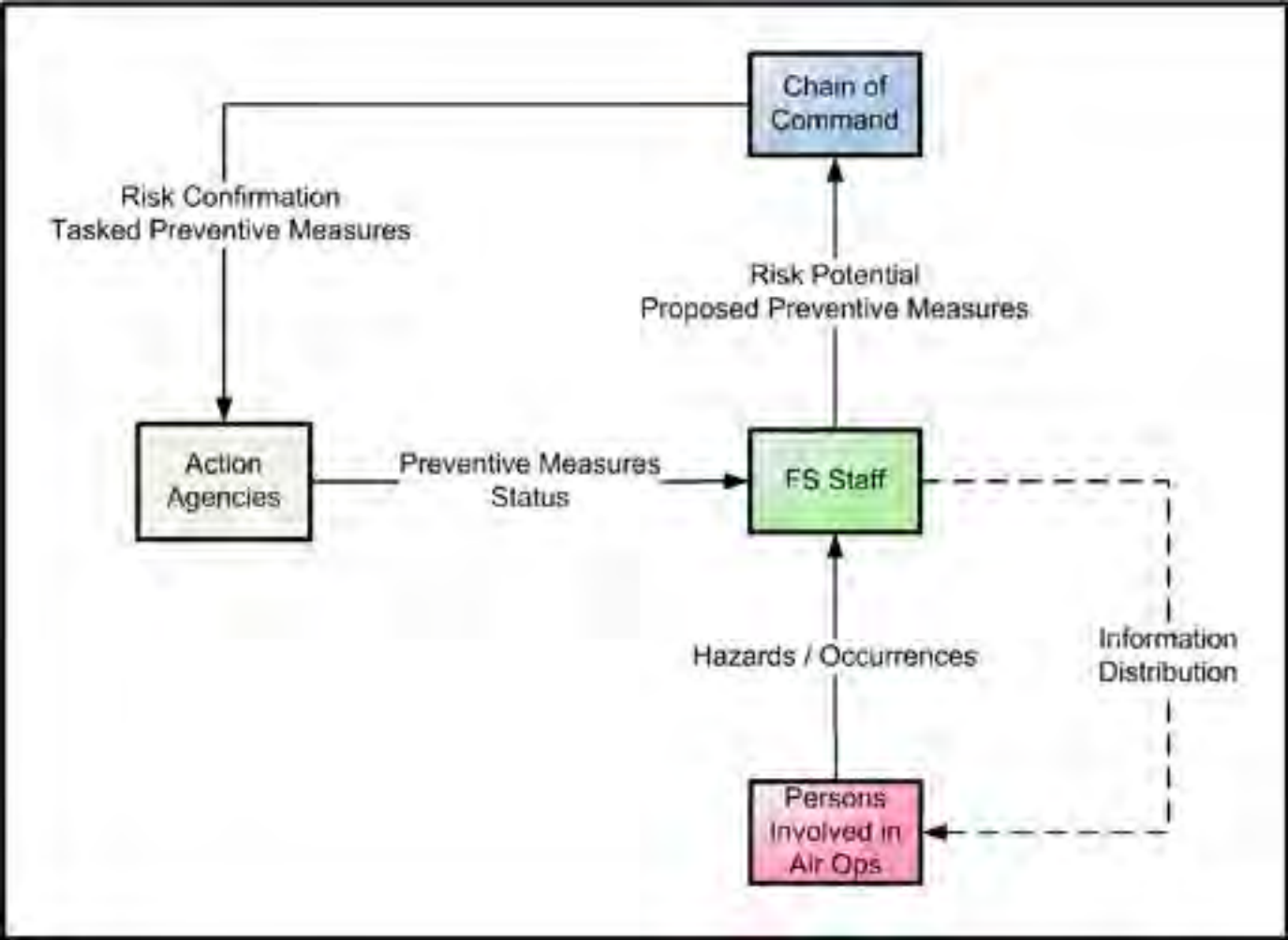
APPENDIX 1 – FS BUSINESS PROCESSES



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APPENDIX 2 – FS INFORMATION MODEL



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CHAPTER 2 – ORGANIZATION

GENERAL

1. The accidental loss of aviation resources can be prevented if hazards are identified and, whenever possible, eliminated. The achievement of this objective requires an effective FS Program that is proactive, adaptable, relevant and highly visible to all members of the organization. This, in turn, requires a dedicated staff of highly motivated, trained FS professionals to develop, revise and administer the FS Program on behalf of the chain of command. In the case of airworthiness investigations, these professionals perform their duties on behalf of the MND through delegated responsibilities to the AIA. Therefore, FS professionals are required at all levels of the organization (tactical, operational and strategic) in order to optimize the effectiveness of the FS Program.

FS STRUCTURE

2. Table 1 below shows the different organizations and the corresponding appointed FSOs. For the designated organizations, it implies that the Commanding Officer (CO)/executive manager will put in place proper oversight of air operations by a designated FSO within their area of responsibility. Reciprocally, the aviation units or sub-units operating under in specific geographic regions or on-board HMCs ships shall ascertain that proper liaison is maintained and that a suitable emergency response plan is put in place, exercised and updated regularly.

ORGANIZATION	FSO STAFF
STRATEGIC	
NDHQ FOR MND/CDS/VCDS/COMD RCAF/ ADM (MAT)	DFS
NDHQ NATIONAL AIR CADET OPERATIONS (D CDTS)	DFS
OPERATIONAL	
1 CDN AIR DIV/CANR	1 Div FSO
2 CDN AIR DIV	2 Div FSO
CANADIAN JOINT OPERATIONS COMMAND (CJOC)	1 Div FSO
CANSOFCOM	1 Div FSO
WING	WFSO
FORMATION HQ (LAND FORCES HQs, MARLANT, MARPAC)	DESIGNATED FSO WITHIN HQ
AIR CADETS REGIONAL OPERATIONS	REGION FSO/DESIGNATED WFSO AS PER TABLE 2 OF ANNEX A OF CHAPTER 2

ORGANIZATION	FSO STAFF
TACTICAL	
AETE	UFSO/4 WING FSO
ATESS	UFSO/8 WING FSO
427 SPECIAL OPERATIONS SQN	UFSO/1 WING FSO
RCAF FLYING UNIT	UFSO
DEPLOYED UNIT/SUB-UNIT (DETACHMENT ON-BOARD HMCS OR ATTACHED AIR ASSETS TO LAND/NAVAL FORCES)	ASSIGNED FSO AS PER TASKING ORDER
AIR CADET GLIDING SCHOOL/SITE	UFSO/GLIDING SITE FSO
CONTRACTED ORGANIZATION	CONTRACTOR FSO/ASSIGNED WFSO AS DETAILED ON DFS WEBSITES UNDER FSOMS/OPERATIONAL GUIDANCE

Table 1–Command Levels and Corresponding FSO

3. For CJOC, Comd 1 Cdn Air Div is the CF Air Component Commander and is responsible for FS. For CANSOFCOM, FS is a residual responsibility that is not relinquished by C Air Force even when detachments are under comd to these commands.
4. For non-Air Force units, the appointment of a dedicated FSO will be based on the unit's level of involvement in flying operations, support and oversight of air operations.

INTERACTION WITH OTHER ORGANIZATIONS

AEROSPACE ENGINEERING TEST ESTABLISHMENT (AETE)

5. AETE, an ADM (Mat) unit, is accountable to C Air Force for their FS Program. Their FS Program is monitored by 1 Cdn Air Div through 4 Wing. The flying and maintenance standards of AETE are the responsibility of 1 Cdn Air Div, which exercises this supervisory role on behalf of C Air Force.

AEROSPACE AND TELECOMMUNICATIONS ENGINEERING SUPPORT SQUADRON (ATESS)

6. ATESS is accountable to C Air Force for their FS Program. Their FS Program is monitored by 1 Cdn Air Div through 8 Wing.

AIR CADET FLYING PROGRAM

7. The Air Cadet Flying Program, comprising the Air Cadet Gliding Program and the Air Cadet Powered Flight Program, must also comply with this publication. Specific arrangements and associated responsibilities are detailed at Annex A. The Air Cadet Flying Program consist of the following:

- a. The Air Cadet Gliding Program is a national program consisting of familiarization flights and glider pilot flying training; and
- b. The Air Cadet Powered Flight Program is a national program consisting of familiarization flights and pilot ab-initio flight training.

IMPLEMENTATION OF FS PROGRAM

8. Every organization who is assigned or tasked to facilitate the employment of air assets must implement a FS Program overseen by an FSO. The latter shall be a trained FS specialist who advises the unit CO/executive manager on FS and AWS Program issues. Being familiar with the full spectrum of operations in the organization, the FSO provides expert advice on both accident prevention and hazardous conditions.

ASSIGNMENT OF FSO RESPONSIBILITIES

9. A CO/executive manager normally assigns responsibility to the FSO for devising, revising, promoting and administering the FS Program including:
 - a. disseminating FS educational material;
 - b. administering FS Committee meetings;
 - c. researching and staffing airworthiness investigation activities on behalf of the AIA to determine PM;
 - d. conducting AWS surveys;
 - e. conducting informal FS surveys;
 - f. monitoring the bird strike prevention program;
 - g. highlight hazardous conditions to the CoC for rectification or acceptance of risk;
 - h. advising on FS matters; and
 - i. participating as a team member in formal FS surveys.
10. Accident prevention is the responsibility of COs at all levels and involves monitoring the control, conduct and support of air operations. The CO is assisted by an FSO who provides specialist advice on the FS Program.

FSO ACCESS TO CO/EXECUTIVE MANAGER

11. An FSO, whether employed full-time on FS duties or not, must have direct access to the CO/executive manager. Although reporting directly to the CO/executive manager, the FSO normally presents their observations or recommendations to the individual who has the authority to take corrective action. Recommendations prepared by the FSO must be constructive, well thought out and tactfully presented.

MANAGEMENT LEVEL OF THE FSO

12. An FSO should be of at least Captain rank, or in the case of civilian contractors, a mid-level manager. Senior positions at C Air Force, 1 Cdn Air Div and wing level are established at the rank of Captain/Major through Colonel. The FSO and D/FSO must have experience in the related operational roles and should have completed formal FS course (FSC) giving a Basic Investigator (BI) 2 qualification. In cases where an individual has not received the FSC prior to their appointment, they should complete this training as soon as possible. Aircrew shall maintain flying currency wherever feasible. The DFS/AIA and the 1 Div FSO shall be advised of FSO and D/FSO appointments and qualifications. Candidates nominated for unit positions shall be able to occupy the position for 18–24 months. Candidates nominated for wing positions shall be able to occupy the position for a minimum of 36 months.

NOTE

When a FSO will be absent for an extended period of time, the 1 Cdn Air Div FSO and DFS need to be advised of the period of absence and who the interim FSO will be .

LIMITATIONS ON FSO SECONDARY DUTIES

13. Although units vary in size, composition and role, it is expected that the FSO will have sufficient time to complete their duties during a normal workday. The FSO is expected to maintain professional qualifications and categories commensurate with the unit's role(s). However, the FSO should be actively involved in the stewardship of the unit FS Program, and as such, FSO duties are normally to be considered the individual's only secondary duty. The CO should avoid assigning duties/assignments (i.e. secondary duties) that require full-time attention. If a unit CO considers it necessary to assign additional duties/assignments that may conflict with FSO duties, then the CO shall obtain written approval from the WComd for a UFSO and the WComd shall obtain approval from the Comd 1 Cdn Air Div for a WFSO. The written request shall outline the circumstances, mitigation and/or period required. The request and authorization shall be held on file with the WFSO for UFSOs, and Div FSO for WFSOs for the duration of the approved period.

TECHNICAL AND ADMINISTRATIVE SUPPORT

14. FSOs shall be given the technical and administrative assistance necessary to perform their duties.

UNIT FS TEAM MEMBERS

D/FSO

APPOINTMENT

15. One or more D/FSOs shall be appointed, as required, at all FS units and sub-units. They are employed as assistants to the FSO and may act as the FS representative for a

sub-unit. For military units the D/FSO should be an NCM. As a minimum, a D/FSO should have completed the FS Course (BI 3). Candidates nominated for unit positions shall be able to occupy the position for 18–24 months.

ROLE

16. The role of the D/FSO is to assist the FSO in administering an effective FS Program.

DUTIES

17. It is the duty of a D/FSO to:
- a. complete tasks assigned by the FSO; and
 - b. act as FSO during the absence of the latter.

FS SPECIALIST

ROLE

18. The role of the appointed FS Specialist (FS Spec) is to provide specific FS expertise to the FSO and D/FSO in order to help them administer a more effective FS Program.

FS SPEC WEAPONS (FS SPEC (W))

APPOINTMENT

19. An FS Spec (W) shall be appointed in any unit utilizing air weapons. The FSS (W) should be an AERE Officer or Senior NCM qualified in aerospace armament, engineering and maintenance (course code SS ADOT).

ROLE

20. The role of the FS Spec (W) is to assist the FSO on matters affecting air weapons safety (AWS).

DUTIES

21. It is the duty of the FS Spec (W) to:
- a. develop the unit AWS Program;
 - b. take the necessary actions to correct hazardous conditions;
 - c. advise on AWS matters;
 - d. liaise with the wing/unit Air Weapons Officer (appointed IAW B-GA-297-001/TS-000) on matters affecting AWS;
 - e. assist in the research and staffing of occurrence reports with air weapons implications;
 - f. assist the UFSO in the conduct of internal AWS surveys;
 - g. assist in implementing and conducting AWS awareness training; and
 - h. participate as a member of the wing/unit FS Committee.

FORMATION FSO

CAF, ROYAL CANADIAN AIR FORCE (RCAF) AND ADM (MAT) FSO

22. DFS is the FSO assigned to the CDS, RCAF Comd and DGAEPM. Coincidentally, DFS, or the person that is assuming the duties of DFS should the position not be filled or DFS is absent or incapacitated, is the AIA so designated by the MND to carry out the requirements listed in the Aeronautics Act section 12. On behalf of C Air Force, DFS shall:

- a. provide advice on all FS and AWS matters;
- b. devise, implement and monitor the FS and AWS Programs as detailed in this publication;
- c. independently investigate and analyse matters concerning aviation safety occurrences to identify safety deficiencies when required;
- d. delegate investigation responsibility to qualified personnel as required to conduct airworthiness investigations;
- e. monitor and facilitate follow-up action to all aviation safety occurrences;
- f. provide Class I investigation reports or other reports of interest to the MND and findings in relation to them;
- g. act as a staff advisor for all FS matters at NDHQ, including acting as FSO to ADM (Mat) in his capacity as comd of a Command;
- h. advise on the adequacy and suitability of policies, procedures and standards for AWS;
- i. collect, maintain and analyze FS and AWS statistics for prevention purposes;
- j. promote AWS awareness;
- k. monitor and participate in an educational program for the training of FS personnel;
- l. produce and distribute educational and promotional material;
- m. monitor the FS Program for air cadet glider and tow plane operations;
- n. recommend nominations for FS awards and approve, as applicable;
- o. represent the CF at international FS conferences;
- p. conduct annual FS briefings at wings, units and contractor facilities; and
- q. participate in and/or conduct formal and informal surveys of wings and units and conduct surveys of contractor facilities.

1 CANADIAN AIR DIVISION FSO

23. The Division FSO (1 Div FSO) is the FSO assigned to Comd 1 Cdn Air Div. On behalf of Comd 1 Cdn Air Div, the 1 Div FSO shall:

- a. provide the Air Div chain of command with specialist advice on FS matters;
- b. liaise with DFS on FS and AWS related matters;

- c. liaise with the unit to monitor, advise and promote the FS and AWS Programs;
- d. advise on the adequacy and suitability of policies, procedures and standards for FS and AWS;
- e. promote safety practices within the Air Force by maintaining effective feedback loops amongst the wings, 1 Cdn Air Div and C Air Force;
- f. review FS and AWS occurrences;
- g. review FS award nominations and staff as per Chap 5 directions;
- h. conduct FS surveys and AWS surveys of all Air Force wings and deployed units on a 24 month cycle;
- i. prepare survey reports, including recommendations for improvement, for review by the chain of command;
- j. represent Comd 1 Cdn Air Div at FS conferences and meetings; and
- k. conduct FS education by coordinating the administrative aspects of the FSC, providing instructors for selected course serials, identifying FS training needs of wings/units, and ensuring sufficient numbers of trained FSOs/D/FSOs are available for units and contractors.

WING FSO

24. On behalf of the WComd, the Wing FSO (WFSO) liaises with the flying units and all of the support functions of a base. It is the WFSO's responsibility to:
- a. advise the WComd on all FS and AWS matters;
 - b. establish and implement FS and AWS Programs that encompass all aspects of wing operations;
 - c. on behalf of the AIA and as laid out in the AIM, ensure that all occurrences are reported, appropriate occurrences are investigated and that proper PM are identified to the chain of command;
 - d. liaise with unit COs to conduct FS and AWS surveys;
 - e. monitor all safety aspects of flying operations and air weapons operations;
 - f. confirm that aircraft publications are up to date;
 - g. develop methods for detecting hazardous conditions;
 - h. be the focal point for all FS and AWS activities at the wing;
 - i. provide advice and assistance to the appropriate 1 Cdn Air Div staff officer;
 - j. monitor air cadet flying operations in accordance with this publication and A-CR-CCP-242/PT-001 – Air Cadet Gliding Manual; and
 - k. review supplementary reports (SR) from lodger units.

FSO FOR ASSIGNED/ATTACHED AIR ASSETS

25. The FS Program shall be promulgated through local flying orders, operations orders, standing orders and equivalent regulatory documents.

26. Comds shall appoint a dedicated FSO (e.g. BFSO, ship FSO) and/or utilize FS personnel within attached flying units (e.g. Sqn/Detachment FSO) to provide FS expertise and advice. This is an overarching requirement, separate from wing/unit programs and procedures that are specific to lodger or detached flying units and their chain of command.

27. For deployed operations, Comd 1 Cdn Air Div will appoint an Air Force wing to provide administrative support (e.g. FSOMS data entry) and quality control to the deployed unit for its FS Program and occurrence handling. If more than one aircraft type is involved, Comd 1 Cdn Air Div may designate additional wings to provide this technical support and assistance.

NON-AIR FORCE FORMATION FSO

28. On behalf of the Formation Comd, the assigned Formation FSO shall:
- a. provide to the comd and to members of the HQ FS training and advice on FS matters;
 - b. develop, devise, implement and monitor the FS Program as detailed in this publication;
 - c. act as the staff advisor for FS matters in the Formation HQ;
 - d. liaise with 1 Div FSO on FS related matters; and
 - e. liaise with the subordinate units/garrisons to monitor, advise and promote FS Programs.

FS COUNCIL

PURPOSE

29. In order to remain relevant, visible and adaptable to changes, the unit/formation FS Program must be periodically reviewed and reassessed. This is the objective of the FS Council. The council should focus on the three pillars of the FS Program: promotion, education and analysis. The FS Council enables Chain of Command oversight of current and emerging FS trends, developing concerns, "issues identified" and provides accountability to the PM implementation processes. In addition, the Council should use the minutes of their meetings to direct necessary changes to the FS Program and to track action items.

ESTABLISHMENT OF FS COUNCIL

30. A FS Council shall be established either independently, or as part of an existing safety council. FS Council requirements will be met as follows:
- a. C Air Force – this function is satisfied by the Airworthiness Advisory Board (AAB);
 - b. 1 Cdn Air Div/CANR Headquarters – this function is satisfied by attendance at the Comd's senior staff meetings; and
 - c. flying units, detachments, or long-term deployments associated with flying operations, both domestic and abroad - regular, formal FS Council meetings are to be carried out.

GENERAL MEMBERSHIP

31. The FS Council will be chaired by an individual who has executive authority (CO/ executive manager) since it is expected to inaugurate and delegate concrete PMs and to ensure tasks are completed in a timely manner. A FS Council shall include a qualified representative from each major agency involved in the control, conduct or support of air operations. It should normally include:

- a. the Comd, CO or manager of the formation responsible for flying operations, who shall be the Council chairperson;
- b. representatives of FS (WFSO, UFSO), operations, technical, support and medical services; and
- c. other representatives as required whenever the agenda for a meeting includes items relating to their specialties.

WING FS COUNCIL COMPOSITION

32. The Wing FS Council should also include the following, or their equivalent:

- a. the WComd, who acts as the chairperson;
- b. the CO of each unit involved in flying operations, including lodger units;
- c. the Wing Logistics Officer (WLogO) or his equivalent;
- d. the CO AMS;
- e. the Wing Surgeon or Flight Surgeon;
- f. the Wing Air Traffic Control Officer (WATCO);
- g. the FOD Committee chairperson;
- h. the WFSO;
- i. the D/WFSO;
- j. staff specialists (i.e. Air Weapons Officer and/or Air Weapons Safety Technical Member) whenever an agenda item requires their presence; and
- k. additional members as deemed appropriate by the WComd (i.e. contracted support agencies, contracted maintenance groups, air traffic control services, co-located airport authority, airport managers, etc...especially in such cases as a particular military capability has been contracted out to civil organizations).

33. The WComd will designate who will act as the secretary.

FREQUENCY OF MEETING

34. Ideally, the FS Council should meet several times a year, but shall form not less than twice per year.

CONDUCT OF MEETING

35. The Council should examine and consider:
- a. action items from previous minutes;
 - b. FS and AWS surveys;
 - c. recommendations and PMs from FS and AWS occurrences;
 - d. necessary corrective action;
 - e. topical items related to present and upcoming operations;
 - f. emerging trends, open HAZREPs, and local concerns;
 - g. points derived from comparative statistical analysis (i.e. what happened last year over the same period);
 - h. items for the next FS Council meeting;
 - i. reports of subcommittees;
 - j. awareness programs or remedial training on relevant safety issues; and
 - k. clarifying and amending existing policies, orders, and/or procedures - or the establishment of new policies, orders and/or procedures - to permanently capture best practices and ways forward decided upon or directed during Council meetings; or associated follow on discussions and deliberations.

ADDITIONAL RESPONSIBILITIES

36. The FS Council should also:
- a. monitor implementation of PMs within their authority;
 - b. recommend to higher authority measures beyond local capability and monitor the progress of such recommendations; and
 - c. maintain minutes of the Council's proceedings.

RECORDS OF DISCUSSION

37. Minutes of FS Council meetings shall be officially recorded. The WFSO is responsible for tracking the progress of action items.

DISTRIBUTION OF MINUTES

38. Distribution of the minutes shall include one copy each for C Air Force/DFS 2, 1 Div FSO and the WFSO, if the minutes are from a unit. These copies should be sent simultaneously to the addressees, so that there is minimum delay. The comments of each level may still be sent through normal channels. Distribution of the minutes to common users should also be considered. Minutes shall be transmitted electronically to accelerate delivery. Minutes shall be posted on FS boards.

FLIGHT SAFETY COMMITTEE

PURPOSE

39. In order to effectively advise the chain of command, information regarding FS, armament and explosive safety, FOD, FS trends, stress points, awareness, promotion, etc., should be shared among Unit and WG FS personnel. It is the intent of the unit/formation FS Committee meeting that the information gathered from it be used to brief the chain of command at the previously described FS Council meeting. The following information is to be considered as guidance only, as the composition, frequency and conduct of these meetings will depend on the size of the unit/formation in question, and the impact of their operations on Flight Safety.

COMMITTEE COMPOSITION

40. The FS Committee should be chaired by the senior FS qualified member of the unit/formation (WFSO, UFSO). The meeting should include a FS qualified representative from each unit/section of the WG/Base, including any contractor FS Rep or affiliate FS officer trained and acting as a UFSO equivalent. The FS Committee should also normally include representatives from:

- a. FOD program;
- b. Bird strike prevention program;
- c. armament and explosive safety; and
- d. other representatives as required, as they relate to FS (i.e. Canadian Army UAS operations, base SP units, ship's Flight Deck supervisors, etc...).

FREQUENCY OF MEETING

41. The FS Committee should meet with equal frequency as, and just prior to, the FS Council meeting. Ideally, the timing of the FS Committee meeting should be such that it allows adequate time to prepare the information gathered from it, including the minutes, to be presented at the FS Council.

CONDUCT OF MEETING

42. The Committee should examine and consider the following items, from all the applicable representatives:

- a. action items from previous minutes;
- b. FS statistics;
- c. FS trends;
- d. significant incidents since the last committee, including cause factors and recommended preventive measures;
- e. unit/section stress points (previously approved by unit/section commanders);

- f. awards and other promotional items;
- g. educational information from the committee chair;
- h. awareness training on relevant safety issues; and
- i. items for the next FS committee meeting.

FOREIGN OBJECT DAMAGE (FOD) COMMITTEE

43. Each unit associated with flying operations must establish a FOD committee in accordance with C-05-005-P10/AM-001. This committee should be set up as a sub-committee of the FS Committee.

PARTICIPATION OF FSO TO OTHER SAFETY COMMITTEES

44. The FSO shall serve on safety committees dealing with issues that impact the safe conduct of flying operations, like hazardous materials (HAZMAT), bird strike prevention snow and ice removal, and send a representative to Ground Safety committee meetings to determine if items discussed have any potential impact to FS.

FS AGREEMENTS

45. Canada/DFS is a signatory of several FS agreements at the national and international level. Their implementation ensures our mandate is accomplished when operating air assets at home or abroad or when foreign military air assets operate in Canada. The following paragraphs summarize the principal flight safety agreements in place. A link to these documents can be found on the DFS Intranet under Resources/Manuals.

INTERNATIONAL AGREEMENTS

46. The DND/CF FS Program is aligned with the policies and aims of the aviation safety programs of the International Civil Aviation Organization (ICAO) and the North Atlantic Treaty Organization (NATO).

ICAO CONVENTION ANNEX 13

47. The ICAO Convention Annex 13 specifies the activities required following an occurrence to an aircraft of a contracting state in the territory of another contracting state.

NATO STANAG 3101

48. This NATO Standardization Agreement establishes procedures for the exchange of safety information peculiar to aircraft types and missiles in current use by NATO nations.

NATO STANAG 3102

49. This NATO Standardization Agreement establishes the requirement for coordination of accident prevention matters when a detachment of one nation operates within or over the sovereign territory of another nation for 8 days or more, or when aircraft of two or more nations participate in combined/joint air operations within the sovereign territory of any NATO nation and/or out-of-area air operations.

NATO STANAG 3117

50. This NATO Standardization Agreement establishes the aircraft marshalling signals and the distinctive garment to be worn by aircraft marshallers.

NATO STANAG 3230

51. This NATO Standardization Agreement establishes the parameters for emergency markings on the outside and the inside of aircraft.

NATO STANAG 3318

52. This NATO Standardization Agreement establishes procedures for the aeromedical investigation of occurrences involving military aircraft or missiles where the equipment, facilities or personnel of two or more NATO nations are involved.

NATO STANAG 3379

53. This NATO Standardization Agreement establishes the in-flight visual signals and the essential procedures for using them.

NATO STANAG 3531

54. This NATO Standardization Agreement establishes procedures for the reporting and safety investigation of occurrences involving military aircraft where the equipment, facilities or personnel of two or more NATO nations are involved.

NATO STANAG 3533

55. This NATO Standardization Agreement establishes basic safety procedures, regulations and responsibilities for flying and static displays that involve aircraft of two or more NATO nations.

NATO STANAG 3564

56. This NATO Standardization Agreement establishes the responsibilities for the planning and conduct of NATO live air weapons demonstrations.

NATO STANAG 3879

57. This NATO Standardization Agreement establishes the procedures and formats for the exchange of information on the intensity of bird migration and the reporting of bird strikes.

NATO STANAG 7160

58. This NATO Standardization Agreement is an aviation safety document (AFSP-1 Flight Safety) that sets out aviation safety principles, policies and procedures, in particular those aimed at accident prevention for use as required by NATO participating nations.

NATIONAL AGREEMENT

DFS/TSB WORKING AGREEMENT

59. FS investigations conducted by DFS follow a protocol similar to that of the TSB as prescribed by the *Aeronautics Act*. A working agreement exists between DFS and the TSB that provides direction for the coordinated investigation of transportation occurrences by DND and the TSB.

SERVICE LEVEL AGREEMENTS

60. Different agreements have been signed between DFS or other departmental organizations mandated to support DFS during the conduct of investigations. Such agreements are in place with the Quality Engineering Test Establishment (QETE), Defence Research and Development Canada – Toronto (DRDC Toronto), the Aerospace Engineering and Test Establishment and the National Research Council of Canada.

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ANNEX A - AIR CADET FLYING PROGRAM

FS PROGRAM RESPONSIBILITY

1. The CF responsibility for the FS aspect of the Air Cadet Flying Program is derived from Section 43 of the National Defence Act. The CDS is tasked with operational command and control of the Air Cadet Flying Program, specifically all air cadet gliding and powered flight operations, including familiarization flying funded by DND/CF and the FS Program.

INVESTIGATION OF CADET OCCURENCES

2. The investigation of air cadet occurrences will be carried out on behalf of the AIA as outlined in the AIM and conducted as follows:

- a. Air Cadet Glider Program (ACGP). The ACGP is a national program consisting of familiarization flights and glider pilot flying training. All air cadet gliding resources are owned by the provincial committees of the Air Cadet League of Canada and are Transport Canada registered, but operational control rests with the CF. All serious occurrences with aircraft involved in the ACGP shall be investigated by DFS/AIA. Thus in accordance with section 18(1) of the Canadian Transportation Accident Investigation and Safety Board Act (CTAISB), the aircraft involved here are considered a “military conveyance”. The TSB must be notified by the quickest means possible following any significant occurrence, using the procedures prescribed in the Canadian Air Regulations (CARs) and the Working Agreement between DND and TSB; and
- b. Air Cadet Powered Flight Program (ACPP). The ACPP is a national program consisting of familiarization training funded by the local Sponsoring Committee of the applicable air cadet squadron and a summer pilot ab-initio flight training funded by DND. The conduct of a cadet occurrence investigation is governed as follows:
 - (1) Familiarization Flights. The civilian registered aircraft used to conduct the winter familiarization flying program are not considered “military conveyance” aircraft given these flights are contracted by the Local Sponsoring Committee. Therefore, the FS investigations of any occurrence related to this part of the ACPP would be the responsibility of the TSB. DFS would be invited to participate in the investigation as per the Working Agreement between TSB and DND, and
 - (2) Ab-initio Flight Training. The civilian registered aircraft used to conduct ab-initio flight training as part of the Power Pilot Scholarship program are considered “military conveyance” aircraft. Therefore, any FS investigations are the responsibility of the CF as per the CTAISB Act. The FS investigation will be conducted as per the Working Agreement between TSB and DND.designated Support Wings

3. In view of the structure of the Air Force, certain FSOs from designated wings will act as

FS advisors to the Region Comds. This working relationship will apply only when these personnel are performing FS duties associated with Air Cadet flying program activities. The Region Comds and associated FSOs are listed in Table 2 below.

REGION	REGION COMD	DESIGNATED FSO
Atlantic	Comd MARLANT	14 Wing Greenwood
Eastern	Comd 2 Cdn Air div	3 Wing Bagotville
Central	Comd 4 Cdn Air Div	8 Wing Trenton
Prairie	Comd 1 Cdn Air Div	17 Wing Winnipeg
Pacific	Comd MARPAC	19 Wing Comox

Table 2 – Regions and Designated FSOs

4. The FSO from the designated support wing will act as the FS advisor for each respective regional site. The FS support to Air Cadet Glider program gliding sites will be promulgated on an annual basis by 1 Cdn Air Div before the start of the annual Air Cadet Glider program.

DUTIES AND RESPONSIBILITIES

DFS RESPONSIBILITIES

5. The DFS responsibilities for the national cadet program are as follows:
- a. advise on the implementation and monitor the effectiveness of the regional FS Program in cooperation with D Cdts and the Regional Cadet Air Operations Officer (RCA Ops O);
 - b. coordinate independent airworthiness investigations for aircraft occurrences and investigate as required;
 - c. provide annual FS briefings to summer gliding schools;
 - d. monitor incidents and the follow-up PM; and
 - e. monitor FS surveys from all gliding sites.

1 CDN AIR DIV FSO RESPONSIBILITIES

6. 1 Cdn Air Div FSO responsibilities for the national Air Cadet Glider program program are listed below:
- a. assign, as required, the Wing and Unit FSO positions to meet designated regional gliding school and gliding familiarization site requirements; and
 - b. provide advice and assistance to Comd 1 and Comd 2 Cdn Air Div on Air Cadet Glider program FS matters.

SUPPORT WING RESPONSIBILITIES

7. The responsibilities of the WFSO and responsibilities for the national Air Cadet Glider program are to:
- a. provide FS assistance to Air Cadet Glider program activities at a designated site;

- b. advise the school/site comds on FS matters in cooperation with the Air Cadet Glider program FSO;
- c. monitor the safety aspects of flying operations in cooperation with the Air Cadet Glider program FSO;
- d. provide assistance in the preparation and timely submission of initial and supplementary occurrence reports, and recommend PM resulting from occurrences;
- e. conduct biennial FS surveys of all designated gliding sites in conjunction with RCA Ops O;
- f. provide assistance to DFS and RCA Ops O in the event of an accident; and
- g. review Air Cadet Glider program occurrence reports for quality assurance.

FSO RESPONSIBILITIES

8. RCA Ops Os shall designate a Unit Flight Safety Officer (UFSO) for the Regional Gliding School and a Regional Flight Safety Officer (Reg FSO) for all the glider familiarization sites. The UFSO/Reg FSO must be familiar with the unit's/region's operations in order to provide sound advice on accident prevention and hazardous conditions. Also, at each gliding site, an FSO will be designated (Gliding Site FSO). In their proper chain of command, the FS staff responsibilities are as follows:

- a. advise the school/site comd on all aspects of FS;
- b. report all incidents and accidents in accordance with A-GA-135-001/AA-001;
- c. aid school/site comds in the implementation of the unit FS Program; and
- d. monitor all aspects of the operation and advise school/site comds of hazardous conditions.

DETECTION OF UNSAFE PROCEDURES

9. If, during the course of their duties, FS personnel detect any unsafe procedures/practices, they shall immediately notify the site comd, who will immediately rectify the situation and advise of corrective actions taken. The UFSO/Reg FSO will keep the WFSO/BFSO informed of important FS matters.

OCCURRENCE ACTION

10. In the event of an FS occurrence:
- a. the FS personel will file the initial occurrence report;
 - b. the UFSO/Reg FSO is responsible through the RCA Ops O for investigating the incident and filing a supplementary report (SR) within 30 days. Distribution of the initial and the SR will be accomplished through the FSOMS as well as any other appropriate addressees;
 - c. the support WFSO will maintain files of all the ACGP FS reports and monitor the reporting process;

- d. the support WFSO will assist the UFSO/Reg FSO with any investigations into air occurrences within their region of responsibility; and
- e. the FSO will advise the Region Comd on serious gliding occurrences as required.

ACCIDENT ACTION

11. In the event of an accident:

- a. the Gliding Site FSO and/or the Site Commander shall complete the necessary action requirements and initiate reporting in accordance with a detailed Site specific Emergency Response Check List approved by the RCA Ops O;

NOTE

This requirement will differ from site to site depending upon whether the field is DND or TC, controlled or uncontrolled, etc.

- b. the Gliding Site FSO and/or the Site Commander shall ensure that the UFSO/Reg FSO is contacted immediately;
- c. the UFSO/Reg FSO informs that the RCA Ops O;
- d. the RCA Ops O inform the appropriate WFSO/BFSO; and
- e. Upon notification of an accident notification, the RCA Ops O/WFSO/BFSO will ensure the fol organizations are notified:
 - (1) DFS (via toll free number 1-888-WARN DFS/927 6337). Personnel requirements for an investigation will be coordinated by DFS and NDHQ/D Cds 4-6 (National Cadet Air Operations officer). DFS will provide investigative assistance and advice as required,
 - (2) the National Defence Integrated Command Centre (NDICC), and
 - (3) the 1 Cdn Air Div Air Ops Centre (AOC) have been notified and then will assist

REVIEW PROCESS

12. On completion of a FS investigation, a draft report for comment will be sent to persons of direct interest (PDI), CO RCSU (or equivalent), Region Comd and NDHQ VCDS/D Cadets. The action letter for PM implementation will be signed by the C Air Force as the AA.

Annex B
Chapter 2
A-GA-135-001/AA-001

ANNEX B – CONTRACTOR FS PROGRAM

GENERAL

1. Contractors form an important part of the DND aircraft maintenance philosophy and by extension, the preservation of DND assets during this unique activity. It is essential that each contractor develop a comprehensive FS Program that takes into account the depth of maintenance and extends to flight line test and ferry flight activities. In those locations where the civilian contractor falls under the FSO for FS matters, the contractor shall follow the wing FS Program.

APPOINTMENT OF FS SPECIALIST (FSS)

2. The contractor shall appoint a FSS at all contractor facilities where DND owned or controlled aircraft are maintained. The FSS and other FS personnel shall attend the CF FS Course (FSC). FSC course loading is done through the 1 Cdn Air Div/1 Div FSO.

FSS DUTIES AND RESPONSIBILITIES

3. The FSS must have direct access to the CEO or equivalent or a delegated company representative with sufficient authority to implement corrective action if required. The FSS should be experienced in the relevant aircraft systems and operations and have a good knowledge of all specialties under the contractor's control. DFS and the 1 Div FSO shall be advised of FSS appointments and qualifications.

4. The post-occurrence obligations of a contractor FSS are fairly similar to those of a DND FSO; however, it is recognized that the Airport Authority or other authorities may have areas of responsibility that supersede or overlap those obligations. It is also realized that much of A-GA-135-001/AA-001 is specific to DND organizations and therefore requires some interpretation for civilian application. Accordingly, the contractor FSS shall ensure that the intent of the requirements of this publication are addressed either by the company or by other authorities, and shall document those areas that are under direct contractor control and those areas that are the responsibility of another authority.

5. The contractor FSS shall ensure that all FS occurrences involving DND aircraft are reported and investigated notwithstanding the fact that NDQAR Offices are identified as the unit of ownership. In that regard, the FSS hold similar status and have the same reporting obligations as a UFSO. The contractor's role with respect to a FS investigation will be determined on a case-by-case basis by DFS. If applicable, questions can be directed to their assigned Wing FSO or DFS. Any investigation activity conducted is done on behalf of the AIA and the provi-

sions outlined in the AIM apply. The AIM stipulates that the airworthiness investigations are based on four principles:

- a. conducted independently from any influence of the Chain of Command;
- b. must not assign blame;
- c. focus in developing effective and practical PM that will preclude or reduce the risk of a reoccurrence; and
- d. make recommendations, through the AIA, to the Chain of Command for action.

6. Contractors that are co-located with units/wings are encouraged to work closely with the local FSO. Offices should be established to promote synergies between the military and civilian programs. Project offices and PWGSC contracting personnel should stipulate the possibility of joint DND/contractor FS offices during the contracting process.

NOTE

Transfer of aircraft airworthiness investigation ownership to organizations outside of the CF is impractical, for financial and legal reasons. When the NDQAR is identified as the unit of ownership in instances identified in chapter 7, the responsibility to report and investigate occurrence rests with the contractor FSS as detailed above.

CHAPTER 3 – EDUCATION AND TRAINING

GENERAL

1. FS education is one of the fundamental elements of the FS Program. All personnel who are involved in flying operations or the support of flying operations must not only be aware of the FS Program, they must have a solid understanding of the program's objectives, principles and basic processes. This therefore requires a robust formal and informal education program.
2. The teaching of specific skills and knowledge is essential in achieving the aim of preserving aviation assets necessary to conduct the missions of the CF. Thus FS education is the responsibility of all personnel.

INFORMAL EDUCATION AND TRAINING

3. FS education/training is achieved through both formal and informal means. Informally, FS publications, magazines, bulletins, videos, posters, web-based materials, FS briefings, aviation conferences and seminars, including those from other militaries and civilian organizations such as Transport Canada, are all resources that may be used in FS education. This list is not exhaustive, so Air Force personnel are encouraged to actively seek materials and information from numerous sources in order to broaden their FS knowledge. Links to the FS websites and FS Programs and materials can be found on the DFS websites.
4. One of the most effective but often overlooked methods of FS education is the passing of lessons learned from leaders and experienced personnel to those with less experience. The FSO should encourage and afford opportunities to facilitate the exchange of information between unit personnel.

FS QUALIFICATION

5. Personnel selected for FS positions require formal training in order to execute the duties and responsibilities of FS professionals.
6. Formal training is required for FS personnel to obtain an FS accreditation. The training is conducted by 1 Cdn Air Div FS staff. There were two formal CF flight safety courses designed to fulfill this training requirement. These courses lead to a recognized qualification. The relevant course codes were:
 - a. Basic Flight Safety Course: AEVM (formerly AGNL); and
 - b. Advanced FS Course: AEWD (formerly AGQG).
7. The two courses have been consolidated in one FS course (FSC) starting in November 2012. The FSC course code is TBD.

INVESTIGATOR QUALIFICATION

8. Under the requirements of the CF Airworthiness Program, all occurrence investigators must be accredited in order to conduct FS investigations. The Airworthiness Investigation Manual (AIM) describes a formal system establishing two levels of basic investigators (BI 1 and BI 2) and three levels of investigators in charge (IIC 1, IIC 2 and IIC 3). The qualification level (1, 2 or 3) determines the investigation activities in which an IIC or BI can participate as described in Chapter 9. The AIM specifies the standards and qualifications for these FS investigators.

AIR WEAPONS SAFETY AWARENESS TRAINING

9. Aircrew personnel working directly with air weapons shall receive air weapons systems familiarization training and instruction on the operational and safety requirements for weapons-loaded aircraft in accordance with B-GA-297-001/TS-000.

10. Air weapons awareness training is applicable to personnel who are regularly exposed to the hazards of air weapons such as maintenance officers, aircraft technicians, aircrew, fuel bowser drivers or those personnel who may have to respond to an air weapons occurrence, such as firefighters or security personnel. This training is required to ensure that those working with or around air weapons possess the knowledge required to perform their duties safely and effectively. This training shall be conducted in accordance with BGA-297-001/TS-000 (Safety Orders for CF Air Weapons Systems).

11. The training will be included in wing or unit familiarization briefings and should encompass, but not be limited to the following:

- a. recognition of the air weapons used at the unit and the dangers associated with them, including the precautions to be taken in the vicinity of the weapons;
- b. recognition of air weapons warning signs, placards, flags and banners that indicate danger areas and hazards;
- c. danger areas into which personnel shall not enter unless authorized;
- d. armament operations which could impinge on the daily routine of the unit i.e. conveying air weapons along regular traffic routes or closing some part of the unit when a particular air weapons operation is in progress; and
- e. persons to contact if air weapons safety information is required.

SPECIALIZED INVESTIGATOR TRAINING

12. DFS and 1 Div FSO investigators undergo additional advanced investigator training. FSOs are encouraged to get additional investigative and FS training as their responsibilities, budgets and COs permit. A list of additional courses is available on the DFS website.

BLOODBORNE PATHOGENS (BBP) TRAINING

13. FS personnel are not typically tasked with handling those injured or killed in aircraft occurrences; however, the subsequent on-site investigation puts them at potential risk from BBP. Jagged metal and other aircraft wreckage covered with tissue or body fluid is a potential hazard in the post-crash environment. The actual risk at any given occurrence site varies considerably. The presence of BBP is often unknown and amount of tissue or body fluid present fluctuates so universal precautions are always applied. Therefore, all CF FS personnel will receive initial and annual refresher training on infection prevention with respect to BBP and safe practice in an investigation context.

14. Initial BBP training for flight safety personnel will be presented on the FS course (FSC). Annual refresher training may be by flight surgeon or by BBP video presentation designated by DFS and will consist of: general information about infection prevention and control, information about BBP transmission, preventing exposures, immunization (Hep B vaccine), specific procedures for occurrence investigation sites, including actions and record keeping

requirements following an exposure, and, resources for further assistance. FS personnel will know how to use personal preventive equipment. Records of participation in BBP training will be maintained by 1 Cdn Air Div FS staff.

OTHER SAFETY COURSES

15. A variety of other safety courses have links to, or application within, the FS education and training program. Courses such as Human Performance in Military Aviation (HPMA) contribute directly to the aims of the FS Program. Courses for other established safety programs also offer opportunities for education/training in FS. These courses include General Safety, Laser Safety, Nuclear Radiation Safety, Electro Magnetic Radiation Safety, Ramp Safety, and On Scene Comd Emergency Response.

FS PROFESSIONAL DEVELOPMENT

16. It is anticipated that comds and managers will provide all FS staff with timely opportunities to enhance their professional knowledge and to interact with local and regional FS organizations like TSB, TC, airport authorities and regional aircraft operators. Participation in relevant FS and aviation conferences / seminars on an annual basis is encouraged. A list of recommended conferences and seminars is available on the DFS website under Training / Flight Safety Professional Development.

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CHAPTER 4 – PREVENTION ACTIVITIES

GENERAL

1. FS prevention activities include the Bird Strike Prevention Program and the FS survey. An effective Bird Strike Prevention program and regular FS surveys are key to maintaining a combat-capable and operationally effective force.

WILDLIFE ENVIRONMENT MANAGEMENT

2. A link to detailed information on airfield environment management procedures can be found on the DFS websites. Transport Canada operates a website on wildlife control which provides access to bird strike data. The DFS website, under the tabs Resources/Links provides a link to the TC Wildlife Control web page as well as to the Bird Strike Association of Canada web page.

BIRD STRIKE PREVENTION PROGRAM

AIM OF PROGRAM

3. The aim of any Bird Strike Prevention Program is to minimize bird hazards to aircraft operating from DND airfields.

OBJECTIVES

4. The Bird Strike Prevention Program must have at least four objectives:
 - a. management of the environment;
 - b. dispersal of birds;
 - c. education of aircrew; and
 - d. reporting bird strikes and near misses.
5. Birds constitute a significant hazard to aircraft. The vast majority of bird strikes occur within five miles of an aerodrome. A comprehensive Bird Strike Prevention Program shall be implemented to reduce their impact.
6. The key element of a good Bird Strike Prevention Program is the establishment of an effective unit bird and animal control committee. Although bird and animal control is an ATC responsibility, FSOs must play an active role.
7. The Bird Strike Prevention Program strives to manage the environment around the airport. The objective of the plan is to make the airfield unattractive to birds. Studying the birds that inhabit the environment of the airport will suggest measures that can be taken to make the airport unattractive to them. Some measures are obvious such as draining wet areas and cutting down trees. Others, such as changing ground cover or using chemicals, are more complex. Each airport has its own study and improvement plan, which must conform to environmental constraints.

8. Successful measures to modify an airport habitat require the advice of an ornithologist. Almost every DND airport has been surveyed. Reports are available through the FSO or DFS. If a new survey is required, the wing can request NDHQ/DGRPP (Director General Realty, Policy and Plans) to arrange a bird hazard survey in conjunction with the Canadian Wildlife Service (CWS).

INFORMATION ON BIRDS

REPORTING BIRD ACTIVITY

9. Pilots shall advise air traffic control and other aircraft of any significant bird activity.

10. Aircrew shall report to their FSO each time they experience a bird strike or near miss. Form CF 215 – FS Occurrence Information Sheet shall be used to assist in providing the required information. The FSO will ensure that the information collected, including category of damage, is entered in the FSOMS database. This will supply the information on bird habits necessary for preventing bird strikes.

IDENTIFICATION OF BIRD TYPE

11. Accurate identification of bird remains provides invaluable information for an effective Bird Strike Prevention Program. Local expertise (bird watcher groups, ornithologists, wildlife specialists) should be used whenever possible to identify bird remains. Annex A contains a list of regional offices of the CWS.

FS SURVEYS

PURPOSE

12. A FS survey does not measure the effectiveness of the FS Program, only assesses that all mandated program elements are present and assists in the identification of measures to correct any noted deficiencies to make improvements in the FS Program. Comds have found that FS surveys identify deficiencies that would otherwise have gone undetected until revealed as the causes of occurrences.

REQUIREMENT

13. Surveys are an FS necessity at every level of operational command as well as at contractor facilities that support the maintenance and operation of CF aircraft.

FREQUENCY

14. FS surveys must be conducted on a regular basis if they are to be effective. The type of survey normally dictates how often they should be conducted.

TYPES

15. There are four types of FS surveys:
 - a. a formal survey;
 - b. an informal survey;
 - c. an air weapons survey; and
 - d. a contractor survey.

FORMAL SURVEY

16. A formal survey is usually conducted by specialists from a formation other than that which is being surveyed (e.g. 1 Cdn Air Div survey of a wing, base or unit). The comd of the formation to be surveyed is usually notified in advance and is always briefed on the results. The survey team must be cooperative, understanding and helpful. Comds can also request surveys whenever they want to have an outside view of their unit. Formal surveys of ATESS and AETE shall be conducted on behalf of C Air Force by the 1 Cdn Air Div FSO, and the Divisional Staff will be responsible for follow-up action.

INFORMAL SURVEY

17. An FSO informal survey is normally carried out as a minimum once a year by the FSO as part of the FS Program. Inviting an FSO from outside the unit to conduct the survey provides a fresh view and an invaluable exchange of ideas.

18. The FSO shall survey the units in their organization at least once every year; this includes contractor operated units/sections. Unit FS teams should survey their unit on a regular basis as part of their yearly program. Both the UFSO and FS NCM should visit each section regularly throughout the year. Further, whenever someone joins an FS team, be it at the wing or unit level, they should visit all sections within their purview within one month of assuming their duty.

AIR WEAPONS SURVEY

19. An internal air weapons safety survey shall be conducted in any unit involved in air weapons operations. The survey should be a coordinated effort involving both FS and AWS personnel. A combined FS/AWS Formal Survey should be conducted by 1 Cdn Air Div every 24 months.

CONTRACTOR SURVEY

20. DFS will conduct a contractor survey of all contractor facilities where DND owned or controlled aircraft are maintained. Annex C contains a sample contractor FS survey checklist. These surveys will be conducted every 18–24 months.

CONDUCT

21. Survey members may receive conflicting information. The survey team must attempt to

balance these inputs and must rationalize these inputs with the “big picture”. There are three basic tenets to conducting an effective FS survey: listen effectively, observe objectively and share all observations in an open and honest manner. The biggest challenge to overcome is the fact that a survey is a snapshot in time and it is difficult to receive feedback and insights from everyone.

TEAM COMPOSITION

22. A survey team comes in many shapes and sizes, all based upon the scope of the survey. An informal unit survey by a WFSO may be comprised of a sister squadron FSOs, the host UFSO/FS NCM and the D/WFSO, whereas a formal survey by 1 Cdn Air Div FSO will have up to 12 members. A unit team that surveys its own operation would likely consist of the UFSO and FS NCM. Another perspective is to do a combined survey, perhaps with the general safety organization, and make up a joint team.

QUESTIONNAIRES

23. Questionnaires can be used effectively during surveys. One of the difficulties of taking a snapshot of a unit is the number of people one can meet. A simple questionnaire that can be distributed beforehand and collected during the survey provides the survey team a much broader reach. The questionnaire should be short, easy to complete, anonymous, and use questions that are objective in nature. It is important to collate the results quickly and ensure effective feedback is provided to both the chain of command and those who were surveyed.

ACTION ON CHANGE OF COMMAND

24. When there is a change of command, a survey of the unit shall be conducted as soon as practical to provide the CO with an updated FS health check of the unit.

FEEDBACK AND FOLLOW-UP

25. The survey process is conducted primarily to provide the chain of command with credible advice on how to better accomplish the mission. There are a variety of formats available to provide such advice, be it the informal verbal debrief or a more formal written report. Regardless of which method is utilized, it is essential to have a clear aim and a set structure that leads to a logical conclusion and recommendations. To ensure closure, it is important that realistic target dates be established for each recommendation; moreover, recommendations must be affordable, achievable and based on common sense. Recommendations without an assigned target date for closure can cause the survey to become merely an event instead of a process, thereby greatly limiting any potential improvements or enhancements that could result from the operation. There are tremendous advantages to capturing the observations and recommendations in a written format. A written report, be it in point form or in full paragraph form, provides a clear delineation of the observations and recommendations.

CONDUCT OF FORMAL SURVEY

26. 1 Div FSO will conduct a formal survey of each wing once every 18–24 months. The FS survey checklist at Annex B or D as applicable will be used as a guideline for areas to be surveyed.

TEAM MEMBERS

27. The survey team for a formal survey will usually be composed of some 10 to 12 members as follows:

- a. Lead – The formal survey team will normally be led by the appropriate 1 Div FSO desk officer at 1 Cdn Air Div;
- b. appropriate desk officer from DFS;
- c. additional 1 Cdn Air Div FS team members as required;
- d. FSO from sister wing (e.g. survey of 4 Wg will have 3 Wg FSO on team);
- e. ATC rep;
- f. maintenance reps (including augmentation from A4 Maint and DFS); and
- g. other members as required.

TIMELINES

28. The following are the recommended timelines for a formal survey:

- a. initial staff check for timings with wing 4–6 months before survey;
- b. request for team member participation 2–4 months before;
- c. survey directive with questionnaire released by 1 Div FSO to WComd 1 month before;
- d. initial FS team brief by team lead 1–2 weeks before survey;
- e. final written report to Wcomd 1 month after survey completion; and
- f. response from applicable OPIs, based on survey recommendations, to 1 Cdn Air Div.

DOCUMENTATION OF FORMAL SURVEY

29. The formal survey report process will consist of three distinct phases:

- a. the first phase is that the survey team lead will provide a verbal debrief, at the end of the survey, to the host WComd/Sqn CO. The debrief should include all significant findings and observations as well as any analysis from items such as survey questionnaires;
- b. the second phase is a written report to the WComd and other applicable comds. The report must identify recommendations and where possible, suggested action levels, e.g. C Air Force, 1 Cdn Air Div, and wing. The written report should be staffed and distributed within one month of the survey completion date; and

- c. the third and final phase of the survey process is for the host wing/unit to provide written feedback on the status of final report recommendations. 1 Cdn Air Div FSO will track status/closure of formal FS report recommendations.

30. DFS must be copied on all written correspondence related to any phase of an official survey. A formal report will be released by the 1 Div FSO to the host WComd/Sqn CO within one month of the survey completion date; subsequently the Comd 1 Cdn Air Div and A-staff will be de-briefed on the survey findings and recommendations. The 1 Div FSO is responsible for tracking the status of all recommendations in the written report .

Annex A
Chapter 4
A-GA-135-001/AA-001

ANNEX A – REGIONAL OFFICES OF CANADIAN WILDLIFE SERVICE

ATLANTIC REGION

Canadian Wildlife Service and Environment Canada
63 East Main Street
P.O. Box 1590
Sackville, New Brunswick E0A 3C0

QUEBEC REGION

Canadian Wildlife Service and Environment Canada
1141, route de l'église, 9th Floor
C.P. 10 100
Sainte-Foy, Quebec G1V 4H5

ONTARIO REGION

Canadian Wildlife Service and Environment Canada
49 Camelot Drive
Nepean, Ontario K1A 0H3

WESTERN AND NORTHERN REGION

Canadian Wildlife Service and Environment Canada
Room 210, 2nd Floor
4999 - 98th Avenue
Edmonton, Alberta T6B 2X3

PACIFIC AND YUKON REGION

Canadian Wildlife Service and Environment Canada
P.O. Box 340
Delta, British Columbia V4K 3Y3

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Annex B
 Chapter 4
 A-GA-135-001/AA-001

ANNEX B – FS SURVEY CHECKLIST

LEGEND

A: SATISFACTORY

B: SATISFACTORY WITH DEBRIEFING

C: UNSATISFACTORY

SER	ITEM	A	B	C	REMARKS
FSO					
1.	ACCESS TO COMD:: <input type="checkbox"/> DIRECT <input type="checkbox"/> INDIRECT				
2.	ACCESS TO BRANCH AND SECTION HEADS:: <input type="checkbox"/> DIRECT WHEN NECESSARY				
3.	RELATIONSHIP WITH SUBORDINATE PERSONNEL:: <input type="checkbox"/> HOW WELL ARE THE FSO / FSNCM KNOWN? <input type="checkbox"/> MEETINGS WITH FS TEAM				
4.	ADEQUACY OF PERSONAL VISITS TO SECTIONS: <input type="checkbox"/> REGULAR AND FREQUENT <input type="checkbox"/> NON-FLYING UNITS				
5.	FEEDBACK PROCESS TO CO: <input type="checkbox"/> IF PROBLEMS IDENTIFIED ON VISITS <input type="checkbox"/> AREAS OF CONCERN THROUGH TREND ANALYSIS <input type="checkbox"/> ROUTINE OR ONLY AS REQUIRED				
6.	FEEDBACK PROCESS TO CO: <input type="checkbox"/> IF PROBLEMS IDENTIFIED ON VISITS <input type="checkbox"/> AREAS OF CONCERN THROUGH TREND ANALYSIS <input type="checkbox"/> ROUTINE OR ONLY AS REQUIRED				
7.	CONCEPT OF OPS / BUSINESS PLAN: <input type="checkbox"/> STRUCTURED ROUTINE OR REACTIVE <input type="checkbox"/> MISSION, ASSUMPTIONS, RISKS, INITIATIVES				
8.	DOES THE FSO HAVE ANY SECONDARY DUTIES? <input type="checkbox"/> TIME DEDICATED TO FS DUTIES <input type="checkbox"/> TIME DEDICATED TO OTHER DUTIES (PRIMARY OR SECONDARY) <input type="checkbox"/> OTHER MAJOR PROJECTS				

9.	LE MR SV A-T-IL D'AUTRES FONCTIONS? <input type="checkbox"/> TEMPS CONSACRÉ AUX TÂCHES SV <input type="checkbox"/> TEMPS CONSACRÉ À D'AUTRES TÂCHES (PRINCIPALES ET SECONDAIRES) <input type="checkbox"/> AUTRES PROJETS IMPORTANTS				
10.	MOS ID CURRENCY: <input type="checkbox"/> MEETS REQUIREMENTS / STAYING CURRENT <input type="checkbox"/> TIME AWAY FROM FS JOB AS A RESULT				
FS OFFICE					
11.	LOCATION: <input type="checkbox"/> PROXIMITY TO FLIGHT LINE <input type="checkbox"/> PROXIMITY TO COMD <input type="checkbox"/> PROXIMITY TO CLERICAL STAFF				
12.	ADEQUACY OF EQUIPMENT: <input type="checkbox"/> CELLULAR, PAGER, VOICE MAIL <input type="checkbox"/> FSOMS, INTERNET, LAPTOP <input type="checkbox"/> DIGITAL CAMERA <input type="checkbox"/> ACCIDENT KITS (COMPLETE)				
13.	SUPPLIES: <input type="checkbox"/> RESOURCE MATERIAL <input type="checkbox"/> HAZARD REPORTS <input type="checkbox"/> POSTERS <input type="checkbox"/> MAGAZINES <input type="checkbox"/> VIDEOS				
14.	SUPPORT: <input type="checkbox"/> TECHNICAL <input type="checkbox"/> ADMINISTRATIVE				
15.	FILES: <input type="checkbox"/> FUNCTIONAL <input type="checkbox"/> ADEQUACY <input type="checkbox"/> SPECIAL INTEREST ITEMS <input type="checkbox"/> COMPLETENESS				
16.	FSOMS: <input type="checkbox"/> NUMBER OF TERMINALS <input type="checkbox"/> LOCATION <input type="checkbox"/> HANDBOOK <input type="checkbox"/> FAMILIARITY				

17.	PUBLICATIONS: <input type="checkbox"/> A-GA-135-001/AA-001 <input type="checkbox"/> AOIs FOR ALL UNIT AIRCRAFT <input type="checkbox"/> HUMAN FACTORS BOOKS <input type="checkbox"/> SAFETY MAGAZINES <input type="checkbox"/> ERP				
FS PROGRAM					
18.	WRITTEN PROGRAM: <input type="checkbox"/> CO'S PHILOSOPHY <input type="checkbox"/> FOCUSED, FAST, FLEXIBLE, FRIENDLY <input type="checkbox"/> ACHIEVABLE <input type="checkbox"/> UPDATED AND CURRENT				
19.	OCCURRENCE REPORTING: <input type="checkbox"/> PROCESS <input type="checkbox"/> RECORDS / FILING SYSTEM <input type="checkbox"/> INCLUSION OF FLYING / GROUND SUPERVISOR <input type="checkbox"/> PROCESS FOR DEPLOYED OPERATIONS <input type="checkbox"/> PREVENTIVE MEASURES FOLLOW-UP <input type="checkbox"/> TRENDS ANALYSIS TECHNIQUE				
20.	FS MEETINGS: <input type="checkbox"/> FREQUENCY <input type="checkbox"/> FORMAT <input type="checkbox"/> TRAINING <input type="checkbox"/> ATTENDEES (OPS, MAINT, SUPPORT)				
21.	FS BOARDS: <input type="checkbox"/> LOCATION <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> UP TO DATE <input type="checkbox"/> METHODS OF DISPLAY				
22.	HAZARD REPORTS: <input type="checkbox"/> USE PROMOTED <input type="checkbox"/> AVAILABILITY OF BLANKS <input type="checkbox"/> PROCESSING OF COMPLETED FORMS <input type="checkbox"/> FOLLOW-UP PROCEDURES				

23.	EDUCATION AND PROMOTION: <input type="checkbox"/> FREQUENCY AND VENUE <input type="checkbox"/> RELEVANCE <input type="checkbox"/> TOPICS (HF, COMMUNICATION, SEASONAL) <input type="checkbox"/> AIRCREW / GROUND CREW <input type="checkbox"/> PRE-DEPLOYMENT <input type="checkbox"/> ORIGINALITY				
24.	ALSE: <input type="checkbox"/> ALSEO TRAINED <input type="checkbox"/> PROCESS TO STAFF AND TRACK ISSUES <input type="checkbox"/> ATTENDANCE/INPUTS TO ANNUAL PRM				
25.	AWARDS PROGRAM: <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> VISIBILITY				
26.	LOCAL SURVEYS: <input type="checkbox"/> FREQUENCY <input type="checkbox"/> USE OF EXTERNAL RESOURCES (FSOs, FS NCMs) <input type="checkbox"/> EFFECTIVENESS IN TRACKING FINDINGS <input type="checkbox"/> FOLLOW-UP ACTION				
27.	USE OF EXTERNAL RESOURCES : <input type="checkbox"/> USE OF EXTERNAL SUBJECT MATTER EXPERTS FOR BRIEFINGS <input type="checkbox"/> USE OF LESSONS FROM SIMILAR FLEETS <input type="checkbox"/> LINKING LESSONS LEARNED FROM OTHER FLEETS				
28.	UCR PROGRAM: <input type="checkbox"/> FS INPUT <input type="checkbox"/> FSO COMMENTS AS REQUIRED <input type="checkbox"/> FS STAMP <input type="checkbox"/> FOLLOW-UP PROCEDURE				
29.	EMERGENCY RESPONSE PLAN: <input type="checkbox"/> COMPLETENESS <input type="checkbox"/> UPDATED AND CURRENT <input type="checkbox"/> DATE LAST TESTED <input type="checkbox"/> WARNING SYSTEM <input type="checkbox"/> TRANSPORT TO SITE <input type="checkbox"/> PHOTOGRAPHER				

30.	ACCIDENT INVESTIGATION: <input type="checkbox"/> CONTROL OF WRECKAGE <input type="checkbox"/> GUARDS <input type="checkbox"/> LIAISON WITH SUPPORTING DND WFSO				
31.	INCIDENT INVESTIGATION: <input type="checkbox"/> REPORTING <input type="checkbox"/> THOROUGHNESS <input type="checkbox"/> COMPLETENESS OF REPORT <input type="checkbox"/> CONTROL OF REPORT				
AIR WEAPONS SAFETY					
32.	WRITTEN PROGRAM: <input type="checkbox"/> INTEGRATED WITHIN FS PROGRAM (REPORTING, PREVENTION, EDUCATION, PROMOTION) <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> ENCOMPASSES ALL AIR WEAPONS ACTIVITIES FROM READY-USE STORAGE TO TARGET OR RETURN TO READY-USE STORAGE <input type="checkbox"/> CURRENT <input type="checkbox"/> AIR WEAPONS SAFETY COMMITTEE				
33.	ESTABLISHED AWO / WLD / AWSTM: <input type="checkbox"/> APPOINTED <input type="checkbox"/> TRAINED AND QUALIFIED <input type="checkbox"/> MEMBER OF UNIT FS COMMITTEE <input type="checkbox"/> MEMBER OF AIR WEAPONS SAFETY COMMITTEE				
34.	TRAINING: <input type="checkbox"/> AIR WEAPONS SAFETY INDOCTRINATION AND AWARENESS TRAINING CONDUCTED AT UNIT INCLUDING ALL FLIGHT LINE SUPPORT STAFF (FIREFIGHTERS, FUEL TENDER DRIVERS, MILITARY POLICE) <input type="checkbox"/> ANNUAL AWS TRAINING <input type="checkbox"/> ANNUAL AIRCREW FAMILIARIZATION TRAINING <input type="checkbox"/> LOAD CREW TRAINING <input type="checkbox"/> WEAPONS LOAD OFFICER TRAINING <input type="checkbox"/> CONVOY TRAINING ARM / DE-ARM TRAINING <input type="checkbox"/> RECORDS SYSTEM EXISTS TO DOCUMENT TRAINING				
35.	SAFETY SURVEY: <input type="checkbox"/> ANNUAL INFORMAL SURVEY CONDUCTED <input type="checkbox"/> EFFECTIVENESS (FOLLOW-UP, CORRECTIVE ACTIONS)				

<p>36.</p>	<p>OPERATIONS:</p> <ul style="list-style-type: none"> <input type="checkbox"/> ABSOLUTELY NO MAINTENANCE CARRIED OUT ON AIRCRAFT IN THE ARMED STATE <input type="checkbox"/> UNIT SOPs DETAILING MAINTENANCE ACTIVITIES THAT MAY BE UNDERTAKEN ON LOADED AIRCRAFT ARE COVERED IN LOCAL ORDERS <input type="checkbox"/> ARMING / DE-ARMING AREAS DESIGNATED AND APPROVED <input type="checkbox"/> LOCATION AND NUMBER OF ARMING / DE-ARMING AREAS DESIGNATED AND APPROVED <input type="checkbox"/> CHECKLIST USED FOR ACCEPTANCE CHECKS ON AIRCRAFT WITH AIR WEAPONS LOADED <input type="checkbox"/> LOADED AIRCRAFT RECOVERY PROCEDURES ENSURE DIRECT ROUTING TO DE-ARMING AREA <input type="checkbox"/> AIRCRAFT LOADED WITH FORWARD-FIRING WEAPONS POINTED AWAY FROM POPULATED AREAS <input type="checkbox"/> EMERGENCY JETTISON AREAS IDENTIFIED IN FLYING AND AIR WEAPONS ORDERS <input type="checkbox"/> PILOT'S HANDS VISIBLE DURING ARMING / DE-ARMING OPERATIONS 				
<p>37.</p>	<p>ADMINISTRATION:</p> <ul style="list-style-type: none"> <input type="checkbox"/> UNIT AIR WEAPONS SOPs CURRENT AND AVAILABLE <input type="checkbox"/> APPLICABLE PUBLICATIONS AVAILABLE AND CURRENT TO ENHANCE UNIT AWS PROGRAM <input type="checkbox"/> DEPLOYMENT SOPs INCLUDE AIR WEAPONS REQUIREMENTS (MANPOWER, EOD, PROCEDURES, EQUIPMENT) <input type="checkbox"/> AWS REPRESENTATIVE APPOINTED FOR UNIT HOSTING DEPLOYMENTS / EXERCISES <input type="checkbox"/> EMERGENCY RESPONSE PLANS INCLUDE AWS CONSIDERATIONS INCLUDING EVACUATION DISTANCES FOR APPLICABLE AIR WEAPONS 				

Annex C
 Chapter 4
 A-GA-135-001/AA-001

ANNEX C – CONTRACTOR FS SURVEY CHECKLIST

LEGEND

A: SATISFACTORY

B: SATISFACTORY WITH DEBRIEFING

C: UNSATISFACTORY

SER	ITEM	A	B	C	REMARKS
CONTRACTOR FSS					
1.	ACCESS TO DIRECTOR: <input type="checkbox"/> DIRECT <input type="checkbox"/> INDIRECT				
2.	ACCESS TO BRANCH AND SECTION HEADS: <input type="checkbox"/> DIRECT WHEN NECESSARY				
3.	RELATIONSHIP WITH COMPANY PERSONNEL: <input type="checkbox"/> HOW WELL IS THE FSS KNOWN? <input type="checkbox"/> MEETINGS WITH FS TEAM				
4.	ADEQUACY OF PERSONAL VISITS TO SECTIONS: <input type="checkbox"/> REGULAR AND FREQUENT				
5.	FEEDBACK PROCESS TO DIRECTOR ON PROBLEMS AND CURRENT PROJECTS: <input type="checkbox"/> REGULAR BRIEFINGS OR ONLY AS REQUIRED <input type="checkbox"/> AREAS OF CONCERN THROUGH TREND ANALYSIS				
6.	TRAINING: <input type="checkbox"/> BASIC, ADVANCED, FSOMS <input type="checkbox"/> ADDITIONAL COURSES (HUMAN FACTORS, SCSI, ETC.) <input type="checkbox"/> TIME IN JOB				
7.	CONTRACTOR FS INSTRUCTIONS: <input type="checkbox"/> STRUCTURED ROUTINE OR REACTIVE <input type="checkbox"/> MISSION, ASSUMPTIONS, RISKS, INITIATIVES				
8.	SURVEY REPORT DISTRIBUTION: <input type="checkbox"/> TO DIRECTOR <input type="checkbox"/> TO NDQAR <input type="checkbox"/> TO DFS				

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SER	ITEM	A	B	C	REMARKS
9.	GENERAL: <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> MUTUAL EXCHANGE OF INFORMATION <input type="checkbox"/> OCCURRENCE REPORTING PROCEDURES				
FS OFFICE					
10.	LOCATION: <input type="checkbox"/> PROXIMITY TO FLIGHT LINE <input type="checkbox"/> PROXIMITY TO DIRECTOR <input type="checkbox"/> PROXIMITY TO CLERICAL STAFF				
11.	ADEQUACY OF EQUIPMENT: <input type="checkbox"/> CELLULAR, PAGER, VOICE MAIL <input type="checkbox"/> FSOMS, INTERNET, LAPTOP <input type="checkbox"/> DIGITAL CAMERA <input type="checkbox"/> ACCIDENT KITS (COMPLETE)				
12.	SUPPLIES: <input type="checkbox"/> RESOURCE MATERIAL <input type="checkbox"/> HAZARD REPORTS <input type="checkbox"/> POSTERS				
	<input type="checkbox"/> MAGAZINES <input type="checkbox"/> VIDEOS				
13.	SUPPORT: <input type="checkbox"/> TECHNICAL <input type="checkbox"/> ADMINISTRATIVE				
14.	FILES: <input type="checkbox"/> FUNCTIONAL <input type="checkbox"/> ADEQUACY <input type="checkbox"/> SPECIAL INTEREST ITEMS <input type="checkbox"/> COMPLETENESS				
15.	FSOMS: <input type="checkbox"/> NUMBER OF TERMINALS <input type="checkbox"/> LOCATION <input type="checkbox"/> HANDBOOK <input type="checkbox"/> FAMILIARITY				

SER	ITEM	A	B	C	REMARKS
16.	PUBLICATIONS: <input type="checkbox"/> A-GA-135-001 <input type="checkbox"/> AOIs FOR ALL DND AIRCRAFT <input type="checkbox"/> APPLICABLE SAFETY PRECAUTIONS AND ACCIDENT PREVENTION INSTRUCTIONS <input type="checkbox"/> SAFETY MAGAZINES <input type="checkbox"/> COMPANY EMERGENCY RESPONSE PLAN (ERP)				
FS PROGRAM					
17.	WRITTEN PROGRAM: <input type="checkbox"/> DIRECTOR'S PHILOSOPHY <input type="checkbox"/> FOCUSED, FAST, FLEXIBLE, FRIENDLY <input type="checkbox"/> ACHIEVABLE <input type="checkbox"/> UPDATED AND CURRENT				
18.	OCCURRENCE REPORTING: <input type="checkbox"/> PROCESS <input type="checkbox"/> RECORDS / FILING SYSTEM <input type="checkbox"/> PM FOLLOW-UP				
	<input type="checkbox"/> TRENDS ANALYSIS TECHNIQUE				
19.	FS MEETINGS: <input type="checkbox"/> FREQUENCY <input type="checkbox"/> FORMAT <input type="checkbox"/> TRAINING <input type="checkbox"/> ATTENDEES (OPS, MAINT, SP)				
20.	FS BOARDS: <input type="checkbox"/> LOCATION <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> UP TO DATE <input type="checkbox"/> METHODS OF DISPLAY				
21.	HAZARD REPORTS: <input type="checkbox"/> USE PROMOTED <input type="checkbox"/> AVAILABILITY OF BLANKS <input type="checkbox"/> PROCESSING OF COMPLETED FORMS <input type="checkbox"/> FOLLOW-UP PROCEDURES				
22.	EDUCATION AND PROMOTION:				

SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> FREQUENCY AND VENUE <input type="checkbox"/> RELEVANCE <input type="checkbox"/> TOPICS (HF, COMMUNICATION, SEASONAL) <input type="checkbox"/> AIRCREW / GROUND CREW <input type="checkbox"/> PRE-DEPLOYMENT <input type="checkbox"/> ORIGINALITY				
23.	AWARDS PROGRAM: <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> VISIBILITY				
24.	FS COMMITTEE: <input type="checkbox"/> FREQUENCY <input type="checkbox"/> ATTENDANCE <input type="checkbox"/> FEEDBACK				
25.	LOCAL SURVEYS: <input type="checkbox"/> FREQUENCY <input type="checkbox"/> USE OF EXTERNAL RESOURCES <input type="checkbox"/> EFFECTIVE TRACKING OF FINDINGS <input type="checkbox"/> FOLLOW-UP ACTION				
26.	USE OF EXTERNAL RESOURCES: <input type="checkbox"/> USE OF EXTERNAL SUBJECT MATTER EXPERTS (SMEs) FOR BRIEFINGS <input type="checkbox"/> USE OF LESSONS LEARNED FROM SIMILAR FLEETS / CONTRACTORS <input type="checkbox"/> LINKING LESSONS LEARNED FROM OTHER FLEETS / CONTRACTORS				
27.	EMERGENCY RESPONSE PLAN: <input type="checkbox"/> COMPLETENESS <input type="checkbox"/> UPDATED AND CURRENT <input type="checkbox"/> DATE LAST TESTED <input type="checkbox"/> WARNING SYSTEM <input type="checkbox"/> TRANSPORT TO SITE <input type="checkbox"/> PHOTOGRAPHER				
28.	ACCIDENT INVESTIGATION: <input type="checkbox"/> CONTROL OF WRECKAGE <input type="checkbox"/> GUARDS				

SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> LIAISON WITH SUPPORTING DND WFSO				
29.	INCIDENT INVESTIGATION: <input type="checkbox"/> REPORTING <input type="checkbox"/> THOROUGHNESS <input type="checkbox"/> COMPLETENESS OF REPORT <input type="checkbox"/> CONTROL OF REPORT <input type="checkbox"/> INDEPENDENT FROM CoC				

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Annex D
 Chapter 4
 A-GA-135-001/AA-001

ANNEX D – AIR CADET GLIDING PROGRAM FS SURVEY CHECKLIST

LEGEND

A: SATISFACTORY

B: SATISFACTORY WITH DEBRIEFING

C: UNSATISFACTORY

SER	ITEM	A	B	C	REMARKS
ACCIDENT PREVENTION PROGRAM					
1.	FS PUBLICATIONS <input type="checkbox"/> INCIDENT / ACCIDENT REPORTS <input type="checkbox"/> MAGAZINES <input type="checkbox"/> POSTERS <input type="checkbox"/> FLASHERS <input type="checkbox"/> MEMORANDA <input type="checkbox"/> BULLETINS <input type="checkbox"/> DISTRIBUTION <input type="checkbox"/> METHOD OF DISPLAY				
2.	FS FILMS AND VIDEOS				
3.	FS BRIEFINGS <input type="checkbox"/> FREQUENCY <input type="checkbox"/> SEASONAL <input type="checkbox"/> EFFECTIVENESS				
4.	STANDARD OPERATING PROCEDURES (SOPs) <input type="checkbox"/> DISPLAY <input type="checkbox"/> CURRENT / ADEQUATE <input type="checkbox"/> ALL READ AND SIGNED				
5.	PUBLICATIONS <input type="checkbox"/> AMENDMENTS <input type="checkbox"/> AVAILABILITY				

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SER	ITEM	A	B	C	REMARKS
6.	FACILITIES DISPLAY <input type="checkbox"/> AIRFIELD LAYOUT				
	<input type="checkbox"/> LOCATION				
7.	MARSHALLING SIGNALS AS PER SOPs <input type="checkbox"/> COMPLIANCE WITH ORDERS <input type="checkbox"/> POSTER DISPLAY				
8.	<input type="checkbox"/> RADIO PROCEDURES <input type="checkbox"/> STANDARDIZATION				
9.	AIRCREW <input type="checkbox"/> QUALIFICATIONS <input type="checkbox"/> PROFICIENCY <input type="checkbox"/> CURRENCY				
10.	OPERATIONS <input type="checkbox"/> LAUNCH CONTROL <input type="checkbox"/> SCHEDULING <input type="checkbox"/> DUTY TIME LIMITATIONS <input type="checkbox"/> FLYING TIME LIMITATIONS				
11.	PUBLICATIONS FOR AIRCRAFT AND EQUIPMENT <input type="checkbox"/> CHECKLISTS <input type="checkbox"/> AVAILABILITY <input type="checkbox"/> USE OF PRE-TAKE-OFF AND LANDING CHECKLIST <input type="checkbox"/> AIRCRAFT OWNER'S MANUAL <input type="checkbox"/> AIRCRAFT HANDOVER <input type="checkbox"/> CHECKLIST HANDOVER <input type="checkbox"/> LOCATION				
GLIDER OPERATIONS-GENERAL					
12.	CHECKOUTS <input type="checkbox"/> THOROUGH				

SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> REALISTIC				
	<input type="checkbox"/> SIMULATED ROPE BREAKS <input type="checkbox"/> AS PER SOPs				
13.	MEDICAL <input type="checkbox"/> VALID <input type="checkbox"/> RESTRICTIONS <input type="checkbox"/> HAZARDS POSED BY ILLNESS <input type="checkbox"/> PROCEDURES TO ENSURE THAT AIRCREW CAN- NOT FLY WHILE MEDICALLY UNFIT				
14.	PUBLICATIONS <input type="checkbox"/> ON-TIME DISSEMINATION AIP <input type="checkbox"/> VFR SUPPLEMENT <input type="checkbox"/> AMENDMENTS DISTRIBUTED				
15.	BRIEFINGS <input type="checkbox"/> LOCATION <input type="checkbox"/> REQUIREMENT TO ATTEND <input type="checkbox"/> NUMBER PER DAY <input type="checkbox"/> SPECIAL REQUIREMENTS <input type="checkbox"/> CURRENT WEATHER <input type="checkbox"/> OPS CONDITIONS <input type="checkbox"/> EMERGENCY PROCEDURES				
16.	LAUNCH CONTROL OFFICER (LCO) <input type="checkbox"/> QUALIFICATIONS <input type="checkbox"/> RESPONSIBILITIES				
17.	LAUNCH PERSONNEL <input type="checkbox"/> DUTIES UNDERSTOOD <input type="checkbox"/> ADHERENCE TO SOPs				

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SER	ITEM	A	B	C	REMARKS
18.	WEATHER / WIND LIMITATIONS <input type="checkbox"/> DAYLIGHT VFR ONLY				
	<input type="checkbox"/> 90° CROSSWIND LIMITS <input type="checkbox"/> Z-33 8 KNOTS / 10 MPH <input type="checkbox"/> SCOUT 15 KNOTS / 17 MPH <input type="checkbox"/> L-19 10 KNOTS / 11 MPH <input type="checkbox"/> 15 KTS / 17 MPH FOR STDS / CHECK PILOT CONDUCTING TRAINING ONLY <input type="checkbox"/> GUSTS NOT GREATER THAN 10 KNOTS OR 12 MPH				
19.	GLIDER MOVEMENTS <input type="checkbox"/> SUPERVISION <input type="checkbox"/> SUFFICIENT PERSONNEL <input type="checkbox"/> BY HAND WHEN BACKWARDS <input type="checkbox"/> BY VEHICLE WHEN FORWARD				
20.	GLIDER PARKING AS PER SOPs <input type="checkbox"/> DISTANCE BETWEEN GLIDERS <input type="checkbox"/> ALIGNMENT AND DIRECTION <input type="checkbox"/> PARKED CONFIGURATION <input type="checkbox"/> SPOILERS EXTENDED <input type="checkbox"/> LOW WING INTO WIND <input type="checkbox"/> TIE-DOWN AS PER SOPs				
21.	VEHICULAR TRAFFIC <input type="checkbox"/> CONTROL OF MOVEMENT				
22.	SPECTATORS <input type="checkbox"/> SUPERVISION				
23.	PILOT LOG BOOKS <input type="checkbox"/> MAINTAINED AND UP TO DATE				

SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> LOG BOOK CERTIFICATION FOR PROFICIENCY AND QUALIFICATIONS				
GLIDER OPERATIONS-EMERGENCY PROCEDURES					
24.	OCCURRENCE RESPONSE PLAN <input type="checkbox"/> EFFECTIVENESS <input type="checkbox"/> WARNING SYSTEM <input type="checkbox"/> TRANSPORT TO SITE <input type="checkbox"/> PHOTOGRAPHER / CAMERA <input type="checkbox"/> PERSONNEL KNOWLEDGEABLE OF PLAN				
25.	GRID MAPS <input type="checkbox"/> AVAILABLE AND CURRENT <input type="checkbox"/> UNDERSTOOD BY DRIVERS				
26.	ACCIDENT ALARM SYSTEM				
27.	VEHICLES TO ACCIDENT SITE <input type="checkbox"/> RULES GOVERNING VEHICLE MOVEMENT <input type="checkbox"/> CONTROL OF VEHICLES BY TOWER <input type="checkbox"/> MARKINGS <input type="checkbox"/> CURRENT WEATHER <input type="checkbox"/> OPS CONDITIONS <input type="checkbox"/> EMERGENCY PROCEDURES				
28.	ACCIDENT RESPONSIBILITIES <input type="checkbox"/> RECOVERY OF WRECKAGE <input type="checkbox"/> WRECKAGE GUARDS <input type="checkbox"/> WRECKAGE SCHEMATIC <input type="checkbox"/> ACCIDENT TRAILER AND ACCIDENT SITE EQUIPMENT				
29.	NOTIFICATION TO <input type="checkbox"/> LOCAL FIREFIGHTERS <input type="checkbox"/> LOCAL POLICE / RCMP				

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SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> CF FS PERSONNEL				
30.	AVAILABILITY OF AMBULANCE <input type="checkbox"/> RESPONSE TIME <input type="checkbox"/> CAPABILITY				
31.	FIRE EXTINGUISHERS <input type="checkbox"/> SPOT CHECKS IN HANGARS, FLIGHT LINE, AIR-CRAFT AND WINCH <input type="checkbox"/> UP TO DATE <input type="checkbox"/> KNOWLEDGE OF USE				
32.	EMERGENCY PROCEDURES <input type="checkbox"/> KNOWLEDGE AND PRACTICE <input type="checkbox"/> TAKE-OFF ABORT <input type="checkbox"/> EMERGENCY RELEASE <input type="checkbox"/> NON-RELEASE <input type="checkbox"/> ROPE / CABLE BREAK <input type="checkbox"/> OFF-FIELD LANDING				
AIR SERVICES					
33.	BIRD STRIKE <input type="checkbox"/> RECORDS, I.E. CF 215				
34.	AIRFIELD CONDITION <input type="checkbox"/> RAMPS, TAXIWAYS, RUNWAYS, LIGHTING, APPROACHES, OVER-RUN AREAS, IN-FIELD AREAS <input type="checkbox"/> METHOD OF DISSEMINATING PREVIOUSLY DISCUSSED INFORMATION TO USERS				
35.	WEATHER SERVICES <input type="checkbox"/> ACCESS TO CURRENT AND FORECAST CONDITIONS <input type="checkbox"/> INFORMATION DISPLAYED <input type="checkbox"/> INFORMATION UPDATED, E.G. USE OF PIREPS				

SER	ITEM	A	B	C	REMARKS
36.	CONTROL TOWER <input type="checkbox"/> COMMUNICATIONS WITH ALL GLIDER OPERATIONS <input type="checkbox"/> LOCAL GLIDING PROCEDURES <input type="checkbox"/> VISIBILITY OF ENTIRE GLIDER OPS AND TRAFFIC PATTERNS <input type="checkbox"/> TOWER CONTROL OF GLIDERS AND TOW AIRCRAFT <input type="checkbox"/> TOWER CONTROL OF VEHICLES ON AIRFIELD				
MAINTENANCE AND SERVICING					
37.	RELATIONSHIP WITH FSO <input type="checkbox"/> MUTUAL EXCHANGES OF INFORMATION				
38.	FS PUBLICATIONS <input type="checkbox"/> POSTER DISPLAYS <input type="checkbox"/> "SAFETY COMMENT" FORMS AVAILABILITY AND USE <input type="checkbox"/> AIRCRAFT ACCIDENT SUMMARIES				
39.	USE OF INTAKE DUCT PLUGS <input type="checkbox"/> TOW PLANES				
40.	FOD PROGRAM <input type="checkbox"/> AIRFIELD INSPECTIONS <input type="checkbox"/> NO LOOSE EQUIPMENT IN COCKPITS				
41.	FLIGHT TESTING <input type="checkbox"/> APPROVED PERSONNEL <input type="checkbox"/> CHECKLISTS USED				
42.	MAINTENANCE ADMINISTRATION <input type="checkbox"/> EQUIPMENT INSPECTIONS <input type="checkbox"/> SNAGS RECORDED <input type="checkbox"/> AIRCRAFT TECHNICAL LOGS UP TO DATE				
	<input type="checkbox"/> CORRECTIVE ACTION ON SNAGS				

SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> STORAGE CONDITIONS <input type="checkbox"/> CLEANLINESS OF AIRCRAFT AND HANGAR				
SAFETY SYSTEMS					
43.	LIFE SUPPORT EQUIPMENT <input type="checkbox"/> PROPER TYPE <input type="checkbox"/> WELL MAINTAINED <input type="checkbox"/> STORAGE <input type="checkbox"/> INSPECTIONS VALID				
44.	PERSONNEL-ISSUE AS PER SCALE OF ISSUE <input type="checkbox"/> USERS FITTED AND BRIEFED ON EQUIPMENT CARE AND HANDLING PROCEDURES FOR OVERDUE EQUIPMENT				
45.	EMERGENCY LOCATOR TRANSMITTER (ELT) <input type="checkbox"/> AVAILABILITY <input type="checkbox"/> USAGE				
46.	ACCIDENT RESPONSE <input type="checkbox"/> EQUIPMENT <input type="checkbox"/> AVAILABILITY <input type="checkbox"/> USAGE				
47.	ACCIDENT RESPONSE EQUIPMENT <input type="checkbox"/> FIRST AID KIT <input type="checkbox"/> DISPOSABLE CAMERA <input type="checkbox"/> RESCUE KNIFE (HARNESS CUTTER) <input type="checkbox"/> TWO FIRE EXTINGUISHERS <input type="checkbox"/> VEHICLE CAPABLE OF TRANSPORTING EQUIPMENT AND PERSONNEL CLOSE TO ACCIDENT SITE <input type="checkbox"/> ACCIDENT AXE				
	<input type="checkbox"/> FIREFIGHTER'S COMBINATION TOOL <input type="checkbox"/> TWO WOOL BLANKETS				

SER	ITEM	A	B	C	REMARKS
TRAINING					
48.	SUPERVISOR TRAINING <input type="checkbox"/> FREQUENCY				
49.	LOCAL SURVEYS <input type="checkbox"/> REGULAR AND SYSTEMATIC <input type="checkbox"/> ADEQUACY OF CORRECTIVE ACTION <input type="checkbox"/> USE OF FSO RESOURCES				
50.	GLIDING SCHOOL LECTURES AS PER DIRECTIVES <input type="checkbox"/> LESSON PLANS <input type="checkbox"/> ADEQUACY <input type="checkbox"/> ACCORDING TO SYLLABUS <input type="checkbox"/> TRAINING AIDS				
AIR TOW LAUNCH PROCEDURES					
51.	AIR TOW LAUNCH CREW <input type="checkbox"/> NUMBER OF CREW THREE (3) MINIMUM <input type="checkbox"/> BRIEFED ON OPERATION <input type="checkbox"/> UNDERSTAND DUTIES				
52.	POSITION OF SIGNALLERS <input type="checkbox"/> WINGMAN <input type="checkbox"/> TOW AIRCRAFT SIGNALLER 45° AHEAD OF AIRCRAFT, 50 FT. FROM TAKE-OFF PATH, FACING WINGMAN AND AIRCRAFT				
53.	TOW ROPE ATTACHMENT PROCEDURE <input type="checkbox"/> ONLY WHEN GLIDER READY <input type="checkbox"/> ROPES AS PER SOPs <input type="checkbox"/> CONDITION OF ROPE CHECKED				
54.	PRE-TAKE-OFF CHECKS <input type="checkbox"/> BACK RELEASE AND FORWARD RELEASE CHECKED AT START OF DAILY OPERATIONS				

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SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> AS PER CHECKLIST				
55.	SIGNALS <input type="checkbox"/> VERBAL AND HAND SIGNALS <input type="checkbox"/> USAGE AS PER SOPs <input type="checkbox"/> CLEAR AND UNDERSTOOD				
56.	TOW AIRCRAFT HANDLING PROCEDURE <input type="checkbox"/> TAKE-OFF AND CLIMB AS PER SOPs <input type="checkbox"/> 15° TO 20° OF BANK <input type="checkbox"/> RELEASE DESCENDING LEFT TURN <input type="checkbox"/> ROPE DROP IN DESIGNATED AREA <input type="checkbox"/> LANDING CLEARANCE OF TRAILING TOW ROPE				
WINCH LAUNCH PROCEDURES					
57.	WINCH LAUNCH CREW <input type="checkbox"/> NUMBER IN CREW (4 MINIMUM) <input type="checkbox"/> BRIEFED ON OPERATION <input type="checkbox"/> UNDERSTAND DUTIES <input type="checkbox"/> CERTIFIED WINCH OPERATORS				
58.	WINCH CABLE AND ATTACHMENT <input type="checkbox"/> CONDITIONS CHECKED <input type="checkbox"/> ONLY WHEN GLIDER READY <input type="checkbox"/> MULTIPLE WINCHES: CORRECT CABLE INSTALLED <input type="checkbox"/> DOWNWIND GLIDER LAUNCHED FIRST				
59.	WINCH LAUNCH SIGNALLING <input type="checkbox"/> PROPER SIGNALS USED <input type="checkbox"/> EASILY SEEN BY CREWS <input type="checkbox"/> CORRECT USAGE				
60.	SIGNALS <input type="checkbox"/> MECHANICAL <input type="checkbox"/> VERBAL AND HAND SIGNALS				

SER	ITEM	A	B	C	REMARKS
	<input type="checkbox"/> CLEAR AND UNDERSTOOD <input type="checkbox"/> USAGE AS PER SOPs				
61.	TAKE-OFF AND CLIMB <input type="checkbox"/> TECHNIQUE <input type="checkbox"/> INITIAL CLIMB SHALLOW <input type="checkbox"/> SAFETY ALTITUDE: 200 FEET AGL <input type="checkbox"/> SAFETY SPEED: 50 MPH <input type="checkbox"/> MAXIMUM CLIMB SPEED: 69 MPH				
62.	CLIMB CONTROL PROCEDURE <input type="checkbox"/> YAW TO REDUCE POWER <input type="checkbox"/> RELEASE IF TOO SLOW				
63.	CABLE BREAK PROCEDURE <input type="checkbox"/> GLIDER IN FLYING ATTITUDE <input type="checkbox"/> NON-RELEASE SIGNALS AND PROCEDURE				
64.	CABLE RETRIEVING <input type="checkbox"/> SIGNALS <input type="checkbox"/> ORIGINATED BY WINCH OP <input type="checkbox"/> MAXIMUM SPEED OF 15 MPH TO LAY OR RETRIEVE CABLE				
AUTO LAUNCH PROCEDURES					
65.	AUTO LAUNCH CREW <input type="checkbox"/> NUMBER IN CREW (4 MINIMUM) <input type="checkbox"/> BRIEFED ON OPERATION <input type="checkbox"/> UNDERSTAND DUTIES <input type="checkbox"/> CERTIFIED VEHICLE DRIVER AND OBSERVER				
66.	AUTO TOW CABLE AND EQUIPMENT <input type="checkbox"/> AS PER SOPs				
67.	CABLE ATTACHMENT <input type="checkbox"/> ONLY WHEN GLIDER READY				

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SER	ITEM	A	B	C	REMARKS
68.	AUTO TOW LAUNCH <input type="checkbox"/> FROM RUNWAY OR HARD SURFACE				
69.	POSITION OF SIGNALLERS <input type="checkbox"/> LAUNCH VEHICLE OBSERVER IN PLACE				
70.	SIGNALS <input type="checkbox"/> VERBAL AND HAND SIGNALS <input type="checkbox"/> CLEAR AND UNDERSTOOD <input type="checkbox"/> USAGE AS PER SOPs				
71.	TAKE-OFF AND CLIMB <input type="checkbox"/> TECHNIQUE <input type="checkbox"/> INITIAL CLIMB SHALLOW <input type="checkbox"/> SAFETY ALTITUDE: 200 FEET AGL <input type="checkbox"/> SAFETY SPEED: 50 MPH <input type="checkbox"/> MAXIMUM CLIMB SPEED: 69 MPH				
72.	CLIMB CONTROL PROCEDURE <input type="checkbox"/> YAW TO REDUCE POWER <input type="checkbox"/> RELEASE IF TOO SLOW				
73.	CABLE BREAK PROCEDURE <input type="checkbox"/> GLIDER IN FLYING ATTITUDE <input type="checkbox"/> NON-RELEASE SIGNALS AND PROCEDURE				
74.	CABLE RETRIEVING <input type="checkbox"/> PARACHUTE NOT DRAGGED				

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ANNEX E - CVR/FDR PARAMETERS REQUIREMENTS BY FAMILIES

Reference: EUROCAE document ED-112 Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems

1. Reference does not address military role specific parameters to be recorded. As a result, an additional set of parameters has been developed for each family of aircraft. The various aircraft roles and types of recording equipment were taken into account in determining the requirement for airborne recorder systems on board CF aircraft. Accordingly, the aircraft required to support the CF operations were divided into several families, some with slightly different recording requirements. Discriminators used in the assignment of aircraft to various families are:

- a. Aircraft type (fixed wing, rotary wing, or UAV);
- b. Aircraft role (trainer, transport, combat, SAR);
- c. Number of engines (single or multi-engine);
- d. Aircraft maximum take-off weight (more or less than 12,500lbs / 5682 Kg);
- e. Maximum aircraft speed (greater or less than 450 knots IAS);
- f. Number of crew; and
- g. Special considerations such as whether the aircraft is ejection seat capable or weapons capable.

2. Based on these discriminators, five generic fixed-wing families and four rotary wing families were identified as follows:

- a. Fixed Wing Aircraft:
 - (1) Trainer: No additional parameters required.
 - (2) Light Transport: No additional parameters required
 - (3) Heavy Transport: Refer to Appendix 1.
 - (4) Heavy Combat: Refer to Appendix 2.
 - (5) Fast Combat: refer to Appendix 3
- b. Rotary Wing Aircraft
 - (1) Single Engine Trainer: Refer to Appendix 4.
 - (2) Multi Engine Trainer: Refer to Appendix 5.
 - (3) Transport / SAR: Refer to Appendix 6.
 - (4) Combat: Refer to Appendix 7.

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**APPENDIX 1 – FIXED WING HEAVY
 TRANSPORT AIRCRAFT CVR/FDR SPECIFICATIONS**

CVR REQUIREMENTS		
DURATION AND RECORDING	APPLICATION	REMARKS
2 HOURS MINIMUM	ALL CREW POSITIONS + AREA MIKE	ALL RADIOS UNLESS IN SECURE MODE.

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
AIRCRAFT GENERAL					
ALTITUDE WARNING SELECTIONS	DISCRETE, AS INSTALLED				RADIO ALTIMETER WARNING BUG ALTITUDE
EMERGENCY SHUT-OFF VALVES ACTIVATION	DISCRETE, AS INSTALLED	1			ACTIVATION (MANUAL OR AUTO) OF ALL EMERGENCY SHUT-OFF VALVES (ENGINE FUEL, HYDRAULICS, PNEUMATICS, ETC) + STATUS OF VALVE POSITIONS (OPEN, CLOSED, FAILED)
FIRE BOTTLE ACTIVATION	DISCRETE, AS INSTALLED	1			ACTIVATION (MANUAL OR AUTO) OF ALL FIRE-FIGHTING AGENTS + STATUS OF ACTIVATED DEVICES (FAIL, DEPLETED, ETC)
TACAN NAVIGATION	AS INSTALLED	1	AS INSTALLED	AS INSTALLED	FREQUENCY SELECTED, STATUS OF EQUIPMENT, BEARING + DIST READOUT
CABIN PRESSURE ALTITUDE	AS INSTALLED	1	AS INSTALLED	AS INSTALLED	PRESSURIZATION READOUT
EMERGENCY BRAKES SELECTION	DISCRETE, AS INSTALLED	1			SELECTION OF EMERGENCY BRAKES

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**APPENDIX 2 – FIXED WING
 COMBAT AIRCRAFT CVR/FDR SPECIFICATIONS**

CVR REQUIREMENTS		
DURATION AND RECORDING	APPLICATION	REMARKS
30 MINUTES MINIMUM (2 HOURS PREFERRED)	ALL CREW POSITIONS + AREA MIKE	ALL RADIOS UNLESS IN SECURE MODE.

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
AIRCRAFT GENERAL					
STORES STATUS	AS INSTALLED	1			STORES STATUS DATA (TYPE, LOCATION), TAKEN FROM THE MISSION COMPUTER.
WEAPONS STATUS	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME A WEAPON DEPARTS THE AIRCRAFT
MASTER	DISCRETE, AS INSTALLED	1			ACTIVATION (MANUAL OR AUTO) OF ALL FIRE-FIGHTING AGENTS + STATUS OF ACTIVATED DEVICES (FAIL, DEPLETED, ETC)
ARM MODE	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME THE MASTER ARM FUNCTION CHANGES STATUS.
ALTITUDE WARNING SELECTIONS	DISCRETE, AS INSTALLED	1			RADIO ALTIMETER WARNING BUG ALTITUDE
DATA LINK SYSTEMS	DISCRETE, AS INSTALLED	5			CODES USED IF APPLICABLE, STATUS OF EQUIPMENT. ENCRYPTION REQUIRED

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APPENDIX 3 – FIXED WING FAST COMBAT AIRCRAFT CVR/FDR SPECIFICATIONS

CVR REQUIREMENTS		
DURATION AUDIO RECORDING	APPLICATION	REMARKS
30 MINUTES MINIMUM (2 HOURS RECORDING PREFERRED)	ALL CREW POSITIONS + AREA MIKE	ALL RADIOS UNLESS IN SECURE MODE.

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
STORES MANAGEMENT SYSTEMS					
EXTERNAL STORES STATUS	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME AN EXTERNAL STORE DEPARTS THE AIRCRAFT.
PRESSING OF TRIGGERS/LAUNCH BUTTONS	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME A WEAPON TRIGGER OR LAUNCH BUTTON/ SWITCH IS ACTIVATED.
MASTER ARM MODE	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME A MASTER ARM OR WEAPONS SELECT OVERRIDE FUNCTION CHANGES STATUS.
AIRCRAFT GENERAL					
MAINTENANCE + SYSTEM STATUS CODES	DISCRETE, AS INSTALLED	1			EACH SYSTEMS STATUS OR MAINTENANCE CODE TRIGGERED SHALL BE RECORDED (EX: MMP CODES)
DISPLAY CAUTIONS, WARNINGS AND ADVISORY MESSAGES	DISCRETE, AS INSTALLED	1			EACH MESSAGE SENT TO THE COCKPIT DISPLAYS, AS WELL AS ILLUMINATION OF ASSOCIATED LIGHTS.
ALTITUDE WARNING SELECTIONS	DISCRETE, AS INSTALLED	1			SELECTED VALUE, AS WELL AS SILENT/MUTE/OVERRIDE SELECTION
ARRESTING GEAR SELECTION + STATUS	DISCRETE, AS INSTALLED	1			SELECTION OF ARRESTING GEAR DEPLOYMENT/RETRACTION/ACTIVATION, AS WELL AS STATUS
EJECTION SEAT DUAL COCKPIT MODE	DISCRETE, AS INSTALLED	10			MODE SELECTION FOR DUAL COCKPIT EJECTION SYSTEM (EX: NORM, SOLO, AFT INITIATE)
FLIGHT CONTROL COMPUTERS MESSAGES	DISCRETE, AS INSTALLED	1			STATUS CHANGES, ERRORS, FAILURES AND DEGRADATIONS IN NORMAL MODES OF OPERATION

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
DATA LINK SYSTEMS	DISCRETE, AS INSTALLED	5			STATUS OF EQUIPMENT.
AUTO THROTTLE (ATC)	DISCRETE, AS INSTALLED	1			ENGAGE/DISENGAGE + STATUS (FAIL, DEGD, ETC)
ENGINE EXHAUST NOZZLE POSITION	AS INSTALLED	0.5	AS INSTALLED	AS INSTALLED	NOZZLE APERTURE + THRUST VECTORING POSITION IF APPLICABLE
FUEL QUANTITIES	AS INSTALLED	10	AS INSTALLED	AS INSTALLED	RECORDING OF ALL FUEL TANK QUANTITIES, AS WELL AS INDICATED TOTAL FUEL AS DISPLAYED IN COCKPIT
EMERGENCY SHUT-OFF VALVES ACTIVATION	DISCRETE, AS INSTALLED	1			ACTIVATION (MANUAL OR AUTO) OF ALL EMERGENCY SHUT-OFF VALVES (ENGINE FUEL, HYDRAULICS, PNEUMATICS, ETC) + STATUS OF VALVE POSITIONS (OPEN, CLOSED, FAILED)
FIRE BOTTLE ACTIVATION	DISCRETE, AS INSTALLED	1			ACTIVATION (MANUAL OR AUTO) OF ALL FIRE-FIGHTING AGENTS + STATUS OF ACTIVATED DEVICES (FAIL, DEPLETED, ETC)
TACAN NAVIGATION	AS INSTALLED	1	AS INSTALLED	AS INSTALLED	FREQUENCY SELECTED, STATUS OF EQUIPMENT, BEARING + DIST READOUT
CREW OXYGEN SYSTEM	AS INSTALLED	10	AS INSTALLED	AS INSTALLED	PRESSURE/QUANTITY IN SYSTEM, SYSTEM STATUS
COCKPIT PRESSURE ALTITUDE	AS INSTALLED	1	AS INSTALLED	AS INSTALLED	PRESSURIZATION READOUT
EMERGENCY BRAKES SELECTION	DISCRETE, AS INSTALLED	1			SELECTION OF EMERGENCY BRAKES
G SUIT PRESSURE, STATUS	AS INSTALLED	0.5	AS INSTALLED	AS INSTALLED	RECORDING OF PRESSURE SUPPLIED TO G SUIT AND STATUS OF EQUIPMENT.
RADAR WARNING RECEIVER STATUS	DISCRETE, AS INSTALLED	1			CHANGES IN MODE OF OPERATION AND STATUS OF RWR.
RADAR MODE OF OPERATION	AS INSTALLED	1			RECORDING OF MASTER MODE USED, AND CHANGES OF STATUS (AIR MODE, GROUND MODE, NAV MODE, ETC).
RADAR STATUS MESSAGES	DISCRETE, AS INSTALLED	1			SERVICEABILITY STATUS + MESSAGES (FAIL, DEGD, RECEIVE ONLY, ETC). ALSO WHICH MODE OF OPERATION IS USED.

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**APPENDIX 4 – ROTARY WING SINGLE ENGINE
 COMBAT AIRCRAFT CVR/FDR SPECIFICATIONS**

CVR REQUIREMENTS		
DURATION AND RECORDING	APPLICATION	REMARKS

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
AIRCRAFT GENERAL					
GROUND SPEED	0 TO 300	1	AS INSTALLED	+/- 1 KNOT	AS INSTALLED (EQUIPMENT CAPABLE OF PRODUCING A GROUND-SPEED READOUT)

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**APPENDIX 5 – ROTARY WING MULTI ENGINE
 TRAINER AIRCRAFT CVR/FDR SPECIFICATIONS**

CVR REQUIREMENTS		
DURATION AUDIO AND RECORDING	APPLICATION	REMARKS

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
AIRCRAFT GENERAL					
GROUND SPEED	0 TO 300	1	AS INSTALLED	+/- 1 KNOT	AS INSTALLED (EQUIPMENT CAPABLE OF PRODUCING A GROUND-SPEED READOUT)

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**APPENDIX 6 – ROTARY WING TRANSPORT
 SAR TRAINER AIRCRAFT CVR/FDR SPECIFICATIONS**

CVR REQUIREMENTS		
DURATION AUDIO RECORDING	APPLICATION	REMARKS

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
AIRCRAFT GENERAL					
GROUND SPEED	0 TO 300	1	AS INSTALLED	+/- 1 KNOT	AS INSTALLED (EQUIPMENT CAPABLE OF PRODUCING A GROUND-SPEED READOUT).

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APPENDIX 7 – ROTARY WING COMBAT AIRCRAFT CVR/FDR SPECIFICATIONS

CVR REQUIREMENTS		
DURATION AUDIO RECORDING	APPLICATION	REMARKS
30 MINUTES MINIMUM (2 HOURS RECORDING MINIMUM)	ALL CREW POSITIONS + AREA MIKE	ALL RADIOS UNLESS IN SECURE MODE.

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
STORES MANAGEMENT SYSTEMS					
ALL LOADED EXTERNAL RACKS/ PYLONS/LAUNCHERS/RAILS	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME A RACK/PYLON/LAUNCHER OR RAIL DEPARTS THE AIRCRAFT OR CHANGES IN STATUS (EX: FAILED, DEGRADED)).
MASTER ARM MODE	DISCRETE, AS INSTALLED	1			A DISCRETE SIGNAL MUST BE RECORDED EVERY TIME A MASTER ARM OR WEAPONS SELECT OVERRIDE FUNCTION CHANGES STATUS.
AIRCRAFT GENERAL					
AIRCRAFT GROUND SPEED	As INSTALLED.	1	± 3%	1 KT	
MAINTENANCE + SYSTEM STATUS CODES	DISCRETE, AS INSTALLED	1			EACH SYSTEMS STATUS OR MAINTENANCE CODE TRIGGERED SHALL BE RECORDED (EX: MMP CODES)
EMERGENCY SHUT-OFF VALVES ACTIVATION	DISCRETE, AS INSTALLED	1			ACTIVATION (MANUAL OR AUTO) OF ALL EMERGENCY SHUT-OFF VALVES (ENGINE FUEL, HYDRAULICS, PNEUMATICS, ETC) + STATUS OF VALVE POSITIONS (OPEN, CLOSED, FAILED)
TACAN NAVIGATION	As INSTALLED	1	As INSTALLED	As INSTALLED	FREQUENCY SELECTED, STATUS OF EQUIPMENT, BEARING + DIST READOUT

FDR PARAMETERS					
PARAMETER	MINIMUM RECORDING RANGE	MAXIMUM RECORDING INTERVAL IN SECONDS	RECORDING ACCURACY	RECORDING RESOLUTION	REMARKS
ELECTRONIC WARFARE					
RADAR WARNING RECEIVER STATUS	DISCRETE, AS INSTALLED	1			CHANGES IN MODE OF OPERATION AND STATUS OF RWR.
RADAR MODE OF OPERATION	AS INSTALLED	1			RECORDING OF MASTER MODE USED, AND CHANGES OF STATUS (AIR MODE, GROUND MODE, NAV MODE, ETC).
RADAR STATUS MESSAGES	DISCRETE, AS INSTALLED	1			SERVICEABILITY STATUS + MESSAGES (FAIL, DEGRADED, RECEIVE ONLY, ETC). ALSO WHICH MODE OF OPERATION IS USED.

CHAPTER 5 – PROMOTION

GENERAL

1. The objective of FS promotion is to facilitate the maintenance of a strong and committed FS culture within all organizations that conduct or support DND/CAF flying operations. Active and visible FS promotion is designed to engender full participation in the FS Program at the tactical, operational and strategic levels and is an excellent way to achieve the Program's objectives with a relatively small investment. The CAF FS Program uses a series of briefings, FS publications and awards as the main mechanisms for promotion.

PROMOTIONAL BRIEFINGS

DFS ANNUAL BRIEFING

2. The DFS annual briefing, commonly referred to as the "road show," is designed to brief all wing and unit personnel where flying operations or support are conducted. It is one of the main FS promotion activities. The objective of this briefing is to remind all personnel of the requirement for and the importance of the FS Program. DFS and the DFS Chief Warrant Officer (CWO), sometimes accompanied by specific fleet desk officer(s), aim to brief as many civilian and military personnel as possible at the tactical, operational and strategic level. In addition, this activity is used to update personnel on new FS concepts as well as to identify key lessons learned through the analysis of occurrences over the previous 12 to 18 months. Although the briefing will be focused on CF/DND formations, wings and units, the briefing will also be presented where possible to deployed formations or out of country organizations. The visits allow DFS to see first hand how the Program is applied and to seek feedback on possible changes.

FSO BRIEFINGS

3. Each FSO is mandated to conduct regular briefings on FS subjects pertinent to the units' activities and aircraft operated. The revision of occurrences of interest shall be done as required and as soon as possible with all persons involved in flying operations. FSOMS reports should be used to the maximum extent possible to pass information of interest. FS *Flash* and *Debriefing* shall be briefed to personnel.

FS BRIEFING CONTENT

4. FS briefings must be relevant to the audience, informative, current and interesting. Graphs, when used, shall be well labelled and easy to understand. When statistical data are included, their source and the method used to obtain them should be pointed out.

PROMOTIONAL MATERIAL

CAF FS PUBLICATIONS

FLIGHT COMMENT MAGAZINE

5. The CAF FS magazine, *Flight Comment*, is produced up to four times a year in both, digital and print form to ensure maximum circulation. *Flight Comment* strives to provide relevant, interesting and timely FS information to all personnel involved in air operations. The magazine is also a forum for anyone wishing to present an article or other media, such as posters or sketches, on any issue related to FS. DFS reserves the right to edit all submissions for length and content.

FLASH BULLETIN

6. A one or two page bilingual electronic bulletin titled *Flash* is released by DFS on an “as required” basis to highlight critical FS information. Typically, *Flash* originates from issues identified during the investigation of a serious occurrence or from reported hazards posing serious threats to air activities. The bulletin usually dictates immediate corrective actions to reduce the threat of an identified hazard. Each new release is posted on the DFS websites with back-issues archived.

DEBRIEFING PAMPHLET

7. An electronic pamphlet, titled *Debriefing*, is produced as required to highlight important FS concerns or issues. *Debriefing* is similar in format to *Flash* and the content covers current FS trends, threats and issues. Each new release is posted on the DFS websites and back issues are archived.

OTHER FS PERIODICALS

8. FS information is available from a myriad of FS magazines produced by national and foreign government departments as well as civilian companies and safety organizations. These periodicals contain a wealth of relevant and interesting FS information that can be used to raise the level of FS consciousness. All members of the FS team are encouraged to regularly review these publications for items of interest. An updated list of appropriate periodicals can be found on the DFS websites.

OTHER MEDIA

WEBSITES

9. DFS maintains comprehensive Intranet and Internet websites that provide information on relevant FS topics, including links to investigation reports, other FS sites and FS periodicals.

NOTICE BOARDS

10. Dedicated FS notice boards are an effective method of transmitting FS information. The purpose of FS notice boards is to remind personnel of the goals and impact of the FS Program. To do this, FS notice boards should be strategically placed in high-traffic areas and should focus solely on relevant FS matters including, but not limited to, the *Debriefing* newsletter, the *Flash* bulletins, awards and AWS occurrences. To be effective, FS notice boards should be prominent enough to be easily seen from a distance. The board should be bordered by red and white alternating stripes (minimum of 5 cm/2 in), as depicted in figure 1. Displaying the pictures of those personnel in the unit assigned to FS positions is strongly recommended.



Figure 1. Sample FS Notice Board

AWARDS

OBJECTIVE

11. Awards are an excellent way of recognizing actions performed in the spirit of the FS Program that are worthy of recognition by peers and the whole of the CAF. Originators and reviewing authorities must give careful thought to which form of recognition would be most appropriate.
12. In order to qualify for a FS award, the action(s) of the nominee(s) must exceed the standard of professional conduct expected of our personnel or be outside the scope of duties relative to their qualifications and position

TIMELINESS OF AWARDS

13. To be most effective, the FS nominations shall be staffed in a timely manner and the awards should then be awarded ideally within 120 days after the event took place.

INFORMAL STAFFING

14. Before submitting a formal nomination, a UFSO can informally query by e-mail the DFS and the Air Division's award OPIs regarding a potential nomination. The e-mail shall provide a brief but detailed description of the actions warranting consideration for a FS award and the type of award being considered. If the contemplated nomination is for a *For Pro*, the e-mail shall be sent to 1 Cdn Air Div FS CWO and for a *Good Show*, to the DFS Promotion Officer (DFS 3-3). The organization's OPI will review the case and advise the unit on its merits. This response is preliminary and the final decision will rest with the formal nomination by the unit as per the processes described below.

TYPES OF AWARDS

15. The FS awards available through the CAF include the *Good Show*, the *For Professionalism*, the DFS Commendation, the Unit Commander's Commendation and the SICOFAA award.

GOOD SHOW AWARD

16. The *Good Show* award is given for an outstanding action or series of actions that averted in extremis a serious accident or reduced its severity. The actions of the individual(s) nominated are such that without their involvement an aircraft would have been lost or much greater injuries or damages would have been sustained. A *Good Show* will be awarded when one or more of the following conditions have been met by an individual, crew or team:

- a. actions directly prevented loss of life or loss of an aviation resource;
- b. actions directly reduced the severity of an accident in terms of damages and/or injuries; or
- c. actions demonstrated outstanding perseverance, skill, knowledge, judgment or situational awareness to identify or rectify a critical hazard that would have, in all probability, lead to an accident or loss of aviation resources.

FOR PROFESSIONALISM AWARD

17. The *For Professionalism* award recognizes acts that may not qualify for the *Good Show* award yet reflects a superior professional attitude that averted an aircraft accident or significantly reduced the threat posed by a hazard. Acts in the completion of normal duties may qualify if clearly indicative of commendable extra effort. A *For Professionalism* award will be awarded when one or more of the following conditions have been met by an individual, crew or team:

- a. actions demonstrated superior skill or perseverance in identifying and rectifying a significant hazard to FS; or

- b. actions exhibited a superior display of skill, knowledge, situation awareness or judgment that resulted in an important contribution that enhanced significantly FS.

COMMANDER'S FS COMMENDATION

18. The Commander's FS Commendation could be given for an action that does not warrant a *Good Show* or a *For Professionalism* but is worthy nonetheless of recognition. In the event that an individual has not been endorsed beyond wing level, it is anticipated that the individual would still be recognized with a Commander's FS Commendation, be it at the wing or equivalent level.

DFS COMMENDATION

19. The DFS Commendation recognizes outstanding professional long-term performance and dedication in the field of FS. The DFS Commendation is awarded to deserving individuals who, through their actions, have contributed significantly to enhance the capability of the FS Program across the CAF and who emulates the values and ethos promoted by the Program.

SICOFAA AWARD

20. Canada is a member of the international aviation association called Sistema de Cooperación entre las Fuerzas Aéreas Americanas. This Spanish designation means System for the Cooperation of the Air Forces in the Americas (SICOFAA). Each year SICOFAA provides member countries with an opportunity to nominate a deserving unit within their individual air force. This unit must have demonstrated the highest level of dedication to the furtherance of FS and, by their actions, been an exceptional example to others. The intent is to acknowledge a concerted effort over a period of time. The unit or formation must have developed, implemented and performed at a high level of FS efficiency or have a FS Program that is:

- a. innovative;
- b. proactive;
- c. comprehensive;
- d. effective; and
- e. enthusiastically embraced by all members of the FS team.

AWARDS STAFFING PROCEDURES

LENGTH OF NOMINATIONS

21. The nominations shall describe unequivocally why the nominee(s) deserve(s) an award. The relevant facts and circumstances must be included. Although flexible, the recommended text length is as follows:

- a. *Good Show* : max of 500 words;
- b. *For Professionalism*: max of 300 words; and

- c. SICOFAA award: a minimum of 500 words and a max of 700 words.

QUALITY OF NOMINATION NARRATIVE

22. The proposed nomination shall be accurate and well researched by the originating unit. It shall be clear, well written and free of abbreviations. The text shall be succinct and avoid using highly technical terms understandable only to professionally trained personnel. The nomination must describe the explicit actions and related facts demonstrating why the individual(s) is/are deserving of a FS award. The UFSO is encouraged to use the awards published in *Flight Comment* as examples.

SUBMISSION OF NOMINATION

23. A FS award nomination shall be submitted electronically using Annex A as a template. An electronic Word copy of the nomination narrative shall be attached with the nomination form. The submission shall include any document supporting the nomination (FSOMS occurrence report, UCR, technical reference, etc) and an explicit detailed narrative suitable for use as the award citation.

24. Nominations shall be staffed electronically by the UFSO, endorsed by the Unit CO, the formation FSO (normally WFSO), and Commander (normally Wing Comd) or its equivalent then e-mailed to the 1 Cdn Air Div FS CWO with the DFS Promotion Officer (DFS 3-3) cc'd on the correspondence.

APPROVAL OF A FS NOMINATION

25. The *Good Show* nomination is reviewed by the 1 Cdn Air Div FS CWO for completeness then forwarded to DFS for consideration. If endorsed, the Comd RCAF and DFS co-sign the award scroll.

26. The *For Professionalism* nomination will be reviewed by 1 Cdn Air Div FSO staff and staffed to Comd 1 or 2 Cdn Air Div for approval. The Div Comd and the DFSO co-sign the award scroll.

27. The SICOFAA FS award staffing originates at the unit level after 1 Cdn Air Div FSO issues a call letter for nominations in the fall. The DFSO nominates the deserving unit, if any, and submits the nomination to DFS. DFS reviews the nomination and presents it to Comd RCAF for approval. The Comd RCAF presents the submission to SICOFAA at the spring meeting (CONJEFAMER). Upon endorsement by CONJEFAMER, the Comd RCAF presents the award to the deserving unit at a suitable time and venue.

REFUSAL OF NOMINATION

28. Before a FS award is rejected, the DFS and 1 Cdn Air Div FSO staff will consult each other and review the nomination to validate their respective assessment. If a nomination is not approved, the Div FSO or DFS, as appropriate, will contact the unit commander and explain why the nomination was not supported and recommend other forms of recognition, as appropriate. As the award was endorsed by a formation commander, usually a WComd, a presentation of a Commander's Commendation would be appropriate.

PRESENTATION OF FS AWARD

29. The signed FS scrolls will be sent directly to the unit for presentation. Each unit is responsible to organize the presentation of the FS award. When possible, it is advisable to coordinate the presentation with a visit from the 1 or 2 Cdn Air Div Comds, the Comd RCAF, DFS or the 1 Cdn Air Div FSO as appropriate for the award presented. To enhance the visibility of the FS Program, the presentation shall be made in front of all unit members. Publication of the presentation in the base or local community newspaper or forum is strongly encouraged. As well, DFS will send a FS coin as described at para 32 to any recipients of a FS award.

PHOTOGRAPH OF FS AWARD RECIPIENT(S)

30. Once the nominee has been presented with a FS award, the unit is responsible to provide DFS with a quality high resolution photograph, at least 1 magabyte, of the recipient(s) that is representative of the FS citation (suitable picture of recipient in front of aircraft, maintenance stand, console, etc.). Special care shall be taken regarding the lighting, contrast, framing and focus. Further, a qualified Image Technician, when available, shall be tasked to take the picture. This photograph should be submitted directly to the DFS Promotion Officer (DFS 3-3) within 10 working days following the presentation of the award.

PUBLICATION OF FS AWARD

31. The citation and recipient's picture a *Good Show, For Pro*, DFS Commendation or SICOFAA award will be published in *Flight Comment* and posted on the DFS websites as soon as practical after having been presented.

FS COIN

COIN DESCRIPTION

32. The FS coin is made of pewter and shows on one side an elevated side face replica of Group Captain R.D. "Joe" Schultz (1922-2011), considered the pioneer of the CAF FS Program. The opposite side shows the DFS relief crest overlaying multiple red maple leaves engraved with a relief rectangle displaying a unique serial number.



Figure 2. FS Coin

FS COIN DISTRIBUTION

33. The FS coin is used to recognize a notable contribution to the FS Program by an individual's particular actions or noteworthy dedication and conveys DFS' appreciation to a worthy recipient that exemplifies the values of the FS Program. As such, all recipients of any FS award as described above will be handed a FS coin. The coin is also awarded on a discretionary basis by DFS. Nomination of an individual for a FS coin can be submitted electronically by the UFSO through the WFSO to the DFS CWO for consideration. A short narrative should explain the individual's contribution to the FS Program.

FS COIN REGISTRY

34. The DFS CWO will maintain a registry of all coin recipients and the following information will be recorded:

- a. Recipient's name and rank;
- b. Coin serial number;
- c. Date of award; and
- d. Reason why the coin is awarded.

PUBLISHING SRs ON THE DEFENCE WIDE AREA NETWORK (DWAN)

35. Publishing SRs on the DWAN for the promotion of FS is allowed as this contributes to improve the FS reporting culture while enhancing FS processes. Notwithstanding this, care must be taken to screen the reports before publishing. The following guidelines shall be followed:

- a. Only completed reports are posted (SR or CR); and
- b. A diligent review of the SRs by senior unit FS staff shall be done to ensure:
 - (1) personnel cannot be identified;
 - (2) no cockpit voice recorder (CVR) transcripts information is provided;
 - (3) no medical information or witness statements are included;
 - (4) blame is not assigned to a specific individual; and
- c. a disclaimer is included in each report stating: "Flight Safety incident reports are produced under the authority of the Minister of National Defence (MND) pursuant to section 4.2(n) of the Aeronautics Act (AA) and in accordance with A-GA-135-001/AA-001 – Flight Safety for the Canadian Forces. They are prepared solely for the purpose of accident prevention and shall not be used for legal, administrative or disciplinary action."

Annex A
 Chapter 5
 A-GA-135-001/AA-001

ANNEX A – FLIGHT SAFETY AWARD NOMINATION FORM

FS AWARD NOMINATION					
UNIT AT TIME OF OCCURRENCE:					
NOMINEE(S)					
RANK	NAME	FIRST NAME	INITIAL(S)	SN	OCCUPATION
TYPE OF AWARD RECOMMENDED	GOOD SHOW		For Pro		Other (Specify)
REFERENCE DOCUMENT(S)	TECHNICAL DOCUMENTS ATTACHED:				
	OCCURRENCE #:				
CITATION LANGUAGE	ENGLISH <input type="checkbox"/>				
	FRENCH <input type="checkbox"/>				
EVENT DESCRIPTION: (SHORT NARRATIVE JUSTIFYING NOMINATION)					

RANK, NAME, INITIALS, POSITION	DATE
PROPOSER: COMMENTS:	
SECTION HEAD: SUPPORTED : YES <input type="checkbox"/> No <input type="checkbox"/> COMMENTS:	
UFSO: SUPPORTED : YES <input type="checkbox"/> No <input type="checkbox"/> COMMENTS:	
CO: SUPPORTED : YES <input type="checkbox"/> No <input type="checkbox"/> COMMENTS:	
WFSO: SUPPORTED : YES <input type="checkbox"/> No <input type="checkbox"/> COMMENTS:	
WING COMD: SUPPORTED : YES <input type="checkbox"/> No <input type="checkbox"/> COMMENTS:	
NOMINATION SENT ELECTRONICALLY FROM WFSO TO 1 CDN AIR DIV FS BY E-MAIL	

RECOMMENDED TEXT FOR AWARD CITATION TO BE ATTACHED TO NOMINATION IN ELECTRONIC WORD FILE AS PER DIRECTIONS PROVIDED IN A-GA-135-001/AA-001.

CHAPTER 6 – FS FEEDBACK TO THE CHAIN OF COMMAND

GENERAL

1. It is the responsibility of FS personnel at all levels to advise their comd when they have concerns with respect to FS issues. This advice can take many forms (formal / informal briefings, briefing notes, safety committee meetings, informal discussions), but it is essential that all FS professionals, as advisors, make their concerns known to the chain of command.

INTENT OF FEEDBACK

2. The intent of feedback is to provide an assessment to the applicable comd, in as objective a manner as possible, of the degree of safety of flight-related activities with the aim of making this information useful and relevant to the comd. Ideally, feedback should highlight the areas upon which comds must focus in order to improve the safety of flying operations. Flight safety indicators that highlight to the chain of command the degree of safety of flying activities or the level of risk at which operations are being conducted is what the FSO is trying to measure.

ASSESSMENT OF FS INDICATORS

3. The assessment of the FS indicators in a unit should be done by looking at the following components:
- a. documentation of unit FS Program;
 - b. FS implementation or culture within the unit; and
 - c. resources dedicated to the unit FS Program and the status of the various FS tasks at the unit.

FS DEDICATED RESOURCES AND TASKS

4. In order to run an effective flight safety program, established FS positions must be filled by appropriate personnel. In establishing the number of FS positions, some key elements that must be considered are:
- a. the existence of a succession plan to ensure continuity in unit FS positions;
 - b. whether the incumbents have the proper qualifications, the appropriate background, the opportunity to build and effectively use FS experience, and any additional secondary duties are assigned in accordance with this order;
 - c. infrastructure and equipment (offices, equipment storage and, when appropriate, classrooms, IT/IM hardware and software, crash kits);

- d. basic transportation (when required) and communication equipment (including IT resources);
 - e. business plan incorporating FS priorities and objectives with a suitable budget to deliver or the commitment of the Comd to support these initiatives; and
 - f. budget allocation matching the business plan intent.
5. The number of established FS positions should be revised annually to adjust to the mission and tempo of the organization based on the degree to which FS tasks are being completed, with an assessment of:
- a. the status of occurrence investigations and reports;
 - b. regularity of Safety Council meetings and the publishing of meeting minutes;
 - c. degree of completion of safety measures recommended from FS investigations, surveys and follow-up actions from FS meetings;
 - d. frequency and conduct of informal flight safety surveys and tours of facilities;
 - e. frequency of review of unit and fleet FS occurrences;
 - f. currency and relevance of promotional material posted on FS bulletin boards and made available to personnel via different media; and
 - g. frequency of submission of nominations of suitable candidates for FS awards and suitable public and private recognition of deserving individuals.

STRESS POINTS

6. Another indicator of the relative safety of a flying operation is the presence or absence of stress points. The presence of stress points that, in the opinion of the FSO, have significant impact on the safety of the unit's flying operation, must be quantified as accurately as possible and reported when observed. Care must be taken to ensure that the stress points reported actually do affect FS.

FEEDBACK METHODOLOGY

7. In order to act on FS issues, the chain of command must be made aware of the concerns of their FS professionals. It is the duty of the FSO to question, to warn and to suggest alternatives. As champions of FS, the FSO cannot shrink away from making subjective assessments, but we must recognize the need to more clearly quantify our assessments wherever possible.

8. Reporting to a comd may be done verbally or in writing. The latter is preferred in that it is more formal and provides the comd with documented examples that can be acted upon. This also allows the comd to acknowledge the report and indicate his/her intentions, if any, to address problematic issues.

9. Performance measurement of the flight safety program could be reported through some

form of balanced scorecard system or a matrix using a “traffic light” system (RED, YELLOW, GREEN) to indicate performance on the criteria assessed. As a minimum, a brief factual justification for factors rated unsatisfactory or RED must be included in order to fully explain the situation leading to the RED assessment. Such a matrix shows at a glance where the FS staff believes there are concerns and where attention should be focused. The matrix should include objective criteria where possible, but given the nature of some of the issues within the matrix (culture, stress points), a subjective assessment is also required. Wherever possible, subjective assessments should be backed up with facts (statistics, trend analysis, statements from personnel) in order to lend more credence to the assessment. However, it is acknowledged that sometimes the best professional judgement of the FS staff and their “gut feel” will be all that is available. A suggested example of the report matrix format is shown in Annex A. The DFS Intranet website contains a quantitative description of the factors listed above under the tab Resources\Administration. It can be used as a guide for the production of the report.

FEEDBACK CONSIDERATION

10. A careful balance must be achieved between the requirement to inform the chain of command and unnecessarily overstating the level of concern. By continually stating that there will be dire consequences if a particular measure is not taken, there is a risk that leadership will become inured to these warnings. Similarly, operations must be periodically reviewed to ensure that more risk has not gradually been assumed over time due to the absence of occurrences. Judicious use of warnings and regular assessment of risk levels are in order to prevent the gradual increase of risk.

11. The FSO will, at times, be in the position of advising non-Air Force COs. In these instances, it must be remembered that the comd may not be aware of the requirements of this manual or of his / her responsibilities under the Aeronautics Act. A tactful explanation of these requirements will be necessary in such situations. By raising the comd’s awareness of the basic principles of FS, these situations should be overcome. However, as these are valid, legal, regulatory requirements, the FSO must ensure that the comd is made aware of his / her responsibilities and, if required, must enlist the assistance of other FS personnel to ensure that these requirements are not violated.

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Annex A
 Chapter 6
 A-GA-135-001/AA-001

ANNEX A – EXAMPLE FS FEEDBACK MATRIX

FACTOR ¹	DESCRIPTION ³	REMARKS
MANNING	ALL POSITIONS FULLY MANNED AND TRAINED	
PROGRAM	AIR WEAPONS SAFETY PROGRAM NOT FULLY DOCUMENTED IN FS PROGRAM	
FS RESOURCES	FS STAFF AND OFFICES FULLY RESOURCED INCLUDING FUNDING FOR PD COURSES / SEMINARS	
CULTURE	CLEAR EVIDENCE OF A FAIR AND FLEXIBLE REPORTING AND LEARNING CULTURE IN THE UNIT	
TASKS	PREVENTIVE MEASURES NOT BEING TRACKED UNTIL COMPLETION	
STRESS POINTS ²	SOME STRESS POINTS ARE PRESENT.	
OVERALL ASSESSMENT	SUBJECTIVE COMBINED ASSESSMENT ON HOW SAFE THE UNIT IS OPERATING	

¹ Assessments factors may be added as required by the FSO, but they must include an explanation as to their intent.

² Any individual or overall factors assessed as RED must be accompanied by a suitable explanation and supporting documentation.

³ The DFS Intranet website contains a quantitative description of the factors listed above under the tab Resources\Administration. These can be used as a guide for the production of the FS feedback report.

⁴ Colour code

 Satisfactory

 Cautious, should be resolved to return to a satisfactory state

 Unsatisfactory, should be risk mitigated and resolved as soon as possible

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CHAPTER 7 – OCCURRENCE REPORTING

AIRWORTHINESS INVESTIGATION AND THE FS PROGRAM

1. Chapters 7 to 11 of this manual deal with the airworthiness investigation of matters concerning safety as delegated to the AIA from the MND and outlined in the AIM (reference C). These investigation activities fulfil both a Flight Safety and an Airworthiness Program objective but are identical in their accomplishment. Because the FS Program predates the Airworthiness Program, all Flight Safety Investigation terms such as FSIR are retained, even though they are the product of airworthiness investigation activities too. Of note, all investigation activities are conducted on behalf of the AIA through a system of qualifications, certifications and authorizations within the FS Program's established structure. Annex C explains the AIA's requirements and conditions for all FS positions with the associated certifications to carry out such investigations.

PURPOSE OF REPORTING

2. The purpose of FS reporting is to alert all concerned of circumstances that have resulted in or have the potential to cause damage to aircraft, air weapons or injuries to personnel. FS occurrence reporting and investigation allow appropriate PM to be identified and implemented by comd authorities.

DEFINITIONS

AIRCRAFT

3. A machine capable of deriving support in the atmosphere from reactions with the air.
- a. CF Aircraft. Includes aircraft that have been accepted by the CF through purchase, loan or bailment. For FS purposes, aircraft belonging to the Air Cadet League of Canada and aircraft considered "military conveyance" as defined by the CTAISB Act. Aircraft under production for the CF are considered CF aircraft from the moment they leave the production line following final assembly, regardless of the actual acceptance date. This situation could be modified by contract provisions or special agreements.

NOTE

The CTAISB Act gives MND the responsibility for investigating occurrences involving military conveyances. A working agreement between DFS and TSB further articulates the generally accepted meaning of the CTAISB Act definition. While it is clear that civilian companies conducting day-to-day military contracted operations, such as contracted for pilot ab-initio and primary flight training for the CF are always considered military conveyances, there remain significant grey areas that can only be resolved on a case-by-case basis between DFS and TSB. When there is a significant occurrence involving a civilian air asset or civilian personnel, the WFSO should inform DFS so that the appropriate coordination with TSB can occur.

- b. Non-CF Aircraft: These are subdivided as follows:
 - (1) Non-CF military aircraft. There are two categories of non-CF military aircraft:
 - (a) Allied Military Aircraft. These are aircraft belonging to an allied military force. When the CF assumes quality-assurance responsibility for these aircraft during production, repair, modification or overhaul, they are considered CF aircraft from the moment they are accepted by the contractor until they leave Canada or are accepted for flight by an aircrew of the country of ownership.
 - (b) Non-allied Military Aircraft. These are aircraft belonging to a non-allied military force.
 - (c) Civilian Aircraft. This term is normally self-explanatory, but when a CF aircraft is lent or bailed to a civilian agency on a temporary basis, the CF continues to be involved.

COLLATERAL INVESTIGATION

4. This term applies to any investigation of an occurrence conducted by other than FS personnel or for purposes other than FS.

FS AIRWORTHINESS INVESTIGATOR

5. The airworthiness investigator is a FSO appointed by DFS/AIA who has received specialty training in aviation occurrence investigations. This airworthiness investigator is certified as qualified as delineated in the AIM and is authorized to conduct independent airworthiness investigations.

FS PUBLICATIONS

6. FS publications include all material published by DND for FS purposes, including posters, charts, booklets and the like, intended to assist FSOs and others in reporting procedures and cause factor assessment.

FS REPORTS

7. This term refers to all reports, whether oral or written, made under the authority of this manual.

FS OCCURRENCE

8. See definition at Chap 1.

NOTE
The aircraft, its equipment or its operation must have contributed to the event for it to be classed as an air incident.

NOTE
During paratroops, SAR Techs and their equipment are considered part of the aircraft until the SAR Tech or equipment has safely reached the ground or water.

NOTE

The following events are FS occurrences: lightning strike, bird strike, emergency jettison, loss of cargo or slung load, inadvertent firing or hang-up of airborne armament equipment or munitions, precautionary power plant shut-down, aircraft exceedence, near mid-air collision, malfunction of life-support equipment, crew member experiences an aeromedical problem, damage to civilian or military property, or any other event having accident potential.

AIR FS OCCURRENCE

9. An event involving a CF aircraft that occurs between the time the first power plant start is attempted with intent for flight and the time the last power plant or rotor stops. For a glider, the event took place from the time the hook-up is completed until the glider comes to rest after landing.

GROUND FS OCCURRENCE

10. An event involving a CF aircraft that occurs when there is no intent for flight, or when there is intent for flight but no power plant start has been attempted, or after the power plants and rotors have stopped.

FS ACCIDENT

11. An event in which one or more of the following occurred:
- a. a person is missing or receives fatal, very serious or serious injuries or illness (Black, Red or Yellow) as determined by a medical officer in accordance with CFAO 24-1. The aircraft, its equipment or its operation must have contributed to the event for it to be classed as an air accident; or
 - b. a CF aircraft is destroyed, missing or sustains very serious or serious damage.

FS INCIDENT

12. An event in which one or more of the following must occurred:
- a. someone receives minor injuries (Green or Nil) as determined by a medical officer in accordance with CFAO 24-1, or there is risk of injury;
 - b. a CF aircraft sustains minor damage; or
 - c. there is no injury or damage but accident potential did exist;

NEAR MID-AIR COLLISION (NMAC)

13. A NMAC situation is an unintentional pass between aircraft within 1000 feet or a situation wherein one or more aircraft had to manoeuvre aggressively to avoid a mid-air collision.

UNMANNED AIRCRAFT SYSTEM (UAS)

14. A UAS is defined as any aircraft, including support and control elements, being part of a system designed or modified not to carry an on-board human pilot and operated through remote or self-contained automated control (ref A). As an aircraft system, a UAS must meet all applicable standards required of a conventionally crewed aircraft.

UNMANNED AIRCRAFT VEHICLE (UAV)

15. A UAV is defined as a power-driven aircraft that is designed to fly without a human operator on board. The UAV is the aircraft portion of a UAS.

STAGE OF OPERATIONS

16. This term refers to the task that is being attempted or performed at the time of an occurrence. To ensure consistency in statistical analysis, the stages of operation are categorized as follows:

- a. Parked: Power plants and rotors are stopped, and the aircraft is stationary or unintentionally in motion; chocks may or may not have been used. No action is in progress that is directly associated with any other stage of operation.
- b. Maintenance: Power plants are stopped and maintenance duties, including servicing, refuelling, inspection, modification, repair and arming, are being performed on the aircraft. Towing, loading and run-up are excluded.
- c. Towing: The aircraft is being positioned, or prepared for positioning, by towing, pushing or bear trap handling.
- d. Loading: The aircraft is being loaded or unloaded with cargo, passengers or crew or is being prepared for loading or unloading.
- e. Ground running: The aircraft is stationary or unintentionally in motion, with a power plant being started, running or being shut down. Temporary pauses in the taxi stage are not categorized as ground running.
- f. Taxiing: The aircraft is intentionally moving under its own power on land, a flight deck or water before the application of power for take-off or after the direction of the landing roll is changed to taxi. It also includes aircraft moving by intentional coasting with power plants stopped or taxi operations where there is no intent for flight. It does not include air-taxiing by helicopters.
- g. Take-off: Lasts from the time that power is applied for take-off until reaching 500 feet AGL or operating height, whichever is lower. For a deliberate touch-and-go landing, the take-off stage starts when power is re-applied.
- h. In flight: In flight lasts from the time the aircraft reaches 500 feet AGL or operating height, whichever is lower, until the landing phase is initiated. Helicopters are considered to be in flight when air-taxiing, slinging, hoisting, rappelling or hooking up or jettisoning loads. Occurrences involving paradrops are also included under this stage of operation.

- i. Landing: Landing lasts from the time the landing phase is initiated until the time the direction of the landing roll is changed to taxiing.

HAZARD CONDITION

17. Any actual or potential condition that results or can result in the degradation of the level of aviation safety.

UNIT OF OCCURRENCE

18. This term refers to the unit involved in the event or, in the case of an accident occurring at other than a CF wing or base, an appropriate unit close to the accident site.

UNIT OF OWNERSHIP

19. This term refers to the unit that has control and authority over the aircraft. For ground occurrences, the unit of ownership is the unit, wing, or base to which the aircraft is assigned in order to accomplish a specific operational or maintenance task. The only exceptions are:

- a. for aircraft that are undergoing depot-level maintenance at a contractor's plant, the appropriate NDQAR is the unit of ownership and ADM (Mat)/NDHQ is the headquarters;
- b. for new aircraft being produced for the CF, the applicable NDQAR assumes unit of ownership status from the moment that the aircraft leaves the production line following final assembly, regardless of the acceptance date;
- c. the provisions of subparagraphs above also apply to allied military aircraft that are being maintained or manufactured in Canada under a CF-supervised contract; and
- d. for other non-CF aircraft, the DFS shall make suitable arrangements.

REQUIREMENT FOR REPORTING

20. A critical requirement of the FS Program is that FS occurrences be reported. If all events that cause a potential or actual SoF compromise are reported, then emerging trends can be identified and analyzed. The analysis then allows appropriate PM to be devised and implemented. Comds must encourage personnel to report all occurrences and hazards.

REPORTING INFORMATION LINKED TO OPERATIONS

21. Reporting FS information is vital to the FS and Airworthiness Investigation Program. However, there will be times when operational security (OPSEC) and operational/time sensitive information could have effect on active operations. In these cases, the method and security associated with reporting must be adjusted to counter the possible negative effects that public release of information or knowledge of an occurrence could impart on non-friendly forces. For example, it may not be appropriate to transfer information in an unsecure manner on an occurrence for an air asset that is actively engaged in operations in a forward area since the knowledge of this event could be advantageous to enemy operations. For such circumstances,

reports must still be made in a timely but secure manner so as to preclude any advantages such knowledge might impart on these non-friendly forces. FS reports containing classified information shall only be transmitted to DFS by secure means in an encrypted message or e-mail as per Annex E of Chapter 9.

REPORTING RESPONSIBILITY

22. Comd 1 Cdn Air Div and 2 Cdn Air Div retain responsibility for the reporting of all FS occurrences involving CF air assets. Comds of commands, formations, wings, bases, and units and managers of contracted organizations responsible for conducting or supporting air operations shall ensure that all FS occurrences, the applicable cause factors and PM are reported in accordance with the provisions of this manual. Comds shall ensure that all aircraft commanders, air vehicle operators and all other personnel supporting air operations are conversant with FS reporting procedures.

23. Injuries reported as part of an FS occurrence and under the authority of this manual must also be reported to the General Safety Program. It will require investigation by the appropriate authorities external to the FS Program in accordance with A-GG-040-001/AG-001.

HAZARD REPORTING

24. Personnel at all levels must maintain vigilance for potential hazards within the work place. This could take the form of unsafe work habits, environmental conflicts, or management direction. When these hazards are recognised, personnel should be encouraged to report them to the FS representatives in their unit. The Hazard Report Form (Annex A) can be used to alert the FS System to potential problem areas. It is available in electronic format on the DFS website. This form may be submitted anonymously or it may be signed. When the unit FS NCM or Officer receives a Hazard Report it shall be assessed for its validity and possible PM to mitigate it. If the Hazard Report has been signed the person that submitted the report may be contacted for further clarification if desired.

25. The hazard shall be treated the same way as an occurrence with respect to the responsibilities for tracking and closing, and the report will be closed only when the PM have been implemented or rejected by the appropriate authority. Once a hazard report has been closed, it is essential that the FSO report back to the individual who submitted the report (if identified) on the action taken or why, as applicable, PM could not be implemented. This all-important step is key if we are aiming to encourage open and honest reporting of hazards.

26. The Hazards Reporting Form at Annex A includes an identification of “Hazard severity” and “Probability”, which will correspond to a level of risk in FSOMS. This level is identical to the risk matrix used for RARM. For all risks above “acceptable”, the hazard has to be reported up to the 1 Div FS office, as detailed in Chap 11 Annex B. To ensure adequate and timely visibility of all hazards at higher headquarters, it is critical that UFSO/WFSO input and release (i.e. “sent”) the hazard reports within FSOMS.

INITIAL INCIDENT REPORT

27. The FSOMS is normally used to report a simple occurrence. If unable to access the FSOMS, a telephone call or a CF215 FS message report is to be submitted to the home unit for input to the database.

INITIAL ACCIDENT REPORT

28. Immediately following an accident or serious occurrence (as per Ch 9 and Annex A and B), call DFS at 1-888-WARN DFS (927-6337) and the chain of command as appropriate (NDHQ CJOC and/or 1 Cdn Air Div AOC). An initial report (IR) must follow. See Annex B for Accident Notification Procedures. DFS shall be contacted as soon as possible for any accident (Occurrence category 'A' to 'C' and/or for any occurrence having a SFCL equal or greater than High).

GUIDELINES FOR REPORTABLE OCCURRENCES

29. The following guidelines should be applied to ascertain if an event should be reported as an FS occurrence:

- a. Was there an accidental injury or illness to a person or damage to a civilian or military property or to a CF/DND operated aircraft as a result of CF/DND air operations?
- b. Was there potential for injury or illness to a person or potential for damage to a civilian or DND property or to a CF/DND aircraft as a result of CF/DND air operations?
- c. Could reporting the FS event generate a PM that may prevent a similar occurrence?
- d. If the answer to any of these questions is yes, then an FS occurrence report shall be filed.

30. This concept can be directly applied to occurrences involving flight and support to flight operations; however, the concept is more difficult to apply where involvement in flight line operations is less obvious. If flight safety is not jeopardized, then the event should be reported as a general safety occurrence.

FS REPORT CLASSIFICATION

31. FS reports and supporting documentation will normally be unclassified. However, some of the information contained in these reports and documentation is protected under the *Aeronautics Act*, the *Canadian Transportation Accident Investigation and Safety Board Act*, the *Canadian Human Rights Act* and the *Access to Information Act*. Therefore, FS information will not be released without the express authority of DFS.

NOTE

FSOMS is not a classified system and shall not mix classified and unclassified data. In the case of a classified FS occurrence, the reporting unit shall provide the IR content relating to the classified FS occurrence over secure means. An electronic proformat form can be downloaded from the DFS Intranet website under tab Resources\ Administration. The details of the occurrence will not be entered into FSOMS. DFS will retain ownership of the occurrence until it is deemed declassified. When the occurrence is declassified, the details of the investigation will be uploaded in FSOMS by DFS. Ownership of the occurrence will then revert to the reporting unit/organizations.

OBLIGATION TO REPORT

32. An FS occurrence IR is required for each separate event involving injury to personnel or damage to CF aircraft, air vehicles or support equipment, or when flight safety was affected. If two or more aircraft are involved in a single event, one FS report will normally be required.

OCCURRENCES INVOLVING NON-CF AIRCRAFT

33. Regardless of the report(s) required by non-CF authorities, occurrences involving non-CF aircraft shall be reported as directed in this publication.

AIRCRAFT AT CIVILIAN CONTRACTORS

34. FS occurrence reports are required for each occurrence involving aircraft where there is CF involvement during the periods specified as follows:

- a. new aircraft (except when special arrangements exist): from the time a CF aircraft leaves the production line after final assembly;
- b. aircraft on inspection, repair or overhaul: for the entire period an aircraft is at a civilian contractor facility; and
- c. allied military aircraft under a CF supervised contract: treat as a CF aircraft until it leaves Canada or is accepted by aircrew of the country of ownership.

CONTRACTED AIRCRAFT/FACILITIES

35. Reports are required for each occurrence involving a non-CF aircraft when there is CF involvement. In the case of contracted training, operational flying or maintenance, the applicable contract or memorandum of understanding (MOU) will govern the organization's FS reporting requirement and clearly identify the extent of CF involvement:

- a. non-CF aircraft and facilities under contract to provide support to CF flying operations at or below the wing/base or unit level shall be included within the existing wing/base or unit FS program and will report FS occurrences under the authority of the applicable wing/base or unit comd;
- b. FS reporting by contractors providing support through NDQAR or equivalent third-line maintenance facilities shall report occurrences through an assigned wing FSO familiar with those contractor operations; and
- c. CF aircraft FS occurrences involving civilian aircraft, civilian facilities and civilian aircraft operating at military facilities in Canada shall be reported to the nearest TSB Regional Office. Near misses or similar occurrences involving civilian ATC units are to be reported to the NavCanada Regional Air Traffic Services Officer, and a normal FS occurrence report is to be filed.

OCCURRENCES INVOLVING PARACHUTISTS/RAPPELLERS

36. SAR Tech Personnel. Occurrences involving SAR Tech personnel jumping from either CF aircraft or CF military conveyance aircraft will be classified as FS occurrences if the event took place during the jump exit, parachute descent or parachute landing. These occurrences will be filed against the tail number of the aircraft from which they jumped. Occurrences that transpire after the SAR Techs are safely on the ground are to be handled through the General

Safety Officer.

37. Other Personnel. Parachute and rappel occurrences involving all other parachutists or rappellers who are jumping from either CF aircraft or CF military conveyance aircraft will be classified as FS occurrences only if the event took place while on board the aircraft or during the aircraft exit and if it is determined that the aircraft (and by extension the flight crew) or aircraft equipment used did contribute to the occurrence. On the contrary, the occurrence shall be reported through the General Safety Officer.

NOTE

These events are logged according to the tail number of the aircraft involved in the occurrence.

OCCURRENCES INVOLVING UAVs

CATEGORIES OF UAVs

38. The categories described below represent guidelines only, especially in regard to maximum takeoff weight (MTOW) and may be adjusted for specific system types. The category in which a UAS resides shall be stated in the Type Certificate, Restricted Type Certificate, or the Specific Purpose Flight Permit. The UASs are divided into three categories according to the UAV MTOW as follows:

- a. Class 1: UAV with MTOW of less than 150kg (330 lbs). This classification comprises the following sub-categories:
 - (1) Micro: UAV weighing less than 1kg (2 lbs),
 - (2) Mini: UAV weighing from 1kg up to and including 15kg (2 lbs up to and including 33 lbs), and
 - (3) Small: UAV weighing greater than 15 kg to less than 150kg (33 lbs to less than 330 lbs);
- b. Class 2: UAV with MTOW of 150kg up to and including 600kg (330 lbs up to and including 1323 lbs) MTOW; and
- c. Class 3: UAV with MTOW is greater than 600kg (greater than 1323 lbs).

UAS OCCURRENCE REPORTING

39. UAVs, like any other CAF aircraft, are subject to the CAF FS Program. UAV FS reporting takes into consideration design, function, complexity and level of skill required for their operation and maintenance. Damage to a UAV component that is designed as consumable will not normally be reported using FSOMS. The following guidelines will apply to the reporting of UAV FS occurrences:

- a. Class 1:
 - (1) Micro: the following occurrences shall be reported:

- (a) injuries or potential for injury to personnel, and
- (b) violation of assigned airspace;
- (2) Mini: Report all occurrences as stipulated above and:
 - (a) Level of damage is at least very serious,
 - (b) Failed launch and recovery/capture,
 - (c) Uncommanded control input,
 - (d) NMAC; and
- (3) Small: Report all occurrences stipulated above and:
 - (a) Level of damage is serious or above, and
 - (b) Maintenance failures or related conditions affecting safety of flight;
- b. Class 2: Report all occurrences stipulated above; and
- c. Class 3: Exactly as per manned aircraft.

NOTE
The Investigation Class and agency will be at the discretion of the AIA as per Annex B of Chapter 9.

OCCURRENCES INVOLVING AIR WEAPONS SYSTEM

40. Para 24 of chapter 1 explains the generic responsibilities accepted by DFS on behalf of the Air Weapons Safety Program. Any occurrence associated with an air weapon, and/or an air weapons system, from the time it is removed from ready-use magazine or unit A&E lock-up for operational use until its safe separation from the aircraft or return to a ready-use magazine or a unit A&E lock-up.

NOTE
Ready-use A&E items have normally been removed from their ammunition containers and could have been assembled in various configurations, as needed for operational use. As qualified, they would be ready for use and as a result do represent a higher risk when handling them.

NOTE
Given the cause of the malfunction of an air weapon cannot be established before an investigation takes place, the aircraft or aircraft weapon system would be quarantined, as required, to determine following investigation the requirements to complete a CF349 and/or a CF410.

- 41. Any occurrence involving an air weapon will be reported in the following manner:
 - a. FSOMS Report (CF215). A CF215 shall be filed through FSOMS for any weapons related occurrence where there was damage or a risk of damage to

aircraft, property or the air weapons system itself, or injury or a risk of injury to personnel. Examples include the following:

- (1) accidental functioning of an air weapons store,
- (2) inadvertent release or firing of an air weapons store,
- (3) hazardous malfunctioning (e.g. runaway gun, hang-up) or mishandling of an air weapon or air weapons system (e.g. maintenance performed on an unsafe air weapon, air weapons system not handled according to approved safety precautions, etc.), and
- (4) related weapon occurrence where approved safety procedures were not followed.

NOTE

The CF215 is not required for hand-initiated and manually deployed or released store occurrences where safety of flight, equipment or personnel was not compromised.

NOTE

For a malfunction such as a dud where there is no safety of flight compromise, the CF215 may be completed using the 'For Tracking Purpose Only' as per direction in this publication at Ch 9.

NOTE

The completion of a CF215 report replaces the requirement to file an Ammunition or Explosives Accident or Incident report as required by the Ammunition and Explosives Safety Program. The staff of the Director Ammunition and Explosives Regulation monitors FSOMS for related safety issues.

- b. Ammunition and Explosives Defect and Malfunction Report (CF410). A CF410 shall be filed by the armament authority IAW A-GG-040-006/AG-002 for any defect and malfunction, regardless whether safety of flight is compromised or not, and whether a CF 215 is filed or not. Examples include the following:
- (1) malfunction of a deployed or released store (i.e. flare malfunction, bomb malfunction, jammed gun, etc.),
 - (2) malfunction of ammunition, weapon or explosive,
 - (3) damage to an air weapons system or component; and
 - (4) the malfunction of a hand-initiated and manually deployed or released store (i.e. flare, signal smoke and marker), and

NOTE

The completion of a CF410 is mandatory and very important in order to document the malfunction or defect and assist in identifying trends and deficiencies of the item IAW DAOD 3002-4. A-GG-040-006/AG-002 provides procedures for CF410 completion.

NOTE

While beyond the responsibility of the FS Program, the usage of air stores within Canadian Forces ranges shall be reported in the Canadian Forces Range Information System (CFRIS) as per CANFORGEN 104/11.

NOTE

The release and/or impact location of the malfunctioned store shall be recorded on the CF410 to aid Unexploded Ordnance (UXO) tracking and is especially important for stores deployed or released over and impacting non-DND property.

- c. Aircraft Unserviceability Report (CF 349). A CF 349 shall be filed when it is assessed the aircraft or aircraft system causes the weapon system malfunction (e.g. hang-up bomb or unexploded ordnance where aircraft system caused the weapon system malfunction).

FS OCCURRENCE MANAGEMENT SYSTEM

42. To evaluate the effectiveness of their FS Programs, comds and FSOs at every level must maintain records of every FS occurrence and hazard involving their facilities, equipment and personnel. The FS Occurrence Management System (FSOMS) is the primary tool to assist this process and is useful for identifying trends.

43. The FSOMS was developed to meet the automated support needs of the CF FS Program. It provides FSOs at all levels with an ability to input, record and track FS occurrences.

44. FSOMS shall be used to record all FS occurrences. If unable to access the FSOMS or if the situation warrants immediate notification of a serious occurrence, the FS occurrence information shall be forwarded to an FSO by telephone, fax or CF msg using the CF 215 FS message form. Routine FS occurrences will be submitted to the home unit FSO for input to the FSOMS database. As FSOMS does not automatically inform comds of FS occurrence information, FSOs shall review FSOMS on a regular basis to ensure FS information has been distributed as required.

45. The unit of ownership is responsible for originating the FS report and ensuring it is entered in FSOMS. The unit of occurrence shall also ensure all additional reports related to the occurrence have been completed. In certain circumstances coordination between the unit of ownership and unit of occurrence may be necessary to ensure all pertinent FS information has been recorded. FSOMS development and policy is a DFS responsibility. The training of FS personnel on the use of FSOMS to input initial investigation data and hazard reports is the responsibility of 1 Cdn Air Div FS and will be delivered through the Basic FS Course.

TRANSFER OF OWNERSHIP

46. In the case where a unit discovers and reports an occurrence that should be investigated by another unit, the reporting unit will liaise formally with the investigating unit and discuss transfer of the investigation. Upon agreement, the unit invited to investigate the occurrence will acknowledge acceptance of ownership by forwarding the correspondence

to DFS 2, cc DFS 3-2 (FSOMS Manager) and request official transfer of the investigation. If agreement on ownership cannot be reached, the reporting unit can request that DFS 2 decide which unit shall be responsible for the investigation. DFS 3-2 will ensure that any transfers be documented as appropriate and actioned in FSOMS.

REPORT FORMS AND TAGS

FS FORMS

47. The following FS forms can be downloaded from the DFS Intranet site under tab Resources\Administration:

- a. Flight Safety Occurrence Report Initial (CF 215). A CF 215 shall be submitted to a FSO within 12 hours of an occurrence involving the security of a Canadian Forces aircraft.
- b. Flight Safety Hazard Report (DND 2484). A DND 2484 should be filed when personnel identifies any condition that has the potential to cause injury or damage during CAF air activities or support to the latter. This form is designed to track and record (through FSOMS) observations on hazardous conditions or deficiencies in the aviation system. A sample form can be found at Annex A.
- c. Report of Emergency Escape from Aircraft (DND 1056). A DND 1056 shall be submitted by every survivor who has abandoned an aircraft during an emergency situation, e.g. fire, ejection or bail-out.
- d. Report of Emergency Landing/Ditching on Water (DND 724). A DND 724 shall be submitted for every emergency water landing (ditch).

OTHER RELATED REPORT FORMS

48. The following reports and / or forms are often used by FSOs to ensure command authorities are properly advised of the circumstances surrounding an occurrence. The forms may be obtained through normal supply action.

- a. Report on Injuries or Exposure to Toxic Materials or Substances (CF 98). A CF 98 is used to report serious or very serious injuries and fatalities. In situations where FS occurrences involve injury to personnel, FSOs should ensure the unit General Safety Officer (GSO) is aware of the injury.

NOTE

Entry of the injury into the FSOMS database does not ensure either a CF 98 Report on Injuries or Exposures to Toxic Materials or Substances or CF 663 Accident Prevention Report is completed or medical authorities are aware of the injury and/or exposure.

- b. Coroner's Report. A copy of this report, if raised, shall be included with the medical report.

- c. Unsatisfactory Condition Report (UCR) (CF 777A). A CF 777A may be submitted to address conditions directly affecting the safety of flight. The report shall be submitted in accordance with C-02-015-001/AG-000. All FS UCRs shall be coordinated with the FSO.

NOTE

Where the occurrence investigation reveals deficiencies with aviation Life Support Equipment (ALSE), the FSO should ensure the Unit ALSE Officer is briefed of the ALSE issues. Entry of the occurrence into the FSOMS database does not ensure appropriate ALSE corrective actions have been taken.

- d. Significant Incident Report (SIR). This report should be filed when an aircraft occurrence will likely create public interest. DAOD 2008-3 – *Issue and Crisis Management* governs the production of an SIR.
- e. Ammunition and Explosives Defect and Malfunction Report (CF 410). A CF 410 shall be submitted for ammunition defects and malfunctions as per A-GG-040-006/AG-002 - DND *Ammunition Accident/Incident/Defect/Malfunction Reports And Disposal Requests*.
- f. Aircraft Maintenance Management Information System (AMMIS) (CF 349 and 543). To be submitted by first-line, second-line and third-line maintenance facilities as required. Maintenance documentation produced following an FS occurrence must be annotated as FS as per C-05-030-001/AG-001. This annotation will ensure that the FS investigation is prioritized and that the chain of evidence custody is preserved.
- g. ADDN Occurrence Report. This form is for ships at sea.

AIRCRAFT ACCIDENT TAGS

49. Tag NSN 9905-21-872-3060 is to be used by investigators to identify and quarantine items during the conduct of FS investigations.

Annex A
Chapter 7
A-GA-135-001/AA-001

ANNEX A – HAZARD REPORT FORM DND 2484



**Flight Safety Hazard Report
Rapport de sécurité des vols - Situation dangereuse**

Ref: A-GA-135-001/AA-001 You can prevent aircraft accidents by reporting hazards. A flight safety (FS) hazard is any condition that has the potential to cause injury or damage. Please take a moment to complete this form. Pass the completed form to your FS staff as promptly as possible so this hazardous condition may be addressed BEFORE it causes an occurrence. The report may be submitted <u>anonymously</u> to any Flight Safety Office or mailed to DFS directly. Reports will be treated in the strictest confidence. The voluntary inclusion of contact details will help the Flight Safety staff to follow up the investigation.		Référence : A-GA-135-001/AA-001 Vous pouvez prévenir les accidents d'aéronef en signalant les situations dangereuses. Une situation dangereuse en sécurité des vols (SV) est toute situation risquant de causer des blessures ou des dommages. Veuillez prendre quelques instants pour remplir le formulaire. Remettez-le dès que possible au personnel de la SV pour que cette situation dangereuse puisse être traitée AVANT que ne se produise un accident. Le rapport peut être soumis de façon anonyme à n'importe quel bureau de la SV ou posté directement à la DSV. Les rapports sont traités en toute confidentialité. La mention volontaire des coordonnées du soumissionnaire permet au personnel de la SV d'assurer un suivi après enquête.		
Contact info: Director Flight Safety National Defence Headquarters Major-général George R. Pearkes Building 101 Colonel By Drive Ottawa ON K1A 0K2 E-mail: dfs.dsv@forces.gc.ca Phone: 1-888-WARN DFS / 1-888-927-6337		Information pour communiquer : Directeur - Sécurité des vols Quartier général de la Défense nationale Édifice Major-général George R. Pearkes 101, promenade Colonel By Ottawa (Ontario) K1A 0K2 Courriel : dfs.dsv@forces.gc.ca Téléphone : 1-888-WARN DFS / 1-888-927-6337		
Date reported (yyyy-mm-dd) - Date du signalement (aaaa-mm-jj)				
Name - Nom		Rank - Grade	Unit - Unité	Telephone - Téléphone
Hazard description (<i>The hazard I observed is ...</i>) Description de la situation dangereuse (<i>La situation dangereuse que j'ai observée est ...</i>) (Use additional sheet if needed – Utilisez une page additionnelle au besoin)				
Hazard severity (<i>provide your personal evaluation of the potential consequences if this hazard materializes</i>) (<i>see reverse for definitions</i>) Gravité de la situation dangereuse (<i>fournissez votre propre évaluation des conséquences possibles si cette situation se produisait</i>) (<i>voir au verso pour les définitions</i>) <input type="checkbox"/> Catastrophic / Catastrophique <input type="checkbox"/> Hazardous / Dangereuse <input type="checkbox"/> Major / Importante <input type="checkbox"/> Minor / Légère <input type="checkbox"/> Negligible / Négligeable				
Hazard probability (<i>provide your personal estimate of the likelihood of this hazard occurring</i>) (<i>see reverse for definitions</i>) Probabilité de la situation dangereuse (<i>fournissez votre propre estimation de la probabilité que cette situation se produise</i>) (<i>voir au verso pour les définitions</i>) <input type="checkbox"/> Frequent / Fréquent <input type="checkbox"/> Probable <input type="checkbox"/> Remote / Faible <input type="checkbox"/> Extremely remote / Très faible				
Suggestion solution – Solution suggérée				

Hazard definitions	Définition de situations dangereuses
Severity	Gravité
Catastrophic: All hazard conditions which would prevent continued safe flight and landing. Could result in death of the flight crew normally with loss of the aircraft.	Catastrophique : Conditions dangereuses qui pourraient nuire à la sécurité des vols et des atterrissages. Pourraient être une cause de mortalité de l'équipage de bord *accompagnée de la perte de l'aéronef, en général.
Hazardous: Hazard conditions that would reasonably be expected to result in a large reduction in safety margins or functional capabilities, including higher crew workload or physical distress such that crew may not be relied upon to perform tasks accurately or completely. Could result in death or major injury to aircraft occupants or major damage to an aircraft system. Could result in death or major injury to ground personnel or the general public.	Dangereuse : Conditions dangereuses qui risquent d'entraîner une diminution importante des marges de sécurité ou des capacités fonctionnelles, incluant d'accroître le charge de travail de l'équipage ou d'entraîner des souffrances qui pourraient empêcher l'équipage d'accomplir adéquatement ou entièrement ses tâches. Pourraient être une cause de mortalité ou de blessures graves aux occupants de l'aéronef ou de dommages graves à un système de bord. Pourraient être une cause de mortalité ou de blessures graves au personnel au sol ou au public en général.
Major: Hazard conditions that would reasonably be expected to result in a moderate reduction in safety margins or functional capabilities, including a moderate increase in crew workload or physical distress impairing crew efficiency. Possible physical distress, including injuries to occupants or minor damage to an aircraft system.	Important : Conditions dangereuses qui risquent d'entraîner une diminution modérée des marges de sécurité ou des capacités fonctionnelles, incluant d'accroître modérément la charge de travail de l'équipage ou des souffrances nuisant à son efficacité. Ces souffrances ou dommages pourraient consister en des blessures aux occupants ou des dommages mineurs à un système de bord.
Minor: Hazard conditions that would not significantly reduce aircraft safety, but would reasonably be expected to result in a slight reduction in safety margins or a slight increase in crew workload.	Légère : Conditions dangereuses qui ne réduiraient pas grandement la sécurité des vols, mais qui pourraient réduire légèrement les marges de sécurité ou la charge de travail de l'équipage de bord.
Negligible: No effect on safety. Negligible effect on safety margins.	Négligeable : Aucun effet sur la sécurité. Effet négligeable sur les marges de sécurité.
Probability	Probabilité
Frequent: Occurs continuously for the entire fleet or aircrew population.	Fréquente : Se produit continuellement dans toute la flotte ou pour tout le personnel navigant.
Probable: Occurs or likely to occur several times per year for the entire fleet or aircrew population.	Probable : Se produit ou susceptible de se produire plusieurs fois par année dans toute la flotte ou pour tout le personnel navigant.
Remote: Occurs or likely to occur one or more times per year for the entire fleet or aircrew population.	Faible : Se produit ou susceptible de se produire une fois ou plus par année dans toute la flotte ou pour tout le personnel navigant.
Extremely remote: Not expected to occur or likely to occur one or more times for the entire operational life of the fleet or aircrew population.	Très faible : Ne devrait pas se produire ou susceptible de se produire une fois ou plus pendant la durée de vie de toute la flotte ou pour le personnel navigant.

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Annex B
Chapter 7
A-GA-135-001/AA-001

ANNEX B – ACCIDENT AND SERIOUS OCCURRENCE NOTIFICATION PROCEDURES

TYPE OF OCCURRENCE	UNIT OF OCCURRENCE	WING *	DFS
ACCIDENTS "A" TO "C" OR ANY OCCURRENCE WITH A SFCL OF HIGH OR EXTREME	NOTIFY WING OF OWNERSHIP BY FASTEST POSSIBLE MEANS. IF NOT PRACTICABLE, CALL 1-888-WARN DFS (927-6337).	IMMEDIATELY TELEPHONE DFS AT 1-888-WARN DFS (927-6337)	IF CIVILIAN INVOLVEMENT, NOTIFY TSB FOR A COORDINATED INVESTIGATION.
		<p>FOR "A" AND "B" ACCIDENTS ONLY, IMMEDIATELY CONTACT AS APPLICABLE:</p> <ul style="list-style-type: none"> The Canadian Forces Integrated Command Centre Strategic Watch Officer: 613-945-2643 if accident in Canada, the Canada COM Operations Desk: 613-945-2639/2417 If accident outside Canada, the Canadian Expeditionary Forces Command (CEFCOM) Operations Desk: 613-995-0454 The Canadian Special Operations Forces Command (CANSOFCOM) Desk: 613-998-4390 during working hours or after hours via Email CANSOFCOMOPS CANSOFCOM Ottawa-Hull@forces.gc.ca 1 Cdn Air Div Combined Air Operations Centre (CAOC) Duty Watch Officer: 204-833-2650. 	
	IF OUTSIDE NORTH AMERICA OR EUROPE, NOTIFY THE NEAREST CANADIAN DIPLOMATIC OR FOREIGN LIAISON STAFF.	ENSURE DFS AND 1 Cdn Air Div FS ARE ADVISED AS SOON AS POSSIBLE. BRIEF DUTY OFFICERS AND CONFIRM DETAILS AS KNOWN.	IF FOREIGN MILITARY INVOLVEMENT, CONTACT APPROPRIATE FS ORGANIZATION.
	WITHIN 12 HOURS SEND AN FS INITIAL REPORT USING FORMAT AT ANNEX E, CHAPTER 9.	IF A FATALITY IS INVOLVED, NOTIFY THE LOCAL PROVINCIAL CORONER IN ACCORDANCE WITH CFAO 24-6.	TASK A FS INVESTIGATION.
	FOLLOW CFAO 24-1 DIRECTIONS FOR CASUALTY REPORTING AND ADMINISTRATION.		

NOTE

Cellular phones should not be used to transmit sensitive information such as crew injuries or fatalities.

* Actions to be taken by the Supporting or Occurrence Wing as applicable.

Annex C
 Chapter 7
 A-GA-135-001/AA-001

ANNEX C - AIRWORTHINESS INVESTIGATOR MATRIX

AI POSITION	CONDITIONS REQUIRED TO CARRY OUT AIRWORTHINESS INVESTIGATION ACTIVITIES		
	QUALIFICATIONS (NORMAL UNLESS WAIVER ISSUED)	AIA AUTHORIZATION	OTHER REQUIREMENTS
UNIT FSO/FS NCM	BI 2 (ISSUED BY 1 DIV FSO)	AS PER AIM REGULATIONS AND POLICY	WHEN IN DESIGNATED POSITIONS OR TASKED (FOR FSI ACTIVITY BY AIA)
WING FS SUPPORT PERSONNEL	BI 2 (ISSUED BY 1 DIV FSO)	AS PER AIM REGULATIONS AND POLICY	WHEN IN DESIGNATED POSITIONS OR TASKED (FOR FSI ACTIVITY BY AIA)
CONTRACTOR FS PERSONNEL	BI 2 (ISSUED BY 1 DIV FSO)	AS PER AIM REGULATIONS AND POLICY	WHEN IN DESIGNATED POSITIONS OR TASKED (FOR FSI ACTIVITY BY AIA)
WING FSO/NCM	BI 2 (ISSUED BY 1 DIV FSO)	IIC 3 (ISSUED BY 1 DIV FSO)	WHEN IN DESIGNATED POSITIONS OR TASKED (FOR FSI ACTIVITY BY AIA)
DIVISION FS PERSONNEL	BI 2 (ISSUED BY 1 DIV FSO)	IIC 3 (ISSUED BY 1 DIV FSO)	WHEN IN DESIGNATED POSITIONS
DIVISION FSO	IIC 2 & BI 2 (ISSUED BY AIA)	IIC 2 (ISSUED BY AIA) BI 2 & IIC 2 (AIA DELEGATION)	AIA DELEGATION OF AUTHORIZATION
FSI TEAM MEMBERS (SEMI PERMANENT)	BI 2 (ISSUED BY 1 DIV FSO) BI 1 (ISSUED BY AIA)	AIA / SUPPORT AGENCY SERVICE LEVEL AGREEMENTS AND UPON INDIVIDUAL CERTIFICATION BY SUPERVISION LEVEL OF APPROPRIATE AUTHORITY	INDIVIDUALS IDENTIFIED IN FSI TASKING MESSAGE (FOR FSI ACTIVITY) AND CoC FROM SLAs
DFS INVESTIGATOR	BI 2 (ISSUED BY 1 DIV FSO) BI 1 (ISSUED BY AIA)	IIC 1, IIC 2 & IIC 3 (ISSUED BY AIA)	INDIVIDUALS IDENTIFIED IN FSI TASKING MESSAGE (FOR FSI ACTIVITY)
DFS REVIEW STAFF (SENIOR INVESTIGATOR AND CHIEF INVESTIGATOR)	BI 2 (ISSUED BY 1 DIV FSO) BI 1 (ISSUED BY AIA)	IIC 1, IIC 2 & IIC 3 (ISSUED BY AIA)	WHEN IN DESIGNATED POSITIONS OR TASKED (FOR FSI ACTIVITY BY AIA)
AIA/DFS		AIA (MND DESIGNATE)	WHEN IN DESIGNATED DFS POSITION

INTENTIONALLY LEFT BLANK

CHAPTER 8 – POST-OCCURRENCE ACTIVITIES

References: A. 1016-18 (DFS) 7 May 2007 - CVR/FDR Policy

B. 1 Cdn Air Div Orders, Vol 3, 3-304: Flight data recorder/Cockpit Voice Recorder/Crash Position Indicator/Other Cockpit Flight Recording Devices

C. *Aeronautics Act*

PURPOSE

1. As indicated in Chap 1, the objective of the FS Program is to prevent the accidental loss of aviation resources. Unfortunately, despite the best efforts of all concerned, accidents can still occur. Accordingly, wings and units must prepare sound plans for this eventuality to ensure that loss of life and injury to personnel is minimized, damage to property is minimized and evidence is collected and protected to facilitate a thorough investigation. In addition, aircraft accidents understandably attract a lot of attention. Therefore plans must include provisions for the timely release of accurate information to the chain of command, next of kin and the media.

CVR AND FDR PARAMETER REQUIREMENTS

2. The Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR) Parameter policy (ref A) established the airworthiness requirements for CF operated aircraft to be equipped with on-board recording devices that are to be used for accident prevention and accident investigation. The policy originally signed off by C Air Force is set to transition to a CFTO being developed by TAA staff titled Aircraft Equipment Requirements (AER).

3. Ref B should be consulted to consider handling, requirements and lists the equipment installed on current aircraft in DND/CAF. Annex E to this chapter describes additional CVR/ FDR parameters for different families of aircraft.

DEFINITIONS

AIRCRAFT RECORDING DEVICE (ARD)

4. An ARD is any device installed on an aircraft that records and stores data in any shape or form.

NOTE

ARDs include cockpit voice recorder (CVR), heads-up display (HUD) with or without voice, aircraft crash position indicator (CPI), flight data recorder (FDR), maintenance signal data recording set (MSDRS), health usage maintenance monitoring system (HUMMS), operational loads monitoring (OLM) devices, air combat manoeuvring instrumentation (ACMI), non-volatile memory chips, cockpit mounted cameras. See annex G.

ON-BOARD RECORDING (OBR)

5. An OBR is defined in the *Aeronautics Act* article S22. It states “In this section and in section 23, “on-board recording” means the whole or any part of either a recording of voice communications originating from an aircraft, or received on or in the flight deck of an aircraft, or a video recording of the activities of the operating personnel of an aircraft, that is made, using recording equipment that is intended not to be controlled by the operating personnel, on the flight deck of the aircraft, and includes a transcript or substantial summary of such a recording.”

DESIGNATED OBR

6. A designated OBR is the the cockpit voice recorder and cockpit video recorder as described at para 5 above.

NON-DESIGNATED OBR

7. A non-designated OBR is any ARD not categorized as a designated OBR that records voice and/or video to and from the cockpit. The non-designated OBR were not designed solely for FS purposes and are used for other purposes such as crew training, mission debriefing and maintenance.

HANDLING OF ARD DATA

8. The following paras explain the categories of ARDs, their status in relation to a FS investigation, the statutory authority specifying how they shall be handled and the releasing authority for the different categories of ARDs. Annex G portrays these provisions in one simple image.

PRIVILEGED STATUS OF OBR DATA

9. Data from designated OBR is always privileged. In the case that a FS occurrence has taken place, data from non-designated OBRs shall be treated as privileged.

HANDLING OF OBR DATA

10. The requirements for handling the data of ARDs are either statutory (based on laws) or regulatory (based on orders).

- a. Designated OBR. The Statutes of the *CTA/ISB Act* and the *Aeronautics Act* require that “On Board Recordings” or designated OBR data be treated with privilege. The details associated for use and access to a designated ORB are contained within the statutes. Therefore, the authority to download data from a designated OBR must be obtained from DFS/AIA, except for the authorized actions associated with verifying the recorder serviceability and its’ maintenance. Otherwise, download and use of these OBRs will only be granted for FS investigations or DFS/AIA approved training and promotion activities; and
- b. Non-designated OBR. The use of data from a non-designated OBR for maintenance or typical post-mission purposes such as training and debrief is authorized by the DFS/AIA unless the recording is associated with an

occurrence. Once a FS occurrence has taken place, the data from these OBR is privileged; therefore, only the specifically delegated WFSO (typically the WFSO responsible for the occurrence aircraft) and those authorized by contact with the DFS/AIA or the designate may view, download or utilize these recordings. Personnel given access to non-designated OBR data under this circumstance must be cautioned regarding the statutory privilege associated with this data.

11. Privileged OBR data shall be protected whereby no person other than an authorized investigator or someone authorized by the AIA shall:
 - a. be given access to the data;
 - b. knowingly communicate or allow the data to be communicated; and
 - c. be required to produce OBR data or give evidence relating to it in any legal, disciplinary or other proceedings.

HANDLING OF OTHER ARD DATA FOLLOWING A FS OCCURRENCE

12. These recording devices may be downloaded for valid purposes such as those associated with fleet maintenance, operations, training or test purposes. The authority to download ARD data on a routine basis must rest within the associated 1 or 2 Cdn Air Div Orders for the personnel conducting such activities. Notwithstanding, after a FS occurrence, these recording devices and data sets shall be quarantined as per para 45 to 56 below pending a decision on the requirement to retrieve the recorded data. This decision will be taken following consultation with Unit FS Personnel and DFS/AIA if/as necessary. The quarantine will remain in effect until the data has been successfully downloaded and is proven usable for evidence purposes.

PROVISIONS FOR DOWNLOADING ARD DATA

13. Designated OBR. Designated OBR unit may be removed from the aircraft or the data downloaded to assist with valid AIA approved activity only when conducted in strict accordance to the following provisions:
 - a. no person, including any person to whom access is provided to the privileged representation shall knowingly communicate it or permit it to be communicated to any person;
 - b. information shall not be used for any administrative, disciplinary proceedings or punitive actions,
 - c. information will not be accessible through the Access to *Information Act* (ATI),
 - d. crew identities shall not be released without their explicit consent;
 - e. the data shall solely be used for the purposes of maintenance activities related to aircraft systems or other valid AIA approved activity;
 - f. instructions for periodic maintenance, data download, and calibration must be established for each fleet. Frequencies for these maintenance activities are to be detailed in the maintenance schedule applicable for each fleet;

- g. data retrieved shall be copied integrally and steps be taken to ensure that no information is lost, altered, or destroyed as a result of the downloading;
- h. once every 12 months, the downloaded data as well as the correlation data are to be sent to the National Research Council (NRC) Flight Data Recorder Playback Center for verification of the recorded parameters and accuracy. The frequency of the data download may be increased, if so requested by the AIA, to verify the accuracy or the reliability of the system.

NOTE

If the capacity to download designated OBR data does not exist, then the complete unit must be sent to NRC for analysis.

14. FDR. Instructions for FDR periodic maintenance, data download, and calibration must be established for each fleet. Frequencies for these FDR maintenance activities are to be detailed in the maintenance schedule applicable for each fleet. Once every 12 months, the FDR data will be downloaded and sent to NRC Flight Recorder Playback Center for the purposes of validating the quality of the recording and the serviceability of the recorder. The frequency of the downloads may be increased, if so requested by the AIA, to verify the correct functioning of a recording system.

NOTE

FDR data that is removed/downloaded for maintenance-related activities do not need special documentation; however, the provisions stipulated in the paragraph above are to be upheld.

OCCURRENCE RESPONSE PROCEDURES

EFFICIENT RESPONSE ELEMENTS

15. The CO, through the FSO, must ensure the unit is prepared to respond to any occurrence, regardless of location. The occurrence response plan shall include provisions for:
- a. saving lives and preventing injury or further damage;
 - b. protecting the response team from hazards at accident sites as per Annex A; and
 - c. thorough investigation of every occurrence.

16. The elements of an efficient occurrence response are:
 - a. immediate, accurate and thorough reporting;
 - b. thorough independent airworthiness investigation leading to the discovery of cause factors and findings that identify PM;
 - c. implementation and recording of PM and feedback of information; and
 - d. periodically revisiting PM at a later date to ensure that they were properly implemented and have been effective.
17. Operation orders for CF activities involving air assets or support for air assets like exercises, operations and deployments on airshows shall include contingencies for FS occurrences. The CO should use this opportunity to assess the hazards of the operation and risks involved, and draw attention to specific areas where there might be particular concern. These should be highlighted in a statement on the overall importance of FS in the conduct of operations.

INVESTIGATION PLANNING REQUIREMENTS

18. Planning is required to ensure that evidence is protected and to conduct a safe and expeditious investigation. Time is most important in post-occurrence activities; evidence may change or be lost, or there may be another accident before PM can be implemented.
19. In preparing a response to an FS occurrence, DFS will:
 - a. maintain a suitable cadre of trained, authorized and accredited aircraft accident investigators as delineated in the AIM;
 - b. authorize the Div FSO to train and accredit airworthiness investigators as delineated in the AIM;
 - c. maintain an adequate inventory of field investigation equipment including recording devices (audio and video), personnel protective equipment (PPE), communication devices, portable IM/IT and field navigation equipment;
 - d. maintain a permanently monitored occurrence notification system (1-888-927-6337/WARN-DFS);
 - e. maintain arrangements for specialist investigation support from organizations such as AETE, QETE, DRDC Toronto and National Research Council (NRC);
 - f. maintain arrangements for coordinated investigations with other agencies within Canada (TSB) and with other nations (where feasible);
 - g. develop a process that can initiate investigations quickly and deploy investigation teams within 24 hrs domestically and 48 hrs internationally; and
 - h. develop a process that can be used to prepare, revise and finalize FSIs.

20. 1 Div FSO shall in relation to FS matters look after the following:
- a. ensure that units and suitable personnel receive adequate training and accredit trained investigators as authorized by the AIA;
 - b. provide guidance in the preparation of accident response plans and review the plans and checklists as part of FS surveys;
 - c. follow up on PM flowing from SRs; and
 - d. conduct trend analyses to provide FS advice to Comd 1 Cdn Air Div.
21. In many instances, action items are not the responsibility of the FSO. However, the FSO shall ensure that the appropriate actions are taken as required.

ACCIDENT RESPONSE PLAN REVIEW

22. Each unit shall develop an accident response plan and validate it to ensure that critical actions are not overlooked. This plan should be reviewed and exercised periodically. It shall be held by:
- a. the unit chain of command and UFSO;
 - b. the Duty Officer;
 - c. the Air Traffic Control Services;
 - d. the Operations Section;
 - e. the Senior military medical authority; and
 - f. the applicable local police, fire halls, hospitals, ambulance services, telephone operators and information services.

ACCIDENT RESPONSE COMPONENTS

23. The response plan shall include, in order of precedence, those individuals to be advised. The Aircraft Accident Checklist at Annex B lists the actions anticipated from the organizations concerned in case of a serious accident.
24. The accident response plan should include:
- a. provisions for the immediate involvement of aeromedical personnel;
 - b. training of firefighting personnel in aircraft rescue techniques;
 - c. availability of rescue personnel whenever flying is in progress, including personnel to disarm, remove or safety explosive devices and pressurized systems;
 - d. provision of technical and operational advice to the pilot in an emergency;
 - e. a checklist to be used during emergencies by personnel in key positions like CO, DCO, SAMEO, tower, operations, OSCER and FSO;
 - f. procedures for recovery or diversion of aircraft;

- g. briefings to the local authorities on how to report an occurrence and what to do at the scene until CF authorities arrive, like liaising with coroner or police;
- h. alert the agencies that must respond to an off-unit site occurrence;
- i. communications for all rescue vehicles and agencies, e.g. Padre, Environmental Officer and PAO;
- j. the accident-rescue grid map of the airfield and surrounding area. Copies should be kept in the control tower, dispatch centres, OSCER vehicle , helicopters, ambulances, fire trucks, maintenance, and other vehicles that must respond to an accident or emergency;
- k. preparations for evacuation and medical treatment of casualties. Make arrangements with local hospitals, fire halls and police for assistance, including briefings on rescue procedures and toxicology requirements for personnel involved in the accident. Copies shall be kept in the tower, ambulances and accident response vehicles;
- l. the search-and-rescue (SAR) plan (water, land or air parties), arrangements for a search centre and for SAR support;
- m. considerations for runway clearance and diversion procedures to allow, if possible, the recording of evidence before wreckage is moved;
- n. procedures for runway clearance, including instructions for the selection, maintenance and use of heavy equipment, cranes, jacks, portable floodlights, spare wheels and slings;
- o. media response guidelines;
- p. measures for the security of the aircraft;

NOTE

Whenever sabotage is apparent or suspected,
Security Orders for the CF apply.

- q. periodic review of instructions, including:
 - (1) the testing or practice of crash alarm systems,
 - (2) the accident rescue response procedures, and
 - (3) the use of training films and other aids;
- r. preparations for safeguarding evidence. Plans should include the following:
 - (1) making video recordings of emergency landings,
 - (2) guarding and protecting accident sites to protect evidence and any contaminated areas associated with the accident site. An accident security team shall be established with a designated comd, who shall be responsible for:

- (a) if crash site is outside a defence establishment, coordinating with local police authority to identify CF security needs and ask for their support;
 - (b) seeking and issuing proper rules of engagement for military personnel;
 - (c) issuing, maintaining and using equipment to support guard operations;
 - (d) developing a shift system;
 - (e) making provisions for transport, money, rations and accommodation;
 - (f) ensuring that communications equipment is functional; and
 - (g) ensuring that provisions are made to set up a single controlled accident site entry/exit point at which appropriate protective instructions and kit will be issued, and
- (3) selecting and briefing alternate security comd and crew;
- s. establishing chain of command for site control, within or outside the defence establishment site, prior to and following the arrival of the FS investigation team;
 - t. selecting, maintaining and using equipment for the protection and collection of evidence;
 - u. using the services of the Recovery and Salvage Squadron (RASS) of ATESS for heavy equipment and diving or dragging equipment to recover wreckage, using both civilian and CF resources (see C-05-010-002/AG-000 – Aircraft Salvage Procedures); and
 - v. preparing for the commencement of the investigation by ensuring that perishable evidence is recorded, personnel involved and witnesses are isolated and requested to provide a written statement as soon as possible after the accident, personnel are instructed to take and ship samples, measurements are taken, accident site diagrams are prepared, appropriate medical exams are conducted, appropriate items are quarantined and impounded as required, witnesses (including start crews) are identified, and weather observations at the time of the occurrence are taken.

NOTE

Annex E amplifies details of the photographic requirements. Custody of photographs must be carefully controlled to ensure maintenance of the chain of evidence custody.

NOTE

A Report of Emergency Escape from Aircraft and/or Report of Emergency Landing on Water may also be required.

COMMUNICATIONS

NOTIFICATION OF FOREIGN NATIONS

25. When occurrences involve non-CF aircraft and/or locations and facilities, DFS shall notify the Nations involved as required by NATO STANAG 3531, Letters of Agreement and other standing arrangements, so that the actual owners of the aircraft may discharge or take possession of their property and indicate what type of support they require from DFS.

REQUESTS BEYOND WING SUPPORTING CAPABILITY

26. Normally, the nearest practicable wing will be designated as the supporting wing. Requests for assistance that are beyond the capabilities of a wing or a supporting wing shall be directed to 1 Cdn Air Div/CANR Headquarters.

NOTIFICATION TO CORONER

27. In the case of fatalities, the provisions of the appropriate provincial coroner statute shall be respected. The coroner is responsible for establishing the cause of death and is the final authority for the removal of human remains.

RELEASE OF INFORMATION

28. The release of information to the public is the responsibility of the Public Affairs Officer (PAO). Following an FS occurrence, the FSO or IIC shall maintain contact with the PAO to ensure timely and accurate news releases. Public and media interest must be anticipated and the FSO should be prepared to assist the PAO. When pressed for information, the FSO and IIC should be guided by DAOD 2008 and AIA delegated authorizations regarding release of information outlined in the AIM. If the occurrence is a significant event in that it involves either prominent persons or circumstances likely to create public interest, there will be a requirement to generate a Significant Incident Report.

29. The FSO and the IIC may be asked to answer questions concerning an occurrence and its investigation. At no time shall they admit Crown responsibility for any damage, no matter how obvious this liability may seem in the circumstances. They should reinforce that the mandate of the FS Program is to investigate to prevent future occurrences and the aim of the investigation is not to assign blame.

30. The investigation team members should be responsive to media or public requests for general or background information, and should always treat reporters politely. The PAO shall be notified of any intent by or request to a team member to conduct an interview related to the investigation.

31. Under no circumstances will the individuals involved in an FS occurrence be interviewed by the media until they are cleared to do so by the IIC.

BRIEFING TO NEXT OF KIN

32. The unit is responsible for keeping family members informed of the progress of an investigation. In the case where the accident involved casualties, the norm would be for DFS to provide the next of kin with an initial briefing describing the FSIR process and provide them with a copy of the FTI prior to its public release on the DFS website. The intent of conducting the initial briefings is to provide the NOK with an explanation of the investigation process and provide them with a copy of the FTI so they can get ready to address the press prior to DFS public release. DFS will also give family members a detailed briefing on the findings, causes and recommendations contained in the final FSIR prior to its public release. Close coordination with Wing and Unit commanders and their advisors is essential to meeting the aim of the briefings while minimizing stress on the NOK and survivors.

INFORMATION NOT TO BE RELEASED

33. To prevent impeding the investigation and to avoid premature or incorrect conclusions, the following shall not be released:
- a. the specific location of an off-site occurrence if rescue procedures would be impeded by sightseers;
 - b. names of personnel killed, missing or injured until after their next of kin have been informed;
 - c. detailed descriptions of injuries or fatalities;
 - d. classified information and/or equipment, including weapons loading;
 - e. privileged information, such as witness statements, related evidence and all flight recorder information;
 - f. statements that tend to indicate responsibility of the Crown or any person;
 - g. statements that imply failure of equipment or facilities;
 - h. premature speculation that could jeopardize the conduct of the investigation;
 - i. statements on causes to civilians, including news media representatives;
 - j. accident statistics, rates, trends, costs of accidents and similar information without DFS authority;
 - k. when civilian or allied military aircraft or installations are involved, anything that has not been approved by their local representatives; and
 - l. information related to contracted organizations.

RELEASE OF INFORMATION TO CONTRACTORS

34. Releasing information to commercial firms under DND contract is subject to QR&O 19.36, in that only general information may be released immediately to contractors, field service representatives or technical representatives. In addition, they may be given other

information only as authorized within security limitations to fulfil their contracts. There will be occasions when field service or technical representatives will be enlisted as specialist advisors to investigations. In that case they will be allocated observer status while supporting the investigation. Procedures regarding this situation are contained in the AIM.

RELEASE OF INFORMATION TO OTHER NATIONS

35. NATO STANAGs provide guidance for the dissemination of FS information. STANAG 3101 provides for exchange of information concerning aircraft or missiles in common use. Information concerning FS matters arising from the operation of a nation's air services within or over another NATO nation's territory is exchanged under the terms of STANAG 3102. Release of information to other Nations is based on the same principles.

PROCEDURES ON ACCIDENT SITE

HEALTH PROTECTION

36. At an accident site, there will be dust, chemicals and/or fumes that can be toxic or very hazardous to health. Therefore it is essential to protect all personnel working at the accident site. Equipment must protect the lungs and skin from contact with and ingestion of particles and fumes. The CF has a legal obligation to ensure the safety of all personnel involved in the support of an accident investigation, including any agency or civilian contractor involved in work at the accident site or the salvage operation. Accident Response Plans must ensure that any information regarding dangerous substances is passed to these support agencies. Refer to Annex A and the AIM for further details.

37. The particulars of all personnel involved in post-crash activities will be recorded prior to entering the cordon placed around the accident site or at the quarantine facility. The nature and duration of each exposure to the accident site/quarantine and the PPE worn during that exposure will also be recorded. This information will be placed on individual personnel files and medical records.

ACCIDENT INVESTIGATION KIT

38. Kits must be available at all wings and units operating in isolation. The FSO Accident Investigation Kit is referred to in the tool control system as TLD 1246. Units looking to re-supply their kits can get the necessary information from CFTCCS ATESS in Trenton. The FSO is responsible for the provision and safekeeping of these kits. Because of the value and attractiveness of many of the items, a member of the investigation team is required to be responsible for the kit when it is in use. Annex C lists the recommended items to be contained in the FSO accident investigation kit. There are three types of items:

- a. Hand-portable Items. These are likely to be required at every accident site;
- b. Contingency Items. These are heavy or bulky items that may be needed on site; and
- c. Facilities. These may be needed on returning from the accident site to complete the investigation.

SITE SECURITY

39. Security is normally required at every accident site and local police are usually the best option unless the site is very isolated or only accessible to CF/DND personnel. On defence establishments it is the responsibility of the MPs. If the site is outside CF military facilities or what is considered a defence establishment, the local police has jurisdiction. The aircraft commander, the CO or the senior capable survivor may obtain local police or other civilian personnel to perform the initial security.

40. Investigators are not to be tasked with the administration of the security party; thus a separate individual shall be tasked, briefed and equipped to handle the responsibility for the security of the site.

41. With the exception of established field service representatives (FSR) under contract to DND, company or contractor representatives are not to be permitted access to an accident site or wreckage components unless authorized by DFS. In the case of FSIs, access to the accident site and the extent of investigative participation is left to the discretion of the DFS. Representatives of the news media should be asked to stay clear to protect the evidence on the crash site and for their own safety. They should be informed that a PAO will provide all details which may be released to the public. Cooperation of news photographers should be requested, but no force will be used by CF personnel to prevent them from gathering imagery. The PAO should be advised of any news media in breach of restricted access areas. Similar procedures are to be followed with owners of the property involved, remembering that a full and effective investigation may depend upon a property owner's cooperation.

42. However, when it is impractical or of doubtful value, the CO, having considered the security classification of the components, may decide not to secure the area. COMSEC authorities should be consulted when COMSEC material is present.

43. For accidents or forced landings outside Canada, security will likely be provided by the country of occurrence, particularly if that country is a signatory of NATO STANAG 3531. Whenever CAF security is not provided, DFS shall be informed.

SECURITY DUTIES

44. Security personnel must be briefed to ensure that no evidence is disturbed or obliterated, unless it is absolutely necessary in order to save lives or to prevent injury or serious damage. Moreover, personnel shall have been briefed on accident site hazards and made aware of the PPE required when working on site. If possible, items should be moved only short distances, in straight lines parallel to other parts being moved to preserve the layout of the scene. Photographs and video should be taken before evidence is disturbed and notes made of any explosive charges made safe and pressure systems deflated. The security cmd shall ensure that:

- a. doctors, coroners, first aid personnel, firefighters, rescue teams, aircraft disarming and wreckage recovery personnel, and authorized investigators and photographers are allowed access and are not impeded in the performance of their duties;
- b. civil and military property is adequately protected;

- c. unauthorized persons are not permitted to enter the area; and
- d. following release by DFS, accident aircraft components appearing on the list of classified equipment are accorded appropriate security. Classified equipment may be removed from the site, on approval of the DFS investigator-in-charge (IIC) to ensure security control during the investigation. Ultimate disposal of classified equipment remains the responsibility of the NDHQ Item Manager, or DCOMSEC for COMSEC material.

SECURITY IN FOREIGN NATIONS

45. Outside Canada, the local authorities or locally provided security have jurisdiction for physical security. CF requirements should be made known and CF methods should be tactfully suggested. For details concerning the security of evidence within NATO countries, refer to STANAG 3531, available on the DFS intranet site under tab Resources\Manuals.

IMPOUNDING ARTICLES

46. Impounding articles refers to safeguarding material to prevent the loss or alteration of all records, documents, films, tapes, and forms that may be required for the investigation. Under unusual circumstances, some of this material may be required for continued operations, program completion or other assessments. Examples of such requirements are battle damage assessment, weapons effect analysis, intelligence gathering and analysis or data assessment for on-going programs. This may require the viewing, copying or assessment of impounded items by personnel not involved with the Flight Safety Investigation activity. In these circumstances, the impounding FSO shall maintain evidence continuity and ensure that such activity is consistent with the higher-level requirements while honouring the privilege associated with such data, should it exist. For example, if the data includes voice or the movements of the crew, personnel viewing the data must be cautioned that particular data is privileged and can only be used for Flight Safety purposes and it should not be transmitted to other persons except for operational reasons. The person designated as the impounding officer shall submit a statement of impoundment to the investigative authority, using the format shown in Annex F. Any impounded items viewed for the above noted exceptions should be appropriately annotated. All impounded items shall bear a notation as per sample below.

Impounded:(*time, date, month, year*) on the authority of:

(*full details of authority for impounding*)

(Signature and Rank)
Impounding Authority

ITEMS TO BE IMPOUNDED

47. The following items shall be impounded following an accident and may be impounded following a serious incident:

- a. the maintenance record set, current logbooks and computer records from ADAM or similar systems for the aircraft concerned and its components;
- b. pertinent Aviation Fuel DND Sampler Reports (CF 907), Equipment Oil Sampling Register (CF 34 2) and Spectrometric Oil Analysis Reports;
- c. ARD data;

NOTE
DFS will issue handling instructions for any recording devices removed from an aircraft involved in an occurrence.

- d. the flight authorization form, flight plan, passenger manifest and load sheets for the flight in question;
- e. data stored on the Mission Management Application (MMA) can be captured through the “impound” feature;
- f. the crew’s log books;
- g. unit training and standards records;
- h. tower log books and ATC communication and data recordings. In the case of civilian ATC facilities, contact DFS or DFS IIC, who will make the official impoundment request;

NOTE
For an occurrence where elements of both a FS occurrence and an aviation infraction/violation are present, DICEP and DFS/AIA can, in order to conduct their respective investigations, request copies of the same ATC voice and data file recordings through their respective chains of command.

- i. pertinent meteorological records, forecasts and special observations;
- j. pertinent photographic records;
- k. radar unit log books, radar scope tape and voice recordings relating to the occurrence;

NOTE
These records must be handled carefully, since they are irreplaceable.

- l. medical records and, in the case of fatalities, dental records and fingerprints from the National Defence Identification Service (NDIS) in NDHQ; and
- m. any other documents, forms, tapes, films or computer records that are pertinent, e.g., maintenance, arrestor cable or AMSE records.

QUARANTINING

48. Quarantining is the withholding and safeguarding of physical evidence or hazardous items. Such items may include complete aircraft components, equipment, stores, and production lots or batches. Quarantining shall begin as soon as a unit learns of an FS occurrence. Objects to be quarantined shall be removed from use immediately, and kept in a secure storage (size permitting). Alternate arrangements shall be taken to withhold and safeguard larger items. In unusual circumstances, as noted above in para 9 above, access to some quarantined items may be required to continue operations, programs or testing and this access must be documented by the quarantine officer while maintaining evidence continuity and other statutory or regulatory requirements.

QUARANTINING DOCUMENTATION

49. If the item has a log book, an entry shall be made that the item is quarantined under authority of this publication. In the case of an accident, the person designated by the CO as the quarantining officer shall submit a statement to the DFS IIC using the format at Annex F.

50. Aircraft equipment/parts shall be prominently tagged with both a CF-706 (Quarantine tag), and a CF942 (Material condition tag).

51. A register is to be kept in the secure storage to identify items held in quarantine and provide a link to the FSOMS occurrences. This register shall also be used to record disposal actions for quarantined items (e.g. shipment data, released to LCMM as per e-mail dated dd-mm-yyyy).

ITEMS TO BE QUARANTINED

52. The following items, if applicable, shall be quarantined:

- a. the aircraft;
- b. the aircraft components (to include software and test equipment used to verify component serviceability) or personal equipment involved or suspected in the occurrence;
- c. the equipment or facilities that last serviced the aircraft with oxygen, POL, armaments or other stores;
- d. any other equipment such as that which may have hit the aircraft, cargo that caused problems, defective ground radar, arrestor cable, starting unit or other facilities; and
- e. any stocks, particular makes or batches of components, like stores and POL, that are suspect.

NOTE

Until the quarantine is lifted personnel will avoid turning on the battery or applying ground power in order to avoid the loss of recorded data. i.e. CVR and FDR information. The quarantine will remain in effect until the data has been successfully downloaded and is proven usable for evidence purpose.

53. When the facility involved is a civilian contractor for into-plane services, quarantining the facility shall be the responsibility of the appropriate technical services detachment.

FLUID SAMPLING

54. Fluid sampling is the gathering and submission of specimens of POL and other fluids for analysis. Sampling shall begin as soon as a unit learns of an occurrence. In the case of an accident, the sampling officer, usually the AFSO, must submit a statement of impoundment to the DFS Investigator using the format shown at Annex F. Sampling procedures shall be as directed in applicable CFTOs; if not specified, use sound engineering practices to prevent further contamination. If contamination is unavoidable, record its nature and if possible obtain a sample of the contaminant and take more than one sample from each source.

55. Ideally, all fluid sample analysis should be done at QETE. However, the need to avoid operational delays may dictate that a preliminary analysis be conducted locally. Coordination with QETE shall be carried out prior to any local fluid sample testing and QETE will provide either direct or delegated oversight of the tests. In this case, a second set of fluid samples will be sent directly to QETE for analysis.

56. Unless clear evidence exists that contamination or other component breakdown did not contribute to the occurrence, the following items must be sampled:

- a. all entrapped fluids in any wreckage;
- b. all entrapped fluids in any failed or suspect fluid systems such as fuel, oil, hydraulics and oxygen along with associated filters; and
- c. all ground equipment (e.g. LOX/HOX cart, fuel bowser) and facilities (e.g. fuel tank) involved.

57. Samples must be analyzed as quickly as possible. If duplicate samples are taken they should be retained by one of the following until they are released:

- a. FSO or D/FSO;
- b. DFS;
- c. CO or designate; or
- d. a CF-approved laboratory when authorized by one of the above and when overseen by QETE.

NOTE

Samples shall be labeled with the source component or item, the section or system of that item, the date and time of sampling, the nature of the sample fluid with any known or suspected contaminants, and any other information which will assist in the analysis.

58. The Fluid Sampling Kit (NSN 8115-21-886-4126) should be used, and is to be sent to QETE in accordance with transport instruction contained therein. QETE will send a replacement kit on request.

AUTHORITY TO ACCESS QUARANTINED/IMPOUNDED ITEMS

59. Apart from the exceptional requirements noted in paras 9, 10 and 11 above, the DFS IIC, WFSO, UFSO, AFSSO (Aircraft Fluid Services Officer) or authorised individuals, are the only people to have access to quarantined/impounded items.

LIFTING OF QUARANTINE/IMPOUNDMENT

AUTHORITY TO LIFT QUARANTINE/IMPOUNDMENT

60. DFS is the authority to lift quarantine/impoundment. This authority is delegated, with the exception of photographic/imagery evidence, to the tasked IIC. Additionally, in order to maintain critical operational capability, the CO, or a CO's delegated person of authority with the requisite knowledge to ascertain that the lifting of the quarantine/impoundment of item(s) will not affect the conduct of the investigation, may also lift a quarantine/impoundment.

NOTE

Due to Privacy Act considerations, the DFS/AIA retains the authority for the release of all photographic/imagery evidence.

PROVISION FOR ARD DATA

61. Lifting of quarantine for ARD data can only be done once the agency charged with producing the data has advised the applicable authority that the information was successfully downloaded and is usable and that a printed copy of the data has been produced.

RECORDING THE LIFTING OF QUARANTINE/IMPOUNDMENT

62. Whenever log book entries have been made impounding or quarantining an item of evidence, a notation as per sample below shall be made in the log book on release of the item.

Released (*time, date, month, year*) on the authority of:

(*full details of authority for lifting impounding/quarantining*)

(Signature and Rank)
Impounding/Quarantining Lifting Authority

NOTE

For aircraft maintenance record sets, see C-05-005-P04/AM-001.

DISPOSAL OF QUARANTINED/IMPOUNDED EVIDENCE

63. Disposal instructions for certain items may only be issued by the appropriate authority at higher HQ, e.g. the applicable item manager at DAEPM. Before issuing such disposal instructions, the authority concerned must confirm whether the item is to be shipped under an FS quarantine or is to be released from quarantine.

64. Disposal instructions will include one or more of the following actions:

- a. DFS handling instructions for OBR data;
- b. Actions to be taken for each quarantined items:
 - (1) repair or return the items to normal use, including the return of personal property to the rightful owner;
 - (2) return the items to supply or forward for repair and overhaul;
 - (3) forward the items to a specified agency, e.g., QETE, AETE or contractor, for further investigation and analysis. Items are to remain under the FS quarantine and must be accompanied by sufficient details to describe the occurrence (e.g., UCR, CF 543, initial / supplementary report). Pack such parts in accordance with D-LM-008-001/SF 001 – Specifications for Methods of Packing, and A-LM-187-001/JS-001 – Packing and Preservation General Procedures;
 - (4) retain the items for a specified period; or
 - (5) scrap the items.

AUTHORITY FOR CIVILIAN INTO PLANE SERVICING FACILITY

65. When a civilian into-plane servicing facility under DND contract has been quarantined by the appropriate NDQAR, the release from quarantine shall be carried out by the CFQAR.

PROCESSING OF SPECIAL EQUIPMENT

66. Certain items must be handled with particular care and caution to avoid personnel injury or equipment damage and to prevent further damage that might hinder the investigation. Specific handling instructions are outlined below.

ESCAPE SYSTEMS

67. If the occurrence involves an ejection seat or canopy, it should not be moved before the AETE specialist arrives on site.

68. Escape system components involved in ejections or damaged in accidents are to be photographed using close up, high quality colour photography before any on site movement. All escape system components must be safetied by an AETE specialist prior to being shipped as per IIC instructions. Such items include ejection seats and all related components, e.g., leg straps, seat pack shells, seat pack/torso vest contents, and parachutes. These components are to be packed in accordance with appropriate CFTOs to ensure that they arrive at AETE in the same condition as found at the accident site. Applicable armament orders shall be observed before shipping any armament component, and the parts shall be packed in accordance with CFTOs.

69. Ejection equipment is not to be dismantled and parachutes are not to be repacked in their original enclosures. This equipment is to be packaged so as to prevent further damage in shipment. If the seat rocket has not fired, separation of the catapult tubes could cause the rocket to ignite unless the seat is made safe by an AETE specialist.

AVIATION LIFE SUPPORT EQUIPMENT

70. In all ejections and in accidents involving injuries, all aviation life support equipment (ALSE) and all items of apparel must be suitably packed, annotated, and shipped to DRDC Toronto. DRDC Toronto should be consulted on proper packing/shipping procedures. Such items include aircrew helmets, oxygen masks, survival vests and contents, immersion suits, anti-G suits, handwear, footwear, flight clothing, and underclothing such as thermal vests, T-shirts and turtlenecks. To preserve the integrity of evidence, in-depth investigation of these items should not be attempted without the approval of DRDC Toronto. These items are to be struck off the appropriate inventory before shipping, as they will not be returned by DRDC Toronto. Personally purchased survival items, crests and badges are not to be removed. They will be returned to the owner when the DRDC Toronto investigation is completed.

QETE FS WORK REQUEST

71. A Unit requiring FS work to be carried out by QETE will need approval beforehand by the WFSO and the appropriate DFS Desk Officer. The UFSO will then confirm feasibility of project with QETE by sending a FS QETE Project Feasibility Assessment request to QETE, attention Q 2-2 with applicable photos, drawings, diagrams, etc. Upon approval by QETE, the FSO shall follow the SOP as detailed on the DFS website under Resources/Investigator Toolbox.

Annex A
Chapter 8
A-GA-135-001/AA-001

ANNEX A – PERSONAL PROTECTIVE EQUIPMENT

EQUIPMENT REQUIRED

1. The following PPE shall be available:
 - a. Coveralls. Coveralls shall be comfortable, light and repellent to the great majority of liquids. Since they are very distinctive, they will also assist in site security.
 - b. Gloves. The gloves shall be leather work gloves or service gloves providing adequate protection for most contaminated situations. With liquid contamination, rubber overgloves shall be used. If there is biohazardous material present, nitrile gloves should be worn under the leather work gloves.
 - c. Boots. Combat boots provide good protection and should be cleaned or changed before the wearer leaves the site. If there is liquid contamination, rubber overboots shall be used.
 - d. Goggles. The goggles shall protect against splashing liquids and flying debris and provide considerable protection from dust.
 - e. Disposable Industrial Dust Mask (referred to as N95 mask). When this light, comfortable industrial dust mask is properly fitted to the face it allows very little unfiltered air to be inhaled. It provides adequate protection from particulate hazards such as composite fibres, lead oxide dust, depleted uranium dust and asbestos. The N95 mask requires a formal biennial fitting which can be arranged through Base Fire Halls or their equivalents. Instructions on use will be provided at the time of fitment.
 - f. Reusable Half Face Piece Respirator. The half face mask provides filtering protection against particulates, many gases and vapours (depending on which filter is used). The half face mask is to be used instead of the N95 mask when the concentration of airborne contaminants is higher or if there are any concerns about the level of protection offered by the disposable industrial dust mask. The half face piece respirator is not a self contained breathing apparatus and should not be used when unknown fumes are present, ambient oxygen supply is short, or if there are substances present for which the filter was not designed. This mask requires a formal biennial fitting which can be arranged through Base Fire Halls or their equivalents. Instructions on use, storage and cleaning will be provided at the time of fitment. Due to current allotment levels, only designated FS personnel will be assigned a half face piece. Designation will be determined and subsequently tracked by the appropriate WFSO or UFSO.
 - g. Miscellaneous PPE. Antiseptic hand-wipe, half face piece respirator cleaning wipes, masking tape for sealing ankle and wrist cuffs, etc.

NOTE

If in doubt as to the type or concentration of substances present do not approach the occurrence site without consultation with fire fighters or preventive medicine technicians on the type of protective equipment that should be worn. Generalized questions regarding PPE should be directed to DFS.

DISTRIBUTION OF HEALTH PROTECTION KITS

2. Health protection kits are issued for aircraft accident sites as per the Appendix 1. These kits will normally be distributed as follows:
 - a. 15-person Kits. 5 Wg Goose Bay, 9 Wg Gander, 16 Wg Borden, CFB Edmonton, CFB Gagetown, CFB Petawawa, CFB Valcartier, 438 Sqn St. Hubert, 440(T) Sqn Yellowknife, 22 Wing North Bay, and FOLs at Inuvik, Ranking Inlet and Iqualiut. These kits are the responsibility of the FSO.
 - b. 30-person Kits. 3 Wg Bagotville, 4 Wg Cold Lake, 8 Wg Trenton, 12 Wg Shearwater, 14 Wg Greenwood, 15 Wg Moose Jaw, 19 Wg Comox, HS 443 Esquimalt. These kits are the responsibility of the FSO.
 - c. 50-person Kits. Two deployable 50-person kits exist for DFS use. They are held by FSO 17 Wg Winnipeg.
3. DFS will dispatch a 50-person kit to an accident site to augment the responding wing's issue if required.
4. Additional kits can be coordinated through DFS as required

Appendix 1
 Annex A
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APPENDIX 1 – HEALTH PROTECTION KITS

HEALTH PROTECTION KITS			
KIT	KIT SIZE		
	15-PERSON	30-PERSON	50-PERSON
HOODED COVERALLS WITH EXTRA PROTECTION (SIZE A/A)	30	60	100
BOOT COVERS (PAIRS)	30	60	100
LEATHER WORK GLOVES SIZE A/A (PAIRS)	15	30	50
CHEMICAL AND OIL PROTECTION GLOVES (PAIRS)	15	30	50
NITRIL/LATEX GLOVES (PAIRS: 6 PER PERSON)	90	180	300
N95 AIR FILTERING DISPOSABLE MASKS (6 PER PERSON)	90	180	300
REUSABLE HALF FACE RESPIRATORS	5	10	10
P100 PARTICULATE FILTERS FOR RESPIRATORS (PAIRS)	5	10	10
P100 ORGANIC VAPOR CARTRIDGES FOR RESPIRATORS (PAIRS)	5	10	10
CLEANING WIPES FOR RESPIRATORS (100 WIPES/BOX)	1	1	2
ANTISEPTIC HAND SANITIZER (115 ML BOTTLE)	5	10	30
GOGGLES	15	30	50
MASKING TAPE (1.5 INCH X 55 METERS)	5	10	30

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Annex B
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ANNEX B – AIRCRAFT ACCIDENT CHECKLIST

References: A. QR&O 19.36 to 19.375 and 19.41
B. DAOD 1002-2, Informal Access to Personal Information
C. DAOD 2008-0, Public Affairs Policy – Authorities Table
D. DAOD 2008-3, Issues and Crises Management
E. DAOD 2008-4, Public Affairs, Military Doctrine and CF Operations
F. DAOD 3002-4, Ammunition or Explosives Accident, Incident, Defect or Malfunction Reporting.
G. DAOD 2008-1, Accountability and Responsibility for Public Affairs

ACTIONS ON NOTIFICATION OF AN AIRCRAFT ACCIDENT

GENERAL

1. Personnel at the site of an accident and for every occurrence shall ensure that action is taken to prevent loss of life, injury to personnel or damage to property and to protect evidence and classified material against loss, alteration or compromise, irrespective of the locations described in the following paragraphs.

TELEPHONE NOTIFICATION

2. When information is received by telephone, the following should be recorded:
- a. the informant's name, location and telephone number;
 - b. the time of the accident;
 - c. whether there is a fire;
 - d. exact location of accident site and its accessibility;
 - e. location and condition of the crew and passengers;
 - f. immediate medical response no matter what the condition of crew and passengers;
 - g. in the case of a fatality, whether the coroner has been advised;
 - h. whether there is serious property or environmental damage;
 - i. the type and tail number of the aircraft;
 - j. where the rescue team will be met;
 - k. whether local emergency services have been notified;
 - l. any other information that may be volunteered; and

NOTE

The checklist should include the need for phoning the informant back to check authenticity.

- m. the times at which the information was received and when it was relayed to designated recipients.

NOTE

Before ending the telephone call, caution the informant to remain clear of the wreckage, and ask the caller to attempt to deter others from entering the area or tampering with evidence. Suggest that this could well jeopardize the investigation and warn of hazards such as fuel fumes, fire, explosives, dust from composite materials, ejection seats, armaments, jettisonable tanks and pressurized systems.

RESPONSE PROCEDURE AT ACCIDENT SITE

IMMEDIATE RESPONSE

3. For every aircraft accident, personnel at the site shall ensure that the accident is reported as quickly as possible and that action is taken in conjunction with local authorities to:
 - a. prevent loss of life, injury to personnel or damage to property (including arranging for medical aid, fire suppression, making explosives safe, and SAR); and
 - b. protect evidence and classified material against loss, alteration or compromise (including arranging for guards, crowd control and photographing of wreckage before it is removed from runways or before the onset of snow).
4. The immediate response to an accident will normally be under the direction of the firefighters, and if fire or fumes are involved, self-contained breathing apparatus, coveralls, gloves and eye protection may be required. Only firefighters and medical personnel should be directly involved in the immediate response.
5. There must be a strictly enforced policy of no smoking, eating or drinking at the site, as these activities promote the inadvertent ingestion of potentially hazardous or toxic materials from the wreckage.
6. Establish a protected entry point to the site, at which a facility should be erected to enable access control, the donning and doffing of protective equipment, cleaning of boots and washing of hands before departing the site. All disposable gear such as masks, coveralls and gloves shall be removed and disposed of in accordance with appropriate directives.

HEALTH PROTECTION

7. After rescue activity is complete and the immediate threat to personnel and property has passed, the OSCER will give the DFS IIC access to the site. The IIC shall inspect the site in full protective gear to assess hazards. The following should be considered (IAW publication C-05-010-002/AG-000):

- a. Fire hazards. Extreme caution should be exercised if the site is contaminated by fuel. Smoking is prohibited. Aircraft batteries should be disconnected as soon as possible.
- b. Explosion hazards. Qualified technicians should safety all explosives including armaments and explosive-activated devices. Death or serious injury can also be caused by a tire exploding due to a damaged wheel.

NOTE

All personnel are to be kept a minimum of 500 feet from explosive devices and pressurized systems that have been subjected to accident impact forces or fire.

- c. Blood-borne pathogens. All blood, tissue and certain body fluids should be treated as hazardous. Puncture-resistant disposal containers must be available at the site if any of these substances are present. Proper biological hazard warning signs must be placed on the containers. Therefore, FS investigators and immediate accident responders should be inoculated for Hepatitis A and B. Non-disposable equipment such as boots and goggles shall be disinfected at the site.
 - d. Composite materials and toxic substances. Smoke and burning composite materials are toxic and hazardous to personnel and aircraft systems. Carbon fibre released from burning composite materials can be inhaled, become embedded in the eyes, or penetrate the skin or aircraft electrical system with adverse effects. Fibres can also be released in the atmosphere when this material is impacted or cut. For further details refer to C-05-040-012/TS001 – Post Aircraft Accident/Accident Release of Carbon Fibre. Exposed carbon fibre should be covered with plastic or sprayed with shellac. Some aircraft also contain plastics or other materials that give off toxins that may be inhaled or absorbed on exposure. Battery acid and Skydrol hydraulic fluid are highly corrosive.
 - e. Radiation hazards. Although efforts have been made to remove equipment containing radioactive substances, many of the older aircraft still have flight instruments containing radioactive material. The main hazard is from inhalation and ingestion of radioactive particles in dust when this equipment is broken or burnt. Refer to CFAO 34-24, Ionizing Radiation Safety.
 - f. Parts and equipment containing radioactive material are listed in C-02-040-003/TP-000. If a radioactive hazard is suspected, the Base Radiation Safety Officer shall be notified.
8. Once the site survey has been completed, the investigator will determine the protective clothing and PPE that personnel must use.

RESPONSE PROCEDURE FOR FIRST UNIT ADVISED

9. On the declaration of any air emergency in the area of a flying unit, the occurrence response plan should be implemented immediately. This ensures that medical, firefighting and rescue services are alerted and brought into position. Occurrences at non-flying units should be referred immediately to the nearest flying unit. The following actions may be required after an occurrence:

- a. preventing loss of life, injury to personnel and damage to property through the provision of medical aid, firefighting, SAR and safetying of explosives, pressure systems and ejection seats;
- b. security and protection of evidence, including wreckage (specific instructions regarding classified equipment are to be obtained from wing security officer. If COMSEC material is involved, the wing COMSEC officer should be consulted);
- c. B-GA-100-001/AA-000 and CFMO 42-04 require that all personnel involved in an air or ground accident or physiological incident receive a medical exam, toxicology screen and human factor assessment. This should be completed as soon as practicable following the occurrence.
- d. If there is a possibility that a “D” Category occurrence may be upgraded to an accident, then the medical requirements of CFMO 42-04 must be implemented; all personnel involved in an air or ground accident or physiological incident receive a medical exam, toxicology screen and human factor assessment. This should be completed as soon as practicable following the occurrence;
- e. reporting the occurrence as quickly as possible to the unit of ownership;
- f. taking photographs of the wreckage and other evidence before it is disturbed or obliterated by the elements;
- g. making a preliminary wreckage diagram should it be necessary to move the wreckage prior to the arrival of the DFS investigator;
- h. quarantining, impounding and/or taking samples from applicable items of evidence;
- i. locating and identifying all witnesses to the occurrence, including start crew supervisors and acquaintances of personnel involved (see CFAO 21-9 and A-GA-135-002/AA-001, Occurrence Investigation Techniques);
- j. implementing investigative procedures as required;
- k. assisting investigators by providing the following:
 - (1) administrative and logistic support,
 - (2) wreckage search-and-recovery teams
 - (3) transportation, and
 - (4) accommodation;

NOTE

If provision of these services is beyond the capability of the unit, refer to para 16 Recovery and Salvage section below.

- i. When an FS investigation is convened, the recovery and salvage officer (RASO) assigned to the occurrence is to abide by the recovery instructions from the IIC. Prior to the complete recovery/salvage of the aircraft, the RASO is to liaise with the appropriate DFS investigator (see also DAOD 4003-0, Environmental Stewardship);
- m. instituting or recommending measures to remedy the causes of the occurrence;
- n. observing the deadlines and routing for all reports by the unit of ownership; and
- o. disseminating information relating to the occurrence.

NOTE

When the unit of occurrence is also the unit of ownership, the actions listed in Para 10 also apply.

RESPONSE PROCEDURE FOR UNIT OF OWNERSHIP

10. On the declaration of any aircraft accident involving a unit aircraft, the occurrence response plan should be implemented immediately as follows:
- a. ensuring that arrangements at the accidents site comply with above section entitled Response Procedures for Unit of Occurrence, and providing the necessary assistance to the unit of occurrence;
 - b. ensuring that the occurrence is reported as quickly as possible. The following may require notification or direction with respect to impounding or quarantining, depending on the severity of the occurrence:
 - (1) C Air Force, DFS (1-888-WARN DFS);
 - (2) 1 Cdn Air Div AOC or through CanadaCOM; CEFCOM or CANSOFCOM;
 - (3) the wing or unit of occurrence;
 - (4) unit(s) of last fuelling, servicing;
 - (5) last unit of departure and other units involved;
 - (6) other units involved (for example, the army unit owning the vehicle being airlifted having developed a fuel leak when airborne);
 - (7) TSB thru DFS if the occurrence involves civilian aircraft and /or ATC agencies;
 - (8) NDQAR (if the occurrence involves a civilian maintenance or servicing contractor); and

- (9) Direction Quality Assurance (DQA) (if the occurrence involves aircraft at NDQAR).

NOTE

If an Address Indicator Group (AIG) is used, ensure that all other applicable addressees are also included in the message.

- c. Wing maintenance shall immediately refer to their copy of the appropriate security guide, i.e., C-12-XXX(A/C type)-000/AS-000, and prepare a list of classified equipment carried by the accident aircraft. Copies of the classified equipment list are to be given as soon as possible to the following personnel at the designated support wing and NDHQ:
- (1) the Wing Security Officer,
 - (2) the FSO,
 - (3) the DFS IIC, and
 - (4) NDHQ/DAEPM for the item manager;

NOTE

The wing custodian, assisted by appropriate personnel, shall determine the type and quantity of COMSEC equipment and material on board. The reporting procedures for loss and / or compromise of COMSEC material are contained in CIS/01/2, CF Instructions for COMSEC Material and Accountable Publications. This report must be sent without delay.

- d. quarantining, impounding and/or taking samples from applicable items of evidence;
- e. locating and identifying all witnesses of the occurrence, including start crews supervisors, and acquaintances of personnel involved (see CFAO 21-9 and A-GA-135-002/AA-001, Occurrence Investigation Techniques);
- f. conducting an appropriate investigation of the occurrence or requesting assistance;
- g. disposing of evidence only as authorized. When an FS investigation is convened, the RASO assigned to the occurrence is to abide by the recovery instructions from the IIC. Prior to the complete recovery/salvage of the aircraft, the RASO is to liaise with the appropriate DFS investigator (see also DAOD 4003-0, Environmental Stewardship);
- h. instituting or recommending measures to remedy each cause;
- i. observing the deadlines and routing of all reports by the unit of ownership; and
- j. disseminating information related to occurrences.

RESPONSE PROCEDURE FOR OTHER WINGS OR UNITS INVOLVED

11. On being notified of the occurrence or when so requested, any other wing or unit involved in an FS occurrence shall immediately carry out the following actions as appropriate:
- a. quarantine, impound and/or take samples from local items of evidence;
 - b. identify witnesses of the occurrence, including:
 - (1) servicing and start crews;
 - (2) tower controllers; and
 - (3) anyone else with pertinent information;
 - c. report the above actions by message to:
 - (1) the wing, base or unit of occurrence;
 - (2) the wing, base or unit of ownership; and
 - (3) C Air Force/DFS and 1 Cdn Air Div;
 - d. assist investigators as required, e.g. providing administrative and logistic support, transportation and accommodation, as required;
 - e. institute or recommend measures to remedy each cause of the occurrence that has been assigned as a responsibility of that unit; and
 - f. disseminate information related to occurrences.

RESPONSE PROCEDURE BY DFS

12. The DFS occurrence response procedure includes:
- a. for occurrences involving non-CF aircraft, notifying the owners of the aircraft as required by NATO STANAG 3531, Letters of Agreement, or other standing arrangements, so that the actual owners of the aircraft may discharge their responsibilities;
 - b. acting as FS advisor to test establishments, technical services agencies and their units;
 - c. monitoring 1 Cdn Air Div, wing, base and unit actions;
 - d. initiating and conducting DFS investigations;
 - e. recommending special investigations when extraordinary circumstances prevail;
 - f. reviewing and amending each cause factor as required;
 - g. analyzing and recording PM;
 - h. recommending and monitoring PM as necessary; and
 - i. performing analysis, follow-up and dissemination of statistics and accident prevention information arising from occurrence reports.

RESPONSE PROCEDURE BY NDHQ

13. NDHQ agencies shall respond to occurrences by:
- a. providing specialist advice, facilities and special testing as required; and
 - b. implementing those PM that are beyond the capabilities of subordinate formations.

SPECIAL ASSISTANCE IN AIRCRAFT ACCIDENT INVESTIGATIONS

14. The unit of occurrence and unit of ownership must provide the DFS IIC with the assistance required to conduct the investigation. If special technical, medical or other assistance is required beyond that available at the unit of occurrence or unit of ownership, such assistance will be requested by DFS. Special assistance might be in the form of:

- a. airlifting personnel and equipment to and from the accident site;
- b. ground search parties;
- c. shelter and messing;
- d. detectors for locating vital aircraft parts;
- e. underwater recovery personnel and equipment;
- f. infrared scanning for aircraft wreckage location; and
- g. a receiver to detect the underwater acoustic beacon.

15. In addition, specially trained advisors may be approved by C Air Force or NDHQ to assist in salvage or analysis. In accordance with a letter of understanding between DFS and DRDC Toronto, DRDC Toronto will provide a human factors specialist for all A, B and C Category accident investigations. In addition, a DRDC Toronto Human Factor/Life Support Equipment member will be provided if requested for examination of non-ejection seat life support equipment. For ejection seat accidents, an AETE ejection specialist will normally be assigned to the investigation team (in accordance with MOU between AETE and DFS).

NOTE

In all cases, DFS must be advised of any such requirements in order to evaluate the benefits and arrange the support.

RECOVERY AND SALVAGE COMMAND/CONTROL AND COMMUNICATIONS GUIDELINES

16. There are four basic accident scenarios for which different command, control and communications guidelines are applicable; the following directions shall apply:

- a. On DND Property:
- (1) The unit comd, through a designated representative, shall retain command of the emergency response until the DFS IIC arrives. Upon completion of all pertinent on-scene investigations, control shall revert to the unit comd's representative;
 - (2) Duties IAW A-GA-135-001/AA-001 shall be carried out by the FSO or his/her representative(s);
 - (3) The unit comd shall ensure the site is cordoned and secured. Access to the site is permitted only on the appropriate authority of the DFS IIC or the unit comd's representative during the pre- and post-investigation process;
 - (4) The DFS IIC shall assume the responsibilities outlined in A-GA-135-001/AA-001 and, in cooperation with the unit RASO, shall determine the hazards that exist and the level of protection required;
 - (5) The RASO assists the DFS IIC as required. The DFS IIC may direct that the wreckage be collected and relocated for further investigation;
 - (6) Accident site communications equipment shall be used, within reason, to ensure communications security. All requests for information should be directed to the DFS IIC through the designated PAO; and
 - (7) The unit comd is responsible for the coordination of all activities that support recovery actions, salvage and clean-up of the site. Such activities shall normally be coordinated through the Environmental Officer, who will ensure that all reasonable efforts are made to leave the site in a condition that will not pose any hazard to the public (see also DAOD 4003-0, Environmental Stewardship).
- b. Off DND Property:
- (1) The supporting unit shall liaise with local authorities, and shall ensure coordinated support that may require a designated representative to be on site. If local authorities are present, military Emergency Response shall assist as required;
 - (2) Applicable duties IAW A-GA-135-001/AA-001 shall be carried out by the FSO or designated representative(s);
 - (3) If the accident is in a remote area or military flying area, the supporting unit shall ensure site control until the DFS IIC arrives;
 - (4) The DFS IIC, in cooperation with the supporting RASO, shall determine the hazards which exist and the level of protection required;
 - (5) The supporting RASO assists the DFS IIC as required. The DFS IIC may direct that the wreckage be collected and relocated for further investigation;
 - (6) Accident site communications equipment shall be used, within reason, so ensure communications security. All requests for information should be directed to the DFS IIC through the designated PAO; and
 - (7) The supporting unit is responsible for coordinating all activities that

support recovery actions, salvage, and clean-up of the site. Such activities shall normally be coordinated through the Environmental Officer, who will ensure that all reasonable efforts are made to leave the site in a condition that will not pose a hazard to the public.

c. Submerged Aircraft:

- (1) Emergency Response and SAR shall be coordinated by the appropriate RCC. The supporting unit shall liaise with RCC and provide available support;
- (2) Applicable duties IAW A-GA-135-001/AA-001 shall be carried out by the FSO or his/her representative(s);
- (3) DFS shall coordinate any external military/civilian assistance beyond the capabilities of the supporting unit for site security and aircraft recovery and salvage. If non-Air Force assets are required, an NDCC Ops tasking will be issued;
- (4) In cooperation with the supporting RASO, the DFS IIC shall provide the external agencies with technical advice, notification of possible hazardous material and the associated safety precautions;
- (5) The DFS IIC may direct the collection and relocation of the wreckage by external military/civilian agencies for further investigation at another site;
- (6) Accident site communications equipment shall be used, within reason to ensure communications security. All requests for information should be directed to the DFS IIC through the designated PAO; and
- (7) The supporting unit, in cooperation with the external military/civilian agency, is responsible for the coordination of all activities that effect recovery actions, salvage and clean up of the site. Such activities shall normally be coordinated through the Environmental Officer who will ensure that all reasonable effort has been made to leave the site in a condition that will not pose any hazard to the public at large. If non-air force assets are required, a NDCC Ops tasking will be issued.

d. Civilian Airport:

- (1) Local Emergency Response authorities shall be in charge according to existing MOUs and Working Agreements and the Aeronautics Act. The supporting unit shall liaise with local authorities. The Working Agreement in force with TSB shall govern the investigative agency that will lead any investigation;
- (2) DFS shall coordinate any external military assistance beyond the capabilities of the supporting unit for aircraft recovery and salvage operations;
- (3) In cooperation with the supporting RASO, DFS shall provide the external agencies with technical advice, notification of possible hazardous materials and the associated safety precautions;
- (4) The supporting RASO assists the designated investigative agency as

required; and

- (5) Accident site communications equipment shall be used, within reason, to ensure communications security. All requests for information should be directed to DFS through the designated PAO.

FACILITIES AND EQUIPMENT NEEDED ON RETURN FROM AN ACCIDENT SITE

FACILITIES

17. The following facilities should be readily available so that investigators can compile their field reports:

- a. a large secure room to which investigators may have 24-hour access;
- b. a telephone (preferably a dedicated line);
- c. competent administrative assistance with applicable security clearance;
- d. a white or blackboard, markers, chalk and eraser; and
- e. at least five large tables or desks for examining evidence and laying out the report during assembly.

REFERENCE MATERIALS

18. The following references should be available:

- a. QR&Os, DAODs and CFAOs;
- b. B-GA-100-001/AA-000, CF Flying Orders;
- c. 1 Cdn Air Div Orders;
- d. local orders and instructions; and
- e. complete CFTO series for the aircraft concerned.

REPORT COMPILATION MATERIALS

19. The following materials should be available:

- a. forms for FS Investigation Report, Ditching Report, and Emergency Escape from Aircraft Report (held by DFS);
- b. a personal computer with Microsoft Word application; and
- c. hard covers, fasteners and labels.

20. The supporting unit, in cooperation with the unit of ownership, is responsible for coordinating the activities that affect recovery and salvage operations and the clean-up

of the site. Such activities shall normally be coordinated through local authorities and the Environmental Officer, who will ensure that all reasonable efforts are made to leave the site in a condition that will not pose a hazard to the public.

Annex C
Chapter 8
A-GA-135-001/AA-001

ANNEX C – ACCIDENT INVESTIGATION KITS

HAND-PORTABLE ITEMS

1. The following items should be prepared for immediate issue and easy transportation.
 - a. Publications;
 - b. Survey Equipment;
 - c. Tools and Sampling Materials; and
 - d. Photographic Equipment.

PUBLICATIONS

2. The following publications should be available:
 - a. A-GA-135-001/AA-001 and A-GA-135-002/AA-001;
 - b. photocopies or excerpts from frequently used CFAOs, DAODs and QR&Os (see Annex D to Chapter 9 for listing of publications);
 - c. CFTOs for unit aircraft;
 - d. the unit telephone directory and a list of local civilian authorities' addresses and telephone numbers;
 - e. notes for the Conduct of Investigations Into Aircraft Accidents, B-GA-015-003/FP-001;
 - f. FS investigation handbooks for the technical and aircrew members; and
 - g. Human Factors Guide for the Conduct of Aircraft Accident Investigation, B-GA-015-001/FP-001.

SURVEY EQUIPMENT

3. The following equipment may be used:
 - a. maps of the area (1:50,000);
 - b. 1,000 feet of light rope or heavy cord, marked at 50-foot intervals;
 - c. a 50-foot tape measure;
 - d. a 12-inch steel ruler;
 - e. a magnetic compass and/or a GPS;
 - f. 50 lightweight stakes;
 - g. a small box of accident investigation tie-on tags (Form CF 219);
 - h. a small pad of accident investigation adhesive tags (similar to the above, but with no catalogue number);
 - i. a knife;

- j. a hatchet;
- k. a small shovel;
- l. magnifying glasses (5X and 10X);
- m. spray lubricant;
- n. rags;
- o. small stiff and soft-bristled brushes;
- p. an aircraft fluids sampling kit (NSN 8115-21-886-4126, available through QETE);
- q. three siphons of various sizes;
- r. plastic bags (assorted), non-static bags for permanent memory chips;
- s. carbon fibre ash stabilizer kit including:
 - (1) paper coveralls (various sizes),
 - (2) disposable latex gloves,
 - (3) liquid floor wax,
 - (4) manual spray pumper, and
 - (5) dust masks;
- t. masking and duct tape;
- u. work gloves;
- v. packaged wash cloths;
- w. hand cleanser;
- x. paper towels; and
- y. an inspection mirror.

TOOLS AND SAMPLING MATERIALS

- 4. The following tools and sampling materials should be available:
 - a. wrenches (adjustable);
 - b. pliers and wire-cutters (assorted);
 - c. screwdrivers (several, including Philips);
 - d. flashlight (with spare bulb and batteries);
 - e. hammer, chisel and small portable cutting torch;
 - f. small magnet and string;
 - g. hacksaw with spare blades;
 - h. small wood saw; and
 - i. knife.

PHOTOGRAPHIC EQUIPMENT

- 5. Still cameras (traditional 35 mm with colour film, or digital) and video cameras may be used. Ideally the digital camera shall be a 5 megapixel camera with minimum 3X optical zoom with 2 GB of storage capacity.

SURVEY EQUIPMENT KIT

6. The survey kit shall contain the following:
 - a. a small first-aid kit;
 - b. pens, pencils, grease pencils and chalk;
 - c. two clipboards;
 - d. notebooks, graph paper and scratch pads;
 - e. voice recording devices and batteries; and
 - f. scale model(s) of unit aircraft.

CONTINGENCY ITEMS

7. The following items are needed only under certain conditions. Notwithstanding the above, all FSOs of frequently deployed units and all Base FSOs must have the items that are scaled on L-49-070-021/LC-092 in their kits and ready for use at all times. Also, all FSOs must arrange to have the following items available for issue to investigators when required, remembering also to provide for necessary transportation of the items to the accident site:
 - a. health protection kit (see Annex A Appendix 1);
 - b. tents, bedding, rations and cooking gear;
 - c. coveralls, boots, parkas and rain suits;
 - d. emergency funds, including foreign currency if applicable;
 - e. axes, machetes, chain saws, floodlights and other heavy equipment;
 - f. assorted sieves (up to 3 feet square) to sift mud for evidence;
 - g. portable lightweight means of on-site communication, e.g., field telephones, portable radio sets or loudhailers, and spare batteries;
 - h. protective packing materials, containers and string for shipping evidence from the site;
 - i. voice recording devices and batteries;
 - j. a CPI receiver (normally available at SAR units and at the home bases of CPI-fitted aircraft); and
 - k. an underwater acoustic beacon receiver (held by SAR units).

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Annex D
 Chapter 8
 A-GA-135-001/AA-001

ANNEX D – OCCURRENCE CHECKLIST

This checklist is a guide for the FSO when monitoring occurrence response procedures.

REQUIREMENTS	REMARKS
RECEIPT AND DISSEMINATION OF BASIC INFORMATION. THESE PROCEDURES ARE TO BE CARRIED OUT BY THE FSO.	INITIATE AND MAINTAIN A LOG TO RECORD CRITICAL INFORMATION, SUCH AS NAMES, PHONE NUMBERS AND LOCATIONS.
RECORD THE INITIAL DETAILS OF THE OCCURRENCE.	NOTE THE PHONE NUMBER AND LOCATION OF THE CONTACT AT THE ACCIDENT SITE. CHECK THAT THE INFORMATION IS GENUINE.
INITIATE AN OCCURRENCE RESPONSE PLAN.	CONFIRM THE AIRCRAFT TAIL NUMBER AND UNIT OF OWNERSHIP. DETERMINE IF THE AIRCRAFT WAS ARMED OR CARRIED DANGEROUS CARGO OR COMSEC.
GIVE PRELIMINARY DETAILS TO A HIGHER AUTHORITY BY TELEPHONE. NDHQ/NDCC, 1 CDN AIR DIV AOC, DFS AND WING/BASE/UNIT MUST BE NOTIFIED.	ENSURE DFS IS ADVISED VIA THE TOLL-FREE HOTLINE: 1-888-WARN DFS (1-888-927-6337).
EXAMINE THE FLIGHT PLAN FOR EN-ROUTE STOPS AND ATC AGENCIES.	ADVISE ATC AND SERVICING PERSONNEL OF THE OCCURRENCE AND REQUIREMENTS.
<p>MONITOR OCCURRENCE RESPONSE PLANNING. CONFIRM THE DISPATCH OF THE FOLLOWING, AS REQUIRED:</p> <ul style="list-style-type: none"> • MEDICAL AID • FIREFIGHTING AND RESCUE • WRECKAGE SAFETY SPECIALISTS • SECURITY CREWS AND • PHOTOGRAPHERS 	<p>ALL PERSONNEL DISPATCHED TO THE ACCIDENT SITE ARE TO RECEIVE PRIOR BRIEFING ON EVIDENCE PROTECTION. WRECKAGE IS NOT TO BE DISTURBED UNLESS ESSENTIAL TO PREVENT FURTHER INJURY OR DAMAGE. TAKE COLOUR PHOTOGRAPHS OR VIDEOS BEFORE DISTURBING. CHECK PROVISIONS FOR:</p> <ul style="list-style-type: none"> • TRANSPORTATION • ACCOMMODATION • RATIONS • FINANCES • COMMUNICATIONS • SPECIAL EQUIPMENT
IF THE RUNWAY IS BLOCKED, ARE PLANS BEING MADE FOR THE RECOVERY OF AIRBORNE AIRCRAFT?	
IF AN EXERCISE, DEPLOYMENT OR AIRSHOW IS IN PROGRESS, THE UNIT SHOULD BE UMPIRED OUT AND COMMUNICATIONS RESTRICTIONS WAIVED.	

REQUIREMENTS	REMARKS
REQUEST ALL NECESSARY EXTERNAL ASSISTANCE (E.G., SAR, HEAVY EQUIPMENT).	
ENSURE THAT PUBLIC AFFAIRS IS AWARE OF THE DETAILS.	THE EXACT ACCIDENT LOCATION SHALL NOT BE MENTIONED IN RADIO OR TV REPORTS. THE PUBLIC SHOULD BE ADVISED TO STAY AWAY FROM THE SITE AND ITS ACCESS ROUTES.
LOCATE THE FLIGHT DATA RECORDER/COCKPIT VOICE RECORDER AND CPI, IF FITTED. IMPOUND AND QUARANTINE THESE ITEMS AND TURN THEM OVER TO THE DFS INVESTIGATOR.	SHUT OFF THE CPI TRANSMITTER.
<p>THE OCCURRENCE RESPONSE PLAN SHOULD HAVE PROVISIONS FOR:</p> <ul style="list-style-type: none"> • NOTIFYING THE NEXT OF KIN; • NOTIFYING A CORONER OR NEAREST CIVIL AUTHORITY IAW CFAO 24-6; AND • REPORTING PROPERTY AND ENVIRONMENTAL DAMAGE. 	
OBTAINING INITIAL EVIDENCE. THESE PROCEDURES ARE TO BE CARRIED OUT BY THE FSO.	THIS SHOULD INCLUDE WRITTEN WITNESS STATEMENTS TAKEN IN ISOLATION.
DETERMINE THE CATEGORY OF AIRCRAFT DAMAGE.	ALWAYS INCLUDE THE DAMAGE CATEGORY IN THE INITIAL REPORT. IF AN ACCURATE ASSESSMENT IS NOT POSSIBLE WITHIN THE TIME FRAME FOR THE DISPATCH, INDICATE AN ESTIMATED DAMAGE CATEGORY.
DETERMINE WHETHER DFS INVESTIGATIVE ASSISTANCE IS REQUIRED.	DFS TASKS ALL CLASS I TO III INVESTIGATIONS AS PER CHAPTER 9, ANNEX B. DFS SHOULD BE INFORMED OF ANY SIGNIFICANT D CAT CATEGORY OCCURRENCE.
ENSURE ALL EVIDENCE AND WRECKAGE IS PHOTOGRAPHED BEFORE BEING DISTURBED.	RECORD ANY INSTANCES IN WHICH EVIDENCE WAS DISTURBED.
ENSURE AN APPROPRIATE MEDICAL AUTHORITY HAS BEEN NOTIFIED.	CFAO 24-1 INJURY CLASS.
<p>NOTE</p> <p>B-GA-100-001/AA-000 AND CFMO 42-04 REQUIRE THAT ALL PERSONNEL INVOLVED IN AN AIR OR GROUND ACCIDENT OR PHYSIOLOGICAL INCIDENT RECEIVE A MEDICAL EXAM, TOXICOLOGY SCREEN AND HUMAN FACTOR ASSESSMENT. THIS SHOULD BE COMPLETED AS SOON AS PRACTICABLE FOLLOWING THE OCCURRENCE. IF THERE IS A POSSIBILITY THAT A D CATEGORY OCCURRENCE MAY BE UPGRADED TO AN ACCIDENT, THEN THE MEDICAL REQUIREMENTS LISTED ABOVE MUST BE ACTIONED. FOR CIVILIANS THAT REFUSE TO COOPERATE WITH THE TOXICOLOGY SCREEN, DFS SHOULD BE CONTACTED IMMEDIATELY SO THAT THE PROVISIONS OF AERONAUTICS ACT , SECTION 14 PARA 10(B) CAN BE INITIATED.</p>	
PREPARE A PRELIMINARY WRECKAGE DIAGRAM.	SEE A-GA-135-002/AA-001.

REQUIREMENTS	REMARKS
RECORD A BRIEF DESCRIPTION OF THE ACCIDENT SITE.	INCLUDE THE CURRENT AND FORECAST WEATHER AND THE EXTENT OF FIRE AND PROPERTY DAMAGE.
ENSURE THAT IMPOUNDING, QUARANTINING AND SAMPLING ACTIONS ARE IN HAND (SEE QUARANTINING, THIS CHAPTER).	
ENSURE THAT SPECIAL WEATHER OBSERVATIONS ARE TAKEN.	
RECORD THE EVENTS LEADING UP TO THE OCCURRENCE.	<p>RECORD:</p> <ul style="list-style-type: none"> • THE PLANNED MISSION • THE T/O TIME • THE DIRECTION OF THE FLIGHT • THE IMPACT ANGLE • WHETHER THE ACCIDENT WAS PRECEDED BY FIRE OR SMOKE • ANY EJECTIONS • ANY PARACHUTE DESCENTS • ANY UNUSUAL MANOEUVRES • OR NOISES • THE WEATHER AT THE TIME
NOTE THE PRESENT LOCATION OF THE AIRCRAFT COMMANDER OR SENIOR SURVIVOR.	
LOCATE ALL WITNESSES TO THE OCCURRENCE AND PRECEDING EVENTS. INCLUDE THE LAST PEOPLE TO SPEAK WITH THE PILOT, SUCH AS FRIENDS, SUPERVISORS AND START CREW. TRY TO SECURE A WRITTEN STATEMENT FROM ALL WITNESSES AVAILABLE. ENSURE THE WITNESSES WILL BE AVAILABLE BY SECURING CONTACT INFORMATION, SUCH AS HOME AND CELLULAR PHONE NUMBERS.	
<p>NOTE</p> <p>IF, AT ANY TIME DURING THE GATHERING OF EVIDENCE OR THE INVESTIGATION OF THE EVENT, IT BECOMES APPARENT THAT ACTION SHOULD BE TAKEN BEFORE THE COMPLETION OF THE INVESTIGATION TO PREVENT A RECURRENCE OF THE EVENT, THAT ACTION IS TO BE TAKEN IN CONSULTATION WITH THE DFS INVESTIGATOR. COMMENTS SHOULD BE ADDED TO THE INVESTIGATION RECORD DETAILING THE ACTION TAKEN. THIS WILL NORMALLY BE ACTIONED BY MESSAGE.</p>	
COMPLETE THE IR OCCURRENCE REPORT (FSOMS OR CF 215) IN ALL AVAILABLE DETAIL.	ENSURE ALL NECESSARY ADDRESSES ARE INCLUDED. REPORT ANY SABOTAGE IN ACCORDANCE WITH A-SJ-100-001/AS-001.
CONVENING THE INVESTIGATION. THESE PROCEDURES ARE TO BE CARRIED OUT BY THE DFS, 1 Div FSO OR FSO.	

REQUIREMENTS	REMARKS
DETERMINE THE TYPE OF INVESTIGATION REQUIRED.	SEE CHAPTER 9, CLASS OF INVESTIGATION, COMMENCING AT PARA 19.
ESTABLISH CONTACT WITH THE INVESTIGATORS.	
DETERMINE IF AN INTERPRETER OR LIAISON OFFICER IS REQUIRED, AND IF SO, COORDINATE.	STANAG 3531 (10B), ICAO 13 AND ASCC AIR STANDARDS 85/2A DEAL WITH PROCEDURES FOR ACCIDENTS INVOLVING FOREIGN AIRCRAFT.
ESTABLISH THE TERMS OF REFERENCE.	
ISSUE TASKING ORDERS TO ALL CONCERNED E.G. HEAVY EQUIPMENT AND RAS.	
ARRANGE A BRIEFING FOR THE INVESTIGATORS.	
PROVIDE FOR THESE ADMINISTRATIVE SERVICES: <ul style="list-style-type: none"> • ADMINISTRATION • FINANCE • PHOTOGRAPHIC SUPPORT • ACCOMMODATION • RATIONS • PROTECTIVE CLOTHING • COMMUNICATIONS • TRANSPORTATION • SPECIAL EQUIPMENT 	
CHECK KIT CONTENTS AND ISSUE AN INVESTIGATION KIT.	
NOTE CASUALTIES MUST BE REPORTED IN ACCORDANCE WITH CFAOs.	
NOTE WHEN AN ACCIDENT OR INCIDENT INVOLVES INJURY OR DEATH TO CIVILIAN PERSONNEL, THE OCCURRENCE MUST ALSO BE REPORTED IN ACCORDANCE WITH A-GG-040-001/AG-001, DND GENERAL SAFETY PROGRAM. ENSURE THE CORONER IS ALSO INFORMED.	
NOTE IF THE OCCURRENCE RESULTS IN THE RELEASE OF FIBRES FROM COMPOSITE MATERIAL, NOTIFICATION PROCEDURES MUST BE COMPLETED IN ACCORDANCE WITH PART 6 OF C-05-040- 012/TS-001, Post Air Crash Accident.	
NOTE A REGISTER IS TO BE KEPT TO DOCUMENT THE EXPOSURE OF PERSONNEL TO FREE COMPOSITE MATERIAL FIBRES IN ACCORDANCE WITH PART 4, CHAPTER 25 OF C-05-040-012/TS-001.	

Annex E
Chapter 8
A-GA-135-001/AA-001

ANNEX E – IMAGERY AND VIDEO COVERAGE

Reference: CF Imaging Instructions, A-PH-007-000/AG-001

INTRODUCTION

1. Any imagery or video coverage of an aircraft accident is an extremely valuable record. It assists in determining the exact cause(s) of an accident, thus facilitating remedial procedures and suggesting training to prevent a reoccurrence. The reference is the official document governing image acquisition and video coverage in support of aircraft accident investigations. This annex is based on ref document and shall serve as a quick field reference for any Imaging Tech or any personnel assigned to an investigative team.

IMAGERY WORK ORDER

2. Accident response procedures shall incorporate local procedures to facilitate the timely arrival of the Imaging Technician at the accident site. Image acquisition coverage will normally be carried out under the direction of the investigating authority on the scene. The investigating authority could be a DFS investigator or an FSO. Unless specifically stated otherwise at the time of the request, the request for imagery coverage will be considered an emergency, and the requirement for the originator to complete a CF315 (Imagery Work Order) prior to the commencement of work will be waived. It is the responsibility of the Image Tech on site to ensure that a CF315 is completed by a member of the accident / fire investigation team as soon as practicable after the initial response.

IMAGERY COVERAGE

3. If the Imaging Tech arrives on the scene ahead of the investigating authority, he / she is to commence acquiring images in accordance with para 8 describing the minimum coverage required. Imagery must be acquired in the case where fatalities have occurred and the CO / OSCER has authority from the coroner to remove the remains before his arrival (refer to Para 8.y. below).

PERSONNEL SAFETY

4. Imaging Techs, including contracted personnel, must be aware of the health hazards inherent in burning aircraft that are constructed of composite materials and the release of carbon fibres. Personnel are not to approach any burning aircraft until it has been established safe by a competent authority (OSCER, AERE Technical or DFS investigating officer). Any Imaging Tech who potentially may be involved in acquiring imagery of burning aircraft shall become familiar with the content of *Post Aircraft Accident/Accident Release of Carbon Fibres* (C-05-040-012/TS-001). Appropriate caution must also be exercised where hazards are created by unburned fuel, POL, hydraulic fluids and possible unexploded armaments.

SECURITY CLASSIFICATION OF IMAGE RECORDS

5. It is the responsibility of the Imaging Tech on site to contact the investigating authority and confirm the security classifications that may apply, as soon as this is practicable. Digital images or video images constituting an imagery record shall be handled as CONFIDENTIAL until the investigating authority assigns a more appropriate security classification or designation in accordance with the *National Defence Security Policy*. Similarly, all imagery coverage that depicts human remains shall, as a minimum, be designated PROTECTED B until the investigating authority assigns a more appropriate security designation.

CONTROL OF IMAGERY

6. Imagery acquired by CF Imaging Techs shall be identified and catalogued in accordance with the Reference, Chapter 8. All coverage of an accident site is considered part of the accident investigation. In addition to that provided by the Imaging Tech, it includes coverage obtained by the pathologist, DFS investigator, military police, firefighters, accident truck operators, ATC tower personnel or anyone else who, by virtue of their responsibilities, is required to be at the accident site and who may have taken such coverage with privately owned equipment. Under the direction of the investigating authority, all coverage of this type shall be turned over to the unit Imaging Section for official recording and processing. FS investigators and Imaging Techs may be the first persons on site. Because imagery is considered as factual info, it is releasable to a BOI and criminal investigators if required. Therefore, Imaging Techs involved in a FS investigation need to maintain chain of evidence custody of the imagery taken on the accident site for possible release to other investigations. Digital images, prints and video tape recordings can only be released under the authority of DFS and shall conform to the provisions outlined in this publication.

STILL AND VIDEO COVERAGE OF FS OCCURRENCES

7. The Imaging Tech shall:
- a. label each digital storage media by inserting an identification card at the beginning of the shoot;
 - b. maintain an image log describing every shot taken;
 - c. include a scale reference such as a ruler in the picture, whenever practical; and
 - d. when shooting video, pan slowly over the scene and leave room for editing.
8. When image acquisition is undertaken without the direction of the investigating authority, minimum coverage, where possible, shall include:
- a. once the emergency rescue team / OSCER or accident crew have declared the area safe, the Imaging Tech shall ensure images and video coverage are taken before the wreckage / evidence are disturbed or obliterated by the elements;
 - b. an overall view of the accident scene showing the damaged aircraft (with identification and insignia, if possible), supplemented by two general images from

- different cardinal setting positions; if facilities permit, and the wreckage is strewn over an extended area, a view from the air is desirable;
- c. a general view from a vantage point closer than that taken above, clearly showing the aircraft number;
 - d. an overall view of the area surrounding the accident scene, including nearby objects, to show the approach of the aircraft and the weather conditions;
 - e. if the accident occurred in trees or bush, a view showing broken tree-tops with a person in the scene to indicate the approximate scale;
 - f. a view from the aircraft towards the first point of impact;
 - g. a view of each point of impact with skid marks leading to the aircraft or, where wreckage extends over a large area, general views taken at various distances from the first point of impact to the main part of the aircraft wreckage;
 - h. marks on aircraft from cartwheel impact to aid correlation with ground marks and possible loose paint flakes;
 - i. where wreckage is strewn over a large area, general views from the first point of impact to each main part of the wreckage as guided by marks made, and showing the marks made by parts of the wreckage on the ground;
 - j. close-up views of each main part of the wreckage such as the fuselage, wings, rotor blades, engines, tail assembly and tail rotor to record the damage;
 - k. a view of the flaps from the tail position, supplemented by a close-up of flaps to show the angle of flap deflection (include a ruler to indicate the scale);
 - l. views of the cockpit to include operating controls, fuel selector(s), fuel, radio, electrical control and circuit breaker panels; on dual control aircraft, similar views of both cockpits; if flying was solo in a dual control aircraft, a photograph of the physical positions of the stick/yoke, throttle, landing gear, flap controls and safety harness;
 - m. a general view of the undercarriage area; if undercarriage is retracted, views of the underside of the aircraft after the aircraft has been lifted at least six feet above the ground;
 - n. photographs of any fluid leakage on any parts of the aircraft, like the engine cowlings, windscreen and fuselage;
 - o. photographs of fire/heat damage or discolouration *;
 - p. photograph of human remains, injuries and blood/tissue smears on wreckage *;
 - q. photograph of extra or missing items *;
 - r. if the aircraft was propeller-driven, a view of any marks on the ground made by the propellers with the aircraft in the background and a view to show the degree of pitch on the propeller hub (with a scale indicator);
 - s. where appropriate, view(s) showing propeller impact marks on the ground that show length of slashes and distance between slashes, and detailed views of

- slash marks (front or rear) that show traces of propeller abrasion marks or paint flakes;
- t. close-up views of damage to property that might result in a claim by or against the Crown;
- u. close-ups of fracture surfaces *;
- v. close-ups of improperly installed components or any components suspected of having contributed to the damage *;
- w. photographs of seats, restraining harness, helmets, parachutes and all other items of life support and safety equipment used;
- x. imagery of steps in removing, opening or cutting apart components *; and
- y. when a fatality has occurred and before the remains are removed from the accident scene, imagery shall be taken and shall include views of the general position of the remains in relation to the aircraft, as well as medium to close-up detail views from all angles to show injury patterns and identification; in addition, imagery with a visible scale reference shall be taken to show the relationship of the remains to nearby life-support equipment.

* Asterix indicates that actions are not reflected in reference document

Annex F
Chapter 8
A-GA-135-001/AA-001

ANNEX F – STATEMENT OF IMPOUNDING/QUARANTINING/SAMPLING FORM



STATEMENT OF IMPOUNDING/QUARANTINING/SAMPLING

I, (SN, rank, initials, surname), in my capacity as (position), did (impound/quarantine/sample) the items of evidence listed below which pertain to the occurrence on (date) to (type of aircraft) tail (number).

ITEM	DATE/TIME	IMPOUNDED/QUARANTINED/SAMPLED	DISPOSAL OF ITEM	PRESENT LOCATION OF ITEM

Date

Signature



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Annex G
 Chapter 8
 A-GA-135-001/AA-001

ANNEX G – AIRCRAFT RECORDING DEVICES BREAKDOWN AND HANDLING

		AIRCRAFT RECORDING DEVICES (ARD)			
		DATA RECORDERS	ON-BOARD RECORDERS (OBR)*		
ARD CATEGORIES		<ul style="list-style-type: none"> - AIR COMBAT MANOEUVRING INSTRUMENTATION (ACMI) - ADVANCED MEMORY UNIT (AMU) - FLIGHT DATA RECORDER (FDR) - HEADS UP DISPLAY (HUD) - HEALTH USAGE MONITORING SYSTEM (HUMS) - ENGINE MONITORING SYSTEM (EMS) - INSTRUMENT PANEL VIDEO MONITORING SYSTEM (IPVMS) - OPERATIONAL LOAD MONITORING (OLM) - OTHERS 	NON-DESIGNATED <ul style="list-style-type: none"> - GO-PRO CAMERA - HUD WITH VOICE - INSTRUMENT PANEL VIDEO MONITORING SYSTEM (IPVMS) 	DESIGNATED (AS PER AERONAUTICS ACT) <ul style="list-style-type: none"> - COCKPIT VIDEO RECORDER - COCKPIT VOICE RECORDER 	
	ARD HANDLING	STATUS	QUARANTINED WITH FS OCCURRENCE	PRIVILEGED WITH FS OCCURRENCE	ALWAYS PRIVILEGED
		STATUS AUTHORITY	A-GA-135-001/AA-001 CHAPTER 8	AERONAUTICS ACT ARTICLE S22	AERONAUTICS ACT ARTICLE S22
RELEASE AUTHORITY		FROM QUARANTINE: FS INVESTIGATOR TO COLLATERAL INVESTIGATION: AIA	AIA		

* OBR refers to any recording of voice and/or video to and from the cockpit as per *Aeronautics Act*, Article S22.

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CHAPTER 9 – INVESTIGATIONS

References: A. CAFAO 24-1
B. CAFACM 2-350, Emergency Response Planning
C. A-GA-135-003/AG-001, Airworthiness Investigator Manual

INTRODUCTION

1. FS occurrences result in or have the potential to cause the loss of aviation resources. It is therefore important to investigate appropriate occurrences with the objective of quickly identifying effective PM that will either prevent or reduce the risk of a similar occurrence. The AIA has been delegated the responsibility to independently investigate matters of aviation safety concern and has delineated the policy by which this activity is conducted in the AIM. All FS investigation activities are also airworthiness investigations and they are carried out on behalf of the AIA. This chapter outlines the authorities for investigations, the occurrence classification system, the investigation classification system and the types of FS investigations done by DND/CAF.

DEFINITIONS

AIRCRAFT DAMAGE

2. Damage is defined as physical harm to an aircraft that impairs the value or normal function of that aircraft. Damage is said to have occurred when the aircraft or any portion of it is lost or requires repair or replacement as a result of unusual forces like a collision, impact, explosion, fire, rupture, or overstress. Damage does not include faults that progressively develop from repeated applications of load at or below the design operating limits of the aircraft as a result of normal flight stresses. Additional damage resulting from stress failures may be classified appropriately as damage. Routine system or component unserviceabilities are not considered to be damage, and need not be reported unless the originator feels that there was injury or damage potential.

NOTE

If the equipment has not been misused or subjected to unusual stress failures, it shall not be classed as damage, but as normal wear resulting from prolonged service use.

AIRCRAFT MAJOR COMPONENTS

3. Aircraft major components are:
- a. Fixed Wing:
 - (1) the fuselage, cargo ramp and major structural sections thereof, but does not include canopies, jettisonable stores, windows, astrodomes, antennae, radomes, MAD booms, aerodynamic braking devices, small non-structural panels, doors or hatches, and non-integral nacelles,

- (2) the wings and major structural sections thereof, but not including the wing-tips, non-integral nacelles, spoilers, flaps, ailerons or other control-of-lift devices,
 - (3) the empennage and major structural sections thereof (vertical stabilizer, horizontal stabilizer, and stabilator), but not including the rudder or elevator; and
 - (4) the landing-gear oleos, legs, struts, sponsons and similar weight-supporting members and structures, but not including the tail wheel strut or support assemblies, wheels, floats, shoes, skis, non-integral removable axles, brakes, tires, gear doors or actuating rods;
- b. Rotary Wing:
- (1) the fuselage, cargo ramp and major structural sections thereof, but does not include, windows, astrodomes, antennae, radomes, small non-structural panels, doors or hatches, and non-integral nacelles,
 - (2) the main rotor and tail rotor blades system, main transmission, and gearboxes but not including the drive shafts,
 - (3) the helicopter tail boom and pylon, but not including the fairings, non-integral vertical or horizontal stabilizers or synchronized elevators, and
 - (4) the landing-gear oleos, legs, struts, sponsons and similar weight-supporting members and structures, but not including the tail wheel strut or support assemblies, wheels, floats, shoes, skis, helicopter cross-tubes or skids, non-integral removable axles, brakes, tires, gear doors or actuating rods; and
- c. UAV Major Components. UAV major components will be defined on a case-by-case basis as determined by individual UAV type and consultation with DFS.

INVESTIGATOR IN CHARGE (IIC)

4. The IIC will be a qualified, trained and certified accident investigator appointed by the AIA or through authorized delegation by the 1 Div FSO. The IIC conducts all airworthiness investigation activities on behalf of the AIA. All activities of personnel involved in the investigation are to be coordinated through the IIC

FS INVESTIGATION

5. A flight safety investigation (FSI) refers to any investigation conducted under the terms of this publication and the AIM for the sole purpose of occurrence prevention. These investigations are also referred to as airworthiness investigations and fulfil the investigation requirement of the CAF/DND Airworthiness Program.

FS INVESTIGATION REPORT

6. The report produced in support for a Class I FSI into the circumstances of a particular FS occurrence, and subsequently commented upon by various levels of command and the PDIs is titled a FSI Report (FSIR).

POWER PLANT

7. The power plant includes the engine, engine-driven components and related systems, including propellers, afterburners, fans and the like.

PERSONS WITH A DIRECT INTEREST (PDI)

8. Typically, PDI status is given to crew members, the affected CoC(s) and contractors directly involved in the operation maintenance or manufacture of the aircraft. Notwithstanding, a PDI is defined as:

- a. an individual who is the subject of the report or a witness used in the report who, in the opinion of the AIA, is able to comment constructively on the factual accuracy of the report; and,
- b. an individual, Command or Organization that in the opinion of DFS is directly affected by the findings, cause factors and/or preventive measures recommended within the report.

NEED TO INVESTIGATE

9. FS occurrences result in or have the potential to cause an accidental loss of resources. Therefore, any occurrence that could lead to the identification of causes and determine effective PM will be investigated. This chapter describes the tasking authorities and necessary protocols for the conduct of FSIs.

AUTHORITY TO INVESTIGATE

10. The Aeronautics Act, the A-GA-135-001/AA-001, Flight Safety for the CAF, and the delegations and authorizations as outlined in the A-GA-135-003/AG-001 Airworthiness Investigation Manual (AIM) provide the authority to investigate FS occurrences. These documents define terminology, responsibilities and procedures for investigation. The A-GA-135-002/AA-001 Investigations Techniques for the CAF also provides guidance for terminology and prescribes procedures specific to investigative techniques.

FSI CONVENING AUTHORITY

11. DFS/AIA is the convening authority for Class I and Class II investigations. The convening authority for a Class III and IV investigations is delegated by the AIA to the WFSO.

INVESTIGATION RESPONSIBILITIES

DEPARTMENTAL RESPONSIBILITIES

12. The MND has designated DFS as the Airworthiness Investigative Authority for the CAF/DND. The AIA is responsible to independently investigate all matters of aviation safety concern, an MND requirement based in the *Aeronautics Act* and a coincidental requirement of both the Airworthiness Program and the FS Program. Consequently, DFS/AIA shall ensure that occurrences as defined in this document are documented and investigated as required. In principle, the completion of a Combined Report or a Supplementary Report constitutes in itself an investigation, although it may consist of the simple gathering of facts as done for occurrences labelled as Repetitive Occurrences (ROs).

COMMAND RESPONSIBILITIES

13. The unit CO shall ensure that all FSIs affecting aircraft under unit control are investigated; however, all investigation activities are undertaken on behalf of the AIA as delineated in the AIM. If an investigation is impractical for the unit of ownership to investigate, the WComd/Comd 1 Cdn Air Div and DFS shall be advised.

OCCURRENCE CATEGORY

14. FS occurrences are categorized according to the overall seriousness of the occurrence. The occurrence category is an alphabetical designation assigning an overall seriousness classification to an occurrence based upon two factors:

- a. the aircraft damage level (ADL); and
- b. the personnel casualty level (PCL).

15. Refer to Annex A for the Occurrence Category to be assigned in accordance with the ADL and PCL at play during an occurrence. Occurrence categories range from A to E for both air and ground occurrences, with A being the most serious and E identifying situations where, although no damage occurred, the potential for damage or injury existed.

AIRCRAFT DAMAGE LEVEL

16. The ADL is a qualitative categorization system used to determine the level of damage sustained by an aircraft during an occurrence. The following damage level definitions are used to reflect the degree of damage:

- a. Destroyed/missing: The aircraft has been totally destroyed, is assessed as having suffered damage beyond economical repair or is declared missing;

NOTE

Aircraft totally destroyed are normally written off the inventory. Accidents with a lower ADL may subsequently result in administrative write-off of the aircraft for reasons not directly related to the damage. The original ADL will be recorded in the FSOMS for statistical purposes.

- b. Very serious: The aircraft has sustained damage to multiple major components;
- c. Serious: The aircraft has sustained damage to a major component;

NOTE

When a fuselage, wing, helicopter drive train or rotor blade are damaged beyond economical repair or are shipped to a repair facility, the level of damage will be referred to DFS for categorization (e.g. rotor blade change is minor damage, multiple blade changes is serious damage, transmission overspeed requiring overhaul is minor damage, sudden stoppage requiring complete change of drive train is serious damage).

- d. Minor: The aircraft has sustained damage to non-major components; and
- e. Nil: The aircraft, including the power plant, has not been damaged.

NOTE

When there are unique contractual maintenance arrangements in place that preclude CAF personnel from performing repairs that are considered within second-line maintenance, the case will be referred to DFS, who will assign the ADL.

PERSONNEL CASUALTY LEVEL

17. The PCL is a colour-based categorization system used to identify the most severe casualty suffered by personnel in an FS occurrence. The PCL is determined by a medical officer in accordance with CAFAO 24-1. The PCL assigned for an occurrence is defined as follows:

- a. BLACK: PCL level assigned when a fatality has occurred;
- b. GREY: PCL level assigned when personnel are missing;
- c. RED: PCL level assigned when personnel are very seriously injured or ill and the person's life is in immediate danger;
- d. YELLOW: PCL level assigned when personnel are seriously injured or ill. There is cause for immediate concern but the patient's life is not in immediate danger. Usually the person is non-ambulatory; and
- e. GREEN: PCL level assigned when personnel are moderately injured or ill in an occurrence for which medical attention is needed but there is no immediate concern. Usually the person is ambulatory.

NOTA
FS reports shall only provide PCL information. No other medical information or details shall be circulated on the FS net or entered in FSOMS.

CLASS OF FS INVESTIGATIONS (FSI)

CRITERIA FOR ASSESSING FSI CLASS

18. In order to assign investigations to the appropriate authority, an occurrence investigation classification system is used. The purpose of classifying FSIs is to determine the amount of time and resources that will be devoted to the investigation. The type of investigation into an occurrence and the level of effort will be determined by an assessment of the following three criteria:

- a. the occurrence category;
- b. the safety of flight compromise level; and
- c. other factors which could impact on the reputation of the FS Program, the Airworthiness Program, the CAF and the Department.

19. FSIs will be classified I to IV based on the above criteria. Annex B shows the Class of investigation assigned based on these criteria.

SoF COMPROMISE LEVEL FACTOR (SFCL)

20. The SFCL is categorized with a qualifier that describes the level to which safety margins were compromised during an occurrence. By extension, it provides an indication of how much the crew and/or aircraft were put at risk.

- a. Extreme: an occurrence where the outcome has been or could have been catastrophic and might have resulted in the loss of life or the aircraft;
- b. High: an occurrence where the outcome has resulted or could have resulted in very serious injury or very serious damage to the aircraft;
- c. Medium: an occurrence where the outcome has resulted or could have resulted in serious injury or serious damage to the aircraft; and
- d. Low: an occurrence where the outcome has resulted or could have resulted in minor injury or minor damage to the aircraft.

OTHER AGGRAVATING FACTORS

21. There are other factors that may elevate the level at which an occurrence is investigated. If a higher level of investigation might lead to a more effective reduction of risk to persons, property or the environment then this level should be assigned. Consideration shall also be given to maintaining the trust of CAF personnel and the general public in the FS Program and the CAF by having occurrences investigated at the appropriate level.

RELATIONSHIP BETWEEN INVESTIGATION CLASS AND INVESTIGATION TYPE

22. Each FSI Class requires the production of a report as follows:
- a. Class I: Flight Safety Investigation Report (FSIR);
 - b. Class II: Enhanced Supplementary Report (ESR);
 - c. Class III: Supplementary Report (SR); and
 - d. Class IV: Combined Report (CR) or SR.

TASKING FOR CONDUCT OF INVESTIGATIONS

23. DFS/AIA conducts all Class I and Class II investigations and depending upon circumstances, tasks the appropriate investigation team to do so. All other investigations are conducted by unit FSO on behalf of DFS/AIA and are released by the supporting wing FSO (IIC). Some occurrences are repetitive in nature and limited benefit would be gained by carrying out a full-scale investigation.

REPETITIVE OCCURRENCES (RO)

DEFINITION OF RO

24. A RO is defined as a recurring type of FS incident where the event and investigation results are consistent with a previous investigation. The use of an RO is limited to a SR or a CR.
25. Example of typical ROs are the Cormorant tail rotor half-hub cracks, bird strikes with little to no damage and the Griffon chip light detectors occurrences. Given the repetitive nature of these incidents and the limited potential to find new causes and original PM, a rudimentary investigation is still required to ascertain the facts and confirm the occurrence is similar in all aspects.

RO CONDITIONS

26. To qualify as an RO, an occurrence must meet the following conditions:
- a. the personnel involved has suffered no injury;
 - b. the aircraft has sustained only minor or no damage;
 - c. the PM and cause factor(s) for the investigated occurrence is/are in line with a reference occurrence; and
 - d. the FS risk and aggravating factors, if any, are in line with the reference occurrence which will serve as the initial RO.

RO STAFFING, APPROVAL AND MONITORING

27. Any occurrence which will be treated as an RO must refer to an original FSOMS reference ID # for which a detailed investigation was completed. It will use the same key words, cause factor(s) and PM(s) of the reference RO.

28. The 1 Div FSO staff monitors the occurrences reported by different wings and is the approving authority to accept a type of occurrences as an RO. If it is determined that a certain type of occurrences should be treated as a RO, the FSO or WFSO shall submit a request to the Div FSO for approval and inclusion on the RO master list. The suitability of the RO designation will be evaluated by the 1 Div FSO staff and approved, as applicable. The WFSOs and FSOs of affected units will be informed of the newly approved RO. The approved RO list will then be updated by the 1 Div FSO staff and posted on the FS Intranet site. By keeping track of ROs, DFS can initiate more detailed analysis, as required, if concerns are identified or as required. The RO list shall be reviewed annually for suitability by the FSOMS WG.

INVESTIGATION FOR TRACKING PURPOSE ONLY

29. If it is assessed by the investigative unit that a Class IV investigation will not lead to the production of significant cause factors and valuable PMs, the investigative officer will ascertain the facts in FSOMS so it can be tracked for future analysis and tracking purpose (FTPO) and make recommendation to the WFSO as follows:

- a. Cause factor: Nil (FTPO); and
- b. PM: Nil (FTPO).

FSI TEAM SELECTION

30. FSI team personnel are assigned by the appropriate FS tasking authority. For Class I and Class II FSI, the AIA appoints the IIC and approves the team composition. For Class III and IV FSIs the team is typically assigned and authorized through the established FS structure positions within aviation units or with units that conduct aviation activities for the CAF/DND.

31. DFS/AIA may, in coordination with the CoC, task a non-DFS IIC to conduct a Class II investigation.

INVESTIGATOR-IN-CHARGE

32. All FS investigations will have an IIC. This is normally the WFSO (typically holding an IIC 3 qualification) for Class III or IV investigations. The IIC for Class I or II investigations should be a DFS accident investigator currently employed at DFS (typically holding IIC 2 or IIC 1 qualifications). In unusual circumstances, DFS may appoint another trained investigator who is not currently employed at DFS. Anyone tasked to conduct an FSI shall be excused from all other duties until released from the investigation by DFS. The IIC reports to DFS/AIA for the conduct of the investigation.

33. The IIC has the authority to quarantine and impound evidence, interview witnesses and examine documents and equipment related in the occurrence. The IIC also has certain delegated authorizations from the AIA for activities associated with investigations as outlined in the AIM. Detailed process guidance for the investigation is promulgated in A-GA135-002/AA-001.

34. The mandate of the IIC is to conduct a thorough and impartial investigation into the occurrence and submit a report in the mandated format detailing the facts, analysis of those facts, causes and PMs relevant to the occurrence as defined and detailed in the AIM.

MEMBERS AND ADVISORS

35. Personnel assigned to an FSI team are tasked by DFS/AIA and will report to the IIC until released from duty by DFS/AIA. Unless there is no reasonable alternative, a team member should not be selected from the unit of occurrence. The circumstances of the occurrence will dictate the team complement best suited to investigate considerations such as human factors, technical issues, recovery and salvage support and medical issues. In addition, advisors such as meteorologists, other aircrew, air traffic controllers and paratroop officers should be appointed when the need arises. Specialist advisors not specifically assigned to the FSI team in the tasking order may be required to assist in the investigation. Each individual will be appointed with an observer status and will normally have limited access to information not related to their field of expertise. At the discretion of the IIC, each individual could be integrated fully into the investigation team provided an undertaking, consisting of two documents (AIA Observer Status granting form and Non-disclosure Agreement form) is signed and witnessed,

NOTE

The undertaking documents are available in the AIM,
Chapter 4, Annex B and C respectively.

TYPICAL FSI TEAM COMPLEMENT

36. The FSI team tasked by DFS/AIA will ideally comprise:
- a. IIC. This person is a qualified and certified investigator who is authorized by the AIA to conduct the investigation and is familiar with the aircraft type and role;
 - b. Aircrew Member. This person is a subject matter expert who is qualified and current on the aircraft type involved in the occurrence;
 - c. Technical Member. This person is the DFS AERE Officer or an AERE officer familiar with the aircraft type;
 - d. Medical Member. This person is the DFS Flight Surgeon or a military physician, ideally a flight surgeon;
 - e. Specialist Advisors. Advisors will be appointed as required; and
 - f. Observers. Observers will be appointed as required.

TYPES OF OCCURRENCE REPORTS

37. There are several types of FS occurrence reports that may need to be completed depending on the Class of investigation carried out:
- a. Initial Report (IR);
 - b. Supplementary Report (SR);
 - c. Combined Report (CR);
 - d. Enhanced SR (ESR); and

e. FSIR.

INITIAL REPORT (IR)

38. The IR describes the immediately available particulars of the occurrence and should be sent within 12 hours of the event. It is generally reported through FSOMS. If the user is unable to access the application, occurrence details shall be sent to the designated wing for input into the database. Annex E lists the information that must be submitted in the IR. An IR form can be downloaded from the DFS websites.

NOTE

The IR should include whether quarantining has taken place (e.g. quarantining of aircraft and aircraft oxygen system, aircrew ALSE, LOX trailer, LOX storage tank), so that those reviewing the FSOMS entry know right away that this important airworthiness investigation step was not omitted or overlooked.

SUPPLEMENTARY REPORT (SR)

39. The SR is the report normally produced by the wing or unit for Class III and IV investigations. It shall be submitted within 30 calendar days of the occurrence. The report requirements are shown in Annex F.

COMBINED REPORT (CR)

40. The CR is the combination of the IR and SR in a single report submitted for minor occurrences requiring limited or cursory investigation, provided it can be released within 48 hrs of the occurrence. The report format is the same as the SR.

ENHANCED SR (ESR)

41. The ESR is the report type used for Class II investigations which summarize occurrences that are sufficiently complex to warrant a more thorough investigation than a normal SR, but do not require the same degree of detail as a FS Investigation Report (FSIR). The format of the ESR is similar to an SR, with expanded detail within paragraph 22 (analysis). The intent of an ESR is to expedite reporting for less complex occurrences; as such the report is much shorter than an FSIR and a preliminary report is not required. A Class II occurrence requires the publication of an FTI, distribution of a Draft ESR for Comment, input of the final report into FSOMS and the publication of the Epilogue on the DFS Website. The AIA is the tasking and releasing authority for all ESRs.

FSIR

42. The final report is titled FSIR. It is a comprehensive report on an FS occurrence and all related aspects to provide reviewing authorities with detailed information on which to base recommended PM. The report follows the ICAO accident report format. DFS will be the tasking and releasing authority for the report. The report requirements are available on the DFS website. The FSIR will include valid PDI input from the Draft for Comment process. The report

will be produced in both official languages. The FSIR shall normally be unclassified and be released to the public via the DFS Internet website under tab Flight Safety Links\Investigation Reports.

ACTIONS LEADING TO PRODUCTION OF FSIR AND ESR

DOCUMENTATION

43. In the process of staffing a FSIR, the IIC will produce different documents as follows:
- a. FSIR:
 - (1) Preliminary FSIR,
 - (2) From the Investigator,
 - (3) Draft FSIR for Comments,
 - (4) FSIR,
 - (5) Epilogue; and
 - b. ESR:
 - (1) From the Investigator,
 - (2) Draft ESR for Comments,
 - (3) ESR (inputs in FSOMS), and
 - (4) Epilogue.

PRELIMINARY FSIR

44. The purpose of the Preliminary FSIR is to provide senior management with factual information pertinent to the occurrence and provide immediate PM recommendations where appropriate. The Preliminary FSIR shall include Part 1, Factual Information, and Part 4, Preventive Measures of the FSIR. One blank page for each of Part 2 and Part 3 shall be included for completeness. In the interest of expediency, the report may be produced in one language only (normally English unless the addressee is a French language unit (FLU)).

FROM THE INVESTIGATOR (FTI)

45. The FTI summarizes factual information from the initial portion of a Class I or Class II Investigation. It shall describe factual information, immediate safety actions taken and the focus of the ongoing investigation. The FTI will be published in bilingual format on the DFS website and in Flight Comment. The complete document will not normally be longer than two pages.

DRAFT FSIR FOR COMMENT

46. Class I and Class II investigations shall be forwarded to PDIs as a Draft FSIR for Comment. Individual PDIs such as involved aircrew or witnesses shall receive individual copies, and their responses shall be privileged. PDI's wishing to share their responses with

the appropriate CoC, may do so at their discretion on the understanding that the information remains privileged and should only be shared on a need-to-know basis. Draft FSIR for Comment to the CoC and organizations may be distributed only to the staff required to effect an appropriate response. Individual and collated staff responses should be addressed directly to the DFS OPI without further redistribution. The AIA deems that Draft FSIR for Comment responses are by definition, extensions of witness statements and as such, the direct response ensures privileged information is protected as required by the *CTA/ISB Act*.

EPILOGUE

47. The *Epilogue* summarizes the information contained in the FSIR. The *Epilogue* will be published in bilingual format on the DFS Internet website and in *Flight Comment*.

IMMEDIATE ACTION TAKEN

48. In the course of investigating an FS occurrence, the IIC shall be responsible for staffing reports in accordance with Para 46 above. Notwithstanding report timelines, PM recommendations shall be promulgated by the IIC whenever the investigation discovers a deficiency that requires immediate notification, assessment or action within the CoC.

REPORT DEADLINES

49. Report deadlines shall represent the desired output. Extenuating circumstances such as workload, investigation complexity and manning may result in significant delays. Nevertheless, the intent is to complete all reports in a timely fashion such that preventive measures can be implemented as soon as possible, without sacrificing the quality of the report. Table 3 provides the desired timelines for each report type.

REPORT TYPE	TIMELINE
PRELIMINARY FSIR	30 DAYS
FTI	30 DAYS
DRAFT FSIR FOR COMMENTS	180 DAYS
FSIR	360 DAYS
EPILOGUE	360 DAYS

Table 3 – Report Timelines

(Refer to the AIM for other report timelines)

FOLLOW-UP ON PROPOSED PM

50. The FSIR and the ESR are distributed in a similar fashion. The FSIR is forwarded from the AIA to C Air Force, who subsequently distributes it to the OAA and TAA, as applicable, to allow them the opportunity to review and provide formal input from the CoC on the proposed PMs. Should the OAA or TAA determine that a recommendation in an FSIR is not feasible, they shall advise the Airworthiness Authority in writing of their decision and the rationale for it. It is highly desirable that the decision not to implement a recommendation be accompanied by a formal risk assessment. An ESR is distributed to the CoC directly from the AIA with a

request for support of all PMs. In the event that the CoC does not support a PM from an ESR, alternative PMs and/or risk assessments are requested.

51. OAA and TAA shall submit any comment and input into the proposed PM (including risk assessments) to C Air Force within 21 days following receipt of the FSIR. The AA will consider the input from the OAA and TAA during the formulation of the final action directive.

52. Chapter 11 of this publication describes the generic handling and follow-up of PM. Chapter 2 of the AIM details the principles of airworthiness investigations and articulate the processes for the follow-up of PM stemming from airworthiness investigations.

USE AND HANDLING OF FS REPORTS

53. Reports prepared under the authority of this publication are considered by the CAF to be sensitive documents and, unless specifically authorized, these reports and their attachments shall not be used for any purpose other than FS. The special treatment accorded these reports is of vital importance in obtaining complete cooperation from witnesses and in determining the real cause(s) of an occurrence. Authorization for other uses shall only be granted with the express concurrence of DFS/AIA. Examples of agencies who might have access to FS information are as follows:

- a. a coroner requests access for the purposes of a coroner's investigation; and
- b. an individual is conducting a coordinated investigation under the provisions of one or more signed agreements (a STANAG or an MOU with TSB).

PROTECTION OF INFORMATION IN FS REPORTS

54. The concept of classifying information given during an FS investigation as privileged encourages a frank and open reporting culture. This helps to determine the cause(s) quickly and to develop the most appropriate PM. It must be noted that FS reports and the supporting investigation files may be accessed through the *Access to Information Act*. Nevertheless, the contents of the reports are eligible for protection under the *CTAISB Act*, *Access to Information Act* and *Privacy Act*.

55. It is the policy of DND that some investigation reports will be made available to the public in order to facilitate accident prevention throughout the aviation community. They are released under the authority of the DFS/AIA pursuant to the powers delegated to him/her by the MND as the Airworthiness Investigative Authority of the CAF, with the understanding that the reports will be used for no other purposes than accident prevention.

RECONVENING A FSI

56. An investigation shall be re-opened by DFS or the delegated FSO without delay if it appears that some evidence was not considered or was omitted; if a relevant aspect was not covered adequately; or new evidence has been uncovered, and this evidence would lead to a PM which has not already been recommended. Such action should not be taken unless absolutely essential.

RELATIONSHIP BETWEEN FSI AND BOARD OF INQUIRY

57. The effectiveness of the FS Program is reliant on open, honest and timely reporting of occurrences by individuals without fear of retribution. When required, the CAF may be required to convene a collateral investigation concurrent with or in addition to a FS investigation for the purposes of determining administrative or disciplinary disposition. In order to preserve the fundamental principles of the FS Program, FSOs shall not be appointed to or participate in collateral investigations. Information gained by FSOs through the conduct of a FS investigation shall only be provided to a collateral investigation on the authority of DFS.

58. When an aircraft accident occurs, a separate Board of inquiry may be convened in accordance with QR&Os. The requirement to conduct a Board of inquiry might be for a variety of reasons such as Investigation of Claim By or Against the Crown; QR&O 21.46, Investigation of Injury or Death; or to support COMSEC, administrative or disciplinary actions. This collateral investigation shall be independent of the FS investigation into the same occurrence. Privileged information (as defined in sections 22, 23 and 24.1 of the *Aeronautics Act*) which is gathered during the course of the FSI shall not be made available to the Board of inquiry President. However, all the factual information and a statement of cause, if available, will be made available upon request.

NOTE

Anyone who in the course of their FS investigation becomes aware of circumstances that require a collateral investigation is to advise the commanding officer or commander immediately. The FSO will only suggest the requirement of a collateral investigation and shall not give evidence as to what circumstances brought them to that determination. The chain of command, after having concluded there is a requirement of a collateral investigation, should act promptly to initiate the process in order to avoid the impression that information gained through the FSI precipitated the collateral action.

COORDINATED INVESTIGATIONS

59. Within Canada, TSB is responsible for investigating all aviation occurrences involving aircraft other than military conveyance aircraft or facilities. DND has the responsibility for investigating all occurrences involving military conveyance aircraft or facilities. The *CTA/ISB Act* defines a military conveyance aircraft as one being operated by or on behalf of DND, CAF or a visiting force.

60. When the occurrence involves both civilian and military aircraft and/or facilities, the work of civilian and military investigators will be coordinated and will be governed by a DND/TSB Working Agreement developed for that purpose. The DND investigation will be conducted under the authority of section 4.2(1)(n) or Part II of the *Aeronautics Act*, the *CTA/ISB Act*, the DND/TSB Working Agreement and in accordance with this publication. The TSB investigation will be conducted under the authority of the *CTA/ISB Act* and in accordance with the DND/TSB Working Agreement. Coordinated investigations with other military forces will normally be conducted within the procedures contained in ICAO Annex 13 for investigations involving non-NATO foreign military aircraft, and in STANAG 3531 for investigations involving NATO nations.

ACCESS TO INFORMATION REQUESTS

61. The *Access to Information (ATI) Act* provides broad and effective legal access to information generated by government employees and information about government employees. With respect to FS investigations in general, and more specifically aviation accident/incident investigations, the ATIA, the *Privacy Act*, the Aeronautics Act and the *CTAISB Act* provide some protection for information obtained through investigations. Provisions for protection of privileged information is fully protected from release through the *ATI Act*. WFSOs are not expected to be current with the provisions of the various statutes mentioned above nor are they expected to handle FS ATI requests. All requests for FS information should be immediately routed through the designated ATI officer for the wing and handled according to the provisions stipulated in Chapter 7 of the AIM and applicable annexes. If that officer is not aware of the protections afforded by the various laws, they should be cautioned and advised to contact DFS for advice.

INVESTIGATION FILE RETENTION/DESTRUCTION

62. All Investigation documentation, evidence and files, in both paper and electronic formats, shall be retained by the originating unit or the respective unit, wing or FS investigation team until the investigation is formally closed. These documents shall be retained for a period of 5 years and disposed of IAW DND/ADM (IM) policy detailed in the Defence Subject Classification and Disposition System (DSCDS). After the 5 year retention period, Category A, Category B and those investigations completed and identified by the AIA/DFS shall be sent to Library and Archives Canada. Investigation files for Category C, D and E occurrences shall be destroyed. The AIA/DFS direction shall be sought for all circumstances falling outside this direction.

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Annex A
 Chapter 9
 A-GA-135-001/AA-001

ANNEX A – OCCURRENCE CATEGORY TABLE

1. The Occurrence Category is based on the combination of the ADL and PCL as per the Occurrence Category table below and is based on whichever is the highest of the two values. The Occurrence Category table is to be used in conjunction with the Flight Safety Investigation Class table at Annex B. The reporting unit shall use the Category table to define occurrences that require immediate reporting to DFS via 1-888-WARN-DFS (927-6337) and toxicological screening for those military personnel involved.

NOTE

DFS shall be contacted as soon as possible and toxicology testing initiated for any occurrence that is C category or higher, or if the occurrence category is unknown for any occurrence with the potential to be a C category or higher.

AIRCRAFT DAMAGE LEVEL (ADL)	PERSONNEL CASUALTY LEVEL (PCL)	OCCURRENCE CATEGORY	INV CLASS
DESTROYED OR MISSING	FATAL INJURY OR MISSING	A	I
VERY SERIOUS DAMAGE	VERY SERIOUS INJURY/ILLNESS	B	I OR II
SERIOUS DAMAGE	SERIOUS INJURY/ILLNESS	C	II OR III
MINOR DAMAGE	MINOR INJURY/ILLNESS	D	III OR IV
NIL	NIL	E	IV

NOTE

Annex B has to be consulted for the final determination of the investigation Class which will take into consideration the SFCL and other aggravating factors.

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Annex B
 Chapter 9
 A-GA-135-001/AA-001

ANNEX B – FS INVESTIGATION CLASS TABLE

1. The investigation class is normally based on the highest level between the Occ Cat., the SFCL and other aggravating factors as per the Investigation Class table below. This table serves as a guide only and DFS/AIA reserves the right to determine the class of investigation to be done. DFS/AIA is the tasking authority for all Class I and II investigations.

FACTORS			RECOMMENDED INVESTIGATION		
OCC CAT	SFCL	AGGRAVATING FACTORS	INVESTIGATION CLASS	INVESTIGATING AGENCY	REPORT TYPE
A	EXTREME	EXTREME	I	DFS	FSIR
B	HIGH	HIGH	II	DFS	ESR
C	MEDIUM	MEDIUM	III	WFSO OR UFSO	SR
D	Low	Low	IV	UFSO	SR OR CR

2. The determination of the class of investigation and the related assigned investigating agency are based on three factors:
- a. Occurrence Category. Refer to Annex A.
 - b. SFCL. The SFCL indicates the actual level of risk experienced by the personnel and/or aircraft during an occurrence. An event could have resulted in no damage and/or injuries but have an extremely high SFCL, hence may require a more thorough investigation
 - c. Aggravating Factors. There are other factors that may elevate the level at which an occurrence is investigated. If a higher level of investigation might lead to a more effective reduction of risk to persons, property or the environment then this level should be assigned. Consideration shall also be given to maintaining the trust of CF personnel, the trust of the general public in the FS Program and in the CF by having occurrences investigated at the appropriate level (e.g. a Medium SFCL occurrence involving a WFSO could be investigated by DFS or a WFSO from another wing).

NOTE
 DFS shall be contacted as soon as possible if it is felt that a Class I or II investigation would be appropriate.

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Annex C
Chapter 9
A-GA-135-001/AA-001

ANNEX C – FSI SITREP TEMPLATE

FS INVESTIGATION SITREP # _____

This report contains information related to an on-going FS investigation. Information shall not be released to the public in whole or in part except under the authority of the Director of Flight Safety, National Defence Headquarters.

DATE/TIME: USE LOCAL TIME

ACCIDENT AIRCRAFT TAIL #:

LOCATION:

DETAILS OF ACTIONS COMPLETED SINCE LAST SITREP: FOR INITIAL SITREPS, INCLUDE ARRIVAL STATUS OF TEAM MEMBERS. INCLUDE A SUMMARY OF ANY PERTINENT FACTUAL INFORMATION COLLECTED SINCE LAST SITREP, LIKE WITNESS INTERVIEWS COMPLETED, PHOTOGRAPHS TAKEN AND RECORDERS REMOVED/SENT. INCLUDE ANY ON-SITE ANALYSIS SINCE THE LAST SITREP SENT. AVOID CONJECTURE.

DETAILS OF NEXT PLANNED ACTION ITEMS: INCLUDE PLAN FOR NEXT DAY TEAM ACTION ITEMS. IDENTIFY ANY EXTRA SUPPORT REQUIRED FOR THE INVESTIGATION LIKE LOGISTICAL SUPPORT, ADMINISTRATIVE SUPPORT, PUBLIC RELATIONS AND FINANCIAL APPROVALS.

PM TAKEN: INCLUDE ANY IMMEDIATE SAFETY ACTIONS TAKEN BY THE UNIT OR ANY HIGHER-LEVEL AGENCY (NOT ALREADY REPORTED IN A SITREP).

RECOMMENDED IMMEDIATE PM: INCLUDE ANY RECOMMENDED MEASURES THAT THE TEAM FEELS, AFTER INITIAL ANALYSIS, MAY PREVENT SIMILAR INCIDENTS / ACCIDENTS IN FUTURE (NOT REPORTED IN A PREVIOUS SITREP).

ADMINISTRATION: PLACE TO INCLUDE INVESTIGATION COST DURING THE DAY AND EXPECTED COST FOR COMING DAY.

IIC HOTEL INFO: ONLY REQUIRED IN FIRST SITREP UNLESS IT CHANGES. INCLUDE HOTEL PHONE NUMBER.

CONTACT NUMBERS: ONLY REQUIRED IN FIRST SITREP UNLESS CHANGES OR ADDITIONS ARE MADE. INCLUDE ALL TEAM MEMBERS CELLULAR, SUPPORT CELL OR OPERATIONS DESK CONTACT NUMBERS, SatCOM AND / OR PAGER NUMBERS.

IIC NAME:

Le présent rapport contient de l'information relative à une enquête en cours de la SV. L'information ne doit pas être rendue publique, en tout ou en partie, sauf avec l'autorisation du directeur de la SV, quartier général de la Défense nationale.

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Annex D
Chapter 9
A-GA-135-001/AA-001

ANNEX D – REFERENCE DOCUMENTATION

- *Aeronautics Act* *
- *Canadian Transportation Accident Investigation and Safety Board Act* *
- ICAO Doc 9839 AN/474, Safety Management System Manual Third Edition 2013 *
- ICAO Aircraft Accident Investigation Convention on International Civil Aviation, Annex 13 *
- A-GA-135-001/AA-001, Flight Safety for the Canadian Armed Forces
- A-GA-135-002/AG-001, Occurrence Investigation Techniques *
- A-GA-135-003/AG-001, Airworthiness Investigation Manual *
- B-GA-015-001/FP-001, Human Factors Guide for the Conduct of Aircraft Accident Investigation *
- B-GA-015-002/FP-001, Aircraft Accident Board of Inquiry Handbook–Technical Member *
- B-GA-015-003/FP-001, Notes for the Conduct of Investigations into Aircraft Accidents *
- B-GA-015-004/FP-001, Aircraft Accident Board of Inquiry Handbook-Aircrew Member *
- CFACM 2-350, Emergency Response Planning
- CFTO C-02-015-001/AG-000, Unsatisfactory Condition Report–CF 777
- CFTO C-05-010-002/AG-000, Aircraft Salvage Procedures
- CFAO 24-6, Investigation of Injuries or Death–Coroner’s Inquest
- CFAO 59-3, Claims By or Against the Crown
- CFAO 210-1, Civilian Witnesses–Fees and Expenses
- QR&O 21.47, Finding of Injury or Death
- QR&O 21.56-57, Aircraft Accidents
- QR&O 24.20, Post-mortem Examination
- CFMO 42-03-04, Medical Investigation and Reporting of Aircraft Accidents/Aeromedical Incidents
- STANAG 3101, Exchange of Accident/Incident Information Concerning Aircraft and Missiles
- STANAG 3318, Medical Aspects of Aircraft Accident/Incident Investigation
- STANAG 3531, Investigation of Aircraft/Missile Accidents/Incidents
- ASCC Air Standard 85/2A
- B-MD-007-000/AF-003, CF Flight Surgeons’ Guidelines for FS Investigation
- DAOD 3002-4, Ammunition or Explosives Accident, Incident, Defect or Malfunction Reporting
- Working Arrangement between the Transportation Safety Board of Canada Air Investigations Branch and the Department of National Defence Directorate of Flight Safety

NOTE

Documents annotated with an asterix are core references for the Flight Safety Course and contain essential information for FSOs.

Annex E
Chapter 9
A-GA-135-001/AA-001

ANNEX E – INITIAL REPORT CONTENT

The following information should be reported in the event of a FS occurrence and will form the content of the Initial Report (including CF 215) and be entered into FSOMS within 12 hours of the occurrence.

GENERAL

- DATE/TIME OF OCCURRENCE
- TYPE OF OCCURRENCE
 - ACCIDENT / INCIDENT
 - AIR / GROUND
 - BIRD STRIKE
 - AIR WEAPONS SYSTEM

SAFETY OF FLIGHT COMPROMISE LEVEL

- LEVEL TO WHICH SAFETY MARGINS WERE COMPROMISED
 - EXTREME
 - HIGH
 - MEDIUM
 - LOW

PERSONNEL CASUALTY LEVEL

- MOST SERIOUS INJURY ASSESSED IAW B-MD-007-000/AF-003
 - NIL
 - MINOR INJURY OR ILLNESS (GREEN)
 - SERIOUS INJURY OR ILLNESS (YELLOW)
 - VERY SERIOUS INJURY OR ILLNESS (RED)
 - FATALITY (BLACK)
 - MISSING (GREY)
- FOR EACH INJURY
 - MOS ID
 - ROLE (AIRCREW, MAINTENANCE, OTHER)
 - POSITION ON AIRCRAFT IF ON BOARD
 - INJURY SEVERITY

NOTA

The FS report shall only provide PCL information. No other medical information or details shall be circulated on the FS net or entered in FSOMS.

AIRCRAFT

- AIRCRAFT DAMAGE LEVEL (ADL)
 - MISSING OR DESTROYED
 - VERY SERIOUS DAMAGE
 - SERIOUS DAMAGE
 - MINOR DAMAGE
 - POTENTIAL FOR INCIDENT OR ACCIDENT
- AIRCRAFT TYPE AND REGISTRATION
 - UNIT OF OPERATION
 - UNIT OF OWNERSHIP
- STAGE OF OPERATIONS (E.G. PARKED, IN-FLIGHT WITH DESCRIPTION, MAINTENANCE)
- MISSION TYPE (SHORT DESCRIPTION)
- FLIGHT ATTRIBUTES (IF APPLICABLE)
- BARRIER ENGAGEMENT (IAS, WIND, WEATHER, AND TEMP)

LOCATION

- LOCATION OF OCCURRENCE (DESCRIBE)
- NAVAID LOCATION (APPLICABLE FOR BIRD STRIKES)

DESCRIPTION

- DETAILED DESCRIPTION OF OCCURRENCE
 - STATEMENT OF FACT (WHO, WHAT, WHERE AND WHEN)
 - DE-IDENTIFIED INFORMATION

CONDITIONS

- WEATHER
- CLOUD
- VISIBILITY
- LIGHT CONDITION
- WIND SPEED / DIRECTION

BIRD STRIKE

THE FOLLOWING INFORMATION SHOULD BE REPORTED IN THE EVENT OF A BIRD STRIKE AND WILL SUPPLEMENT THE CONTENT OF THE INITIAL REPORT AND BE ENTERED INTO FSOMS WITHIN 12 HOURS OF THE OCCURRENCE.

- CATEGORY
 - IMPACT / NEAR MISS / SIGHTING
- REMAINS SUBMITTED
 - YES / NO
- WITHIN 5 NM OF AIRPORT
 - YES / NO
- FLIGHT DISRUPTION
 - CONTINUED FLIGHT
 - RETURNED TO AIRPORT

- LANDED NEAREST AIRPORT
- ABORTED TAKE-OFF
- NOTAM WARNING
 - WAS ALERTED
 - DIDN'T CHECK
 - NONE ISSUED
 - NOT AVAILABLE
- LIGHTS ON
 - EXTERNAL
 - WING
 - NAVIGATION
 - STROBE
 - RED ROTATING BEACON
 - WHITE ROTATION BEACON
 - LANDING
- PART STRUCK
 - CANOPY
 - RADOME
 - ENGINE #1 / #2 / #3 / #4
 - NOSE
 - TAIL UNIT
 - WING
 - FUSELAGE
 - FLAP
 - ROTORS
 - LANDING GEAR
 - STORES / TANKS
 - OTHER
- TYPE OF DAMAGE
 - AIRCRAFT SKIN RUPTURED
 - AIR INLETS / SCOOPS BLOCKED
 - IMPAIRED FUNCTION OF FLIGHT CONTROLS, FLAPS, SPOILERS, SLATS
 - METAL DEPOSITED IN OIL FILTERS OR OTHER INTERNAL ENGINE DAMAGE
 - WINDSHIELD OR OTHER GLAZING DAMAGED
 - FANS / COMPRESSOR BLADES, INLET GUIDE VANES
- BIRD DESCRIPTION
 - SPECIES / QUANTITY
- BIRD SIZE
 - SMALL (STARLING) / MEDIUM (GULL) / LARGE (DUCK)

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Annex F
Chapter 9
A-GA-135-001/AA-001

ANNEX F – SUPPLEMENTARY REPORT REQUIREMENTS

1. The following information should be reported as part of the Supplementary Report (SR) and will form the content of the information entered into FSOMS. Not all the information categories below are required on all occurrence investigations. FSOs should provide information in the categories below only if that information is considered as contributing to the occurrence.

AIRCRAFT

- FLIGHT ATTRIBUTES
- ALTITUDE
- AIR SPEED
- DIVE ANGLE
- G STATUS
- HEADING

MAINTENANCE INFORMATION

- AIRCRAFT MAINTENANCE
- TIME SINCE NEW
 - TIME SINCE OVERHAUL
 - TIME SINCE INSPECTION
 - INSPECTION TYPE
 - CF349 #
 - CF543 #

AIRCRAFT COMPONENT INFORMATION

- AIRCRAFT COMPONENT OR MUNITIONS FOR EACH COMPONENT
- NOMENCLATURE
 - WUC
 - SERIAL #
 - TIME SINCE NEW (TSN)
 - TIME SINCE OVERHAUL (TSO)
 - TIME SINCE INSTALLATION/INSPECTION
 - PART NUMBER
- CFTO REFERENCE
- MUNITION LOT AND BATCH #
- DISPOSITION

ARRESTING SYSTEM

- ARRESTING SYSTEM – IF ARRESTING SYSTEM WAS ENGAGED OR ATTEMPTED? THE REPORT SHALL INCLUDE:
 - AIRCRAFT SPEED AND WEIGHT AT ARRESTING SYSTEM
 - POSITION AND ANGLE OF ENGAGEMENT FROM RUNWAY CENTRELINE
 - USE OF BRAKES AT ENGAGEMENT
 - CHUTE USED (VISITING AIRCRAFT)
 - DISTANCE
 - SUCCESSFUL OR UNSUCCESSFUL – EXPLAIN
 - REASON FOR ENGAGEMENT
 - DAMAGE TO ARRESTING SYSTEM – BRIEF DESCRIPTION
 - ELAPSED TIME UNTIL ARRESTING SYSTEM AVAILABLE FOR REUSE
 - AIRCRAFT DAMAGE CAUSED BY ENGAGEMENT – BRIEF DESCRIPTION

FLIGHT CONDITIONS

- WEATHER CONDITIONS
 - FLIGHT CONDITIONS (I.E. IFR/VFR)
 - CEILING (FT)
 - TEMPERATURE (CELSIUS)
 - VISIBILITY (NAUTICAL MILES)
 - LIGHT CONDITIONS (I.E. TWILIGHT – DUSK/DAWN)
 - WIND SPEED
 - WIND DIRECTION
- ALIGHTING CONDITIONS:
 - TYPE OF ALIGHTING AREA (UNPREPARED)
 - ALIGHTING SURFACE CONDITIONS (ICE-COVERED)

PERSONNEL

- FOR ALL PERSONNEL IDENTIFIED
 - TIME ON DUTY: LAST 48 HOURS
 - TIME ON DUTY: LAST 24 HOURS
- FOR AIRCREW ONLY – FLYING HOURS
 - GRAND TOTAL
 - TOTAL ON TYPE
 - PAST 30 DAYS (ALL TYPES)
 - LAST 48 HOURS (ALL TYPES)
 - AIRCREW ROLE (AIRCRAFT COMD, CO-PILOT)
- INVESTIGATION NARRATIVE
- DETAILED EXPLANATION OF HOW AND WHY
- CAUSE FACTORS/HFACS
- PM

Annex G
Chapter 9
A-GA-135-001/AA-001

ANNEX G – PREPARATION OF INVESTIGATION REPORT

1. The intention of this annex is provide FSOs with guidance on the drafting of an investigation report, and in particular, the investigation narrative.

DETAILS OF NARRATIVE

2. The investigation narrative portion of an SR entry is an important section of the overall report. The narrative section should describe, in sufficient detail appropriate to the occurrence circumstances, what happened (factual data based on the evidence collected) and why it happened. The information contained in the narrative should clearly support the assigned cause factors and PMs and allow the reader to understand how and why conclusions were reached. The length and amount of detail included in the SR investigation narrative will depend on the occurrence circumstances and generally be related to the complexity of the occurrence itself and the value output of the report.

EVIDENCE GATHERING

3. The “Whys” cannot be addressed until the “Whats” are known. Before you begin, determine if the evidence is complete enough and good enough to do a thorough and logical analysis of the occurrence. If not, continue to gather additional evidence related to the occurrence. If, for whatever reason, no further evidence is available, explain in the narrative why the relevant factual data was not available in the narrative.

FACTUAL DATA PARAGRAPH(S)

4. The initial paragraph, or several paragraphs, as required, should describe the factual data relevant to the occurrence. One possible approach to organizing the factual data portion of the narrative is to in turn describe the operation, the persons (Human Factors data), the machine, and the environment. The factual narrative should describe what happened, when it happened and where it happened in a logical order. Deviations from accepted norms should be clearly identified in the narrative. Do not include non pertinent information if the information provided has no influence on the cause of the occurrence (eg, detailed weather information if weather was not a factor). Performance data calculations, technical investigation results from other studies (eg QETE) are all considered to be factual data. Of note, no analysis or opinions should be part of this section.

ANALYSIS PARAGRAPH(S)

5. Analysis is the bridge between the factual information and the cause factors. The

analysis paragraph(s) should explain how and why it happened. In other words: what story is told by the evidence that you presented in the factual portion of the narrative? Do not introduce new information in the analysis paragraphs. The analysis should be based on critical thinking processes and application of the rules of logic. The most commonly used logical approach is inductive reasoning, which means making inferences based on the evidence (facts) and using specific information to come to a general conclusion. There is no set order to the analysis text but the investigator should arrange the analysis section to provide a clear explanation of why the occurrence happened.

BIASES

6. There are some common biases to be aware of and avoid while doing your analysis of the evidence:
- a. Availability Bias: the investigator depends primarily upon information that is readily available to them and does not actively seek out other evidence.
 - b. Confirmation Bias: the investigator has a natural tendency to confirm rather than to deny a current hypothesis or use only the evidence that supports the opinion of the investigator.
 - c. Hind Sight Bias: the investigator see events that have already occurred as being more predictable than they were before they took place. One method to mitigate this bias for human factors related investigations is to ask these three questions for those involved in the occurrence:
 - (1) What did they understand the situation to be?
 - (2) What was their plan or intent? and
 - (3) How were they going to accomplish their plan?

NARRATIVE REVIEW

7. When the narrative is complete, the investigator shall do a thorough review to critically check if the conclusions (cause factors) are supported by the evidence. If the factual data is complete and the analysis thorough and logical, accurate cause factors can more easily be identified.

CAUSE FACTORS SECTION

8. No analysis and no new information shall be introduced in this section of the report. The cause factor(s) should be self evident from the factual information and the analysis that was written previously. While there has to be a correlation between the unsafe act(s) and what caused the unsafe act(s), there is no requirement to assign a cause factor for each unsafe act. Notwithstanding, the combination of the cause factor(s) assigned should cover the unsafe act(s) carried out.

PMs SECTION

9. As with the Cause Factors section of the report, no new information shall be introduced in the in the PMs section of the report. The reason for recommending the PMs should be self evident based on the investigation narrative. While there has to be a correlation between the cause factor(s) and the PMs assigned there is no requirement to assign a PM for each cause factor assigned. Notwithstanding, the combination of the PMs assigned should minimize the risk of a repeat of the contributing cause factors.

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CHAPTER 10 – CAUSE FACTORS IDENTIFICATION

References:

- A. James Reason (1990) *Human Error*; Cambridge UK, Cambridge University Press
- B. Wiegmann DA, Shappell SA (2003). *A human error approach to aviation accident analysis: The human factors analysis and classification system*. England: Ashgate Publishing Ltd

PURPOSE OF CAUSE FACTOR IDENTIFICATION

1. The purpose of FS occurrence investigation is to determine cause and contributing factors and to establish PMs that will reduce the likelihood of recurrence. Identification of cause factors assists with a comprehensive and thorough understanding of the reasons why an accident or incident occurred. The “why” is an essential step toward the ultimate goal of finding relevant and effective PMs.
2. The use of standardized cause factor terminology assists with tracking and examination of cause factors. Tracking cause factors helps to determine the effectiveness of recommended PMs. A common definition and categorization of cause factors allows data to be collected in the FS database for analysis; this facilitates analysis of not only individual occurrences, but also of cause factor trends and PM effectiveness across the full spectrum of CF air operations.

DEFINITION OF CAUSE FACTOR

3. A cause factor is defined as the presence or absence of an action, condition or circumstance that leads to a FS occurrence. Cause factors are assigned for FS purposes only, they do not assign blame and they do not need to be substantiated in the strict legal sense or be in accordance with QR&O 21.47 concerning causes of injuries or death for Pension Board purposes.

ASSESSMENT OF CAUSE FACTORS IN FS REPORTS

4. Cause factors derived from the CF Human Factors Analysis and Classification System (CF HFACS) will be assigned for all FS reports that involve human factors. For the Class I FSIR report, causal and contributing human factors will be stated in plain narrative form. DFS will then convert the plain narrative form to CF HFACS for recording in the FS database. For CR, SR, and ESR formats, CF HFACS cause factors will be recorded in the FS database. The final authority for cause factor assignment and publication is DFS.
5. The recommended PMs should normally address all cause factors. Therefore:
 - a. Each cause factor will typically be associated with at least one corresponding PM;
 - b. A number of related cause factors may all be addressed by one PM, or
 - c. One cause factor may generate multiple PMs.

NOTE

It is rare that an assigned cause factor is not associated with a PM; however, a PM may not necessarily relate to any assigned cause factor.

NOTE

Any example given in this chapter for a specific condition does not exclude that other conditions were at play during the occurrence.

TYPES OF CAUSE FACTORS

6. There are six types of cause factors that are applied to CF aviation occurrences:
 - a. Personnel;
 - b. Material;
 - c. Environmental;
 - d. Operational;
 - e. Foreign Object Debris; and
 - f. Undetermined

PERSONNEL CAUSE FACTORS

DEFINITION PERSONNEL CAUSE FACTOR

7. A Personnel cause factor is an act of omission or commission by an individual or individuals or organization that lead to a FS occurrence.

BACKGROUND OF PERSONNEL CAUSE FACTOR CLASSIFICATION SYSTEM

8. There are many ways to define errors and to classify human factors. Prior to 2003, the FS Program used a different taxonomy for the assignment of personnel cause factors. On 1 January 2003, the CF adopted CF HFACS V1.0 to document personnel cause factors. Subsequently, V2.0 was implemented in 2007 and the current iteration, V3.0, in 2013. For statistical research, details of the old classification system can be obtained by contacting DFS 3.

IDENTIFICATION OF PERSONNEL CAUSE FACTORS

9. The FS investigator should identify the most relevant cause factors when investigating occurrences. The process of deciding which cause factors are most relevant can be subjective, requiring critical evaluation. Though there can be multiple cause factors identified, it is important to note that some of them play only a minor role and may not be a productive area of focus. Identifying too many cause factors can dilute the impact of those most important, while not identifying enough can neglect a vital causal component. The investigator will often have to balance between these two extremes. Notwithstanding this, if a cause factor leads to an effective PM, it shall be listed in the report.

10. It is important to ensure that the most significant Unsafe Acts and Latent Conditions are identified and investigated. What constitutes the most important contributory conditions is context-dependant. Making one Unsafe Act may increase the chances of making a subsequent one, so some Unsafe Acts simply follow sequentially from the ones before in what can be called an “error cascade.” Acts that initiate an error or deviation, or a cascade of either, may be more significant than those at the end of the sequence that are closer in time and space to the occurrence. Additionally, it is most likely that an error or deviation was facilitated by a Latent Condition that was even further removed in time and space from the initiating act that led to the occurrence. In sum, it is important to identify the conditions that:

- a. Initiated an unsafe act or sequence of acts;
- b. Had the greatest consequence in the occurrence; and
- c. Were central, causal and contributory to the event.

JUST CULTURE

11. As described in Chapter 1, the analysis of human factors in the FS Program is done solely to prevent future occurrences, not to assign blame. The promotion of a “just culture,” along with the accurate identification of critical human errors and suitable PMs will reduce the probability of reoccurrence.

12. A “just culture” lies between a non-punitive culture and one of sanction and punishment. A non-punitive environment is fundamental to a good reporting culture; however, negligence or a wilful, deliberate or malicious act shall not be tolerated by leadership. A “just culture” recognizes that certain circumstances may require punitive or administrative action in order to define the line between acceptable and unacceptable behaviour. Accordingly, acts that are negligent or of a wilful, deliberate or malicious nature may also need to be addressed outside of the FS Program. When investigators encounter this kind of situation, DFS shall be notified.

13. When circumstances described above are present, the *Aeronautics Act* section 23 provisions may become active where the AIA may decide to give access to an OBR when “the public interest in the proper administration of the Canadian (Armed) Forces outweighs in importance the privilege attached to the OBR by virtue of section 22.” Of note, an OBR that is made available to a section 45 BOI may be used in other proceedings related to competence of any person subject to the Code of Service Discipline.

CF HFACS V3.0 DESCRIPTION

14. The CF HFACS is the method used by the FS investigator to categorize human cause and contributing factors. The system is based on the work of James Reason (Ref A) and Shappel and Wiegmann (Ref B). Since its 2004 introduction, the CF HFACS model has undergone two modifications with notable changes to the taxonomy, grouping of factors and factor definitions. The complete CF HFACS model is now significantly different than the Shappel and Wiegmann model.

15. DFS extensively studied current literature on HFACS modeling and working systems prior to introducing CF HFACS V3.0. The most significant observation from this study was that any human factors model generates classifications that are subjective in nature and express differences of investigator opinion. The problem is compounded by variances in investigators’

familiarity with the system. Consequently, different conclusions may be reached by different investigators or re-examination of an occurrence may not provide repeatable results. Therefore, HFACS data mining will not yield data that is scientifically beyond reproach, but rather data that provides a general understanding of those human factors involved in CF air operations.

16. Notwithstanding the above, the CF HFACS provides a taxonomy that analyzes and identifies, in general terms, the human element of an occurrence so that conclusions can be reached and PMs can be formulated. This endeavour is not a science with all its inherent certainty, but rather an art. The important point to the conduct of this analysis is not to document absolutely the HF involved in an occurrence, but rather to identify elements of the HFACS model that will aid in the determination of appropriate PMs.

17. The CF HFACS, referred to hereafter as HFACS, is divided into two major sections:
- a. First, the Unsafe Act covering the unsafe acts that lead directly to the occurrence; and
 - b. Second, the Latent Conditions covering the underlying conditions that influenced or predisposed the Unsafe Acts to take place. Latent Conditions are categorized according to the source of the factors that influenced an Unsafe Act to take place or how it influenced those individuals who were contributory to the occurrence. They are divided into three groups according to:
 - (1) Personnel Influence;
 - (2) Supervision Influence; and
 - (3) Organizational Influence.

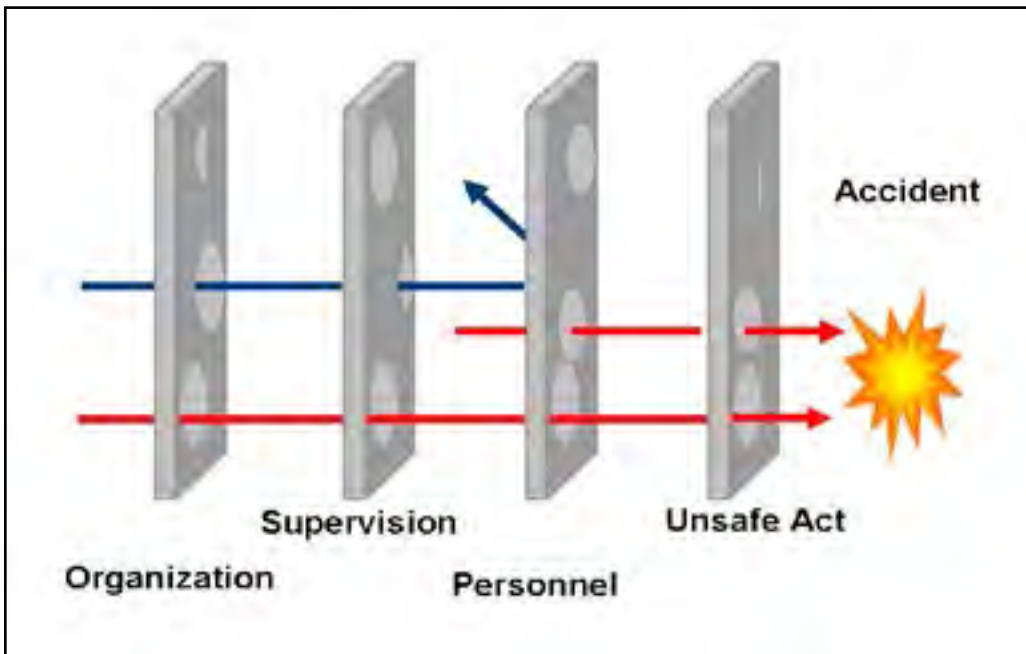


Figure 1: Reason's "Swiss Cheese" Model Applied to CF HFACS 3.0

18. The HFACS model is often referred to as a systems model, assuming that many elements of a system must interact successfully for efficient and safe operation. Accordingly, more than one aspect of the system is normally implicated when an unsafe event takes place. Thus, a FS occurrence can be conceptualised as a combination of issues at several levels of an organization where gaps in the defence layers line up like holes in Reason’s “Swiss Cheese Model,” Figure 1.

UNSAFE ACT GROUP

19. The Unsafe Act Group describes the actions or inactions of personnel who directly contributed to the occurrence. The most direct causes, or those most closely tied to an occurrence or safety of flight compromise are referred to as Unsafe Acts. Unsafe Acts tend to be close to the occurrence in both time and/or space, but they may also be distant from the event as well. For instance, an investigator determines that the unsafe act in a gear-up landing occurrence was the pilot’s omission to lower the landing gear while conducting the pre-landing check. Conversely, the investigator determines that the unsafe act in a near mid-air collision was ATC’s incorrect assignment of an altitude clearance; in this case the controller passed the instruction several hours prior to the occurrence and from an ATC installation far away. Occurrences may involve many Unsafe Acts since multiple or compounding actions or omissions can be directly causal to the occurrence.

20. The Unsafe Act Group is shown at Figure 2. It is broken down based on the intention of the individual and is divided into two categories:

- a. Error: When a planned or actual action did not go as intended; and
- b. Deviation: When an individual intentionally did not follow approved procedures and regulations.



Figure 2 – CF HFACS Unsafe Act Group

ERROR CATEGORY

21. The Error Category refers to well-intentioned mental or physical actions, or inactions that were incorrect, that compromised safety of flight. It is often referred to as an honest mistake where the intended outcome differed from the actual outcome. The Error Category is divided into three sub-categories:

- a. Perception: A misperception of the situation, the occurrence happened due to the presence of this misperception;
- b. Decision: An inappropriate selection of a course of action; or
- c. Skill: A flaw in the execution of a course of action.

NOTE

There is a clear distinction between an Error and a Personnel Pre-Condition. The latter consists of one or more latent conditions that increase the individual's vulnerability to err, such as when fatigue increases the chance of making an error or deviation.

Perception Sub-Category

22. The Perception Sub-Category refers to the erroneous conversion of physical stimuli into a meaningful understanding of a situation; this involves both sensing and interpreting sensory information. A mistaken perception of the situation that differs from reality can lead to errors. Perception may involve any or a combination of visual, auditory, olfactory (smell), touch, proprioceptive (relative position of parts of the body), or vestibular senses.

23. Perception is not a passive process and processing can be influenced by one's background, training, memory, and expectation. Perception requires that physical inputs are received by detectors (detection). These inputs either are or are not attended to depending on the situation, environment, the nature of the stimuli, and the mental and physical states of the individual (awareness). The inputs that are unconsciously selected for attention then undergo a complex process of human information processing (understanding).

24. Perception requires information processing and interpretation; it is strongly influenced by one's expectation and understanding of the current situation. In other words, humans tend to see what they expect to see. It is important for the investigator to ask "what did you think was happening?" Perception is also influenced by an individual's training, experience, interruptions, time pressure, fatigue, distraction, preoccupation, etc, includes misidentification of objects or signals, and non-detection of problems during inspection or monitoring steps, and is present if the occurrence happened due to its' presence. The Decision Sub-Category might apply if the individual could have been reasonably expected to anticipate and counteract the misperception, such as a pilot who does not use flight instruments in IMC or a technician who does not make sure his work area is sufficiently illuminated for the task.

25. The Perception Sub-Category also relates to an individual who either does not detect elements of the environment accurately or who does not process information correctly, or when there is accurate detection and a conscious awareness of the elements of the environment but there is an erroneous interpretation of its meaning or significance. Examples of the Perception Sub-Category include:

- a. Spatial Disorientation: The inability of a person to determine his true position, motion, or attitude relative to the earth or his surroundings;
- b. Visual Cue: The false or unreal visual perception of reality. There are many different types of visual illusion, the most commonly known of which are the black hole, false horizon, or the height-depth misperception when flying over an area devoid of visual references;
- c. Auditory Cue: Not detecting an unusual engine noise or mistaking it with another engine malfunction;

- d. Olfactory Cue: Not detecting acrid smell of an electrical fire;
- e. Proprioceptive Cue: Not detecting change in relative body position under G; and
- f. Vestibular Cue: An illusion of the balance senses caused by movement of vestibular fluids. A Somatogyral illusion (the leans) occurs during angular acceleration while a somatogravic illusion occurs during linear acceleration.

Decision Sub-Category

26. The Decision Sub-Category relates to an occurrence where a deliberate and conscious action was intended and executed as anticipated, but it did not achieve the desired outcome. Decision-making begins after conclusions have been formed about the situation (for example, perception takes place and then a decision is made). Decision-making is a function of relevant training and knowledge of the task, the system and operations. It is influenced by previous experience and proficiency. The Decision Sub-Category, then, may be evident during the assessment of the situation or may be present right from planning the action.

NOTE

It can be challenging for the investigator to evaluate the Decision Sub-Category since the optimal decision may not be known. The investigator should ask the witness what he was trying to do.

27. It is important to note that simply not achieving the desired outcome does not necessarily imply a mistake was made. Every plan has a process and an outcome. The process could be sound but circumstances beyond the control of the planner can lead to an undesirable outcome. Similarly, an inadequate plan could lead to a good outcome. The Decision Sub-Category is divided into two sub-sub-categories:

- a. Procedure; and
- b. Knowledge.

Procedure Sub-Sub-Category

28. The Procedure Sub-Sub-Category relates to the incorrect application of a procedure despite correctly detecting and understanding the situation. Personnel tend to look for a pattern in a given situation and normally apply a pre-learned problem-solving action set. Often, choosing to carry out the correct procedure is based on the level of training and experience. For many situations there is a set response based on rules, SOPS, checklists, CFTOs, etc. The Procedure Sub-Sub-Category is present when the selected response to the situation was inappropriate. Examples of the Procedure Sub-Sub-Category include:

- a. Misdiagnosed Situation: A normally good procedure is used in a situation for which it is not appropriate, e.g. the decision to takeoff after a pilot received a communication from ATC that was interpreted incorrectly as a takeoff clearance would be an application of a good rule set (correct takeoff procedures) that does not match the situation (takeoff without clearance);

- b. Unrecognized or Ignored Situation: The appropriate procedure is not applied, e.g. a warning indicator is noted, but the decision is made to not apply the checklist procedure (failure to apply a good rule set); and
- c. Suboptimal Procedure Applied: The situation is diagnosed correctly, but the selected action is flawed. Of note, the individual may not realise the procedure is flawed. This flawed rule set may have worked many times in the past, but on this occasion the flaw makes a difference. Application of a “bad” (suboptimal) rule set is often referred to as a bad habit, e.g. a technician that bends the tips of wires out of the way rather than cutting them off.

Knowledge Sub-Sub-Category

29. The Knowledge Sub-Category relates to when, in the absence of a set procedure, an original solution is applied that is not suitable for the situation. There are many situations that may be new to the individual and require an original solution rather than applying a pre-learned solution. The situation must be assessed and a choice must be made by drawing from knowledge to consciously find a solution. When combined with well-developed procedures, effective training and relevant experience the likelihood of an individual applying an unsuitable solution is lowered. There are no routines or rules involved in knowledge-based performance; slow and conscious thought is involved in these situations. New or unfamiliar tasks, unusual modifications or hard-to-diagnose system faults are typical circumstances that can lead to errors in knowledge. Examples of the Knowledge Sub-Sub-Category include:

- a. Knowledge or Information: A lack of knowledge or missing information concerning the task, mission, tactics, systems, orders, directives, procedures, checklists, etc, interfered with optimal decision making; and
- b. Problem Solving or Risk Management: Reasoning and risk management processes are needed to develop a proper course of action. If these processes are not employed properly then a Problem Solving or Risk Management element may be present. For example, the bias and thought processes that shape the way individuals process information (e.g. confirmation bias is the tendency to interpret information in a way that confirms one’s preconceptions) may lead to an incorrect course of action.

Skill Sub-Category

30. The Skill Sub-Category relates to an occurrence where an individual performed a routine action that did not go as planned. Skill-based behaviours are automated routines that require very little conscious attention. Once they are learned, control to non-conscious habit sequences is delegated. Therefore, skill-based acts consist of pre-set, rehearsed action patterns such as riding a bike.

31. While the Decision Sub-Category relates to when the intended course of action is flawed, the Skill Sub-Category relates to when the execution of the action is flawed. If there is no intent to act then the action may still be a learned automatic reaction and could also be classified within the Skill Sub-Category, such as, the reflex of a fixed wing pilot who is learning to accelerate a helicopter by raising collective, but inadvertently moves the collective like advancing his fixed-wing throttle and moves the collective down by mistake and this results

in unintended deceleration. Skill-based behaviour is vulnerable to a variety of human factors; often there will be associated issues of attention (distraction), memory (missed items on a checklist), forgotten intentions, or, particularly, a lack of proficiency.

32. The Skill Sub-Category includes performing a task in the wrong sequence or using an inappropriate technique, tool, equipment, control or switch, etc. It also includes performing a task with a subtle lack of finesse (e.g. a hard landing may occur despite the application of correct technique but still be suboptimal). When one has not learned or practiced the skill adequately, skill-based performance will suffer (lack of appropriate training or a deficiency in proficiency or currency). The Skill Sub-Category is divided into three sub-sub-categories:

- a. Technique;
- b. Attention; and
- c. Memory.

Technique Sub-Sub-Category

33. The Technique Sub-Sub-Category relates to an individual performing a task with workmanship, mechanical skills or any other aspect of operation that is below the level expected from an individual of their level of training and task experience. These are often linked to proficiency, training and currency deficiencies. Examples of the Technique Sub-Sub-Category include:

- a. Inappropriate or Poor Technique: E.g. overcontrol, undercontrol, lack of appropriate visual scan technique, inadvertent activation or operation or non-operation of a pump or lever, unsuitable handling of a delicate component, using the inappropriate tool or equipment, etc;
- b. Timing of Response: E.g. control inputs initiated too early or too late to correct for crosswind on landing; and
- c. Finesse: Lacking delicacy or subtlety in performance of an action or skill. The individual's technique included correct elements but the overall performance was suboptimal.

Attention Sub-Sub-Category

34. The Attention Sub-Sub-Category relates to when an individual has difficulty maintaining attention and it compromises the safety of the task. Deterioration in attention can be the result of maintaining sustained attention to one task to the exclusion of others, overload by too many elements of one or multiple tasks, or stress, whether self-imposed or external. Conversely, it can be difficult to sustain attention when under-stimulated, such as when conducting an automated routine like driving to work when you intended to go a different route to get groceries. Examples of the Attention Sub-Sub-Category include:

- a. A technician attempts to complete a repair task while pre-occupied with stressful family problems and commits a mistake;
- b. The wandering mind of a radar controller monitoring an inactive screen over a long period of time causes him to miss a lone radar contact; and

- c. A pilot channelized attention on a minor emergency to the detriment of proper aircraft control.
- d. Un-Noticed condition such as a pilot not recognizing a hand signal or a technician not noticing a missing documentation entry; and
- e. Negative transfer such as when an individual reverts to a highly learned skill routine used in a previous system or situation.

Memory Sub-Sub-Category

35. The Memory Sub-Sub-Category relates to when an individual does not remember, or recalls incorrectly, information that is required to complete a task. A memory lapse can be either detected immediately by the individual or remain undetected. Memory functions are very susceptible to interruption and distraction. Examples of the Memory Sub-Sub-Category include:

- a. Information Recall when one knows but cannot bring to mind at that moment, such as the name of a particular switch;
- b. Information Store such as when one loses place in a series of actions, e.g. forgetting a checklist item; and
- c. Automatically performing actions without remembering them, e.g. having no memory of performing a routine maintenance or pre-flight action.

DEVIATION CATEGORY

36. A Deviation refers to an act that is intentionally carried out in contradiction of approved procedures, rules or regulations. A Deviation may be done for many reasons. Most Deviations are deliberate departures from procedure, rules or regulations made with the best of intentions; the person intends to deviate from procedure with the goal being consistent with the task, e.g. taking a “short cut” to get the job done faster. The decision not to abide by rules is influenced by motivation, context and social factors. There is often a cost-benefit consideration in which a shortcut or modification appears to save time, make the task easier, or more efficient.

37. The difference between a Deviation and an Error can at times be blurred, particularly since not following a procedure may be the result of a simple mistake. The principle difference between a Deviation and an Error is the intent of the individuals involved in the occurrence. A Deviation is an intended departure from the norm or procedures, whereas an Error is not.

38. A Deviation does not necessarily indicate an inadequate performance. On occasion, it may be difficult to do a job without deviating from the accepted norm. The Deviation may be the symptom of deficient, conflicting or insufficient rules, organizational problems or flawed procedures and regulations, and may point to an important FS issue with respect to those rules or regulations. The rule or regulation may be the primary issue rather than the action by the individual or team. The Deviation may have been recognized, assessed and sincerely determined by the individual to be the best course of action.

39. The Deviation Category relates to the motives that drove the actions of the individual and is divided into two sub-categories:

- a. Mission-Centric; and

- b. Person-Centric.

Mission-Centric Sub-Category

40. The Mission-centric Sub-Category relates to a deviation with the intent of ultimately achieving the mandate of the task at hand keeping in mind the best interests of the CF, e.g. a pilot flies under a bridge to avoid cloud in order to complete a SAR mission or a technician uses amended procedures in order to expedite the turnaround of aircraft. Mission-centric Deviations can at times include actions that are entirely appropriate under specific circumstances, such those listed in the B-GA-100 National Defence Flying Orders.

41. The Mission-centric Sub-Category is divided into two sub-sub-categories:
- a. Routine; and
 - b. Exceptional.

NOTE

A Routine and Exceptional Deviation is differentiated primarily by whether the act is the norm within the organization (Routine) or is inconsistent with the culture or norms of the organization (Exceptional).

Routine Sub-Sub Category

42. The Routine Sub-Sub-Category relates to the organization's common and accepted use of an unapproved procedure to complete a task; inherent in it is the supervisor's awareness and tolerance of the unapproved procedure's use. It is often referred to as "bending the rules." Routine deviations normally have related latent conditions involving supervisors at multiple levels of the organization. It is important to consider that the Routine deviation may at times be a sign of a problem with rules and regulations rather than the supervision, culture, or structure of the organization. Routine deviations may require investigation of the supervisory chain or the unit culture to determine the extent of the acceptance of the behaviour. Examples of the Routine Sub-Sub-Category include:

- a. Routine "Workarounds" or Shortcuts: Sometimes it is not possible to get the job done effectively by following the rules or the rules seem unnecessarily lengthy or laborious, e.g. an inspection procedure may call for multiple time-intensive steps to be done in sequence. In order to optimize the inspection, the steps are usually conducted all at once rather than sequentially at this particular unit. The "shortcut" version of the procedure may lead to missing a critical item and damage or injury; and
- b. Lack of Time or Resources: An act intended to optimize time or resources but still get the job done, e.g. a crew on a busy squadron decides to skip a mission pre-brief so that they can meet their takeoff time and this is done regularly by other crews.

Exceptional Sub-Sub-Category

43. The Exceptional Sub-Sub-Category relates to a unique or isolated departure from established rules or regulations in order to complete the task. The deviation is totally unusual for that organization and is isolated to specific individuals. The Exceptional deviation is neither sanctioned nor condoned by supervisors, leadership, or peers. Conversely, supervisors, leadership or peers may be unaware of the exceptional deviation. The Exceptional Sub-Sub-Category should be assigned only when an Error has been ruled out, e.g. flying an aircraft beyond operating limits even with a valid operational reason could be, depending on the context, an Exceptional Deviation if it was done deliberately; however, if flying outside the operating limits was not intended, the act is an Error. Examples of the Exceptional Sub-Sub-Category include:

- a. Ad-hoc Workarounds: E.g. a technician replaces a damaged part with another similar yet unapproved one in order to get the aircraft serviceable;
- b. A technician knowingly conducts an unapproved repair action by not following the CFTO; or
- c. A crew intentionally exceeds aircraft limits during a training flight to complete the mission within the scheduled timeframe.

Person-centric Sub-Category

44. The Person-centric Sub-Category relates to a deviation contrary to established procedures based on personal motives, gains or goals; this type of deviation can be said to be discordant. The Person-centric Sub-Category involves reckless, wilful, or negligent behaviour or misconduct that may be carried out to demonstrate perceived prowess or skills. The discordant action may or may not be condoned by supervisors or peers. Examples of the Person-centric Sub-Category include:

- a. An impromptu air show at low level to show off personal flying skills; and
- b. Skipping procedural steps in order to leave work early for a social engagement.

<p>NOTE</p> <p>The Person-Centric Deviation is very rare in a professional organization.</p>

<p>NOTE</p> <p>When aware that a Person-Centric Deviation has taken place, the FS Investigator shall notify DFS so that a decision about engagement with the chain of command is coordinated concerning a separate investigation; the scope of the FS Investigation may be modified at this stage. The FS Investigator shall at no time provide to the chain of command any evidence that is privileged under the <i>Aeronautics Act</i>.</p>
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LATENT CONDITIONS

45. Latent Conditions describe a broad spectrum of underlying conditions that predispose individuals to commit Unsafe Acts. In fact, Unsafe Acts are only a small part of the causal picture of an occurrence. Once Unsafe Acts are identified and categorized, the next step is to find out why they occurred. The “why” will normally be found within their Latent Conditions.

46. There could be a few or many Latent Conditions influencing an occurrence, and often they interact with one another, e.g. mental fatigue is a pre-condition that can increase susceptibility to another pre-condition such as emotion, which in turn can lead to an individual compromising safety of flight.

47. Establishing Latent Conditions encourages the investigator to consider factors beyond the Unsafe Acts attached to an occurrence. Latent Conditions can be recent or longstanding and may have a direct or indirect influence on the occurrence. Some latent conditions may appear quite removed from the occurrence, but they may also have a strong role in causation that is extremely important. They often lead to the production of very effective, pertinent and worthwhile PMs.

48. Latent Conditions are divided into three different groups:

- a. The Personnel Influence Group describes the working and personnel conditions and personnel practices that influenced personnel in an occurrence;
- b. The Supervision Influence Group describes the supervisory aspects involved in an occurrence; and
- c. The Organizational Influence Group describes the roles and influence of organizations in an occurrence.

PERSONNEL INFLUENCE GROUP

49. The Personnel Influence Group covers conditions, excluding those related to Supervision and the Organization, that predisposed occurrence personnel to commit an unsafe act. The Personnel Influence Group is shown at Figure 3 and is divided into three categories:

- a. Personnel Condition: Describes individual factors that had a direct influence on personnel;
- b. Work Environment: Describes the surrounding job elements that personnel were confronted with while on-task; and
- c. Team Practice: Describes how personnel interacted with each other during the planning and conduct of the occurrence task or mission.



Figure 3 – CF-HFACS Personnel Influence Group

PERSONNEL CONDITION CATEGORY

50. The Personnel Condition Category describes factors that had a direct influence on personnel and is divided into three sub-categories:

- a. Mental State;
- b. Physiological State; and
- c. Professional Status.

Mental State Sub-Category

51. The Mental State Sub-Category relates to psychological conditions that adversely affect performance. A deficiency in mental preparedness can reduce cognitive performance; in this sense, cognitive refers to mental processes such as attention, perception, and reasoning. The Mental State Sub-Category is divided into five sub-sub-categories:

- a. Mental Fatigue;
- b. Personality;
- c. Emotion;
- d. Attitude; and
- e. Mental Limitation.

Mental Fatigue Sub-Sub-Category

52. Mental Fatigue occurs when the safety of a task is compromised by an individual's low alertness or cognitive impairment usually associated with prolonged mental activity or stress. Many aviation tasks require individuals to process large amounts of information in a short period of time and to do this on a continuous basis, leading to a condition referred to as acute fatigue. The long-term demands of sustained operations can also degrade an individual's performance, which is referred to as chronic fatigue. Mental fatigue can manifest itself both as somnolence (decreased wakefulness) or a general decrease of attention and performance, not necessarily including sleepiness. Examples of the Mental Fatigue Sub-Sub-Category include:

- a. An inexperienced Air Traffic Controller deploys to an operational airfield and is overwhelmed by high traffic density during a long shift, consequently delivering an invalid clearance; and
- b. A Squadron Commander suffers a "burn-out" during a period of prolonged deployed operations.

Personality Sub-Sub-Category

53. The Personality Sub-Sub-Category relates to a person's enduring and consistent character traits that affect the individual's ability to perform the task safely. An individual's personality may affect their performance, decision-making, or communication and should not be confused with the transient Emotion or Attitude Sub-Sub-Categories. An individual's drive, hesitancy, overconfidence, ego or stubbornness, etc, can impede their ability to safely complete a task. Examples of the Personality Sub-Sub-Category include:

- a. An authoritarian aircraft captain matched with a submissive co-pilot in a multi-crewed aircraft creates a breakdown of cockpit communications that leads to a missed ATC clearance and subsequent airspace violation; and
- b. An aggressive maintenance supervisor who is not satisfied with maintenance results of the inexperienced crew is causal to the crew's omission of a maintenance check.

Emotion Sub-Sub-Category

54. The Emotion Sub-Sub-Category relates to the individual's compromised ability to perform the task safely due to a strong emotional response. Certain strong emotions, such as anger, frustration, sadness or happiness, may influence their ability to perform safely. Examples of the Emotion Sub-Sub-Category include:

- a. An angered technician who was chastised by his supervisor performs a pre-flight inspection and misses a component unserviceability; and
- b. A pilot frustrated with a recently announced posting carries out a maintenance test flight and records as serviceable an element of the flight when it was not.

Attitude Sub-Sub-Category

55. The Attitude Sub-Sub-Category relates to the individual's compromised ability to perform the task safely due to a negative or positive belief, feeling, value or disposition to act in a certain way. Examples of Attitude Sub-Sub-Category include:

- a. Expectancy: People function with a mental framework or model of the situation they are in. This mental framework can create an expectation of what will happen next. When an individual's expectation of what is going to occur interferes with the processing of the actual environmental cues (what is actually taking place) expectancy is said to occur. Expectancy can predispose one to illusions and other information processing errors. Expectancy is generally part of a subconscious process of building mental models of the world so humans can function efficiently, e.g. a pilot carry out a pre-flight inspection sees a switch in the off position, when it is on;
- b. Motivation: There are several aspects to motivation, including peer pressure, pride, misdirected motivation, inadequate or excessive motivation and hidden agenda. Misdirected motivation may include replacing the primary goal of a mission with a personal goal, or losing the "big picture" to focus on a subtask, e.g. a SAR pilot proceeds with the rescue mission when weather conditions are below acceptable minimums;
- c. Complacency: Complacency refers to a rare attitude in which a person knows they are not employing the mandated care and attention to a task but believes this makes no difference. When an investigator suspects complacency, the investigation should focus on why an individual's impression of contentment or satisfaction with a situation or procedure existed, and why it interfered with the assessment of a hazard or taking action, e.g. a maintenance crew not wearing proper protective equipment;

- d. Overconfidence or Overaggressiveness: Too great a reliance on one's own skills, team or equipment, e.g., a macho pilot performs aggressive manoeuvres when the mission does not call for it;
- e. Can-do Attitude: Overestimating one's own or crew's ability to perform a task, e.g. an aircraft commander accepts a mission even though he and his crew are completely fatigued due to previous taskings; and
- f. Pressing or Haste: A type of misplaced motivation relating to time pressure, e.g. a crew pressing in marginal weather in order to return to home base (get home-itis).

NOTE

Situation awareness (SA) does not appear in the CF HFACS taxonomy. Although situation awareness is often discussed in aviation, the concept is very broad and ill-defined. For instance, geographical awareness (knowing where you are on a map) is a subset of SA that might describe what happened, but not why. The focus of a human factors investigation should be on the factors that lead to "loss of SA" or the "inability to achieve SA." Contributory issues often include reduced attention, workload, fatigue, time stress, inadequate proficiency or experience and many physiological states. Finding these contributing factors will guide the PM selection.

Mental Limitation Sub-Sub-Category

56. The Mental Limitation Sub-Sub-Category relates to limitations in the faculty of consciousness and thought of the human brain that impair an individual's ability to perceive and process the information required to safely complete the task. This may refer to limitations common to most people in general, or to a specific individual. Examples of the Mental Limitation Sub-Sub-Category include:

- a. Human Capability Exceeded: The demands of the task exceeded the capability of the typical person. Humans have given limitations with respect to amount or complexity of data that can be processed, e.g. an excessively long and complicated approach clearance may be misinterpreted; and
- b. Limited Aptitude: Inability to execute a mental task. The cognitive challenges involved with managing multiple tasks can result in either incomplete or inaccurate processing of information. Specifically an individual may have difficulty absorbing or processing a variety of information, adequately acquiring or remembering new information or lapsing in the recall of past experiences, e.g. the ATC controller's inability to maintain aircraft separation was due the loss of air picture resulting from his not being capable of handling more than three contacts and this aircraft was the fifth contact.

Physiological State Sub-Category

57. The Physiological State Sub-Category relates to the physical capacity or medical conditions that impair performance.

58. Certain physiological and medical conditions can predispose the individual to adverse reactions and inaccurate sensations in an aviation environment. Important physiological conditions that can have a catastrophic influence on performance include spatial disorientation, illusions, G-induced loss of consciousness (G-LOC), almost loss of consciousness (A-LOC), hypoxia, and physical fatigue. Further, there are numerous occupational health, pharmacological, and medical circumstances that can influence performance. The Physiological State Sub-Category refers to predictable and normal human performance limitations or the capability specific to an individual to carry out a task in that the task requirements may exceed the capabilities of the individuals involved. If the task exceeds the capabilities of many individuals, then human-machine interface or aspects of the task itself should be examined. If the task exceeded the capability of one specific individual, then examination of the tasking assignment, supervision, training or selection of standards, etc, may be necessary.

NOTE

Consult with a flight surgeon before assigning any
Physiological State cause factor.

59. The Physiological State Sub-Category is divided into six sub-sub-categories:

- a. Medical Condition;
- b. Toxicological Exposure;
- c. Physical Fatigue;
- d. Physiological Effect;
- e. Physical Limitation; and
- f. Physiological Preparation.

Medical Condition Sub-Sub-Category

60. The Medical Condition Sub-Sub-Category relates to any medical illness or injury condition identified by a qualified medical professional or any direct, secondary or residual pharmacologically-induced effects from prescribed medication that compromised the individual's ability to perform the task safely. This includes mental illness determined when an individual meets diagnostic criteria for a personality, psychological or psychosocial disorder. Consultation with a Flight Surgeon should be undertaken before assigning this sub-sub-category. Examples of the Medical Condition Sub-Sub-Category include:

- a. A pilot flying with an ear infection suffering from spatial disorientation; and
- b. A maintenance technician operating specialized machinery while taking prescription medication that makes him drowsy.

NOTE

Non-prescribed, recreational, and homeopathic supplements are categorized in Physiological Preparation.

Toxicological Exposure Sub-Sub-Category

61. The Toxicological Exposure Sub-Sub-Category refers to exposure to a dangerous substance that degraded the performance and compromised the individual's ability to perform the task safely. Consultation with Preventative Medicine or a Flight Surgeon should be undertaken before assigning this sub-sub-category. Examples of the Toxicological Exposure Sub-Sub-Category include:

- a. A technician exposed to fumes in an aircraft fuel tank is injured after collapsing; and
- b. A loadmaster becomes drowsy from carbon monoxide emitted from an unattended external aircraft power unit while he is loading an aircraft.

Physical Fatigue Sub-Sub-Category

62. The Physical Fatigue Sub-Sub-Category refers to non-mental fatigue. The source and kind of fatigue, whether acute or chronic, can vary greatly. It may be due to a lack of quality sleep or circadian rhythm changes, a build-up of sleep debt, or excessive physical effort to complete a work task. Examples of the Physical Fatigue Sub-Sub-Category include:

- a. Inability to sleep in an unairconditioned tent prior to reporting for a night flight; and
- b. A weapons loader drops a manually loaded weapon after loading 40 other similar weapons without proper rest between loads.

Physiological Effect Sub-Sub-Category

63. The Physiological Effect Sub-Sub-Category refers to medical effects resulting from the flight environment that compromised the individual's ability to perform the task safely. Examples of Physiological Effect Sub-Sub-Category include:

- a. Motion Sickness: Sickness caused by exposure to movement, e.g. flight, simulator, etc;
- b. Acceleration Effect: Relative incapacitation caused by application of positive or negative G, e.g. grey-out, black-out, G-LOC, A-LOC;
- c. Decompression Sickness (DCS): Also known as the 'bends,' DCS symptoms follow exposure to a reduced atmospheric pressure, e.g. an aircraft with failed pressurization system, a hypobaric chamber run, or scuba diving;
- d. Hypoxia: Hypoxia is an inadequate supply of oxygen to the tissues. Generally in aviation the hypoxic effect on the brain is most important and includes a potentially insidious and dramatic decrease in coordination, memory and

judgement. This can happen following an aircraft depressurization or a malfunction of an oxygen regulator;

- e. Hyperventilation: Hyperventilation is a rapid rate of respiration that decreases carbon dioxide and causes symptoms of anxiety, dizziness and decreased performance. Hyperventilation can be caused by anxiety, motion sickness, pain, high ambient temperatures, hypoxia, etc; and
- f. Trapped Gas Disorder: A trapped gas disorder is an expansion or compression of gas contained in closed and semi-closed cavities of the body that may lead to severe sinus pain, eardrum pain or perforation, lung rupture, or bowel discomfort. This can be caused by aircraft ascent or descent or loss of cabin pressurization, and can rapidly change the volume of gas held in closed areas of the body.

Physical Limitation Sub-Sub-Category

64. The Physical Limitation Sub-Sub-Category relates to any human physical limitation that impairs an individual's ability to perform a task safely, e.g. size, strength, dexterity, mobility, task-specific physical fitness level, psychomotor skills, or other biomechanical limitation.

Examples of Physical Limitation Sub-Sub-Category include:

- a. Anthropometric Limitation: E.g. body weight, arm reach, eye-height;
- b. Visual Limitations: E.g. visual acuity, color vision, contrast sensitivity;
- c. Auditory Limitation: E.g., hearing acuity, speech discrimination;
- d. Motor Skill Limitation: E.g. coordination or reaction time is inadequate, "poor hands and feet coordination;" and
- e. Strength Limitation: E.g. the inability of a helicopter pilot to fly with a hydraulic flight control system malfunction.

Physiological Preparation Sub-Sub-Category

65. The Physiological Preparation Sub-Sub-Category relates to self-generated physical or mental stress or an unreported medical condition that impairs performance and ability to complete the task safely. Each individual is expected to arrive at work ready to perform at optimum levels, but there are many factors that may cause performance to suffer. Additionally, Physiological Preparation deals with aspects of physical or mental preparation that are typically under the individual's control. Sometimes Physiological Preparation has associated rules and regulations, but much of the time it involves personal habits or judgement; it includes the self-evaluation of fitness to work with respect to illness. Examples of the Physiological Preparation Sub-Sub-Category include:

- a. Poor Physical Fitness: Fitness in terms of a regular exercise program or a physically active lifestyle to meet task requirements;
- b. Inadequate Rest: The individual did not rest appropriately after an extreme physical work out prior to reporting for a maintenance shift;

NOTE

Lack of sleep and “jet lag” from crossing several time zones or shift work can lead to either acute or chronic fatigue.

- c. Unreported Medical Condition: An individual performs a task or mission with a known but unreported medical condition, e.g. flying with a cold or upper respiratory tract infection; and
- d. Inappropriate Consumption: Self-imposed stresses such as poor nutrition, consumption of alcohol, dehydration, recreational drugs, supplements or self-medication (including over-the-counter drugs) that result in degraded performance. Examples of Inappropriate Consumption include:
 - (1) A technician shows up for work without having eaten breakfast, and faints while working on an aircraft;
 - (2) A pilot is legal to fly, but latent effects of alcohol impaired his performance; and
 - (3) An ATC controller is impaired by over-the-counter cold medication.

NOTE

Inappropriate Consumption could, in certain circumstances, constitute a Deviation.

Professional Status Sub-Category

66. The Professional Status Sub-Category covers the qualifications, currency, and proficiency of the individual to carry out assigned duties; it is divided into three sub-sub-categories as follow:

- a. Qualification;
- b. Currency; and
- c. Proficiency.

NOTE

Professional Capability issues are often related to Supervision issues.

Qualification Sub-Sub-Category

67. The Qualification Sub-Sub-Category relates to the level of training or qualification standard provided to, or demonstrated by, an individual not being appropriate for the safe conduct of the assigned task. Examples of the Qualification Sub-Sub-Category include:

- a. A pilot training syllabus that did not cover night unaided approaches to unprepared surfaces;
- b. A technician performed a maintenance task for which he was not qualified; and

- c. A newly qualified pilot on type using inappropriate automated procedures on a fully automated aircraft.

Currency Sub-Sub-Category

68. The Currency Sub-Sub-Category relates to a lack of recent task experience that led to the erosion of skill and knowledge. Normally, this currency status translates in a number of hours or sequences to be completed per month, quarter or year. Examples of the Currency Sub-Sub-Category include:

- a. A pilot who did not complete the required number of quarterly instrument flight hours experienced an occurrence while flying in IMC; and
- b. A flight engineer did not carry out the requisite number of maintenance actions to maintain his annual certification.

Proficiency Sub-Sub-Category

69. The Proficiency Sub-Sub-Category relates to an individual who is qualified and current but is not sufficiently competent or skilled to conduct the task safely or efficiently. Examples of the Proficiency Sub-Sub-Category include:

- a. A fully qualified and current pilot descended below MDA during an instrument approach; and
- b. A fully qualified air traffic controller who just returned from leave provided conflicting flight instructions that caused a near mid-air collision.

WORK ENVIRONMENT CATEGORY

70. The Work Environment Category relates to the working conditions and immediate environment affecting the occurrence personnel. This category is divided into three sub-categories:

- a. Documentation;
- b. Technological; and
- c. Physical.

Documentation Sub-Category

71. The Documentation Sub-Category relates to publications, rules, regulations, orders, policies, instructions, standard operating procedures, forms, informal guidelines, safety procedures, checklists, etc, or lack thereof, that contributed to an occurrence. This includes not just the content of procedures or regulations, but also the format and ability to convey information of documents, charts, maps, manuals, computer applications, and other automated systems. The content and organisation or physical arrangement of documents or computer applications can impede an individual's ability to perform safely and effectively. In order to achieve optimal operations, it is important to ensure that procedures are feasible and practical. The Documentation Sub-Category is appropriate when provided information is unclear or inadequate. Examples of this condition include:

- a. A manual is wordy and difficult to understand;
- b. A checklist layout is difficult to use;
- c. A publication uses confusing symbology;
- d. An approach chart is cluttered;
- e. An operations manual content is not presented in a rational way;
- f. A CFTO describes a procedure in unclear terms or lacks detailed step by step instructions; and
- g. A touch down zone on an approach plate is incorrectly depicted.

NOTE

When the Documentation environment is a contributing factor the investigator should look closely at the Organizational Influence (typically in the Resource or Management areas), especially if policy or higher level guidance is at play.

Technological Sub-Category

72. The Technological Sub-Category relates to tools used to perform a task or to the interaction of the individual with that equipment. Technological issues may involve the design of equipment and controls, display or interface characteristics, confusion between automation modes, and automation. Equipment or vehicle design can influence performance when size, shape, arrangement, location, compartment space or other physical aspects of equipment negatively affect performance. Automation can include the function, reliability, use, guidance, symbology, logic or other aspects of automated systems that can influence performance.

73. The conditions of the Technological Sub-Category create circumstances in which an individual is forced to “make do” or adapt to the equipment, thus increasing the potential for error. The Technological Sub-Category is divided into two sub-sub-categories:

- a. Equipment Suitability; and
- b. Equipment Design.

Equipment Suitability Sub-Sub-Category

74. The Equipment Suitability Sub-Sub Category relates to equipment that is unsuitable for the task or impedes the individual’s ability to perform the task safely and effectively. Examples of the Equipment Suitability Sub-Sub-Category include:

- a. An unapproved vehicle is used as a tow vehicle; and
- b. An unauthorized tool is used for a given maintenance activity.

Equipment Design Sub-Sub-Category

75. The Equipment Design Sub-Sub Category relates to design, layout, control interface or automation of the equipment where an individual is unable to or has difficulty accessing or processing information, rendering the completion of the task unsafe. Poor conceptual design of computer-based systems can have a profound impact on human performance. Examples of the Equipment Design Sub-Sub-Category include:

- a. A software design that does not allow the operator to trouble shoot an aircraft malfunction; and
- b. A display screen colour that is not compatible with NVGs and reduces the operator-machine interface in night operations.

Physical Sub-Category

76. The Physical Sub-Category includes workspace elements that impede the completion of the task. The Physical environment can adversely affect vision, hearing, physical ability or information processing, e.g. vision might deteriorate due to poor lighting, smoke, haze, adverse weather, dust, etc. Further, mental processing can be impacted by noise, vibration, temperature, etc. The use or non-use of Personal Protective Equipment may be a factor. The Physical Sub-Category is divided into two sub-sub-categories:

- a. Climate; and
- b. Workspace.

Climate Sub-Sub-Category

77. The Climate Sub-Sub-Category refers to exposure to climatic conditions, potentially also in the confines of a cockpit or hangar, that impede the ability of the individual to perform the task. Conditions applicable to the Climate Sub-Sub-Category include:

- a. Temperature;
- b. Cloud;
- c. Precipitation;
- d. Wind or Turbulence;
- e. Density Altitude;
- f. Lightning; and
- g. Visibility.

Workspace Sub-Sub-Category

78. The Workspace Sub-Sub-Category refers to an inadequate work area that physically influences the safe completion of a task. The work area includes the cockpit, hangar, flight line, office, lab or other workspace where an individual performs a task. Examples of the Workspace Sub-Sub-Category include:

- a. The poorly marked propeller danger zone allowed the civilian contractor to walk in front of an engine propeller;
- b. The inadequately lit workbench prevented the technician from noticing an equipment failure; and
- c. The flight line ambient noise level prevented good communications between the pilot and technician.

TEAM PRACTICE CATEGORY

79. Team Practice Category relates to deficiencies and breakdowns identified within the team in preparation for and during the execution of a task. In the context of this category, the term “team” refers to the interrelationship within a crew and those personnel immediately involved with that crew during the occurrence. All phases of air operations and maintenance require successful teamwork. An effective team must be appropriately constituted, should make use of the knowledge, skills and abilities of all members involved and build on the interactions among them. It assumes that someone will effectively lead the team and that the team members will support and execute their roles as assigned. Deficiencies and breakdowns in human performance in military aviation (HPMA) can impact an individual or worse, the team performance. The Team Practice Category is divided into two sub-categories:

- a. Planning; and
- b. Command and Control (C2).

Planning Sub-Category

80. The Planning Sub-Category refers to a failure at any stage of the task to collect information, analyze it, and integrate it within the activities of the team; to perform deliberate and contingency planning; or to properly risk assess, thus compromising the safe completion of the task. It may involve personnel actively conducting a task or supporting personnel and external agencies. It refers to all activities done by those intimately involved with the occurrence. This sub-category covers not just the pre-task planning but also the ongoing assessment and adjustment of the plan during task execution. Examples of the Planning Sub-Category include:

- a. A loadmaster does not inform the AC of a change in cargo weight; and
- b. A tow crew chief does not assign specific positions to his tow crew.

Command and Control (C2) Sub-Category

81. The C2 Sub-Category relates to any command and control activities that hinder safe task completion. It includes poor communication or coordination among a crew or between different crews or other organizations, such as ATC, maintenance, or support staff interfaces that may be involved in the occurrence. This sub-category covers all elements of interpersonal interrelations (HPMA, etc.) related to the execution of the task. Examples of the C2 Sub-Category include:

- a. Leadership: Detrimental aspects such as an ineffective crew climate, not establishing and maintaining an accurate and shared understanding of the evolving task, or poor distribution of duties;
- b. Communication: Verbal, written, or visual communication that results in misspoken, misread, misheard, incorrect, or otherwise misunderstood communications within the team. This includes miscommunication of critical information, use of non-standard or imprecise terminology, inappropriate challenge/reply/acknowledgement, inadequate shift turnover, inadequate log entry, e.g. an ATC controller does not brief his incoming replacement;
- c. Performance Monitoring: Not monitoring crew or performance, assisting or providing back-up when needed, e.g. inadequate monitoring of the flying pilot by the non-flying pilot during an instrument approach or inadequate supervisor assistance provided to the apprentice technician during an aircraft repair; and
- d. Authority Gradient: Inadequate communication of critical information due to a lack of persistence or assertiveness by a subordinate to a superior. This authority gradient exists in crews with members of mixed rank, age, qualification, experience, etc. Though the authority gradient is inherent in our organizations, how it is handled determines its role in mission outcome, e.g. a young co-pilot is afraid to warn his unit CO, who is at the controls, of the impending aircraft stall.

SUPERVISION INFLUENCE GROUP

82. The Supervision Influence Group of conditions relates to methods, decisions, policies or implementation of doctrine used by the supervisors within the unit's chain of command and how this influenced and predisposed the occurrence personnel to commit one or more unsafe act. Supervisors often have a substantial influence on the Unsafe Acts committed by the occurrence personnel. Supervisory conditions may lie dormant or undetected for long periods but still contribute to an occurrence sequence of events.

NOTE

Standards, evaluation and testing, and work relating to staff functions of the headquarters are typically captured in the Organizational Influence Group of Latent Conditions.

83. The Supervision Influence Group is shown at Figure 4 and is divided into four categories:

- a. Planned Activity;
- b. Level of Supervision;
- c. Problem Correction; and
- d. Supervisory Deviation.



Figure 4 – CF HFACS Supervision Influence Group

PLANNED ACTIVITY CATEGORY

84. The Planned Activity Category relates to when the supervisor’s assessment of hazards or resource provisioning hinders the individual’s or team’s ability to conduct its task. Good supervisors assess risks appropriately and plan and supply the resources needed for task completion. The Planned Activity Category is divided into three sub-categories:

- a. Risk Assessment;
- b. Planning Beyond Capability; and
- c. Provision of Resources.

Risk Assessment Sub-Category

85. The Risk Assessment Sub-Category refers to when a supervisor who does not adequately evaluate the risks associated with the task, misjudges the crew pairing, or misjudges other factors affecting the performance of the individual or the crew. Examples of the Risk Assessment Sub-Category include:

- a. A unit CO authorized a mission manned with an unqualified crew without conducting a risk assessment; and
- b. A maintenance shift supervisor who approved a non-standard aircraft repair.

NOTE
 This sub-category applies to those actions before a task is executed; actions that apply during task execution apply to the Level of Supervision Category.

Planning Beyond Capability Sub-Category

86. The Planning Beyond Capability Sub-Category refers to when supervisors knowingly allow or authorize personnel to undertake a task beyond their ability, training, or qualification; the limitations of their equipment; or the limitations of their working environment etc. The analysis of these factors should reasonably have raised safety concerns in the mind of the supervisor. Examples of the Planning Beyond Capability Sub-Category include:

- a. A supervisor allowed an inexperienced ATC to control two busy active runways;
- b. A supervisor misjudged the impact of an unrealistic work tempo and caused a fatigued technician to work on an aircraft;

- c. A supervisor authorized a pilot who has lost his night qualification to lead a formation at night; and
- d. A supervisor directed crews to alternate too frequently between day and night shifts.

Provision of Resources Sub-Category

87. The Provision of Resources Sub-Category applies when the task is planned without proper manning and resources or when the composition of the crew is inadequate for the task at hand. Inadequate provision of support to meet basic individual needs and normal comfort such as food, water, heat, appropriate quarters, adequate work environment, etc, are part of this category. It also relates to the inadequate provision of training in terms of quality, quantity or timeliness within the span of the supervisor's control. Examples of the Provision of Resources Sub-Category include:

- a. A supervisor assigns fewer aircraft than the mission called for, resulting in a task overloading of the assigned aircraft or the aircraft being overloaded to exceed weight limitations;
- b. A supervisor fails to schedule NVG training prior to a night operational deployment; and
- c. A supervisor tasks a tow crew with less than the minimum number of personnel.

LEVEL OF SUPERVISION CATEGORY

88. The Level of Supervision Category relates to inappropriate supervision or a lack of guidance, oversight, or training, etc. Supervisors at all levels should provide leadership, sound professional guidance, oversight, training opportunities, constructive feedback, motivation and be a positive role model to ensure that work is done safely and effectively. The Level of Supervision Category is divided into two sub-categories:

- a. Leadership; and
- b. Local Policy.

NOTE

This also applies to the inadequate identification and control of hazards and risk while the task is underway; if the task is in the planning stage hazard and risk recognition control fall under the Planned Activity Category.

Leadership Sub-Category

89. The Leadership Sub-Category relates to when the chain of command's availability, competency, and timeliness of decisions negatively affect the safety of the assigned tasks. Inadequate leadership includes poor supervision, weak oversight and lack of guidance by supervisory personnel within the unit of occurrence. Examples of Leadership Sub-Category include:

- a. Inadequate Communication: An inaccurate exchange of information or a style or tone of interaction that interferes with an individual succeeding at a task. This can include personality conflict, incorrect information, inadequate feedback or handover based on quality or timeliness, and miscommunication of intent, e.g. an ATC supervisor confronts a ground controller regarding his performance, causing the ground controller to miss an important radio call; and
- b. Inadequate Oversight or Guidance: Relates to a supervisor's unavailability, inadequate performance tracking, low proficiency, insufficient qualification, expired currency, invalid authorizations, improper inspection of work, etc, for the personnel under their control, e.g a check pilot pressures an aircraft captain to continue an instrument approach after the overshoot was initiated.

Local Policy Sub-Category

90. The Local Policy Sub-Category relates to the efficiency of local guidelines, policy, etc, or lack thereof, in terms of quality, quantity, dissemination or updating that is under the control of the supervisor to provide, that influence the safe conduct of the task. Examples of the Local Policy Sub-Category include:

- a. Local ramp procedures not covering known conflict between taxing aircraft and a ramp inspection crew;
- b. A new piece of ALSE is fitted to an aircraft and although everyone is briefed on its use, no formal record of the training is made; and
- c. Cadet glider summer camp ramp procedures not being published, resulting in numerous runway incursions by personnel and vehicles.

PROBLEM CORRECTION CATEGORY

91. The Problem Correction Category refers to instances when deficiencies concerning individuals, equipment, training or related safety areas are known to the supervisor, yet are allowed to continue uncorrected. This includes instances when a supervisor does not take the time to identify individuals who exhibit risky behaviour or unsafe tendencies. Additionally, it includes when a supervisor does not do a risk assessment or institute remedial actions when an unreasonable risk is known. This category may be related to a Supervisory Deviation. The Problem Correction Category is divided into three sub-categories:

- a. Correction of Performance;
- b. Correction of Equipment; and
- c. Correction of a Procedure.

Correction of Performance Sub-Category

92. The Correction of Performance Sub-Category relates to a supervisor's failing to correct the behaviour or performance of personnel impeding the safe completion of a task. Examples of the Correction of Performance Sub-Category include:

- a. A supervisor ignores routine deviations carried out within his section;

- b. A supervisor does not take action when observing substandard performance in his section;
- c. A supervisor does not adequately correct known training deficiencies; and
- d. A supervisor ignores warning signs given by an individual regularly reporting to work fatigued.

Correction of Equipment Sub-Category

93. The Correction of Equipment Sub-Category relates to supervisor who does not correct deficiencies in relation to material or associated documentation. Examples of the Correction of Equipment Sub-Category include:

- a. A supervisor who does not submit a UCR for a known tow bar deficiency; and
- b. A supervisor ignores the accumulation of minor discrepancies in an aircraft maintenance set.

Correction of Procedure Sub-Category

94. The Correction of Procedure Sub-Category relates to a supervisor who does not correct deficiencies or discrepancies in relation to standard operating procedures, regulations, standards or policy. Examples of the Correction of Procedure Sub-Category include:

- a. A new regulation not documented in Unit Flying Orders; and
- b. A supervisor allows a Unit Standards Officer to perform an unauthorized abbreviated Unit Checkout.

SUPERVISORY DEVIATION CATEGORY

95. The Supervisory Deviation Category definitions match the Unsafe Act Deviation definitions. The category Deviation relates to the action or inaction of the immediate unit supervisors. In this case, the investigation should focus on the factors predisposing the supervisor to carry out a deviation. A Supervisory Deviation includes actions such as directing an individual to violate existing regulations, instructions, technical guidance, SOP or rules. The Supervisory Deviation sub-categories are also identical to the Deviation sub-categories. The Supervisory Deviation Category is divided into two sub-categories:

- a. Mission-Centric; and
- b. Person-Centric.

Mission-Centric Sub-Category

96. The Mission-centric Sub-Category relates to the supervisor's intent to ultimately achieve the mandate of the task at hand while keeping in mind the best interests of the CF, e.g. a supervisor extends his flying crew's duty day beyond published limits. A Mission-Centric Deviation can at times include actions that are entirely appropriate under specific circumstances, such as defined in the B-GA-100. The Mission-centric Sub-Category is divided into two sub-sub-categories as follow:

- a. Routine; and
- b. Exceptional.

Routine Sub-Sub Category

97. The Routine Sub-Sub-Category relates to the unit's common and accepted use of an unapproved procedure to complete a task; inherent in it is the supervisor's awareness and tolerance of the unapproved procedure's use. It is often referred to as "bending the rules." It is important to consider that the Routine deviation may at times be a sign of a problem with rules and regulations or inadequate structure rather than the supervision or culture within the unit.

Examples of the Routine Sub-Sub-Category include:

- a. Routine "Workarounds" or Shortcuts: Sometimes it does not seem possible to get the job done effectively by following the rules or the rules seem unnecessarily lengthy or laborious, e.g. an inspection procedure may call for multiple time-intensive steps to be done in sequence. In order to reduce the time for carrying out the inspection and improve productivity, the supervisor permits personnel to conduct the steps all at once rather than sequentially. The "shortcut" version of the procedure may lead to missing a critical item or other unintended results such as overtorqued bolts or gaskets; and
- b. Lack of Time or Resources: An act that appears to optimize time or resources but still get the job done, e.g. the OpsO on a busy squadron allows crews to skip mission pre-briefs so that they can meet their takeoff times.

Exceptional Sub-Sub-Category

98. The Exceptional Sub-Sub-Category relates to a unique or isolated departure by a supervisor from established rules or regulations in order to complete the task. The deviation is totally unusual for that unit and is isolated to a specific supervisor. The exceptional deviation is neither sanctioned nor condoned by the supervisor's peers or leadership. Examples of the Exceptional Sub-Sub Category include:

- a. A supervisor knowingly directs a technician to conduct an unapproved repair action to return the aircraft to the flight line as soon as possible; or
- b. A supervisor allows a pilot to carry out a training mission below minimum weather limits so that pilot does not lose his currency.

Person-Centric Sub-Category

99. The Person-centric Sub-Category relates to a deviation contrary to established procedures based on the supervisor's personal motives, gains or goals that reflects badly on the professionalism of the organization and its members; this type of deviation can be said to be discordant. The Person-centric Sub Category involves reckless, wilful, or negligent behaviour or misconduct that may be carried out to falsely inflate one's reputation or for motives not in line with the objectives of the Canadian Forces. The discordant action may or may not be condoned by the supervisor's peers. Examples of the Person-centric Sub-Category include:

- a. A deployed maintenance detachment supervisor releases an aircraft for flight despite a lack of qualification and authorization to do so in order to meet a mission requirement and maintain an untarnished record;
- b. A pilot intentionally flies an aircraft under a bridge or too low to the ground to impress peers; and
- c. A flying supervisor accepts a tasking from a higher authority and then, in order to maintain credibility in the eyes of the higher authority, authorizes the mission to be flown knowing that the crew is not qualified to conduct it.

ORGANIZATIONAL INFLUENCE GROUP

100. The Organizational Influence Group refers to methods, decisions or policies made above the unit level that contributed to the occurrence. This can include equipment, resources, procedures, manning, procurement, etc. Senior leadership decisions have a profound impact on the organization and its function, including supervisory practices or an individual’s pre-conditions or actions. Organizational Influences, therefore, are an important set of Latent Conditions as the organization’s leaders set the foundation for all of its activities.

101. The Organizational Influence Group is shown at Figure 5. It is divided into three categories:

- a. Resource;
- b. Culture; and
- c. Management.



Figure 5 – CF HFACS Organizational Influence Group

RESOURCE CATEGORY

102. The Resource Category refers to management’s and leadership’s allocation of proper and sufficient resources to the team for the safe conduct of the task. It is divided into four sub-categories:

- a. Personnel;
- b. Financial;
- c. Equipment; and
- d. Facility.

NOTE

Training issues at the organizational level may be implicated if any of these four sub-categories are selected. Additionally, training issues dealing with documentation may be present in the Documentation Sub-Category found under the Work Environment Category within the Personnel Influence Group.

Personnel Sub-Category

103. The Personnel Sub-Category refers to the lack of or inadequate allocation of human resources, including maintainers, operators, staff and support personnel. This could include deficiencies in staffing, manning, enrolment quotas, and availability of training programs. Examples of the Personnel Sub-Category include:

- a. An improper unit manning level that forces excessive individual or unit workloads; and
- b. OTU training that is unreasonably shortened in order to increase throughput.

Budget Sub-Category

104. The Budget Category refers to the lack of or improper apportioning of financial resources for assigned tasks, such as for funding of acquisitions, maintenance, and operation of equipment. Examples of the Budget Sub-Category include:

- a. Flying gloves are not replaced in a timely manner due to a lack of funding, forcing aircrew to buy their own non-standard gloves externally; and
- b. Runway maintenance unreasonably postponed due to budgetary reductions.

Equipment Sub-Category

105. The Equipment Sub-Category refers to issues related to unsuitable equipment in relation to design, or failure to correct known design flaws with aircraft, tools, support equipment, publications, etc. Examples of the Equipment Sub-Category include:

- a. An aircraft CFTO supplied to maintenance units is out of date;
- b. An aircraft hoist control switch design that lead to inadvertent cargo release; and
- c. An organization did not action a UCR reporting a long-standing hydraulic test stand problem.

NOTE

Should an Organizational level documentation issue dealing with clarity or practical usability be present, it would be annotated in the Policy Sub-Category of the Management Category. However, should the documentation be out of date, not have a user-friendly format or not be accessible using supplied government documentation systems, it would be annotated in Equipment Sub-Category or the Resource Category.

Facility Sub-Category

106. The Facility Sub-Category refers to the inadequate design of workspaces or a failure to correct infrastructure issues. This includes inadequate design of workspaces such as cockpits, control towers, or hangar facilities, and suboptimal use and maintenance of training facilities, simulators, ranges, etc. Examples of the Facility Sub-Category include:

- a. An ALSE workshop operating out of a very small and cluttered work space that results in missing an item during a survival kit inspection; and
- b. Improper hanger lighting compromises a visual inspection of an aircraft component.

CULTURE CATEGORY

107. The Culture Category refers to the prevailing organizational cultural climate that adversely affects the team's performance and safety. It is made up of elements such as stress, cohesiveness, and morale, and it greatly influences the behaviour of personnel within an organization.

108. The Culture Category also relates to norms, values, attitudes, beliefs and customs within the organization that adversely influence safety in general. This includes misconceived rules, acceptance of lowered standards, misaligned values, negative attitudes, flawed beliefs, misplaced customs, and the lack of occurrence reporting and discussion. Elements of the organizational culture, such as the presence of "Group Think," disintegrating esprit de corps and discipline, or ill-conceived traditions can adversely influence safety and the way the task is conducted. Examples of the Culture Category include:

- a. Pre- or post-flight debriefings that are superficially conducted; and
- b. The non-reporting of FOD hazards in the belief that the FOD walk will resolve a flight line FOD issue.

MANAGEMENT CATEGORY

109. The Management Category refers to how higher HQs being ill-structured to manage and provide proper oversight of the team and the units for the safe conduct of a task. It is divided into three sub-categories:

- a. Planning;
- b. Policy; and
- c. Command and Control (C2).

Planning Sub-Category

110. The Planning Sub-Category refers to undesirable characteristics or conditions of work established by leadership that ultimately impaired the safe completion of the task. These characteristics include unrealistic operational tempo, unreasonable workload, unworkable time constraints, overly optimistic production quotas, non-motivating incentive systems, impractical schedules, and inadequate training, standards, or certification plans. It can also include the lack of contingencies for unforeseen problems in complex operations. Examples of the Planning Sub-Category include:

- a. The introduction of a new capability in an operational theatre without a proper risk assessment;
- b. A capability that is not suitable for the roles assigned; and
- c. A risk management process that is not followed thoroughly for a high risk operation.

Policy Sub-Category

111. The Policy Sub-Category relates to the inefficiency of documented rules, regulations, procedures, guidelines, etc. It relates to doctrine, or its lack thereof, in terms of quality, quantity, or dissemination that influences the safe conduct of the task. It also relates to poorly formulated directives, guidelines, etc, that negatively influence or compromise the safety of a task. This includes the policies and the handling of documents within the organization with respect to recruiting, promotion, posting, retention and release, or those that are ill-defined, adversarial, overly complex, conflicting or supplanted by unofficial rules or values. Examples of the Policy Sub-Category include:

- a. A CFTO on a maintenance procedure is poorly written with overly complex or impractical processes;
- b. A deployed unit has no means to consult or download electronic records or procedures for the aircraft with which they are deployed;
- c. A personnel reduction program severely impacts unit supervision levels; and
- d. The introduction of an untested electronic maintenance records system leads to multiple missed inspections.

Command and Control (C2) Sub-Category

112. The C2 Sub-Category relates to higher headquarters in terms of their oversight, structure, delegation of authority, and communications that influenced a subordinate unit's safe conduct of the task. This includes ambiguous delegation of authority, poor monitoring and scrutiny of resources used, unrealistic risk assessment and flawed processes that impaired the safe completion of a task and hindered the work environment. Examples of the C2 Sub-

Category include:

- a. An orphan unit not receiving proper oversight and guidance from higher HQs;
- b. An aviation resource is assigned to an operational theatre with a mitigation strategy to deal with environmental challenges but the higher levels in the chain of command do not check to ensure that they are put in place; and
- c. The assignment of a detachment to a UN mission without proper rules of engagement.

MATERIAL CAUSE FACTOR

DEFINITION MATERIAL CAUSE FACTOR

113. A Materiel cause factor relates to a failure of any aircraft component, support equipment or facility used in the conduct and support of air operations that lead to a FS occurrence.

ASSIGNMENT OF MATERIAL CAUSE FACTOR

114. A Materiel cause factor can be assigned in a FS occurrence which identify:
- a. A flaw in the basic material used to manufacture a part;
 - b. An improper design, manufacture, construction or assembly; or
 - c. A failure or malfunction of components when there was no overstress, abuse or misuse, and proper maintenance practices were carried out (undetected progressive breakdown).

NOTE

Although the improper design, manufacture, construction or assembly could ultimately have been caused by personnel at the OEM or fourth line level, these kind of flaws are categorized as Material cause factor rather than Personnel because the Canadian Forces had no control on how these activities were conducted.

115. Materiel cause factor includes all aircraft and / or engines, equipment and facilities used in the conduct and support of air operations. Although most materiel failures may be traced ultimately to some human origin, personnel causes are assigned only when failures result from incorrect maintenance by CF or contracted parties or from incorrect operating procedures. It is preferable, both statistically and realistically, to consider the remaining cases as materiel failures of the items in themselves, regardless of the reason or mode of failure. Materiel cause factors are divided into the following categories.

116. The Material cause factor is divided in two categories:
- a. Aircraft or Engine Component; and
 - b. Related Facility.

AIRCRAFT OR ENGINE COMPONENT CATEGORY

117. The Aircraft or Engine Component category relates to equipment failure or malfunction. The failed or damaged component must be specified in the investigation report. If it is beyond the capability of the unit to precisely determine the technical nature of the fault, then the component need only be identified. For example, it may require a repair contractor to determine that a bushing has failed in a generator. The unit should specify “generator” as the component.

RELATED FACILITY CATEGORY

118. The Related facility category relates to failure or malfunction of facilities or equipment that is not part of, but relevant to, the operation of aircraft, such as maintenance support equipment. The nature of the item is to be specified in the investigation report, for example:

- a. Ground vehicles, test stands, ladders, chocks, tow bars, helicopter ground handling wheels, and similar equipment used in the vicinity of aircraft;
- b. Personal safety equipment;
- c. Ground equipment supporting air navigation and ground / air communication; or
- d. Helicopter securing device such as the bear trap used in shipborne helicopter operations.

119. Materiel cause factors should be amplified with a short descriptive narrative including, when possible:

- a. The mode of failure, e.g. fatigue, shear, corrosion, wear, seizure, overheat, out of adjustment; and
- b. The reason for failure, if known, e.g. improper design, manufacture, construction or assembly.

ENVIRONMENTAL CAUSE FACTOR

DEFINITION ENVIRONMENTAL CAUSE FACTOR

120. An Environmental cause factor relates to external factors that affect the flight or aviation activity, be it a climatic (temperature, humidity, turbulence, convective weather, ceiling, wind, visibility, precipitation) or environmental (light conditions, degraded visual environment caused by snow, sand or lack of contrast) or other condition that leads to a FS occurrence despite all reasonable precautions being taken by the personnel involved.

ASSIGNMENT OF ENVIRONMENTAL CAUSE FACTOR

121. An Environmental cause factor is assigned when the condition encountered was beyond human control to predict with the present state of the art equipment and when all reasonable precautions had been taken and applicable SOPs applied; reasonable precautions includes, but are not limited to, the full use of weather forecast information, use of airborne weather radar, requesting updated weather information, timely abort or turnaround, delaying launch, seeking shelter or taking alternative action decisions, as applicable, for vectoring to avoid

areas of hazardous weather or bird concentrations.

122. The Environmental cause factor is divided in five categories:

- a. Weather;
- b. Unusual Phenomena;
- c. Surface operating area;
- d. Wildlife; and
- e. Atmospheric Pressure, Simulator or Centrifuge.

WEATHER

123. The Weather category relates to normal environmental phenomena such as cloud, hail, lightning, rain, ice, snow, sea state and wind.

UNUSUAL PHENOMENA

124. The Unusual Phenomena category relates to all other environmental conditions exclusive of weather that cannot be easily predicted, e.g. tidal waves (tsunami), earthquakes, landslides, avalanches etc.

SURFACE OPERATING AREA

125. The Surface Operating Area category relates to a condition where the landing/take-off area is causal in the occurrence, e.g. earth surface, water surface or landing/take-off manoeuvring area generating FOD, a degraded visual environment, a hidden object (snow covered stump), etc.

WILDLIFE

126. The Wildlife category relates to a condition where wildlife activity is causal in an occurrence, bird / bat strike, bird avoidance manoeuvring, wildlife strike or presence, etc.

ATMOSPHERIC PRESSURE, SIMULATOR OR CENTRIFUGE

127. The Atmospheric Pressure, Simulator or Centrifuge category relates to a condition where involved personnel suffer adverse physiological consequences during or after exposure to a change of atmospheric pressure, a simulator or centrifuge. Consultation with a Flight Surgeon is recommended when considering this cause factor area. Examples of Atmospheric Pressure, Simulator, Centrifuge include:

- a. High altitude decompression sickness;
- b. Disorientation or after-effects caused by simulator or centrifuge training; and
- c. Neck or other body strains from centrifuge.

NOTE

The Atmospheric Pressure, Simulator or Centrifuge cause factor could be assigned independently, especially in the case in an hypobaric chamber where there is no intent to fly. For instance, the investigation could reveal that an individual suffered from decompression sickness, a trapped gas disorder, hypoxia, etc, and that no further safety of flight compromise was present. These occurrences are valuable for statistical tracking and possible PMS.

OPERATIONAL CAUSE FACTOR

DEFINITION OPERATIONAL CAUSE FACTOR

128. An Operational cause factor relates to a condition or situation where the CoC has formally accepted higher risk estimated to be above an acceptable level of safety to achieve an operational mission objective and when the risk was present and causal, either in whole or in part, to the FS occurrence.

ASSIGNMENT OF OPERATIONAL CAUSE FACTOR

129. An Operational cause factor can only be assigned by the AIA when the applicable formation Comd or legally authorized individual has lawfully accepted a higher risk in accordance with the provisions of individual CDS (delegation) Orders as part of the Airworthiness Program or as stipulated by the B-GA-100-001/AA-000 National Defence Flying Orders, Volumes 1 and 3.

130. The assignment of an Operational cause factor can be done in isolation or in combination with other cause factors.

FOREIGN OBJECT DEBRIS (FOD) CAUSE FACTOR

DEFINITION OF UNIDENTIFIED FOD CAUSE FACTOR

131. An Unidentified FOD cause factor relates to a condition where the presence of a foreign object in or around an aircraft leads to a FS occurrence and where the type of FOD cannot be established.

ASSIGNMENT OF UNIDENTIFIED FOD CAUSE FACTOR

132. Usually, the Unidentified FOD cause factor should not be assigned in conjunction with or in addition to any other cause factor type. On the other hand, when the source of the debris is known, e.g. Material, Personnel or Environment, the applicable cause factor Type shall be selected. Examples of FOD that should not be assessed against Unidentified FOD include any FOD generated by aircraft systems or component failures, loose or lost parts or pieces, personal equipment misplaced in the aircraft and FOD ingestion related to environmental factors like birds, ice, etc..

NOTE

If FOD is present in an occurrence, the Event Descriptor FOD shall be selected as well as any other pertinent Event Descriptors applicable to the occurrence. This ensures that FOD-related occurrences are tracked accurately.

UNDETERMINED CAUSE FACTOR

DEFINITION OF UNDETERMINED CAUSE FACTOR

133. An Undetermined cause factor relates to a condition where the investigation was unable to reasonably determine the probable cause of an occurrence.

ASSIGNMENT OF UNDETERMINED CAUSE FACTOR

134. An Undetermined cause factor should only be assigned as a last resort when all investigative avenues have been exhausted and when the investigation does not provide enough evidence to reasonably determine a specific cause factor. Prior to assigning an Undetermined cause factor, the investigation shall consider assigning cause to one or more of the three main cause factor categories (Personnel, Materiel and or Environmental). If the assessment of the evidence eliminates all other cause factors as causal and there is no reasonable means to determine that one of the three main cause factor categories was causal, then an Undetermined cause factor will be assigned.

UNDETERMINED CAUSE FACTOR

DEFINITION OF UNDETERMINED CAUSE FACTOR

135. An Undetermined cause factor relates to a condition where the investigation was unable to reasonably determine the probable cause of an occurrence.

ASSIGNMENT OF UNDETERMINED CAUSE FACTOR

136. An Undetermined cause factor should only be assigned as a last resort when all investigative avenues have been exhausted and when the investigation does not provide enough evidence to reasonably determine a specific cause factor. Prior to assigning an Undetermined cause factor, the investigation shall consider assigning cause to one or more of the three main cause factor categories (Personnel, Materiel and or Environmental). If the assessment of the evidence eliminates all other cause factors as causal and there is no reasonable means to determine that one of the three main cause factor categories was causal, then an Undetermined cause factor will be assigned.

NOTE

PMs can still be recommended when the occurrence cause is undetermined.

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Annex A
Chapter 10
A-GA-135-001/AA-001

ANNEX A – PRE-HFACS PERSONNEL CAUSE FACTORS

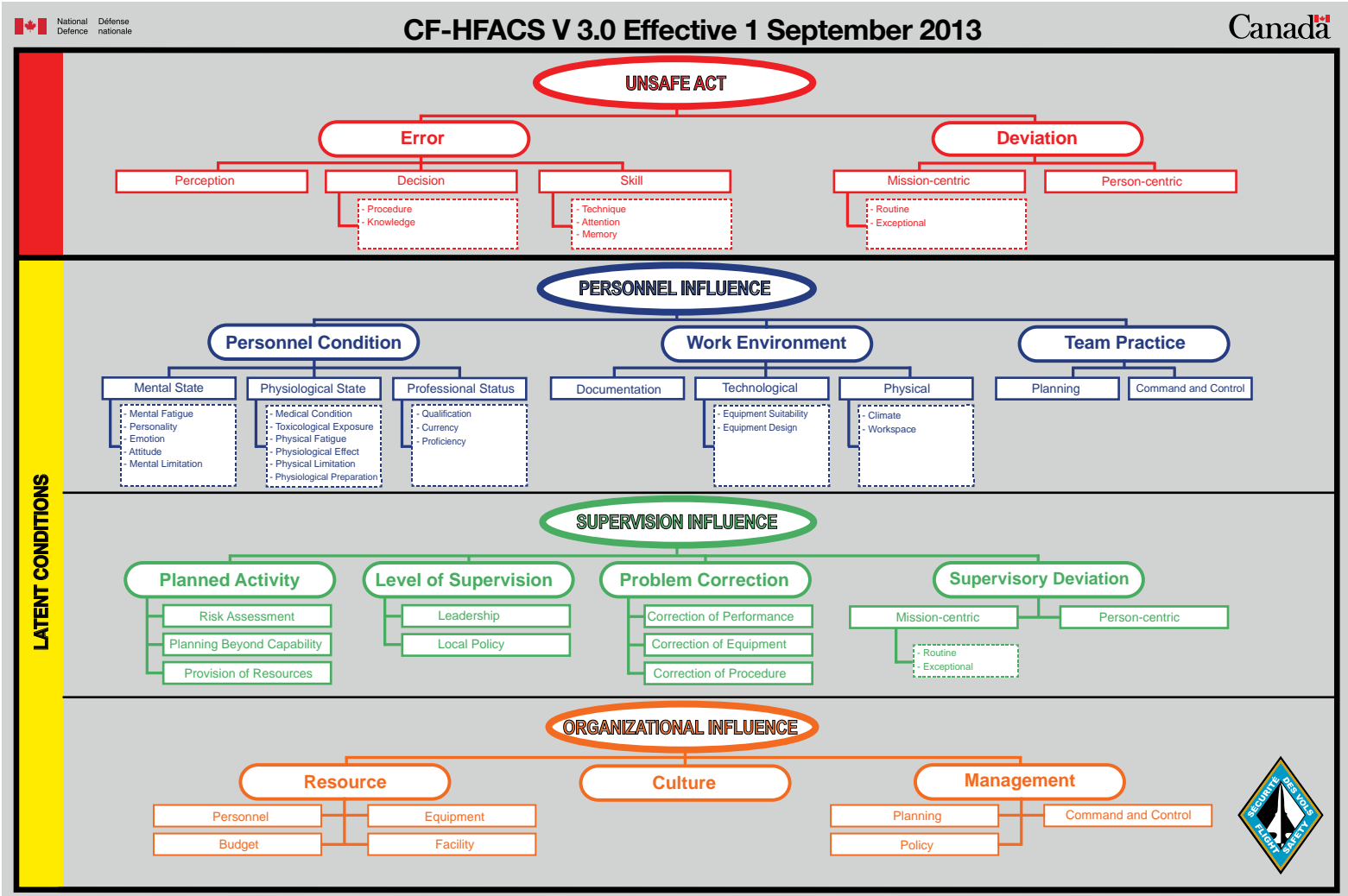
NOTE

The Pre HFACS Personnel cause factors used before the introduction of HFACS in January 2004 are available from DFS if required for statistical analysis.

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Annex B
 Chapter 10
 A-GA-135-001/AA-001

ANNEX B – CF-HFACS V 3.0 CHART



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CHAPTER 11 – PREVENTIVE MEASURES AND ANALYSIS

APPLICATION OF TERMINOLOGY

1. Common terminology accepted by the CF shall, with few exceptions, meet the aims of this manual and maintain consistency. Where terms or words have taken on meanings specific to FS, they are defined below.

ANALYSIS PURPOSE

2. The goal of the FS System is to prevent accidental loss of CF aviation resources. The analysis and subsequent PM steps are the most important of investigation activities because the successful implementation of PMs is means to achieve the goals of the FS Program and the Airworthiness Investigation activity. This is met through the clear identification of hazards and the effective implementation of practicable PMs. Such measures normally modify some aspect of procedures in the manufacture, support, operation or maintenance of aircraft or components. Further, by investigating occurrences, the FS System obtains valuable feedback and develops PMs so that similar occurrences can be reduced, mitigated and ideally eliminated. Feedback also allows lessons learned by a unit to be used by other units not directly involved and raise the awareness of personnel.

3. FSOs at all levels should make every effort to ensure that PMs / corrective actions are monitored to ensure they are implemented and assessed for effectiveness. Feedback shall be provided to subordinate units and HQ as to the status and effectiveness of these measures.

DEFINITION

PREVENTIVE MEASURE (PM)

4. A PM is any step that can be taken to decrease the likelihood of a FS occurrence.

NOTE

When practical, one or more PM may be applied to each cause factor assigned to an occurrence. While there has to be a correlation between the cause factor(s) and the PMs assigned there is no requirement to assign a PM for each cause factor assigned. Notwithstanding, the combination of the PMs assigned should minimize the risk of a repeat of the contributing cause factors.

ANALYSIS METHODOLOGY

5. Most types of analysis involve statistics. Statistics can be misleading, and methods for avoiding the more common pitfalls are described in the paragraphs that follow. It is suggested the following data be considered:

- a. the number of occurrences involving a formation in any given period;

- b. the most common types of occurrences and cause factors (look for trends and their root causes);
- c. the most common PM (have they been implemented and are they effective?);
- d. trends in individual aircraft and / or components, equipment, stages of operation, units, sections and personnel and the probable reasons for these trends;
- e. environmental and seasonal factors; and
- f. the effects of exercises, competitions and deployments.

OCCURRENCE RATE

6. The rate of occurrences is expressed as the number of occurrences per 10,000 flying hours. It is calculated with the formula: (# of accidents) / (incidents) / (occurrences) X 10000 ÷ (# flying hours). E.g. four air accidents in 30,000 flying hours would result in an accident rate of 1.33.

ANALYSIS OF LOCAL OCCURRENCES

7. Comds and FSOs at every level must evaluate the effectiveness of their FS Programs. To achieve this, FSOs must maintain records of every FS occurrence involving facilities, equipment and personnel. The FSOMS is the primary tool used to aid this process and is useful for identifying trends.

ANALYSIS AVAILABLE FROM FSOMS

8. The FSOMS trending tools can provide FS staff with a comprehensive range of data for use in identifying problem areas and implementing PMs. FSOs can contact DFS either directly or through their WFSO for assistance in generating or interpreting an analysis.

USE OF RESULTS

9. Regular in-depth analysis can indicate where additional PMs are required. Recommendations should be made to the first level authorized to implement them.

PM MANAGEMENT PROCESS

10. PMs are the final outcome from investigations (for both Occurrences and Hazards) which, when implemented may prevent accidents. Considering this is the ultimate aim of the entire Flight Safety program, there needs to be a formal management process to address PMs from formulation to final closure.

11. Annex B details the process flow for the development and tracking of PMs to completion.

DEVELOPMENT OF EFFECTIVE PM

12. PMs are to be implemented so that they will have lasting effects despite frequent changes in personnel. New accidents are rare; usually it is simply a matter of new people being involved in “old” accidents. Short-term PMs, such as briefing aircrew or maintenance

personnel, have little lasting effect and may allow hazards to reoccur when new people arrive.

13. The guidelines for developing effective PM are listed below:
 - a. the PM should, when applicable, target the lowest level in the chain of command that is able to deal effectively with the PM;
 - b. the PM must treat the cause of a problem and not its effect;
 - c. the PM must be realistic and practicable, and their effects on operational capability should be considered. PM must also be judged according to cost-effectiveness, training and manpower requirements and implementation time;
 - d. the PM need not be limited to the cause of a specific incident, as other hazards may surface during the course of an investigation;
 - e. the occurrence resulting from personnel cause factors should lead to a search for PMs in management, training and supervision;
 - f. the PMs resulting from an occurrence should be consistent with and developed logically from the cause;
 - g. similar occurrences in the past or with other fleets should be reviewed for ideas;
 - h. the organization responsible for ensuring that PMs are completed should be identified and target dates set for all follow-up action;
 - i. when a hazard is identified that requires immediate action, comds and FSOs should address the particular problem immediately and independently;
 - j. units shall action PMs contained in SRs from other units if applicable; and
 - k. lessons learned shall be identified and disseminated when applicable.
14. When preparing the SR, the FSO should focus on PMs that can truly mitigate or eliminate the chance of future accidents, like improving a training syllabus, amending SOPs and modifying equipment, to name a few.

15. The Human Factors Intervention matrix (HFIX®) is a tool that can be used for mapping intervention strategies related to the human errors identified in the HFACS model. HFIX can help a FSO to systematically generate comprehensive PMs that directly target the underlying systemic causes of errors. The HFIX matrix has been posted on the DFS Web site under the FSOMS Ops Guidance page at http://airforce.mil.ca/fltsafety/fsoms/docs/HFIX_Checklist.pdf.

REVIEWING PM

1 Cdn AIR DIV REVIEW

16. On review of the occurrences and hazards reported, 1 Cdn Air Div will:
 - a. implement the appropriate PMs within their authority;
 - b. recommend additional PMs and, where applicable, identify the responsible offices and target dates for follow-up action;
 - c. provide recommendations for PMs that are beyond their capabilities; and
 - d. consider whether or not specific PMs should also apply to other aircraft types under their comd.

DFS REVIEW

17. On review of the occurrences and hazards reported, DFS shall:
 - a. coordinate with other agencies for action as necessary;
 - b. establish target dates for outstanding items;
 - c. disseminate PMs and information back to 1 Cdn Air Div, wings, bases, and units;
 - d. consider the application of PMs to other aircraft types; and
 - e. produce educational material for distribution to units.

RESPONSIBILITY FOR IMPLEMENTING PM

18. Comds at all levels, with advice from their FS staffs, are responsible for devising and instituting PMs and for advising higher HQ of required PMs that are beyond local capabilities.

TRACKING OF PM

19. Tracking means monitoring all PMs until they have been fully implemented or rejected by the appropriate authority. Tracking is the responsibility of Comds at all levels, with advice from their FS staffs. Tracking also ensures that the entire user community is kept up to date on the nature, status and effectiveness of PMs. Additionally, it ensures that PMs are not forgotten. Further guidance is provided at Annex B.

MAPPING CF DATA TO ICAO DATA

20. For data comparison and exchange of information, the FSOMS is required to be mapped to ICAO data. Annex A details the relationship between the CF occurrence categorization system and the ICAO occurrence categorization system.
21. In order to map FSOMS data to ICAO data, CF FS occurrences are divided into three major occurrence classes. Appendix 1 to this Annex details the specific mapping.
 - a. 100 Accident Class. A 100 accident is defined as any occurrence categorized as an "A", "B" or "C" category occurrence. It involves a CF aircraft, its equipment or its operation having caused someone to be missing (Grey) or have received fatal (Black), very serious (Red) or serious (Yellow) injuries or illness, or where the CF aircraft is either destroyed, missing or left with serious damage which adversely affects the structural strength, performance or flight characteristics of the aircraft and would normally require major repair or replacement of the affected component(s).
 - b. 200 Serious Incident Class. A 200 serious incident is defined as any "D" or "E" category occurrence involving a CF aircraft, its equipment or its operation where there was extreme to medium potential for a serious accident or where someone received a minor injury or where the CF aircraft sustained minor damage. A list of likely serious incidents can be found at Appendix 1 of Annex A.

- c. 300 Incident. A 300 incident is defines as any “D” or “E” category occurrence involving a CF aircraft, its equipment or its operation where a low potential for an accident or serious incident existed.

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ANNEX A – MATRIX MAPPING CF OCCURRENCES TO ICAO DATA

OCCURRENCE CATEGORY	SAFETY OF FLIGHT COMPROMISE	ICAO OCCURRENCE CLASS
A	YES	100 ACCIDENT
B		
C		
D, E	EXTREME TO MEDIUM	200 SERIOUS INCIDENT
D, E	Low TO NIL	300 INCIDENT

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Appendix 1
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APPENDIX 1 – LIST OF SERIOUS OCCURRENCES

1. The incidents listed are typical examples of incidents that are likely to be serious. The list is not comprehensive and only serves as guidance to the definition of serious incident.
 - a. Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate;
 - b. Controlled flight into terrain (CFIT) only marginally avoided (near CFIT);
 - c. Aborted take-off on a closed or occupied runway;
 - d. Take-off from a closed or occupied runway with marginal separation from obstruction;
 - e. Landing or attempted landing on a closed or occupied runway;
 - f. Gross failure to achieve predicted performance during take-off or initial climb;
 - g. Engine fire or fire and smoke in the passenger cabin or cargo compartment, even though such fires were extinguished with extinguishing agents;
 - h. Event requiring the emergency use of oxygen by the flight crew;
 - i. Aircraft structural failure or engine disintegration not classified as an accident;
 - j. Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft;
 - k. Flight crew incapacitation in flight;
 - l. Fuel quantity requiring the declaration of an emergency by the pilot;
 - m. Incidents such as runway undershoot or overshoot or running off the side of a runway;
 - n. System failure, weather phenomenon, operation outside the approved flight envelope or other occurrences that could have made controlling the aircraft difficult; and
 - o. Failure of more than one system in a series of redundant systems mandatory for flight guidance and navigation.

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Annex B
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ANNEX B – OCCURRENCE/HAZARD PM MANAGEMENT PROCESS

Reference: C-05-005-P12/AM-001 *Policy and Procedures Aircraft Weapon Systems Engineering – Aerospace Equipment and Program Management Division Engineering Process Manual*, Part 12 Airworthiness Risk Management

1. This Annex details the steps required to develop and track PMs until completion. Although Hazards and Occurrence have completely different triggering mechanism (Proactive vs Reactive), the method used to resolve any noted deficiencies highlighted in the FS investigation will be through the formulation of PMs.
2. Although the procedures documented in this Annex standardize the PM management process across the CF, especially for PMs tasked above the wing, it is understood that each wing could use local procedures to deal with PMs within their sphere of responsibility. This is deemed acceptable provided the Chain of Command maintains visibility and responsibility for the implementation of PMs. Further, the intent of the principles described in this Annex are adequately documented in local unit/wing procedures (e.g. FS program, or AF9000 procedures).
3. This Annex should be read in conjunction with the flow chart at Appendix 1. This annex aims to achieve the following:
 - a. show how to identify risks to the chain of command (usually resulting from hazard reports);
 - b. describe the process to be used for validation of PMs;
 - c. describe how to transfer PMs addressed outside the unit;
 - d. detail the essential steps needed for traceability;
 - e. recommend a method to transfer the PMs from the FS network to the Chain of Command (CoC);
 - f. recommend a method for the CoC to task organizations under their command; and
 - g. describe the process to use when the CoC does not agree with the proposed PM.
4. Record of Airworthiness Risk Management (RARM). In the case of hazards, the reporting form (Chapter 7, Annex A) includes an identification of hazard “Severity” and “Probability”, which can be used to determine a level of risk according to the RARM (reference). The individual filing the hazard form will not necessarily be familiar with the risk management process; therefore the risk should be validated prior to be entered in FSOMS. If after an initial investigation of the hazard (Block H-4), the risk exceeds the acceptable level of safety, the information needs to be passed along to the Division FS office (Block H-6) within 48 hours. Following validation of the risk, the Division FS office will pass-on to information to the OAA (Senior Staff Officer Operational Airworthiness – SSO OA). The SSO OA will initiate

a risk evaluation and a RARM will be created if deemed necessary. In cases where a RARM is completed, a copy will be provided to the WFSO, to include the appropriate reference in FSOMS.

5. PM Validation Process. The validation process detailed in the flow chart (originated at block PM-1), has four steps:

- a. assignment of the PM to the proper FS level (UFSO, WFSO, Div FSO, or DFS);
- b. verification of the PM to determine if PM is acceptable and suggest the Action Organization (AO);
- c. pre-coordination of the PM between the FS network and the AO; and
- d. feedback to the investigator accepting and confirming the validity of each PM.

6. PM Assignment Process. For all PMs with an AO outside the unit, the relevant PMs will be forwarded to the WFSO. Similarly, the WFSO will forward the PMs with AO outside the wing to the Div FS team, who will forward PMs with AO outside the Division's responsibility to DFS. It is expected that before a PM is passed to the next level (up the FS chain), the FS officer will ensure that the PM meets the criteria of an effective PM (Chap 11 para 13).

7. Third Line Contractor. In situations where PMs have to be implemented by a third line contractor, the following will apply:

- a. For simple & pre-coordinated PMs: the AO should be the Wing and the FSOMS tracking field for each PM should reflect that the contractor has agreed to implement the PMs; or
- b. For all other PMs: the staffing process detailed in para 6 applies and the AO should be the unit managing the contract with the applicable contractor (normally the Weapon System Manager).

8. PM Verification and Pre-coordination Process. Once the proper level is reached, the FSO of that organization will confirm that an appropriate AO has been assigned. In most cases, a pre-coordination should be performed with the AO, ensuring a buy-in from the start, and possibly a quicker implementation of the PMs. It must be noted that often, many PMs are implemented prior to the release of the final report. In a situation where the pre-coordination process is not completed on some PMs and the FS report is ready to be sent, the UFSO/WFSO can still release the FS report and select 1 Cdn Air Div/Div FS as the AO. Once the PM has been pre-coordinated with the appropriate AO by the Div staff, the FSOMS AO will be updated accordingly

9. PM Feedback Recording Process. For each PM staffed up the FS chain, there shall be a record providing feedback to the WFSO, confirming that the PM is valid and has the proper AO assigned.

10. PM Assignment to AO Above Wing. Once the final report is released (Block PM-2), the PM will be transferred formally (e-mail is acceptable) to the responsible FS organization level (Block PM-3). If the validation process was completed adequately, there should not be any PMs that were wrongly assigned; however it is possible that some PMs will be returned to the WFSO if the PM is not supported by the FS Chain (Block PM-11A).

11. PM Transfer to Chain Of Command (CoC). Following an investigation, a clear transfer of all PMs from the FS network to the appropriate level of the Chain of Command is required (Blocks PM-4 and PM-12).
12. PM Refusal or Modification. The responsibility to implement PMs rests with the CoC. In some cases, the implementation of a PM may not be possible or practical. In such situation, a PM may be refused, or modified in an attempt meet the original intent. In such a situation, correspondence with the appropriate FS level (Block PM-5A or PM-13A) should take place. If the FSO of the appropriate organization agrees with the recommendation or suggested modification, the rationale shall be inputted in FSOMS with the pertinent record and the PM closed or amended as required. However, if the FSO does not agree with the recommendation, he can raise his reasoning one level up in the chain of command (Bloc PM-5B and PM-13B), for final vetting.
13. PM Tasking by CoC. Once the PM have been accepted, a formal tasking should be done by the commanders at all levels. This is a necessary step that not only formally tasks the appropriate AOs, but confirms acceptance of the PM by the CoC.
14. PM with Associated RARM. Even when the intent of a PM is met by a mitigating action of an approved/signed RARM, the PM will remain open and the tracking field in FSOMS shall include an appropriate comment, e.g. "RARM Ref #XX includes this PM as mitigating action #YY, with an expected completion date of DD/MM/YY. No updates on this PM will be done as part of the quarterly open PM Report. The assigned DFS desk officer will monitor during the yearly fleet review at the ARB." Once the specific mitigating action of the RARM is completed, the PM can be closed.
15. PM Closure. PM can be closed under the following conditions:
 - a. when the PM is implemented to the satisfaction of the responsible FS level (WFSO, 1 Div FSO, or DFS). Once a PM is completed, the AO will provide the specific records/documentation to the appropriate FS network. If the responsible FSO concurs, he will close the PM and include the details in FSOMS (Blocks PM-9 and PM-17). Also, the appropriate documentation will be forwarded to the FSO that originated the occurrence for tracking purposes; or
 - b. when the PM not to be implemented by the CoC has undergone the review detailed at para 12 above. The appropriate reference(s) showing the CoC refusal of the PM will be included in the FSOMS tracking field before closure of the PM.
16. PM from Reports/Studies. In some cases, reports or studies are mandated as an individual PM. When such a report/study is formally released, that particular PM shall be closed; however, if PMs are resulting from this report/study, they shall be documented as new PMs within the same FS occurrence report that initiated this activity. PMs validation and pre-coordination is to be carried-out as described in this Annex. This will ensure that those follow-up actions are adequately tracked and recorded in FSOMS. Similarly, if an independent report/study has identified FS risks, a hazard report shall be generated in FSOMS if one or more PMs have been identified.
17. Occurrence Report/Hazard Report Closure. Once all PMs for a specific Occurrence or Hazard are completed, that specific investigation will be formally closed in FSOMS, by the originating unit.

18. PM Tracking. Although the Commanders at all levels are responsible for the tracking of PMs, the FS staff will provide all necessary tools (regular reports) to facilitate this function, and ensure that no PMs are forgotten. For traceability purposes, the FS Representative will update FSOMS using the following guidelines stipulated in Table 1.

NOTE

In the case of Unsatisfactory Condition Report (UCR)/Publication Deficiency Report (PDR)/Statement of Capability Deficiency (SOCD), the PM will remain open until it is fully implemented on the fleet. IF the UCR/PDR/SOCD is rejected at higher level, the situation will be reviewed by the FS team as if the PM was rejected (para 11).

NOTE

For the purpose of tracking the PM, the responsible organization, in FSOMS, will change as the UCR/PDR/SOCD is staffed up the chain.

FLOW CHART BLOCK	ACTION TO RECORD	REQUIREMENTS
H-6	TRANSFER HAZARD TO CoC FOR RISK ASSESSMENT	DATE STAMP/FULL REFERENCE ³
PM-4 & PM-12	PM TRANSFER TO CoC	DATE STAMP/FULL REFERENCE
PM-5A & PM-13A	PM REFUSED OR MODIFIED	FULL REFERENCE
PM-6 & PM-14	PM TASKED	DATE STAMP/FULL REFERENCE
PM-8 & PM-16	PM AUDIT (WHEN CONSIDERED INCOMPLETE)	DATE STAMP/FSO NAME/COMMENT FIELD
PM-9 & PM-17	PM CLOSURE	DATE STAMP/FSO NAME/COMMENT FIELD

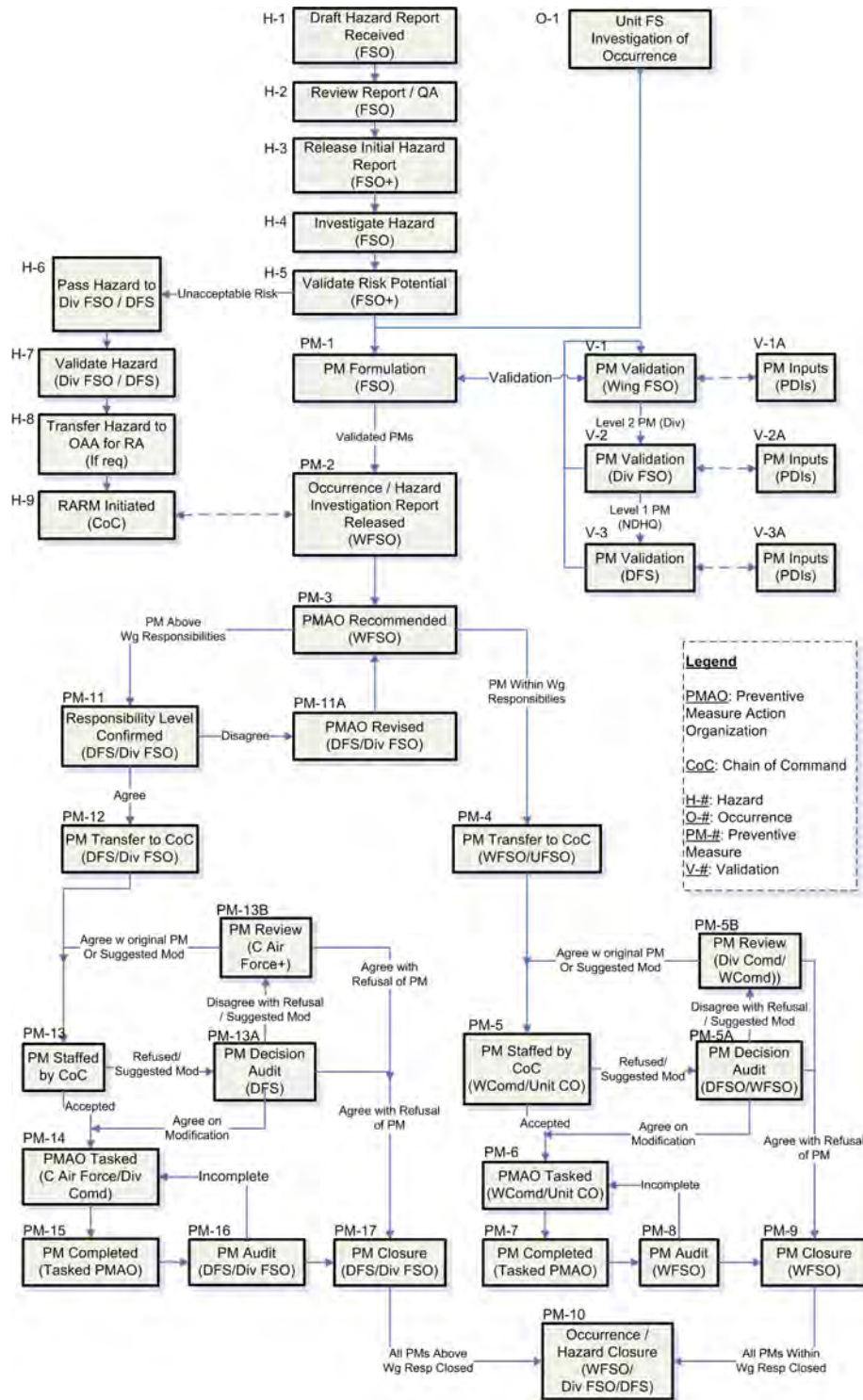
Table A1: Information to be recorded in FSOMS (refer to Appendix 1)

NOTE

Full reference is defined as follows: WFSO to keep a copy of the correspondence (e-mail, letter or message) on file; FSOMS to include reference details with a short description (in free text field).

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APPENDIX 1 – PM MANAGEMENT PROCESS DIAGRAM



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ABBREVIATIONS

AA: Airworthiness Authority

ACGP: Air Cadet gliding program

ACMI: Air Combat Manoeuvring Instrumentation

ACFPF: Air Cadet powered flight program

ADL: Aircraft damage level

ADM (Mat): Assistant Deputy Minister (Materiel)

AER: Aircraft equipment requirement

AERE: Aerospace engineer

AETE: Aerospace Engineering Test Establishment

AFSO: Air Force Safety Officer/Aviation Fluids Services Officer

AGL: Above ground level

AIA: Airworthiness Investigative Authority

AIG: Address indicator group

AIM: Airworthiness Investigator Manual

AI: Airworthiness investigator

ALSE: Aviation life support equipment

AMU: Advanced Memory unit

ARD: Aircraft recording device

AOC: 1 Canadian Air Division Air Operations Centre

ATESS: Aerospace and Telecommunications Engineering Support Squadron

ATI: Access to information

AWO: Avionics and Weapons Officer

AWS: Air weapons system

AWSTM: Air weapons safety technical member

ARD: Aircraft recording device

BI: Basic investigator

BOI: Board of inquiry

Canada COM: Canada Command

CANSOFCOM: Canadian Special Operations Forces Command

C Air Force: Chief of the Air Force

CDLS: Canadian Defence Liaison Staff

CDS: Chief of the Defence Staff

CEFCOM: Canadian Expeditionary Forces Command

CAF: Canadian Armed Forces

CFAO: Canadian Forces Administrative Order

CFICC: Canadian Forces Integrated Command Centre

CFMO: Canadian Forces Medical Order

CFQAR: Canadian Forces Quality Assurance Region

CFR: Aircraft Crash, firefighting and rescue

CFTO: Canadian Forces Technical Order

CoC: Chain of command

Comd RCAF: Commander RCAF

COMSEC: Communication security

CPI: Crash position indicator

CTAISB: Canadian Transportation Accident Investigation Safety Board

CVR: Cockpit voice recorder

CR: Combined (initial and supplementary) flight safety investigation report

DAEPM: Director Aerospace Equipment Program Management

DAOD: Defence Administrative Orders and Directives

DAU: Data acquisition unit

D Cdts: Director Cadets

DFS: Director/Directorate of Flight Safety

DICP: Division Instrument Check Pilot

Div FSO: Division FSO

DQA: Director Quality Assurance

DRDC: Defence Research and Development Canada

DTMU: Data transfer memory unit

EMS: Engine monitoring system

ESR: Enhanced supplementary flight safety investigation report

FDR: Flight data recorder

FLU: French language unit

FOD: Foreign object debris

FS: Flight safety

FSI: Flight safety investigation

FSIR: FS investigation report

FSO : Flight safety officer

FSOMS: FS occurrence management system

FSO(W): Flight safety officer (weapons)

FS Spec: FS specialist

FTI: From the Investigator

FTPO: For tracking purpose only

HALE UAV: High-altitude long endurance UAV

HFACS: Human Factor Analysis Classification System

HUD: Heads up display

HUMMS: Health usage maintenance monitoring system

IAS: Indicated airspeed

IAW: In accordance with

ICAO: International Civil Aviation Organization

IFR: Instrument flight rules

IIC: Investigator-in-charge

IPVMS: Instrument panel video monitoring system

IR: Initial flight safety investigation report

IVHMU: Integrated Vehicle Health Management Unit

JAG: Judge Advocate General

MALE UAV: Medium altitude long endurance UAV

MoU: Memorandum of understanding

MRP: Mobile repair party

MTOW: Minimum takeoff weight

NATO: North Atlantic Treaty Organization

MSDRS: Maintenance Signal Data Recording Set

NDHQ: National Defence Headquarters

NDQAR: National Defence Quality Assurance Region

NOTAM: Notice to airmen

NRCC: National Research Council of Canada.

OAA: Operational Airworthiness Authority

OLM: Operational load monitoring

PAO: Public affair officer

PCL: Personnel casualty level

PDI: Persons with a direct interest

PM: Preventive measure

PMAO: Preventive measure action organization

POL: Petrol, oil and lubricants

QA: Quality assurance

QETE: Quality Engineering Test Establishment

QR&O: Queen's Regulations and Orders

RA: Risk assessment

RCSU: Regional Cadet Support Unit

Reg FSO: Region FSO (Cadets)

RO: Repetitive occurrence

RASO: Recovery and salvage officer

RCAF: Royal Canadian Air Force

RCAF Comd: RCAF Commander

RCA Ops O: Regional Cadets Air Operations Officer

SAMA: Senior Aircraft Maintenance Authority

SFCL: Safety of flight compromise level

SoF: Safety of flight

SOP: Standard operating procedures

SITREP: Situation report

SR: Supplementary flight safety investigation report

STANAG: NATO standardization agreement

TAA: Technical Airworthiness Authority

TSB: Transportation Safety Board of Canada

TSN: Time since new

TSO: Time since overhaul

UAV: Unmanned aircraft vehicle

UAS: Unmanned aircraft system

VCDS: Vice Chief of Defence Staff

VFR: Visual flight rules

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