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This manual provides aviation unique guidance to support AFI 91-204, *Safety Investigations and Reports*. It applies to all US Air Force (USAF), US Air Force Reserve (USAFR), and Air National Guard (ANG) military and civilian personnel. For the purposes of this manual, ANG and Air Force Reserve Command (AFRC) are included in all references to Major Commands (MAJCOM). It directs procedures specific to investigating and reporting USAF aviation mishaps and events. It also provides attachments and examples that may be used as a guide in performing an investigation. This manual implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs* and DoD Instruction (DoDI) 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping*, and North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 3531 FS (Edition 8), *Safety Investigation and Reporting*

of Accidents/Incidents Involving Military Aircraft, Missiles and/or UAVs. It applies to commanders, managers, supervisors, and safety staffs at all levels, all persons who investigate and report Air Force aviation mishaps, and those persons who handle such reports. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in the Air Force Records Information Management System (AFRIMS).

Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through the appropriate MAJCOM Safety office. Send MAJCOM/FOA/DRU supplements to HQ AFSEC/SEF, 9700 G Avenue SE, Kirtland AFB, NM 87117-5670, for approval before publication.

(AETC) This supplement implements and extends the guidance in AFMAN 91-223, *Aviation Safety Investigations and Reports*, 16 May 2013. It establishes and provides AETC procedures and guidance for investigating and reporting aviation mishaps. It applies to all AETC commanders, functional managers, supervisors, and personnel as well as Air National Guard and the Air Force Reserve Command members while operating AETC aircraft. Units will coordinate local supplements with HQ AETC/SEF prior to publication. Units may recommend changes and address conflicts by sending AF Form 847, *Recommendation for Change of Publication*, to the HQ AETC/SEF, 244 F Street East, JBSA Randolph TX 78150. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

(AETC) Ensure that all records created as a result of processes prescribed in this publication are maintained IAW AFMAN 33-363, Management of Records, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed.

(AETC) This revision reflects the deactivation of 19 AF and updates the following areas: reporting of TCAS RAs, AETC Form 645-4 procedures, QA responsibilities, and AFSAS message release requirements.

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Chapter 1

GENERAL INFORMATION

1.1. Overview. This manual directs procedures and provides guidance specific to the investigation and reporting of USAF aviation mishaps and events in support of the Air Force Chief of Staff (CSAF) Safety Program and supplements material in AFI 91-204, *Safety and Investigations Reports*.

1.2. Waiver Authority.

1.2.1. Unless specified, deviations from policies and requirements in this AFMAN require waiver approval by HQ AFSEC/SEF, or designated representative, prior to execution. Submit waiver requests through MAJCOM/SE to HQ AFSEC/SEF. Report deviations without waiver through channels to MAJCOM/SEF (or equivalent) who will notify HQ AFSEC/SEF for follow-on action, if necessary.

1.2.2. See paragraph 6.4.2. for formal report waiver procedures.

1.3. Aviation Mishaps and Events that Require Safety Investigations and Reports.

1.3.1. Class A-D mishaps as directed by AFI 91204. In cases where the mishap initial cost estimate is within 10% of the next higher mishap class, consider using the higher class and issuing a status message reflecting the class change should the mishap subsequently downgrade. This process will ensure the appropriate level of oversight and Safety Investigation Board (SIB) composition is properly resourced.

1.3.2. Class E Events. Unless noted, report all of the following events whether intent for flight is established or not. In most cases, events do not require reporting if they occur as described in the aircraft flight manuals and are expected responses to a crew's actions or flight regime. For example, do not report the loss of pitot-static instrument indications if the loss is the result of crew failure to activate the pitot heat. If the circumstances of an event meet two or more criteria, such as an in-flight fire which results in a physiological episode, report the event using the following hierarchy: Physiological, Propulsion, Flight Control, Instrument, Miscellaneous, High Accident Potential (HAP), Hazardous Air Traffic Report (HATR), Controlled Movement Area (CMA) Violation, Bird/Wildlife Aircraft Strike Hazard (BASH). **Note:** Although Class E events do not require findings, a finding is required in order to input a recommendation into the Air Force Safety Automated System (AFSAS).

1.3.2.1. Physiological Events. If a physiological event meets the criteria of a Class A, B, C or D mishap IAW AFI 91-204, then the event will only be reported once as the higher class (i.e., no Class E report will be made). If injury, illness, or abnormal symptoms are experienced as a result of the flight environment that do not meet the Class D threshold as defined in AFI 91-204, then it must be reported as a Class E Physiological Event. Include any physiological symptoms that were experienced in the event narrative. Smoke and fumes without physiological symptoms does not constitute a Class E physiological event and will be reported as Class E miscellaneous. Aircrew or passenger decompression sickness from evolved gas (bends, chokes, skin, neurological, or neurocirculatory manifestations) is usually considered a mishap (Class A, B, C, or D), not an event. Only report decompression sickness as a Class E Physiological Event if

symptoms resolved during descent (with or without in-flight oxygen) or during a 2-hour observation period (with or without ground level oxygen), and no recurrent symptoms or other medical treatment (compression chamber or prolonged oxygen) is required. Assign mishap class IAW AFI 91-204. For assistance in determining reportability of physiological events, contact the owning MAJCOM/SEF, MAJCOM Chief of Aeromedical Services (SGP), or HQ AFSEC/SEH (DSN 263-1117 or 246-0880, commercial (505) 853-1117 or (505) 846-0880). The following physiological events will be reported:

1.3.2.1.1. Aircrew trapped gas disorders (ear, sinus, teeth, or abdominal).

1.3.2.1.2. Aircrew hypoxia (suspected, probable, or definite). Loss of cabin pressurization without hypoxia is addressed in paragraph 1.3.2.5.10.

1.3.2.1.3. Aircrew loss of consciousness or incapacitation in-flight (not resulting from injury or occupational illness), including G-induced loss of consciousness (GLOC).

1.3.2.1.4. Aircrew or passenger symptoms or health effects caused by toxic, noxious, or irritating materials such as smoke, fumes (including carbon monoxide), or liquids.

1.3.2.1.5. Aircrew spatial disorientation of any type (including visual illusion) resulting in an unusual aircraft attitude.

1.3.2.1.6. Any medical condition, event, or physical injury directly resulting from performance of flight activities associated with a specific mission that a medical provider determines is significant to the health of the aircrew.

1.3.2.1.7. Laser strikes. Damaging laser strikes to both personnel and aircraft should be reported IAW this AFMAN according to the respective class of the mishap (i.e., Class A-D). Laser strikes involving exposure to personnel should be reported IAW AFI 48-139, *Laser and Optical Radiation Protection Program*, attachment 4. Additionally, aircrew should consider reporting laser strikes to the Federal Aviation Administration (FAA) laser incident reporting website at **http://www.faa.gov/go/laserinfo**.

1.3.2.2. Propulsion-Related Events. The following paragraphs identify those occurrences, which when reported, provide the necessary information for the timely identification and tracking of propulsion hazards while limiting the reporting of "nuisance" occurrences. Report the following propulsion related events:

1.3.2.2.1. Loss of thrust sufficient to prevent maintaining level flight at a safe altitude or which requires the pilot to jettison stores.

1.3.2.2.2. All non-afterburner operation engine stalls.

1.3.2.2.3. Emergency or precautionary landing of a single engine or rotary wing aircraft, with imminent engine or rotor drive system failure confirmed after landing.

1.3.2.2.4. Any unselected or inadvertent propeller or thrust reversal event (to include Remotely Piloted Aircraft (RPA)).

1.3.2.2.5. Engines which do not restart normally after an intentional in-flight engine shutdown for training, functional check flights (FCFs), or other non-emergency

purposes. A normal restart is one that occurs at the planned and expected time and altitude using routine restart procedures.

1.3.2.2.6. Engine fires that were extinguished with agent.

1.3.2.2.7. Emergency, precautionary, or inadvertent engine shutdown at any time after taxi until normal engine shutdown.

1.3.2.2.7.1. Do not report:

1.3.2.2.7.1.1. Flameouts, engine stalls, or emergency engine shutdowns occurring during maintenance engine runs.

1.3.2.2.7.1.2. Intentional in-flight engine shutdowns for training, testing, or FCFs.

1.3.2.3. Flight Control-Related Events.

1.3.2.3.1. Unintentional departure from controlled flight for any reason. Use the mission design series (MDS)-specific flight manual for definition of a "departure" for that aircraft.

1.3.2.3.2. All uncommanded inputs to the flight controls (including stability augmenter, autopilot, or trim systems) whether it resulted in a dangerous situation or not. Report autopilot faults if, in the opinion of the aircrew, the autopilot would have put the aircraft in a dangerous situation.

1.3.2.3.3. All uncommanded reversions to a backup mode for any safety-critical flight control system that resulted in an in-flight emergency (either declared by the crew or directed by the flight manual).

1.3.2.3.4. Unintentional aircraft stick or yoke controller interference from any source or for any reason resulting in a hazardous situation.

1.3.2.3.5. Any incident resulting in RPA action not complying with the operator's intent. This includes, but is not limited to: unintentional autonomous goaround, permanent loss of all command and control links, and malfunctions or emergencies for which the aircraft modifies its flight path without operator input.

1.3.2.4. Instrument-Related Events.

1.3.2.4.1. In-flight loss of all pitot-static instrument indications.

1.3.2.4.2. In-flight loss of both primary and standby attitude indicators.

1.3.2.4.3. Any permanent loss of more than one electronic primary flight display (as defined in MDS-specific flight manuals) in either primary duty station, regardless of the ability to fly the aircraft on standby instruments.

1.3.2.5. Miscellaneous Aircraft Events. The following paragraphs, while not all inclusive, identify occurrences that are to be reported due to the potential for becoming a mishap:

1.3.2.5.1. In-flight fire.

1.3.2.5.2. Fuel leakage resulting in an in-flight emergency or forced landing.

1.3.2.5.3. Landing with any gear up.

1.3.2.5.4. Structural failure of critical landing gear components. A critical landing gear component is defined as any component that could cause landing gear collapse.

1.3.2.5.5. Unintended departure from takeoff or landing surfaces (e.g., runway, helipad, landing zone, etc.) onto adjacent surfaces, including landing short of the landing surface. For the purposes of this manual, the overrun is considered part of the takeoff or landing surface. EXCEPTION: Unintended departures of USAF Academy sailplanes from the planned landing surface are not required to be reported if the aircraft is undamaged.

1.3.2.5.6. Inadvertent or uncommanded canopy openings in flight.

1.3.2.5.7. Spillage or leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores or cargo creating a hazardous condition or an in-flight emergency divert. Identify in the message which agency or unit prepared the shipment. If cargo was shipped under a waiver, specify the agency (MAJCOM, NAF, etc.) who granted the waiver.

1.3.2.5.8. Any unintentional strike by an aircraft to another object regardless of damage cost or need for repairs.

1.3.2.5.9. All events where a member of the crew executed any portion of an emergency checklist in response to smoke or fumes, regardless of aircrew symptoms. This includes smoke and fumes events in the ground control station (GCS) of an RPA. If the event resulted in aircrew or passenger health effects, report as a "Physiological Event" IAW paragraph 1.3.2.1. of this manual.

1.3.2.5.10. Loss of cabin pressurization that requires executing an emergency checklist.

1.3.2.5.11. In-flight malfunction of an air refueling drogue (Multi-Point Refueling System, Wing Air Refueling Pod, Boom Drogue Adapter, etc.), hose, hose reel assembly, refueling pod, or malfunctions involving helicopter air refueling probe oscillations.

1.3.2.5.12. In-flight hoist malfunctions involving inadvertent separation of the hoist cable from the hoist (e.g., inadvertent cable shear or cable unwrapping from the drum).

1.3.2.5.12.1. Intentional helicopter hoist cable shear due to a fouled or stuck cable.

1.3.2.5.13. All in-flight events where electrical power was completely lost. Momentary power loss events that resulted from a purposeful act of the aircrew, such as a transfer from one generator to another, need not be reported.

1.3.2.5.14. Any inadvertent system actuation due to design or ergonomic issues that created a potentially hazardous condition.

1.3.2.5.15. F-16 Canopy Water Pooling. Report rain pooling events referenced in Chapter 7 of the 1F-16()-1. Describe the effects on the canopy, the phase of flight (final, short final, etc.), and the weather conditions. Additionally, report when it

dissipated (e.g., "The rain pooled 20 degrees aft on final (both sides); just in front of the HUD on short final; dissipated when the nosewheel touched down. Heavy rain from 3-mile final to landing .").

1.3.2.6. Hazardous Air Traffic Report (HATR) Events. The intent of the HATR program is to identify potentially hazardous aviation practices or procedures based on a particular event and to disseminate information that might prevent similar hazardous conditions at other USAF locations or operations. See paragraph 1.4. for HATR reporting procedures.

1.3.2.6.1. Report any air traffic or movement area hazardous occurrence that endangered the safety of an aircraft. HATR information is not privileged information and therefore releasable outside AF channels, with the exception of the identity of the personnel involved. Reports completed by another agency such as the FAA do not relieve safety offices of the requirement to submit a HATR if AF personnel or equipment were involved.

1.3.2.6.1.1. Report the following as a Class E HATR event using an AF IMT Form 651, *Hazardous Air Traffic Report (HATR)*:

1.3.2.6.1.1.1. Near Mid Air Collision (NMAC): the aircrew took abrupt evasive action to avoid a collision or would have taken evasive action if circumstances allowed. While unintentional separation less than 500’ (well clear) would qualify, it is not necessarily required. Incident circumstances such as closure rate, visibility, airspace class, airspace control, etc., can also lead to NMAC reporting with far greater separation distances. This also includes Traffic Collision Avoidance System (TCAS) Resolution Advisories (RA) requiring the aircrew to deviate from a planned or assigned flight path and USAF aircraft triggering TCAS RA aboard civil or other DoD aircraft. If a TCAS RA required the aircrew to deviate, then they are required to file a HATR regardless of position deconfliction.

1.3.2.6.1.1.2. Communication or Navigational Aid (NAVAID): an equipment indication or malfunction that contributed to a hazardous air traffic condition. This does not include any incident involving a near miss of multiple aircraft; those should be entered as a NMAC.

1.3.2.6.1.1.3. Ground Incidents: any occurrence on the airfield movement area that endangered an airborne aircraft or an aircraft operating on the ground. This includes improper runway use (landing on the wrong runway, clearance of multiple aircraft at the same time, access without clearance, or access by multiple conflicting aircraft when no clearance authority present), or taxi conflicts.

1.3.2.6.1.1.4. Publications or Directives: publications or directives (FLIP, NOTAM, AIP, etc.) that contributed to a hazardous air traffic condition. This does not include any incident involving a near miss of multiple aircraft; those should be entered as a NMAC.

1.3.2.7. Controlled Movement Area Violation (CMAV) Events. Use AF IMT Form 457, *USAF Hazard Report*, to report airfield infractions caused by aircraft, vehicles, or pedestrians entering the CMA without specific control tower approval. CMAV

information is not privileged information and therefore releasable outside AF channels, with the exception of the identity of the personnel involved. See paragraph 1.4. for CMAV reporting procedures.

1.3.2.7.1. This includes incidents of aircraft landing or taking the runway for takeoff without clearance. If the violation resulted in the endangerment of an aircraft, report as a Class E HATR event using AF IMT Form 651.

1.3.2.8. Bird/Wildlife Aircraft Strike Hazard (BASH) Events. All bird/wildlife strikes falling below Class D dollar damage threshold will be reported in AFSAS as a Class E BASH event. Non-damaging BASH reports are important and required to trend accurately for mishap prevention. Information contained in BASH reports is not privileged and is releasable outside AF channels, with the exception of personally identifiable information. Ensure the reports do not include safety privileged information IAW AFI 91-204. See paragraph 1.5. for BASH reporting procedures.

1.3.2.9. High Accident Potential (HAP) Events. Report any hazardous occurrence that has a high potential for becoming a mishap and is not reportable under any other category as a HAP event. This includes emergency conditions arising from aircraft operation or from the failure or malfunction of systems or components essential for safe flight.

1.4. Class E HATR and CMAV Reporting Procedures.

1.4.1. Unit commanders will ensure AF IMT Form 651 and AF IMT Form 457 are available to aircrews at base operations facilities, flying squadron operations offices, in trip kits, and in USAF Air Traffic Control (ATC) facilities. Commanders must emphasize the importance of identifying hazardous situations and direct the filing of appropriate HATRs or CMAV events as a method of preventing future mishaps.

1.4.2. Any person (e.g., air traffic controller, pilot, safety officer, etc.) aware that a reportable event occurred will file a HATR or CMAV. Report the details on AF IMT Form 651 or AF IMT Form 457 in the following manner:

1.4.2.1. If the individual is at the AF base where the event occurred, file the report within 24 hours to the base safety office.

1.4.2.2. If the event occurred away from an AF installation, report the event to AF safety personnel at the nearest AF safety office or the next landing location with an AF safety office. If not planning to transit an installation with an AF safety office, crews should contact home unit safety offices.

1.4.3. If an aircrew experiences a HATR and circumstances permit, immediately (i.e., while airborne) inform the nearest ATC agency, civil aviation authority (CAA) for overseas events, or flight service station and provide the following information:

1.4.3.1. Identification or call sign.

1.4.3.2. Time and place (name of NAVAID, radial and distance, and GPS coordinates, if available) of event.

1.4.3.3. Altitude or flight level.

1.4.3.4. Description of other aircraft in the event.

1.4.3.5. Advise the controlling agency a written report will be filed and request all available data be saved.

1.4.4. It is the responsibility of the unit safety office to ensure all aircrew members, ATC, and other personnel controlling aircraft (e.g., Tactical Air Control Party personnel) are aware of HATR reporting requirements. **Note:** Aircrews who experience a NMAC under FAA control should immediately request that facility initiate a FAA Near Miss report.

1.4.5. Within 24 hours after notification of the event, the safety office receiving the report determines which safety office is responsible for the investigation. Send the AF IMT Form 651 or AF IMT Form 457 to the appropriate safety office. The responsible office is determined in the following order:

1.4.5.1. If applicable, comply with host nation agreements or other international agreements (e.g., STANAGs, ICAO agreements, etc.). If unable to determine agreements, contact the overseas MAJCOM/SE or the AFFOR/SE.

1.4.5.2. If foreign ATC or aircraft are involved, the unit involved in the HATR in conjunction with the overseas MAJCOM/SEF, or the AFFOR/SE.

1.4.5.3. For local hazardous events, the AF safety office at that installation.

1.4.5.4. If no AF safety office is available or if an airborne report is initiated by pilot or aircrew, the originator's home station or deployed location. The originator's home station safety office will then forward the HATR to appropriate agency for investigation.

1.4.6. The investigating safety office will:

1.4.6.1. Determine if the reported event merits a HATR. Notify the individual or unit that filed the HATR of this determination and the pending actions.

1.4.6.1. **(AETC)** While aircrews will submit an AF IMT Form 651 for all TCAS RAs, they do not automatically merit reporting in AFSAS as a Class E-HATR unless proper de-confliction procedures or see and avoid were not present (depending on class of airspace).

1.4.6.2. If the event is reportable, document the event in AFSAS as either a Class E HATR or Class E CMAV. **Note**: Class E HATR and CMAV messages should not contain findings.

1.4.6.3. Determine which organizations were involved and request those offices' assistance with the investigation. Notify the following organizations:

1.4.6.3.1. The base Airfield Operations Flight Commander (AOF/CC), or equivalent, if USAF ATC, Tactical Air Control, or Airfield Management (AM) services were suspected to be involved. **Note:** Review ATC recordings needed for HATR investigations as quickly as possible. ATC recordings are routinely retained for only 45 days. Due to various types of recording equipment installed, review of ATC recordings is best conducted at the ATC facility. Coordinate times for review with the AOF/CC in order to minimize impact on support of flight operations.

1.4.6.3.1.1. If ATC or AM personnel are contributory to the event, the Investigating Officer (IO) should contact the AOF/CC to discuss the investigation and advise on ATC/AM procedures. At the conclusion of the investigation,

AOF/CC concurrence or non-concurrence with the IO's report must be input into AFSAS. If the AOF/CC non-concurs, his/her rationale with corrective actions must also be input in AFSAS. If the event takes place at a non-USAF base (e.g., Navy base or civil airfield), contact the AOF/CC equivalent. If no AOF/CC equivalent can be identified (e.g., contingency operations at a foreign airfield), contact the AF organization responsible for coordination with the airfield owner/operator. If unable to identify an appropriate organization, contact the MAJCOM staff for assistance.

1.4.6.3.1.2. The base Communications Commander if NAVAIDs were likely involved.

1.4.6.3.2. The flying unit if local base aircraft were involved. If transient aircraft were involved, notify the aircrew's unit of assignment safety office.

1.4.6.3.3. The FAA facility or Flight Standards District Office (FSDO) if FAA ATC or civil aircraft were involved. **Note:** Contact the AOF/CC or FAA Air Force Representative (AFREP) for help in notifying the proper facility or FSDO. See Table 1.1 for which AFREP to contact. Include the AFREP in these investigations as needed, especially if you are having difficulty getting information from the FAA.

Table 1.1. FAA AFREP and Regional Boundaries by State.

MAILING ADDRESS	TELEPHONE	RESPONSIBILITY
HQ FAA, USAF Liaison/AJR-01 800 Independence Ave SW Washington, DC 20591	DSN: 325-6270 COM: (202) 267-9427 FAX: DSN 325-6001 FAX: COM (202) 267-5868	NATIONAL
FAA Eastern Service Area AFREP Southern Region/ASO-910 P.O. Box 20636 Atlanta, GA 30320-5000	DSN: 797-5481 COM: (404) 305-6901 FAX: COM (404) 305-6911	AL, CT, DC, DE, FL, GA, KY, MA, MD, ME, MS, NC, NJ, NY, PA, PR, RI, SC, TN, VA, VT, WV, SWAN IS, VIRGIN IS
FAA Central Service Area AFREP SW Region/ASW-910 2601 Meacham Blvd Fort Worth, TX 76193-0910	DSN: 477-2910 COM: (817) 222-5910 FAX: DSN 477-2992 FAX: COM (817) 222-5992	AR, IA, IL, IN, KS, LA, MI, MN, MO, ND, NE, NM, OH, OK, SD, TX, WI
FAA Western Service Area AFREP NW Mtn Region/ANM-900 1601 Lind Ave SW Renton, WA 98055-4056	DSN: 382-5204 COM: (425) 227-2947 FAX: COM (425) 227-1114	AZ, AK, CA, CO, GUAM, HI, ID, MT, NV, OR, UT, WA, WY,

1.4.6.3.3.1. The AFREP at FAA Regional Offices reviews HATR and CMAV events in their region involving FAA ATC or civil aircraft and provides assistance when requested.

1.4.6.4. HQ Air Force Flight Standards Agency (AFFSA) uses AFSAS to administer program oversight for AF review of Airfield Operations related HATRs. Coordinate with MAJCOM Airfield Operations staffs to reconcile any discrepancies in conclusions and recommended corrective actions for AF-wide trends. Coordinate safety reviews, evaluations, recommendations, and time critical notifications with HQ AFSEC/SEF.

1.5. BASH Reporting Procedures. Report all bird/wildlife strikes falling below the Class B threshold in AFSAS as a Class C, D, or E BASH mishap/event using the format in Attachment 5, Class C/D/E Sample Report Format. If a Class E BASH event is non-damaging, the Attachment 5 Sample Report Format is not necessary; however, reasonable investigation efforts and documentation within AFSAS are required. Wildlife-related information contained in BASH reports is not privileged and is releasable outside AF channels with the exception of personally identifiable information. Any subsequent safety investigation into these events and the resultant analysis, findings, and recommendations are privileged and not releasable outside AF channels.

1.5.1. Flight safety offices of the organization owning the aircraft will report wildlife strikes sustained by their assets. This allows for universal reporting standards for all mishap classes for non-expeditionary forces. Host installation aviation safety offices will also report all non-USAF aircraft/wildlife strikes at that AF installation in AFSAS as no-cost Class E BASH events for trending.

1.5.2. When aircraft are under the Operational Control (OPCON) of an expeditionary organization, wildlife strikes to aircraft will be reported by the owning expeditionary force flight safety office to facilitate timely reporting. Ensure transient aircrew that have not notified or coordinated with the expeditionary force safety office fill out an AF IMT Form 853, *Air Force Wildlife Strike Report* (or equivalent), and send a copy to the safety office of the organization owning the aircraft for entry into AFSAS. See paragraph 2.5.2. for investigation responsibilities.

1.5.3. For every bird/wildlife strike, send samples of the remains (if available) to the Smithsonian Institution's Feather Identification Lab (FIL) for identification and record the incident in AFSAS. Coordinate with aircraft maintenance personnel prior to collecting remains from aircraft surfaces. For whole bird or partial carcass, pluck a variety of feathers from the head, breast, back, body, and tail if possible. Collect any/all blood, tissue, or fluid remains for DNA analysis. To do this, spray the area with ethyl alcohol (ethanol) or 70% isopropyl alcohol and wipe with a clean paper towel, or use pre-packaged alcohol wipes. If there is a concern over using alcohol on certain aircraft surfaces, use a dry cloth. Use water and a clean paper towel as a last resort. Ethanol is preferable to isopropyl alcohol but both types of alcohol are preferable to water. Allow all bird strike remains to completely dry, fold the towel, and place remains into a labeled re-sealable plastic bag. Investigators should not delay recovering and shipping remains to the FIL, as the DNA in the sample could degrade. Also, report all wildlife remains, whether whole or in part, found on the airfield within 200 feet of a runway centerline in AFSAS as a bird strike, unless another reason for the animal's death is identified, and send remains to the FIL for identification. If you find a complete bird carcass in good condition on the airfield, place it in a freezer and contact the FIL at (202) 633-0801 to see if the museum would like to have the specimen for their collections. Attach a copy of the corresponding BASH shipping sheet, found on the BASH web page in AFSAS, to all types of wildlife strike evidence and ship to the following address: Smithsonian

Institution, Feather Identification Lab, NHB-E -600 MRC 116, PO Box 37012, Washington, DC 20013-7012. For high priority mishap identifications, ship remains via weekday overnight delivery to the following address: Smithsonian Institution, Feather Identification Lab NHB-600, MRC 116, 10th and Constitution Ave., NW, Washington, DC 20560, (202) 633-0801 (include the telephone number on overnight shipments). Once the FIL has entered the identification into the AFSAS report, AFSAS will automatically notify the named investigators of the species identification via email. If there are any questions, contact HQ AFSEC/SEFW (DSN) 246-5674.

1.5.4. For wildlife strikes other than birds, gather samples of skin, hair, teeth, or other non-fleshy remains following procedures in paragraph 1.5.3. While physical evidence is preferred, gathering remains of wildlife other than birds may not be practicable. In these cases, photographs will be accepted. Send an electronic image/email of the carcass or remains to the FIL (**dovec@si.edu**).

1.5.5. Additional BASH guidance is available on the AF BASH Portal page (found on the AF Portal : FOAs : AFSEC - Air Force Safety Center : Sub-Organizations: Aviation Safety Division : Bird/Wildlife Aircraft Strike Hazard (BASH)) and the AF BASH public webpage (**http://www.afsec.af.mil/organizations/bash/index.asp**).

1.6. RPA Mishaps. RPAs are considered aircraft, and mishaps will be reported IAW DoDI 6055.07 and AFI 91-204 unless exempted as follows:

1.6.1. Damage or destruction of an RPA resulting from a deliberative risk acceptance decision by an appropriate command authority to employ the vehicle in an environment or condition where the risk of loss of the vehicle is outweighed by operational requirements**.**

1.6.2. Intentional or expected damage to RPA during authorized testing is not reportable if both of the following conditions are met:

1.6.2.1. The extent of the damage or destruction was an expected or desired result of the planned test or operation and the damage or destruction occurred in the intended manner.

1.6.2.2. The damage or destruction occurred at planned times, location, and for anticipated reasons with no other collateral damage.

1.6.3. Parachute Recovered RPA. Damage to parachute recovered RPAs is reportable if it is the result of an abnormal event including but not limited to: torn parachutes, late recovery initiation, failure of a parachute to properly open or release, high winds, etc., and are reportable under the appropriate overall mishap class criteria. Include the repair costs or loss involved related to abnormal events. Do not include the cost of expected damage to parachute-recovered RPAs resulting solely from surface or water impact during an otherwise normal recovery sequence since this meets the definition in AFI 91-204, Chapter 1, of expected damage during authorized testing. This is an operational expense and not reportable. Likewise, do not include cost of recovery since recovery is normally a mission objective for recoverable RPAs.

1.6.4. Tethered Aerostat Radar Systems (TARS) and other buoyant platforms are considered RPAs for the purposes of mishap reporting.

1.6.4.1. When a mishap occurs while the buoyant platform is moored to its ground station tower, it will be reported as an Aircraft Ground Operations (AGO) mishap.

1.6.4.2. When a mishap occurs after the buoyant platform is released from its mooring tower, it will be reported as an Aircraft Flight mishap.

1.7. (Added-AETC) Emergencies and Other Unusual Occurrences. Unit safety offices are responsible for tracking all AETC aircraft ground emergencies, in-flight emergencies, and other unusual occurrences that could require safety investigations. Tracking may be accomplished via physical (AETC Form 645-4 or suitable alternative) or electronic means. Unit's will identify applicable deficiencies, track corrective actions, and reportable events will be investigated IAW this instruction and entered into AFSAS. Wing Safety will provide training on local tracking processes.

Chapter 2

RESPONSIBILITIES

2.1. Responsibilities of the Convening Authority (CA).

2.1.1. Determine the size and scope of the investigation required for each mishap, subject to the minimums established in AFI 91-204 and this manual.

2.1.2. Provide funding for the mishap investigation.

2.1.3. Receive an out-brief for all Class A and B mishaps with the exception of mishaps in which the entire formal report has been waived by HQ AFSEC. This briefing should be in-person; however, other forms (e.g., video teleconference, slides-only) may be conducted at the discretion of the CA. The out-brief should occur within 15 days after the SIB completes the investigation to avoid minimizing the urgency of the safety investigation and to begin implementation of recommendations aimed at mitigating hazards to avoid future mishaps.

2.2. Responsibilities of the MAJCOM or NAF Chief of Safety (SE).

2.2.1. Ensure an adequate number of potential SIB members are appropriately trained and available to fulfill the membership requirements in Chapter 4 of this manual. The AFSEC conducts training through courses such as Aircraft Mishap Investigation Course (AMIC), Safety/Accident Investigation Board President Course (BPC), etc. For a complete listing of courses available, see the Media and Force Development page on the AFSEC AF Portal. Request training allocations through the MAJCOM POC for training.

2.2.1.1. CA/SE will be postured for a timely identification of SIB members. CA/SE should ensure the SIB is physically in place within 72 hours of mishap notification unless the situation precludes this timing (e.g., recovery operations, travel restrictions, available transportation, etc.).

2.2.2. For Class A and B mishaps, the CA safety staff or designated representative will provide the following support and assistance on behalf of the CA to the SIB or Single Investigating Officer (SIO) as applicable:

2.2.2.1. Provide Interim Safety Board (ISB) contact information to the SIB Board President (BP) as soon as the BP is identified.

2.2.2.2. Appoint an individual from the CA aviation safety staff or designated representative to act as a point of contact during the course of the investigation to answer SIB/SIO questions and provide investigative assistance. Issues that cannot be resolved should be forwarded to the AFSEC/SEFF SIB support line at DSN 263-6175, Comm (505) 853-6175.

2.2.2.3. Advise each SIB member to hand carry and e-mail a copy of their Information Assurance Awareness training certificate to the SIB's host wing safety office POC so that network access and an e-mail account can be established.

2.2.2.4. Ensure an AFSAS account is set up for each SIB/SIO member with the appropriate security roles.

2.2.2.5. Issue orders appointing SIBs. For each board member, the order must contain the SIB position, full name, rank/grade, organization, assigned base, and assigned board status (primary or secondary member as defined in Chapter 4). Do not include observers on SIB orders. See Attachment 3 for the suggested SIB Convening Orders Format. These orders will be signed by the CA or designated representative.

2.2.2.6. Provide formal briefing templates and example briefings.

2.2.2.7. Act upon requests for additional members to be added to the SIB as the investigation progresses. See paragraph 4.2.2.

2.2.2.8. For mishaps involving suspected material or system related failures or where complex technical issues are expected, ensure adequate technical expertise is assigned to the investigation.

2.2.2.9. Assist the SIB/SIO with determining Office of Primary Responsibility (OPR) and Office of Collateral Responsibility (OCR) for recommendation(s) and other recommendation(s) of significance.

2.2.2.10. Formal reports and final messages Quality Control. It is the responsibility of the CA's SEF to accomplish the following:

2.2.2.10.1. Ensure the final report Tab T follows specific guidance set forth in paragraph 6.4.5.1. See Sample Tab T at Attachment 4**.**

2.2.2.10.2. Ensure the final message is derived from the formal report Tab T and is a stand-alone product without images/pictures/diagrams/tables, contains no references to any portion of the formal report (e.g., "see Tab W"), and does not mention persons/companies/products by name (e.g., use "mishap pilot," "prime/sub-contractor," "abradable coating," etc.).

2.2.2.10.3. Review, as a minimum, the formal report Tab T, Tab Y, and final message to ensure the SIB/SIO followed formatting and investigative guidance placing special emphasis on paragraph 6.4.5. and AFI 91-204, Chapter 5.

2.2.2.10.4. Review AFSAS data fields for accuracy prior to the release of the final message (e.g., mishap category, mishap class, mishap cost, one-liner, etc.), and do not solely rely on AFSAS error check.

2.2.2.10.5. Per paragraph 6.1.4. of this manual, reviewing safety specialists should provide suggestions for accuracy and effectiveness but will not supersede the judgment of the SIB/SIO.

2.2.2.11. Other than HQ AFSEC involvement, the investigation will not be staffed during this review process outside of the CA safety office or designated representative. IAW AFI 91-204, Chapter 6, no pre-screening, staffing, or review is permitted. SIB/SIO independence is paramount and even the appearance of influence must be avoided. CA/SE will ensure the CA and staff understand the importance of preserving SIB independence.

2.2.2.12. SEs will ensure the content of board briefings to the CA match the formal report and final message prior to being presented to the CA for acceptance.

2.3. Installation Commander Responsibilities.

2.3.1. Ensure appropriate Comprehensive Emergency Management Plan (10-2) includes ISB procedures for aviation mishaps IAW Chapter 3 of this manual.

2.3.2. Ensure adequate facilities are identified and ready for use by an ISB/SIB. Host units are responsible for funding the administrative and logistical support required for a SIB even if the host installation is not assigned to the investigating MAJCOM. See AFI 91-204, Chapter 5. A "host unit" is an Air Force wing or installation supporting an ISB or SIB. Several host units may exist for a given SIB depending on the mishap location, the home unit of the aircraft, etc.

2.3.3. Establish provisions for the host unit to provide information system support to the SIB. Prior coordination with the unit's Network Control Center (NCC) is essential to the timely establishment of account access and proper creation of these information processing tools. This support will include:

2.3.3.1. Access to the global information grid and a local area network (LAN) common drive access folder for the SIB. Ensure the folder and its contents' access permissions are restricted to only the SIB.

2.3.3.2. Ensure administrative and logistical support is provided to the SIB as requested. For example transcribers, copy machines, and vehicles.

2.4. Wing/Installation Chief of Safety (CoS):

2.4.1. The CoS may have as many as three broad responsibilities in the aftermath of a major mishap:

2.4.1.1. Ensure a timely and effective response to the mishap scene IAW with the Comprehensive Emergency Management Plan (CEMP) and wing's Mishap Response Plan (MRP). See AFI 91-202, *The US Air Force Mishap Prevention Program*, Chapter 1.

2.4.1.2. Support the activities of the ISB and SIB.

2.4.1.3. Notify the Incident Commander (IC) or Recovery Operations Chief (ROC), as applicable, once all investigative activities are completed to allow mishap site cleanup, unless there will be a follow-on Accident Investigation Board (AIB).

2.4.1.3. **(AETC)** The CoS will coordinate with the ISB/SIB President and AETC/SEF to determine when all investigative activities are completed prior to notifying the IC/ROC.

2.4.2. The CoS can best fulfill the above responsibilities by ensuring:

2.4.2.1. A viable pre-accident plan is in place and frequently exercised, preferably in conjunction with a Major Accident Response Exercise (MARE).

2.4.2.2. Necessary investigation and board support supplies are on hand or immediately available.

2.4.2.3. Maintain a list of potential SIB members who have completed the formal training requirements IAW AFI 91-202, Chapter 1.

2.4.2.4. Provide identified potential ISB and SIB members training annually on the basics of mishap investigation, IAW AFI 91-202, Chapter 1.

2.4.2.5. Tenant unit safety offices should coordinate with the host unit to determine mishap response actions.

2.5. Deployed Safety Operations.

2.5.1. When an aviation mishap occurs during wartime or contingency operations, the CA will investigate the mishap, subject to access restrictions imposed by the Theater Commander. Close coordination with the theater safety office is crucial to ensuring all required SIB members are properly vetted for theater entry.

2.5.2. Mishap Ownership. OPCON or Tactical Control (TACON) of an aircraft does not change mishap ownership. While expeditionary safety personnel will often perform initial reporting functions, Class A and B mishaps will be investigated by the owning organization in accordance with AFI 91-204, Chapter 4. Expeditionary forces flight safety officers (FSO) and non-commissioned officers (FSNCO) may conduct Class C through E investigations (when allowed by paragraph 4.2.1.3.2) at the request of the mishap owner and upon approval of the deployed expeditionary Wing Commander or equivalent.

2.6. Mishaps Involving Civil Aviation or Federal Air Traffic Services. Cooperation between the National Transportation Safety Board (NTSB), FAA, and the AF in these investigations is essential (reference AFI 91-204, chapters 2 and 4). For mishaps involving Civil Air Patrol (CAP)-USAF, USAF active duty, or government civilians flying CAP-owned assets on approved AF missions, follow the procedures in AFI 91-204 and this manual. Mishaps involving CAP volunteers will be handled by the NTSB/FAA.

2.6.1. USAF Aero Club Mishaps. For mishaps involving Air Force Aero Clubs, the NTSB is the lead investigating agency. If the NTSB or designated representative agency does not investigate, the host wing commander may direct the wing safety office to conduct an investigation. Exception: For mishaps occurring outside the United States, the host nation civil aviation authority may have jurisdiction and investigative authority; check existing host-nation agreements.

2.6.1.1. The CoS at the host wing will appoint an FSO to assist with or conduct Aero Club mishap investigations if needed. In units with no active flying mission, the CoS will appoint a ground safety technician to assist with Aero Club investigations.

2.6.1.2. Aero Club mishaps investigated by the wing safety office are conducted under AFI 34217, *Air Force Aero Club Program*, Chapter 3**.** An Air Force FSO will conduct an official investigation on each reportable Aero Club mishap as a sports and recreation mishap under AFI 91-224. The FSO will work closely with applicable ground safety, NTSB, FAA, or host country investigators.

2.6.1.3. If an Aero Club aircraft is on a USAF directed mission, investigate IAW AFI 91-204 and this manual (e.g., Air Force personnel using an Aero Club aircraft to conduct an airfield assessment for certification purposes).

2.6.2. Civil Aviation mishaps resulting in injury to Air Force students participating in Initial Flight Screening (IFS) or Navigator Introductory Flight Training (NIFT) are considered Aircraft Flight mishaps and investigations of these mishaps will be conducted IAW AFI 91-204 and this manual.

2.6.3. AF Participation in NTSB Investigations. Reference AFI 91-206(I), *Participation in a Military or Civil Aircraft Accident Safety Investigation*. The AF may take part in NTSB-led investigations. If the AF does take part in such an investigation or public hearing, it does so as "a party to" the investigation or hearing.

2.6.3.1. Air Force representatives to NTSB investigations will be graduates of formal Air Force safety training courses. Colonels and above will be graduates of the Air Force's BPC. All others will be graduates of AMIC or trained and qualified FSOs. Air Force representatives to NTSB investigations are responsible to AF/SE while assigned to the NTSB investigation.

2.6.4. FAA Participation in USAF Investigations. When a military flight mishap involves a function of the FAA, the CA will allow the FAA to participate in the military investigation. FAA participants must sign nondisclosure of privileged information agreements. If a military investigation concludes FAA personnel or facilities were causal in the mishap, comply with AFI 91-206(I).

2.7. Safety Investigations Involving Both the Air Force and Other Services. If a mishap involves aircraft, materiel, facilities, or personnel from the USAF and another Service or the Coast Guard, the investigation will be convened under a single Service's procedures but conducted jointly and with joint membership in accordance with the current Inter-Service Memorandum of Understanding and DoDI 6055.07. Each Service reserves the right to conduct independent, concurrent safety investigations; however, the joint investigation takes precedence with regards to access to evidence and witnesses. The involved DoD components shall determine which DoD Component has primary responsibility for investigating and reporting each multiple DoD Component mishap. Normally, the CA for the investigation will be the DoD Component experiencing the greater loss, although other factors such as operational roles and degree of involvement will also be considered. The convening DoD Component's safety investigation directives shall be used in investigating and reporting the mishap.

2.7.1. The DoD Component that is determined to have ownership of the mishap will account for all fatalities, injuries, and property damage in that DoD Component's statistics.

2.8. Friendly Fire Investigations. When the USAF is the lead for a friendly fire investigation, the Air Force Component Safety staff and the SIB will adhere to AFI 91-204 and this manual for sourcing, support, and conduct of the safety investigation. Reference DoDI 6055.07 for further guidance.

2.9. (Added-AETC) QA Responsibilities.

2.9.1. **(Added-AETC)** Assist in mishap investigations and provide wing safety with technical information and technical assistance as required by AFI 91-204 and AFI 21-101 for mishaps involving component malfunctions, maintenance malpractices, and equipment damages.

2.9.2. **(Added-AETC)** Coordinate recommendations between wing safety and maintenance functions. Ensure the MXG/CC is aware of mishap reports and trends affecting aircraft and maintenance.

2.9.3. **(Added-AETC)** Verify the accuracy and completeness of all AETC Form 645-4 (or suitable alternative) documentation, to include the work unit code, part number, national stock number, cost, and DR number of any defective components.

Chapter 3

INTERIM SAFETY BOARD (ISB) REQUIREMENTS

3.1. Data Collection. ISBs are convened by installation commanders to provide an organized evidence preservation response to mishaps within their area of responsibility before the arrival of the SIB. The ISB members are selected based upon their respective expertise within their normal professional specialty. It is not within the ISB's charter to conduct analysis or "solve" the mishap. The ISB lays the groundwork necessary to ensure a successful investigation process is accomplished by the SIB. Safety personnel (ISBs and Disaster Response Force (DRF) safety members) will endeavor to capture as much data as possible to assist the SIB (e.g., weather, flight crew records, flight plans, etc.) and take care to follow proper marking, handling, and storage procedures. Particular attention must be given to classified or privileged safety materials.

3.2. Mishaps during Wartime or Contingency Operations. Aviation mishaps occurring during wartime or contingency operations present unique challenges. Access to crash sites may not be possible if the aircraft is in hostile territory. Logistics and transportation for SIB members may delay their arrival or even preclude the investigation from being completed within established timeline guidance. In this case, produce applicable status messages and coordinate for an extension with the CA. While it is recognized that wartime, contingency operations, or classified operations may create delays in evidence gathering and reporting, these operations do not relieve commanders of the requirements in 91-series directives. Conduct a Force Protection Risk Assessment before traveling to a hostile area/crash site to gather/preserve evidence. The safety of personnel is the top priority.

3.3. ISB Interaction with the Disaster Response Force (DRF).

3.3.1. The DRF is the Air Force structure that responds to disasters or accidents, establishing command and control, and supporting disaster operations. See AFI 102501, *Air Force Emergency Management Program Planning and Operations* and AFMAN 10-2504, *Air Force Incident Management Guidance for Major Accidents and Natural Disasters,* for more information on the DRF, members of the DRF, and the roles of the IC and ROC.

3.3.2. Initial Response. The IC is the individual responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources. The IC has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site.

3.3.3. The safety member of the DRF may also be a member of the ISB. Regardless of additional roles, such as ISB membership, the safety member of the DRF should act in the interest of the ensuing safety investigation, but not at the expense of their disaster response duties.

3.3.3.1. DRF Safety members must understand the priorities of the IC immediately following a mishap are to rescue the injured, to prevent or minimize fire damage to the wreckage, to remove wreckage obstructing essential air or ground traffic or rescue and firefighting services, and to make the site safe. Access to the site for safety investigation purposes will be subordinate to those priorities.

3.3.3.2. Once site access is approved and coordinated with the IC, the DRF safety member should always keep two goals in mind, both directly relating to preserving evidence: site preservation and identifying witnesses for the ISB.

3.3.3.3. The safety member of the DRF must ensure the mishap site is preserved and documented by working with the IC to keep the mishap site as undisturbed as possible.

3.3.3.3.1. Unnecessary vehicle and personnel movements must be curtailed, since they can obliterate vital ground scar evidence. Single routes into and out of the area, enforced with cordons, should be established as quickly as possible.

3.3.3.3.2. Aircraft components must be left undisturbed if they pose neither a threat to survivors nor a hazard to the DRF; otherwise, it may not be possible to characterize damage as pre- or post-impact.

3.3.3.3.3. If the site is constantly changing or subject to significant changes in conjunction with survivor recovery actions, photograph or video every change as it happens.

3.3.3.3.4. Be cognizant of changing weather conditions which can alter or obliterate evidence, such as ground scars. Document conditions and place protective coverings as needed.

3.3.3.3.5. When it is necessary to disturb the site to reduce site hazards, document the conditions prior to their disturbance whenever possible.

3.3.3.3.6. Consult with a bioenvironmental engineer to ensure proper personal protective equipment (PPE) is worn to protect against blood-borne pathogens, composite materials and other potentially hazardous materials at the mishap site.

3.3.4. Recovery Phase. The recovery phase begins when first responders have completed emergency response and lifesaving actions. Once the emergency is over and recovery starts, control of the site is transferred from the IC to the ROC, who is a subject matter expert in the hazards or activities within the incident site. The ROC will likely be the person in charge of the mishap site when the ISB/SIB begins their evidence collection and investigation.

3.4. ISB General Information.

3.4.1. The ISB is not responsible for determining mishap cause. The sole purpose of the ISB is to gather, preserve, and protect evidence. ISB investigation is normally limited to determining what evidence exists. The ISB only analyzes evidence when it will perish prior to arrival of the permanent SIB and with the SIBs permission. The ISB is responsible to ensure perishable evidence is preserved by identifying items such as air traffic control tapes and surveillance video tapes for impoundment, notifying the owning installation of the need to collect aircraft and crew records, impounding all equipment which may be related to the mishap event, collecting perishable fluids, photographing the crash site, removing to a secure location the voice and flight data recorders, and advising en route installations and airports visited by the mishap aircraft prior to the accident so servicing people and equipment can be identified. The items of interest to be impounded are typically found in the wing's MRP. After collection, ensure the only people with access to the evidence are members of the ISB.

3.4.2. In some situations, multiple ISBs may be required following a mishap. If a locally based aircraft has a mishap off station, an ISB may be required at more than one location to

preserve and gather evidence. In any case, the CA will determine the lead ISB president, typically at the mishap location, who will coordinate and control the activities at all locations.

3.4.3. **ISB Membership.** An ISB will consist of at least the following members who should be chosen from outside the mishap unit:

3.4.3.1. ISB BP. The ISB BP should be an O-6 and a graduate of the HQ AFSEC BPC. The ISB BP ensures evidence is preserved and the installation is prepared to provide all necessary support to the SIB on their arrival. Knowledge of the safety process is required by the ISB BP to ensure the proper collection and preservation of safety evidence and protection of privilege.

3.4.3.2. ISB Investigating Officer (IO). The ISB IO must be a graduate of AMIC or the legacy FSO course. The ISB IO's principal function is to ensure preservation of physical evidence at the scene of the mishap. Additionally, the ISB IO should coordinate with the home unit safety office to preserve evidence if the mishap was at a location other than the home base.

3.4.3.3. ISB Pilot Member (PM). A pilot, preferably qualified in the mishap aircraft type, whose main function is to assemble all factual information about the mishap flight and aircrew. This includes but is not limited to: training records, flight evaluation folders, flight crew information files, flight plans, weather briefings, flight orders, briefing notes, radar/tower tapes, etc.

3.4.3.4. ISB Maintenance Member (MM). A maintenance officer or Senior Non-commissioned Officer (SNCO), with experience in the mishap aircraft. It is preferred to select a maintenance officer or SNCO who has graduated from either the AMIC or JEMIC courses. The MM's chief function is to assemble as much information as possible regarding the history of the mishap aircraft, including but not limited to: AFTO Forms 781, automated maintenance records, training records of maintainers who last performed maintenance on the aircraft, fuel/oil/hydraulic/liquid oxygen (LOX) samples, impound Aerospace Ground Equipment (AGE) used on the aircraft, etc.

3.4.3.5. ISB Medical Officer (MO). This member is a flight surgeon whose main function is preservation of medical evidence and care of mishap crewmembers, if required. The MO may be the flight surgeon who provided initial response to the mishap. This member must take responsibility for: the post-mishap medical history, 72-hour and 14-day history, examination, care and toxicological testing of all those identified to be tested (IAW AFI 91-204, Chapter 2), collection of medical and dental records, and ensuring human remains are photographed, preserved and documented. The 72-hour and 14-day histories are an attempt to gain knowledge of a person's life events preceding the mishap and are not intended to be an investigative interview concerning mishap events. The MO serves as the liaison between local medical authorities or coroners and military investigators, including medical examiners from the Joint Pathology Center (JPC), if assigned. The MO also coordinates medical care at the mishap site and advises the ISB on the site's environmental hazards.

3.4.3.5.1. For RPA mishaps, directed post-mishap medical history, 72-hour and 14-day history, examination, and toxicological testing are only mandatory for the RPA crew or associated personnel (including instructors or evaluators performing "over the

shoulder" duties and technicians who performed maintenance or troubleshooting on the ground control station) who operated the RPA during and immediately preceding the mishap sequence. This is defined as the last two crews to operate the aircraft. This does not negate a commander's prerogative, IAW AFI 91-204, Chapter 2, to test any other military member whose actions or inactions, in their judgment, may have been factors in the mishap.

3.4.3.6. ISB Recorder. This individual, normally a junior officer or non-commissioned officer (NCO) familiar with administrative duties, is responsible for ensuring the administrative and logistical needs of the ISB are met. Extensive experience in information technology and computers is extremely valuable for this individual. The recorder facilitates a timely and orderly process of evidence collection and transfer. The ISB recorder may be retained as the SIB recorder with MAJCOM and local unit agreement.

3.4.3.7. Aircrew Flight Equipment (AFE) Member. This member is an officer or NCO who should be a graduate of the Life Sciences Investigation Course and is charged with preserving all evidence associated with AFE and aircraft crew protection and egress systems. This member also assembles as much information as possible regarding AFE, its most recent servicing, and the qualifications of the individuals who most recently worked on it to include electronic records (e.g., Automated Life-Sustainment Equipment Records (ALERTS) or similar system).

3.4.4. The ISB will ensure the following actions are accomplished:

3.4.4.1. The ISB will not allow any piece of evidence to be reviewed, copied, tampered with, or modified (e.g., Head Up Display (HUD) tape, aircraft or training records, flight evaluation folder (FEF), maintenance logs, etc.) nor will there be any mission debrief (with the exception of time sensitive intelligence debriefs), either by supervisors or among crewmembers. All mishap participants will be kept separated to preclude collective reconstruction of mishap events. Interviews or witness statement collection will be conducted on an individual basis. The integrity of each piece of evidence is crucial to the success of the investigation and the Air Force's mishap prevention program.

3.4.4.2. Record the name, office symbol, address, e-mail address, and phone number of each person who provides records or evidence (e.g., photos, videos, ATC tapes, training records, etc.). Document source information for any photographs or videos provided including the date of the photograph or video.

3.4.4.3. Ensure power is removed from Flight Data Recorders (FDR) and Cockpit Voice Recorders (CVR) by pulling the appropriate circuit breakers as quickly as possible if aircraft power still exists after the mishap. Information on the data recorders can be overwritten and rendered useless in as little as 30 minutes if they remain powered after the mishap. The ISB should contact MAJCOM/SEF or HQ AFSEC/SEFE Technical Assistance (DSN 246-5867, Comm (505) 846-5867) prior to accomplishing any of the following:

3.4.4.3.1. Downloading or transferring any data from recorders. The ISB should immediately download perishable data or ship data recorders or other recorded media and devices to a facility able to salvage the data. AFSEC/SEFE can help determine or

designate a location if required. Any delays in shipping may needlessly extend the SIB's timeline.

3.4.4.3.2. Recovering data from other aircraft systems. Several other aircraft systems may retain useful data for the investigation. This data can be in the form of either volatile or non-volatile memory. Each of these systems is unique. AFSEC/SEFE can provide assistance for recovering this data.

3.4.4.3.3. Downloading information from RPA Ground Control Stations (GCS). GCS data is RPA unique data that provides valuable information for mishap investigations. If not properly recovered and handled in a timely manner, this data can be overwritten and lost. With AFSEC/SEFE guidance, download the information from the applicable ground stations. **Note:** data may need to be downloaded from multiple GCSs. GCS data is typically classified and special procedures may be required to download and preserve evidence. Contact local Special Security Officer (SSO) to coordinate download.

3.4.4.3.4. Securing perishable data from other sources. AFSEC/SEFE can provide assistance for identifying other applicable sources of data. This includes, but is not limited to, Test Range Data Systems, Training Range Data Systems, Security Camera Video, Tactical Data Links, Air Traffic Control, AWACS, recorders from companion aircraft, etc. The ISB should secure perishable data from all other applicable sources.

3.4.5. Written and Verbal Testimony. The intent of ISB interviews is to capture witness recollection as soon as possible after the mishap. Collect witness contact information (name, address, phone number, and e-mail) for all individuals who provide a statement, are interviewed, or are potential witnesses. All potential witnesses must be identified, logged, and given an opportunity to provide at least a written statement as quickly as possible after the mishap. For interviews with contractors (e.g., contract maintenance, etc.) involved in the mishap, ensure the contract wording provides for cooperation with Safety Investigation Boards (Defense Federal Acquisition Regulation Clause 252.228-7005, *Accident Reporting and Investigation Involving Aircraft, Missiles, and Space Launch Vehicles*). Have Quality Assurance (QA)/Contracting Office Representative or the Government Flight Representative review the contract; look for wording like "…the service provider will assist with the investigation and reporting of mishaps." If that type of wording is not in the contract, contact the CA on how to proceed.

3.4.5.1. On an ISB, only the BP or IO can authorize the offering of the promise of confidentiality, and only under the conditions established in AFI 91-204, Chapter 3. Promises of confidentiality will only be given as needed to ensure forthright cooperation of the witness and may not be given on a blanket basis to all witnesses. Limiting the persons authorized to make the promises of confidentiality does not mean the ISB President must be present at all witness interviews.

3.4.5.2. Ensure each interview or written statement includes privilege or non-privilege documentation. Review the interviewee's involvement in the mishap and willingness to provide information to determine whether to offer a promise of confidentiality or not.

3.4.5.2.1. Privileged Interviews. For privileged interviews, whether written or recorded, all witnesses sign the form from AFI 91-204 Attachment 3, *Witness*

Promise of Confidentiality and Non-Disclosure Agreement. This only needs to be accomplished once for recorded interviews but must be done for ALL written statements whether initial or subsequent follow-up.

3.4.5.2.2. For recorded privileged interviews ensure all interviewees are read the *Notice to Witness Documenting Promise of Confidentiality of Recorded Statements* from AFI 91-204 Attachment 3, and it is recorded and transcribed. This must be done for ALL recorded interviews whether initial or subsequent follow-up interviews.

3.4.5.2.3. Non-Privileged Interviews. For non-privileged interviews, whether written or recorded, all interviewees sign the form from AFI 91-204 Attachment 3, *Non-Privileged Witness Statement*. This only needs to be accomplished once for recorded interviews but must be done for ALL written statements whether initial or subsequent follow-up.

3.4.5.2.4. For recorded non-privileged interviews ensure all interviewees are read the *Notice to Witness that Recorded Statement is not Confidential* from AFI 91-204 Attachment 3, and it is recorded and transcribed. This must be done for ALL recorded interviews whether initial or subsequent follow-up interviews.

3.4.5.3. It is vital that when testimony is solicited, the ISB member does so without influencing the witness' recollection. The member conducting the interview must not lead the witness but rather allow the witness to simply recount the details surrounding the mishap as he or she observed or experienced the events. Begin with general questions such as "Can you please tell me what happened from the beginning of the duty day until the mishap occurred?" Do not interrupt the witness' testimony. Allow them to tell their story and ask any clarifying questions when they are complete. Also, don't assume the terminology used by all weapon systems is the same. If the SIB arrival will be delayed and additional, focused interviews by the ISB are needed, contact HQ AFSEC/SEF and the SIB President for additional interview guidance.

3.4.5.4. The ISB should transcribe pertinent interviews prior to the SIB's arrival if personnel and time is available. This will prove invaluable to the SIB as it begins the formal investigation since the ISB member can be present during handover to clarify difficult to understand words or jargon.

3.4.6. Ensure all equipment associated with the mishap is impounded (IAW AFI 21-101 and AFI 91-204) and turned over to the SIB. The ISB should create an inventory list and transfer it to the SIB. Coordinate with the Maintenance Group Commander or designated impoundment authority to ensure aircraft and equipment impoundment is properly accomplished. Immediately notify other bases with involved equipment of the need for impoundment.

3.4.7. Photographic and Video Evidence. Digital and video images can be effectively used as evidence. Keep a list and description of photos taken. This listing should include, as a minimum, the location of the part(s) being photographed (in relation to main wreckage and including GPS coordinates) and what was photographed (e.g., left flap actuator, right wing tip, ground scar, etc.). Ensure all images are properly protected from release to the public. To ensure no potentially privileged or inappropriate photographs (e.g., staged/diagrammed photos, human remains, etc.) are inadvertently disclosed to the public, all mishap-related

photographs/videos taken by individuals who have authorized access to the mishap site must be approved by the BP via the CA prior to being considered for public release by the public affairs office. Investigators should ensure no unauthorized photographs/videos are taken within the mishap site. The host unit will provide digital photography support. Personal cameras and cell phone photography is forbidden unless used for official photos with BP authorization. For release authority of electronic images, refer to guidance in AFI 91-204, Chapter 5.

3.4.8. Coordinate with IC/ROC to ensure access to the mishap site is closely controlled. Only those with a legitimate need to be at the mishap site will be included on the entry access list (EAL). Additionally, on military property, and when possible on civil property, photography at the site will be closely controlled to prevent inadvertent release of potentially privileged photographs, photographs of human remains, etc. Non-ISB/SIB members who are granted temporary access to the mishap site will be escorted by an ISB/SIB member who will ensure evidence is not contaminated and will collect all copies of the photos taken. The ISB BP will coordinate these requirements directly with the IC/ROC. The ISB BP will not assume the role of IC or ROC.

3.4.9. If wreckage or evidence must be moved due to operational necessity or other circumstances prior to the SIB's arrival, the ISB will document the scene as thoroughly as possible using both still photographs and video. Aerial perspectives may prove particularly useful in these cases. Ensure photo or video documentation of both the wreckage as discovered and the removal process is accomplished.

3.4.10. Medical Evidence Preservation.

3.4.10.1. Preserve perishable evidence (by using video and still photography at the mishap site), collect laboratory samples, complete radiological studies, and obtain initial statements such as the 72-hour and 14-day medical histories. Every attempt should be made to collect 72-hour and 14-day medical histories without the promise of confidentiality. Only the ISB BP, ISB IO, SIB BP, or SIB IO/SIO can authorize offering of the promise of confidentiality.

3.4.10.2. Ensure evidence not associated with human remains (e.g., AFE, aircraft egress systems, etc.) is left undisturbed at the mishap site until the evidence is turned over to the SIB or when directed by the SIB President. Carefully photograph and examine personal flight equipment and escape equipment if their removal from the remains is required.

3.4.10.3. Ensure medical, mental health, family advocacy, pharmacy, and dental records are collected and shipped to the SIB (as needed) for all involved personnel.

3.4.11. Fatalities.

3.4.11.1. The ISB medical officer and mortuary affairs officer (when assigned by the command) will collect and preserve life sciences evidence as required. The ISB medical officer should be present before human remains are removed from the mishap site when possible. Great care must be taken to ensure a positive chain of custody for all human remains. If any chain of custody issues arise, contact the CA immediately. The following steps will be conducted by or under the supervision of the ISB medical officer:

3.4.11.2. Contact the Armed Forces Medical Examiner System (AFMES) to coordinate forensic pathology assistance. AFMES can be reached at **http://www.afmes.mil** or via telephone at DSN 366-8648 or (302) 346-8648. Contact HQ AFSEC/SEH (DSN 263-4868, Comm (505) 853-4868) if further assistance is needed.

3.4.11.3. Before moving any human remains, determine jurisdiction (legal control) for those remains. In most cases, the local coroner or medical examiner will have jurisdiction over the remains. Jurisdiction issues for geographic areas surrounding military installations and ranges should be delineated ahead of time during incident response planning. Most FAA Regional Medical Examiners maintain a database delineating the areas of jurisdiction and may be of assistance in clarifying these issues.

3.4.11.4. Complete detailed site diagramming before any human remains are moved. Use clearly labeled stakes and take sufficient photographs recording pertinent details.

3.4.11.5. Remove human remains only after completely documenting and closely scrutinizing all surfaces of remains with on-scene photography. Ensure photographs include adjacent structures which could account for traumatic injuries or objects which show evidence of tissue transfer.

3.4.12. The ISB President will conduct a hand-off briefing to the SIB. This briefing will provide a full accounting of all evidence on and off-station or in transit. All members of both the ISB and the SIB will be present during the briefing unless approved by the SIB BP. Briefing should also include ISB actions accomplished to date, site hazards, etc., as well as a local area safety brief (see paragraph 5.1). This should be accomplished prior to the joint ISB/SIB site visit if one is conducted. The hand-off briefing should contain, as a minimum, the following information as applicable:

3.4.12.1. Location/condition of the accident scene, including collateral property damage.

3.4.12.2. Actions taken by emergency response forces that affected the scene or wreckage.

3.4.12.3. Location/condition of participants/survivors, including any bystanders killed/ injured.

3.4.12.4. Status of toxicological testing, autopsies, etc.

3.4.12.5. Next-of-kin notification status.

3.4.12.6. Location/condition/status of wreckage, including all classified equipment.

3.4.12.7. Presence of munitions, composites, or other hazardous materials at scene (including potential for blood borne pathogens based on presence of human remains).

3.4.12.8. Civil authorities involved in managing scene/casualties.

3.4.12.9. Status of records impoundment actions (refer to individual ISB member guidelines below for list).

3.4.12.10. Status of witness search/statement collection.

3.4.12.11. Technical reports issued to date.

3.4.12.12. Technical assistance immediately available/offered/en route.

3.4.12.13. Media interest/statements made to date.

3.4.12.14. Logistical arrangements in place for permanent board (work center, communications, transportation, billeting, personal equipment, etc.).

3.4.13. Once the hand-off is complete, the ISB will discontinue any involvement in the investigation or discussion of the mishap except when the SIB seeks further clarification.

3.4.14. Coordinate with the IC/ROC to update the mishap site EAL with the members of the SIB. This will expedite a joint site visit by the ISB and the SIB. Following the handover, all ISB members' names will be removed from the EAL.

Chapter 4

SAFETY INVESTIGATION BOARD (SIB) / SINGLE INVESTIGATING OFFICER (SIO) REQUIREMENTS

4.1. General Guidelines and SIB Composition. The SIB member or SIO duties prescribed by this instruction take precedence over all other duties while the SIB is convened. SIB members will be relieved of all non-SIB duties while supporting the investigation. Table 4.1. establishes the minimum requirements. Board Presidents (BP) may request additional board members from the CA. If the CA concurs with request, the CA will source these members. The CA will identify additional members as necessary to thoroughly investigate and document a mishap (reference paragraphs 4.2.2, 4.2.3, 4.2.4). The CA may request a waiver to the minimum requirements by contacting HQ AFSEC/SEF to request an AF/SE waiver. **Note:** If a CA chooses to convene a non-Class A investigation board with SIB members required for a Class A board, the CA should consider requiring a formal report with all tabs and requiring the SIB to provide the CA with a formal out-briefing.

Table 4.1. Investigation Membership - Minimum Requirements.

1	Class A (Destroyed Manned Aircraft, Group 4 or 5 RPA, Fatality, or Permanent Total Disability) (Note 4)	Board President (Note 1) Investigating Officer AFSEC Representative (Note 3) Maintenance Member Medical Officer Pilot Member Recorder Other Primary Members as required (Note 5)
2	Class A (Other)	Board President (Note 1) Investigating Officer Medical Officer Recorder Other Primary Members as required (Note 5)
3	Class A or Class B (Engine-Confined or buoyant platforms) (Note 2)	Single Investigating Officer Other Primary Members as required (Note 5)
4	Class B (Note 6)	Board President (Note 1) Investigating Officer or Investigating Officer (Note 1) Recorder Other Primary Members (Note 5)
5	Class C, D, or E (Event)	Single Investigating Officer

4.2. Safety Investigation Personnel Requirements, Restrictions, and Roles. Safety investigations are conducted by either an SIO (typically Class C and D mishaps or Class E events) or by a SIB (Class A/B mishaps). SIB personnel fall into one of four categories: Primary members, "Conditional" Primary members, Secondary members, and Observers.

4.2.1. Primary SIB members. Primary SIB members determine findings, causes, and recommendations, and any primary member may submit a minority report (refer to Chapter 6 of this manual) if they do not agree with the BP in the outcome of the investigation. Primary members are the only SIB members authorized to sign the Authentication Page of Tab T. The following requirements apply to all Aviation SIBs:

4.2.1.1. Board President (BP). The BP is in charge of the SIB, is the final decision authority, and reports directly to the CA. The SIB BP should coordinate site access requirements directly with the IC/ROC. The BP will not assume the role of IC/ROC at any point during the investigation.

4.2.1.1.1. BP requirements for Class A Aviation Mishap SIB.

4.2.1.1.1.1. The BP must be a pilot or navigator but does not have to be current or previously qualified in the type aircraft involved in the mishap. For RPA mishaps, the BP must be a pilot, navigator, or RPA pilot. This requirement may be waived in those mishaps that clearly indicate the aircrew was not a factor and for buoyant platform mishaps involving non-aviation ground operators. Submit the waiver request with sufficient information about the mishap to HQ AFSEC/SEF.

4.2.1.1.1.2. Required Training. The BP must be a graduate of the HQ AFSEC BPC (no waivers permitted).

4.2.1.1.1.3. Required Rank. For manned aircraft mishaps, the BP must be a Colonel or higher in rank. For RPA mishaps, the BP must be a Lieutenant Colonel or higher. The BP must be equal to or higher in rank than the highest ranking individual involved in the mishap. If the mishap involved a fatality, the BP must be a Brigadier General select or higher in rank.

4.2.1.1.1.4. Organizational Independence. The BP must be appointed from outside the wing (or equivalent organization) experiencing the mishap, and must neither be attached to the mishap organization for flying purposes nor anticipating an assignment to the mishap organization within the next six months.

4.2.1.1.2. BP requirements for Class B Aviation Mishap SIB.

4.2.1.1.2.1. The BP must be a pilot or navigator but does not have to be current or previously qualified in the type aircraft involved in the mishap. For RPA mishaps, the BP must be a pilot, navigator, or RPA pilot. For requests to waive this requirement in those mishaps that clearly indicate the aircrew was not a factor, submit the request with sufficient information about the mishap to MAJCOM/SEF and copy to AFSEC/SEF.

4.2.1.1.2.2. Required Training. The BP should be a graduate of the HQ AFSEC BPC.

4.2.1.1.2.3. Required Rank. The BP must be a Lieutenant Colonel or higher rank

(Major or Lieutenant Colonel for ARC). The BP must be equal to or higher in rank than the highest ranking individual involved in the mishap.

4.2.1.1.2.4. Organizational Independence. The BP must be from outside the mishap unit.

4.2.1.2. Investigating Officer (IO). The IO is responsible for daily SIB activities, the investigation, and preparing of reports and messages. The IO directs and coordinates activities of other board members and works with the AFSEC Representative (if assigned) to "manage" the SIB. The IO is responsible for guiding the SIB through determining factors, findings, causes, and recommendations as well as other findings of significance (OFS) and other recommendations of significance (ORS), including influence and effects of human factors.

4.2.1.2.1. IO Required Specialty. For Class A and B mishaps, the IO must be a pilot or navigator, unless operations were clearly not mishap factors, but does not have to be current or previously qualified in the type aircraft involved in the mishap. For RPA mishaps, the IO must be a pilot, navigator, or RPA pilot unless operations were clearly not mishap factors.

4.2.1.2.2. IO Required Training. The IO must be a graduate of the USAF legacy FSO Course or AMIC. No waivers to this requirement are authorized.

4.2.1.2.3. Organizational Independence. For Class A mishaps, the IO will not be assigned to the mishap wing. For Class B mishaps, the IO will not be assigned to the mishap unit. For Class C, D, and E investigations, the IO should be from outside the mishap unit.

4.2.1.3. Single Investigating Officer (SIO). The SIO is responsible for the investigation and preparing of reports and messages. The SIO is responsible for determining factors, findings, causes, and recommendations (as applicable), including influence and effects of human factors.

4.2.1.3.1. SIO Required Specialty. The SIO will be a pilot or navigator, unless operations were clearly not mishap factors, but does not have to be current or previously qualified in the type aircraft involved in the mishap. For RPA mishaps, the SIO must be a pilot, navigator, or RPA pilot unless operations were clearly not mishap factors. The SIO may be an FSNCO or civilian (not contractors) for Class C and D mishaps and Class E events when no operational factors are suspected provided they meet the training requirements below. Aerospace and Operational Physiologist (AOP) officers may investigate Class E Physiological Events as an SIO provided they meet the training requirements below.

4.2.1.3.2. SIO Required Training. The SIO must be a graduate of the USAF legacy FSO Course or AMIC. No waivers to this requirement are authorized. FSNCOs and civilians (not contractors) that are eligible to investigate and report Class C and D mishaps and Class E events must have attended the legacy FSO course or the FSNCO course and either the AETC Jet Engine Mishap Investigation Course (JEMIC) or AMIC. AOP officers that are eligible to investigate Class E Physiological Events must have attended the legacy FSO Course, AMIC, or Aircraft Mishap Investigation and Prevention (AMIP) Course.

4.2.1.3.3. Organizational Independence. For Class A mishaps, the SIO will not be assigned to the mishap wing. For Class B mishaps, the SIO will not be assigned to the mishap unit. For Class C, D, and E investigations, the SIO should be from outside the mishap unit.

4.2.1.4. Air Force Safety Center Representative. The AFSEC Representative acts as the investigation process expert to guide SIB analysis efforts. He or she conducts "refresher training" of SIB procedures and is familiar with technical assistance resources which may be required by the SIB. An AFSEC Representative that is assigned to and is on-site with the SIB is considered a primary member. AFSEC Representatives that support a SIB telephonically are not primary members but are considered required consultants to the SIB. If appointed, the AFSEC representative (or AFSEC telephonic advisor in the absence of an on-site representative) should be the single point of contact with AFSEC for the duration of the investigation.

4.2.1.4.1. The AFSEC Representative works directly for the BP and is charged with facilitating the proceedings of the entire board. This includes helping the SIB President and IO formulate an overall investigative strategy and schedule, as well as lending his/her expertise to specific investigative issues. Because the AFSEC Representative will normally have completed multiple SIBs and reviewed many others, he or she is considered the expert regarding the process and is included in all aspects of the investigation. Specific duties include:

4.2.1.4.1.1. Leading the development of findings and recommendations by first educating SIB members on the process and then guiding the SIB through determining Factors, Findings, Causal Findings, and Recommendations as well as OFS and ORS

4.2.1.4.1.2. Ensuring the formal report is complete, consistent, and in compliance with AFI 91204 and this manual, particularly with regard to protecting privilege.

4.2.1.4.1.3. Assisting the BP and IO in managing the day-to-day activities of the SIB recorder.

4.2.1.4.1.4. Facilitating a smooth hand-off of factual material and evidence to the AIB.

4.2.1.5. Pilot Member (PM). The PM analyzes operations factors, to include: qualifications, proficiency, training, communications, aircrew actions throughout mishap sequence, mission-specific concerns, performance data, all flight-related publications, and aircrew stressors.

4.2.1.5.1. Required Specialty. The PM should be a current and qualified instructor pilot or flight examiner in the mishap aircraft type. At a minimum, the PM must be an experienced pilot as defined in MDS-specific Volume 1.

4.2.1.5.2. Required Training. None.

4.2.1.5.3. Organizational Independence. For Class A mishaps, the PM will not be assigned to the mishap wing. For Class B mishaps, the PM will not be assigned to the mishap unit.

4.2.1.6. Maintenance Member (MM). The MM analyzes maintenance factors, to include: pre-mishap status of mishap aircraft, aircraft systems, records, and maintenance personnel qualifications, proficiency, and training. The MM also evaluates depot and QA actions, as well as possible design or engineering deficiencies.

4.2.1.6.1. Required Specialty. The MM must be a fully qualified maintenance officer, civilian equivalent, or SNCO, with maintenance experience on the type aircraft involved. The MM will have a minimum of one year flightline or QA experience on the type aircraft involved.

4.2.1.6.2. Required Training. The MM must be a graduate of AMIC or JEMIC.

4.2.1.6.3. Organizational Independence. For Class A mishaps, the MM will not be assigned to the mishap wing. For Class B mishaps, the MM will not be assigned to the mishap unit.

4.2.1.7. Medical Officer (MO). The MO shall be an AF flight surgeon credentialed in aerospace medicine and, whenever possible, should be qualified in the mishap aircraft, and may be assisted by a separate HF Member. The MO:

4.2.1.7.1. Analyzes medical data to evaluate medical histories, records, laboratory, radiologic, and pathology reports; and determines the cause(s) and mechanisms of injuries or death.

4.2.1.7.2. In the event of fatalities, great care must be taken to ensure a positive chain of custody for all human remains. If any chain of custody issues arise, contact the CA immediately.

4.2.1.7.3. Partners with other board members and consultants to provide a complete analysis of all factors relating to life sciences, human performance, injury mechanisms, and the related use and performance of aircrew protection equipment and crashworthiness design features.

4.2.1.7.4. Serves as the lead expert for human factors discussions and has the primary responsibility for completion of all parts of Tab Y IAW paragraph 6.4.5.11 of this document.

4.2.1.7.5. Advises the SIB on the Health Insurance Portability and Accountability Act (HIPAA) restrictions governing protected health information (PHI) and the need to protect it from inappropriate subsequent release.

4.2.1.7.6. Required Training. The MO investigating fatal mishaps shall be a graduate of AMIP, AMIC, or have previous experience as the primary board member of an aviation Class A or Class B SIB. It is highly desirable for the MO of non-fatal aviation mishaps to be a graduate of AMIP, AMIC, or legacy FSO Course.

4.2.1.7.7. Organizational Independence. For Class A mishaps, the MO shall not be a member of or assigned/attached to fly with the mishap wing or anticipate flying with the mishap organization within the next six months. For Class B mishaps, the MO will not be a member of or assigned to fly with the mishap unit.

4.2.2. Conditional Members. SIB BPs may request these members from the CA depending on the circumstances of the mishap as either Primary or Secondary members. Alternately,

the CA can assign these members as either Primary or Secondary Members. The CA will be responsible to source these members and ensure they are properly categorized on the Board orders. If their area of expertise relates to a factor that was integrally involved in initiating or sustaining the mishap sequence, these individuals are accorded Primary Member status.

4.2.2.1. Organizational Independence. For Class A mishaps, they will not be assigned to the mishap wing. For Class B mishaps, they will not be assigned to the mishap unit.

4.2.2.2. Additional Crew Member (e.g., Navigator, Air Battle Manager, Flight Engineer, Loadmaster, RPA Sensor Operator, etc.). Assign this member if the mishap involved the crew position in a manner requiring their representation.

4.2.2.2.1. Required Specialty. These members must be current and qualified in their crew position.

4.2.2.3. AFE Member. Assign this member if AFE is known or suspected to have been a factor in the mishap, may have contributed to injuries, or was used during the mishap sequence. This member is also required for all mishaps that involved the successful or unsuccessful use of an ejection seat. The AFE member is a conditional primary member of the SIB.

4.2.2.3.1. Required Specialty. This member must have experience with the mishap aircraft AFE.

4.2.2.3.2. Required Training. Flight Equipment members will be graduates of the Life Sciences Equipment Investigation Course and must be at least a 7-Skill Level SNCO or fully qualified AFE officer.

4.2.2.4. Human Factors (HF) Member. The CA assigns this member if HF is known or suspected to have been a factor in the mishap or may have contributed to injuries. The HF Member is a conditional primary member of the SIB as outlined in Table 4.1 of this manual. The HF Member:

4.2.2.4.1. Analyzes the impact of human factors and human performance in aviation to include its impact on the mishap investigation, application to operations and mishap prevention, and individual and environmental elements.

4.2.2.4.2. Evaluates the individual's relationship with working and living environments, machines and equipment, policy and procedures, and other people, and uses the Human Factors Analysis and Classification System (HFACS).

4.2.2.4.3. Required Specialties. HF Members include, but are not limited to: AOP with an AFSC of 43A3, Aviation or Operational Psychologists, Flight Surgeon/Pilot Physicians, Human Factors Engineers, and other appropriate Aerospace Medicine Specialists. The MAJCOM SGP or SE and/or HQ AFSEC/SEH may act in an advisory capacity to assist the SIB in determining the most appropriate type of consultant. ARC units will request lead MAJCOM support to assist with HF-related mishaps.

4.2.2.4.4. Required Training. HF Members should be fully qualified in their career field (see current Air Force Officer Classification Directory for requirements). It is highly desirable for the HF Member of aviation mishaps to be a graduate of AMIP, AMIC, or legacy FSO Course.

4.2.2.4.5. Organizational Independence. For Class A mishaps, the HF Member shall not be a member of or assigned/attached to fly with the mishap wing or anticipate flying with the mishap organization within the next six months. For Class B mishaps, the HF Member will not be a member of or assigned to fly with the mishap unit.

4.2.2.5. Airfield Operations Member. Assign this member when ATC, Tactical Air Control, or AM issues are a suspected factor in the mishap.

4.2.2.5.1. Required Specialty. The CA will coordinate with the MAJCOM Airfield Operations staff to source a properly qualified member with air traffic control or airfield management expertise for the board. The CA must coordinate with HQ AFFSA/A3A, DSN 884-8628, to identify a qualified SIB member if one cannot be sourced from within the command.

4.2.2.5.2. Required Rank. This member may be an officer or SNCO.

4.2.2.6. Weather Member. Assign this member when weather or meteorological service issues are suspected factors in the mishap.

4.2.2.6.1. Required Specialty. This member must be at least a 7-skill level weather specialist (N/A if officer).

4.2.2.6.2. Required Rank. This member may be an officer or SNCO.

4.2.2.7. Weapons Safety Expert. Assign this member when weapons or associated systems are suspected factors in the mishap.

4.2.2.7.1. Required Training. This member must be a graduate of the Weapons Safety Manager Course and be knowledgeable of the weapon(s) involved.

4.2.2.8. Air Force Operational Test and Evaluation Center (AFOTEC) Representative. Assign this member anytime AFOTEC people or equipment, or AFOTEC-managed test, assessment, or evaluation procedures are involved. Other Test organizations may take part in investigations and send a representative when they have test responsibilities.

4.2.2.9. Jumpmaster Member. Assign this member if jump operations were affected or were suspected factors in the mishap.

4.2.2.10. Other Service Representatives (USN, USA, USMC, and USCG). Assign this member when his/her aircraft, facilities, materiel, or personnel were involved and that service elects to participate in the investigation. The non-AF members will actively participate in the investigation and aid in report preparation under the provisions of AF 91-series guidance. The CA determines whether they are accorded primary member status IAW any inter-service agreements. Depending upon the extent of involvement, other services may provide a qualified investigator to serve as an assistant IO on the SIB.

4.2.2.11. Crash Fire & Rescue (CFR) Member. Assign this member if CFR response, actions, or failures were suspected to have played a major role or contributed significantly to the extent of damage or injuries.

4.2.2.12. AFFSA Member. Assign this member if instrument flight procedures or publications are involved. The CA coordinates with AFFSA/CC, DSN 884-6562 for assistance.

4.2.2.13. Nuclear Expert. Assign this member if nuclear reactors, nuclear power systems, or radioactive sources are involved.

4.2.2.14. Defense Contracting Management Agency Member. Assign this member if contract maintenance and operations are involved and government oversight and contractor actions may be factors in the mishap.

4.2.3. Secondary Members. Secondary Members assist the SIB in mishap investigation and reporting. The BP determines the extent of their participation. They are not authorized to submit a minority report and do not sign the Authentication Page of the Tab T. Any additional member subordinate to a Primary Member will be designated as a Secondary Member and will not be a Primary Member (i.e., if there are two AFE members, one will be primary and one will be secondary). If the BP determines a conditional primary member's area of expertise is not a factor in the mishap but that member's expertise is still needed, then this member serves as a Secondary Member. The following Secondary Members may be added as indicated:

4.2.3.1. AFE Members. If the mishap involved a successful ground egress with no injuries, an AFE Member may be assigned as a Secondary Member unless an AFE Member is already assigned as a Primary Member.

4.2.3.2. Technical Engineering Member. If an investigation requires a significant level of technical expert involvement, as defined by the CA, a member should be assigned to lead these efforts. This member must have a technical background compatible with the technical nature of the investigation. HQ AFSEC/SEFE will be the coordinating agency for sourcing this member.

4.2.3.2.1. This member must either be military or a government civilian employee but cannot be a contractor.

4.2.3.3. Technical Assistance Members. These members can be from various technical backgrounds and training levels to include contractor safety/technical personnel. If a Technical Engineering Member is appointed, he or she is the lead for the Technical Assistance members. HQ AFSEC/SEFE will be consulted for sourcing these members.

4.2.3.4. Recorder. An officer or NCO familiar with administrative procedures and experienced in the use of typical office computer software. Normally, recorders come from the base providing support to the SIB. If possible the ISB recorder should transfer directly to the SIB. The recorder's primary objectives are to:

4.2.3.4.1. Coordinate with the AFSEC Representative, or the IO if no AFSEC Representative is present, to ensure full administrative and logistical support is provided to the board.

4.2.3.4.2. Manage the work center, control access, and make it an effective communications focal point for all board activities.

4.2.3.4.3. Supervise all additional administrative assistants assigned to the board.

4.2.3.4.4. Maintain a filing system to account for all evidence, testimony, and board proceedings, both electronically and physically, to ensure security and prevent loss.

4.2.3.4.5. Assist the AFSEC Representative, BP, and IO with the compilation, assembly, and distribution of the formal report electronically and in AFSAS.

4.2.3.4.6. Assist the BP with the administrative portion of the preparation of a briefing to summarize the mishap formal report to the CA.

4.2.3.4.7. Assist the AFSEC Representative or IO to facilitate a smooth hand-off of factual material and evidence to the AIB.

4.2.3.5. Representatives from the FAA or NTSB, if appropriate. See AFI 91-204, Chapter 4, and AFI 91-206(I).

4.2.3.6. Commander's Representative. The SIB BP may request a representative from the commander whose assets were involved in the mishap, subject to CA approval. The commander who owns those assets may also request to have a representative on the board. The Commander's Representative's role is limited to providing basic information to the SIB regarding operational and organizational details and practices to help the SIB determine who to interview, mishap organization hierarchy, etc. This individual is considered the expert on local procedures, local command relationships, organizational structure, and unit personalities. The Commander's Representative's presence on a SIB will not substitute for interviews with mishap principals.

4.2.3.6.1. The Commander's Representative must not have had any involvement in the mishap event and must not have supervised or trained involved persons. This individual will have no affiliation with a follow-on AIB. The Commander's Representative is strictly prohibited from providing any information regarding the SIB investigation to anyone outside the SIB, including his/her commander or chain of command.

4.2.3.7. Additional Personnel. Personnel determined by AF/SE to be necessary and appropriate under cooperative agreements (e.g., foreign military representatives).

4.2.3.8. Administrative Specialists. NCOs or airmen that assist the SIB with administrative tasks such as building formal report tabs, transcribing interviews, answering phones, or filing.

4.2.3.9. Cyberspace Member. If there is a possibility that Cyberspace systems were involved in the mishap, an expert in this area may be requested to support the investigation.

4.2.4. Observers. Civil aviation, foreign military, and sister service personnel may request to observe the Air Force investigation. An observer is not a member of the Air Force SIB. Requests for observers must be approved by both AF/SE and the CA. DoD Observers may participate to the extent authorized by the BP. Non-DoD observers may not participate in privileged SIB proceedings or have access to confidential testimony or other privileged information. Non-DoD Observers may participate in other SIB proceedings to the extent authorized by the BP. See AFI 91-204, Chapter 5 and AFI 91-206(I) for additional guidance.

Chapter 5

CONDUCTING THE FORMAL SAFETY INVESTIGATION

5.1. Handover Briefing. The SIB BP will ensure the SIB receives a handover briefing from the ISB to include an updated site hazard briefing from either the ISB or IC/ROC prior to the initial site visit. See paragraph 3.4.12. for details on the handover briefing. The handover between boards marks the end of the ISB's involvement in the investigation.

5.2. Entry Access List (EAL). The SIB will ensure the mishap site EAL is updated by adding the SIB members and removing the ISB members.

5.3. Investigative Evidence.

5.3.1. The SIB will make a full accounting of all evidence that has been collected or impounded at all geographic locations before releasing the ISB.

5.3.2. In the event of fatalities, great care must be taken to ensure a positive chain of custody for all human remains. If any chain of custody issues arise, contact the CA immediately.

5.3.3. All privileged safety information must be protected IAW AFI 91-204, Chapter 3. The Investigating Officer or AFSEC Representative will provide all members of the SIB a refresher briefing on the concept of safety privilege immediately prior to beginning the investigation. This may be accomplished by viewing the video located on AFSEC JAG Portal page (found on the AF Portal : FOAs : AFSEC - Air Force Safety Center : JAG : Protecting Privileged Safety Information). All members of the SIB given or provided access to privileged safety information, to include administration support, must have a *Safety Investigation Non-Disclosure Agreement* (AFI 91-204 Attachment 3) on file with the SIB.

5.3.4. Written or Verbal Testimony. On a SIB, only BP, IO, or SIO can authorize the offering of the promise of confidentiality under the conditions established in AFI 91-204, Chapter 3. Promises of confidentiality will only be given as needed to ensure forthright cooperation of the witness and may not be given on a blanket basis to all witnesses. Limiting the persons authorized to make the promises of confidentiality does not mean that the SIB President or the IO must be present at all witness interviews. The SIB President may task this offering to the member of the SIB accomplishing the interview. Ensure each statement or interview document is appropriately marked to indicate whether it is provided under privilege or not.

5.3.4.1. For interviews with contractors (contract maintenance, etc.) involved in the mishap, ensure the contract wording provides for cooperation with Safety Investigation Boards (Defense Federal Acquisition Regulation Clause 252.228-7005, *Accident Reporting and Investigation Involving Aircraft, Missiles, and Space Launch Vehicles*). Have QA/Contracting Office Representative or the Government Flight Representative review the contract; look for wording like "…the service provider will assist with the investigation and reporting of mishaps." If that type of wording is not in the contract, contact the CA on how to proceed.

5.3.4.2. Privileged Interviews. For privileged interviews (including 72-hour and 14-day histories), whether written or recorded, all interviewees sign the form from AFI 91-204 Attachment 3, *Witness Promise of Confidentiality and Non-Disclosure Agreement.* This

only needs to be accomplished once for recorded interviews but must be done for ALL written statements whether initial or subsequent follow-up.

5.3.4.3. For recorded privileged interviews ensure all interviewees are read the *Notice to Witness Documenting Promise of Confidentiality of Recorded Statements,* AFI 91-204 Attachment 3, and it is recorded and transcribed. This must be done for ALL recorded interviews whether initial or subsequent follow-up interviews.

5.3.4.4. Non-Privileged Interviews. For non-privileged interviews (including 72-hour and 14-day histories), whether written or recorded, all interviewees sign the form from AFI 91-204 Attachment 3, *Non-Privileged Witness Statement*. This only needs to be accomplished once for recorded interviews but must be done for ALL written statements whether initial or subsequent follow-up. During the interview, ensure questions are not derived from privileged sources. If it is determined after the interview that privileged information was divulged, the entire interview is now considered privileged. The interviewee must be notified and must sign the form from AFI 91-204 Attachment 3, *Witness Promise of Confidentiality and Non-Disclosure Agreement*.

5.3.4.5. For recorded non-privileged interviews ensure all interviewees are read the *Notice to Witness that Recorded Statement is not Confidential* from AFI 91-204 Attachment 3, and it is recorded and transcribed. This must be done for ALL recorded interviews whether initial or subsequent follow-up interviews.

5.3.4.6. Give a complete list of all witnesses to the AIB regardless of whether the statements of the witnesses are in the safety report. Include contact information such as addresses and telephone numbers. Provide the names of witnesses to the AIB only after the SIB decides to conduct no further interviews of any of the witnesses (Contact HQ AFSEC/JA for guidance in unusual mishaps where the SIB may release witnesses to the AIB before completing interviews of all witnesses).

5.3.5. Photographic and Video Evidence. Digital and video images can be effectively used as evidence. Keep a list and description of photos taken. This listing should include, as a minimum, the location of the part(s) being photographed (in relation to main wreckage and including GPS coordinates) and what was photographed (left flap actuator, right wing tip, ground scar, etc.). Photos or videos which do not suggest SIB analysis are non-privileged. Photos or videos that indicate interpretation or analysis by primary SIB members are privileged. These include staged photographs, simulated reenactments, etc. Photos and videos produced by technical experts as a part of field or laboratory analysis of factual evidence are non-privileged. This includes parts reconstruction, measurement of debris field, parts locations and dimensions, identification of key features and witness marks, identification of failure sequences, etc. Still images that are privileged should be marked as such to include use of digital watermarks or coding on digital photos or video. To ensure all images are properly protected from inadvertent release to the public, especially those identified as privileged, all photographs relating to the mishap to be released by Public Affairs must be approved by the CA via the BP prior to release. Investigators should ensure no unauthorized photography takes place at the mishap site. Only those authorized by the ISB/SIB President or ISB/SIB IO should record images or video. The host unit will provide digital photography support. Any photography not authorized by ISB/SIB President or ISB/SIB IO is forbidden. Personal imaging devices, such as cell phones for photos by SIB

members, may not be used without ISB/SIB President or ISB/SIB IO authorization. For release authority of electronic images refer to guidance in AFI 91-204, Chapter 5.

5.3.6. Recorded data, data analysis, simulation, and animation tools. The Mishap Analysis & Animation Facility (MAAF) at HQ AFSEC is the central Air Force agency for recovery, transcription, analysis, simulation, and animation of all data in support of Air Force Safety Investigations. The ISB should have downloaded perishable data and sent FDRs, CVRs, or other recorded media and devices to the appropriate location. If unsure of where to send devices, contact the CA SEF or HQ AFSEC/SEFE at DSN 246-5867 or (505) 846-5867. If this has not been accomplished, the SIB will make it an immediate priority.

5.3.6.1. Transcription and analysis of recorded flight data will be reviewed by HQ AFSEC/SEFE to ensure the validity, limitations, and appropriate use are addressed. Simulation and animation products and tools, including those generated from contractor simulators, test range data systems, training range data systems, tactical data links, and companion aircraft used by the SIB for analysis and briefing purposes must meet the highest standards of completeness and accuracy to adequately support investigative thoroughness. However, the MAAF is not staffed, in either manpower or expertise, to provide other services such as the development or editing of multimedia products to be used solely as briefing aids.

5.3.6.2. The MAAF will be the primary source for animations intended to represent the actual mishap sequence. If the MAAF cannot produce a specific mishap animation, or if additional animations are produced, SIB/SIOs will submit externally-generated mishap animations to the MAAF for review. The MAAF will analyze the externally-generated animation for any shortfalls, inadequacies, or inaccuracies that may impact accurate SIB deliberations or CA conclusions. The CA, through their SE, will decide whether the SIB/SIO will use the animation in analysis or briefings. If it is not used, they will not enter the animation into the formal report tabs. All animation products must be appropriately marked to indicate whether they are privileged or not.

5.3.6.3. The Military Flight Operations Quality Assurance (MFOQA) program, managed by HQ AFSEC personnel, has the capability, using flight data recorder information only, to provide flight data analysis and animation products for those fleets that currently employ MFOQA analyses. There may be times when the MAAF is unable to support the analysis/animation requirements of a mishap or incident investigator, or when MAAF personnel and the MFOQA program manager determine the MFOQA analysis capability is better suited to the investigation requirements. In these cases, MAAF personnel will coordinate with the MFOQA program manager to establish investigation support.

5.3.7. Proactive Aviation Safety programs, such as MFOQA and Line Operations Safety Audit (LOSA), can be used to provide evidentiary information to SIBs as part of their deliberative processes. Unusual events, threats and errors encountered during routine operations and documented through proactive safety programs often are the same factors present during a mishap chain of events; contextual factors, such as weather or terrain, may determine the severity of the outcome of a chain of events. Mishap investigators can use data from proactive programs to determine if and how similar factors found in a mishap were encountered during non-mishap events and then can assess what contextual differences mitigated the severity of the non-mishap events. Proactive safety data can prove particularly

helpful when investigating whether the actions of mishap aircrew constituted isolated events or whether such actions form part of a larger pattern of normalization of deviation from established procedures.

5.3.7.1. The MFOQA Program has the capability to analyze historical flight data for a given MDS, operating location, or phase of flight. Such analyses may be requested based on the SIB/IO needs and may include: analysis of the incident file; animation of the incident file; historical analyses of similar operational activities (trends) of data associated with the affected aircraft tail number and of the location where the event occurred (same and additional tail numbers); and running of interpretive models. MAAF personnel will coordinate with the MFOQA program manager to establish investigation support.

5.3.7.2. The LOSA program produces reports of non-punitive and unobtrusive peer-to-peer cockpit observations. LOSA reports contain safety-related flight data collected during normal operations in order to assess safety margins and improvement measures. LOSA reports can be used by a SIB/IO as evidence of previously documented threats and errors encountered by aircrew, of how such threats and errors were managed, and of the outcome of such events. LOSA reports also may provide excellent insights into training and organizational culture. LOSA reports are filed as Class E incidents in AFSAS.

5.4. Safety History Analysis. The SIB should have the AFSEC or safety trained representative conduct historical research in AFSAS early in the investigation. Specific areas of inquiry may include, but are not limited to:

5.4.1. Mishap history (aircraft, unit, individual).

5.4.2. Similar mishap sequences (all classes of mishaps).

5.4.3. Prior recommendations to address similar mishap circumstances.

5.5. Surveys. A survey can substitute for observations and interviews. Surveys are particularly useful when investigators doubt that face-to-face interviews will yield valid answers to their questions. Surveys are also useful when investigators lack time to interview. Surveys can be very useful to a SIB, but there are some pitfalls with conducting a survey that SIBs need to overcome before deciding on a survey. Poorly designed and poorly executed surveys may yield invalid data and mislead investigators. It is tempting to apply statistics to summarized survey results. Investigators must recognize the risks of applying statistics to survey data.

5.5.1. There are many types of surveys. They can be as simple as asking a single yes-no question. They can be as complex as multi-item branching questions with combinations of forced choice, narrative, and Likert-type responses. In every case, investigators should strive to create a survey that meets the requirements of reliability and validity. Investigators should take time and care in developing, testing, administering, and interpreting surveys.

5.5.2. Survey development requires the same attention as every other part of the investigation process. There are countless texts and scholarly journals that will offer the investigator useful guidance. When considering the use of a survey, understand that it may take several hours to learn about survey techniques and several hours more to develop. A checklist that serves as a good place to start is included in the SIB Support Documents (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support).

The checklist is neither authoritative nor universally accepted, but is provided for reference. Contact AFSEC/SEH (DSN 246-0677) for assistance with formal survey development and validation.

5.6. Removing Wreckage from the Mishap Scene. The SIB will coordinate wreckage recovery through the IC/ROC. In most cases the SIB travels to the location of the mishap; however, combat zones present unique challenges, and in certain cases such as RPA mishaps, evidence (including data recorders, aircraft components, sections of airframes, etc.) may need to be shipped out of the AOR to a suitable location for analysis.

5.6.1. Prior to having mishap parts analyzed/torn down, etc., call the Engineering Tech Assist Hotline at the AF Safety Center at DSN 246-5867. They will determine who to contact, where to send parts, whether it would be better to have the analysis performed at the SIB's location, etc. Do not send parts for analysis without coordinating with AFSEC/SEFE first. Additionally, do not attempt field disassembly of the suspect components without prior coordination with HQ AFSEC/SEFE.

5.6.2. The key to getting a part to a suitable location for analysis is to treat all critical aircraft components needing shipment as time critical investigative evidence. AFI 91-204, Chapter 2, instructs the Commander of the active duty Air Force installation nearest the mishap to provide logistical and investigative support as required. In cases where AOR airfields are predominately non-Air Force, paragraph 2.5. would be applicable to the Commander of an active duty Air Force Wing with an SE office nearest the mishap. Contingency funds will reimburse the shipping agency for a mishap that occurred while supporting a contingency mission. To ensure reimbursement, the shipping agency must use the appropriate Emergency and Special Program (ESP) Code based on their MAJCOM and the AOR.

5.6.3. Investigative evidence will be shipped via the nearest (local) Traffic Management Office (TMO) or Distribution Flight. When laboratory analysis is requested or a deficiency report (DR) submitted for components suspected of being critical to the cause of a Class A or B mishap, such as data recorders or suspect components, the BP should consider designating an individual fully conversant with all factors involved in the mishap to accompany the components. This individual should observe the laboratory analysis or teardown and will request a preliminary evaluation for the SIB. If a part cannot be hand carried, ship the part via commercial carrier (FedEx, UPS, etc.), if possible, to ensure proper tracking and priority shipping. If military transport is used to move wreckage, ensure proper tracking information (signature service cargo) and priority shipping is obtained. Ensure the SIB receives a copy of all wreckage tracking information.

5.6.4. For non-critical shipment of evidence, use Air Force organization and assets to the maximum extent possible. The shipping agency will set the priority of the cargo for channel flights IAW AFI 24-203, *Preparation and Movement of Air Force Cargo*, Chapter 3. Investigative evidence will be priority coded TP-1. In some instances, the shipping agency may also need to provide a priority shipping letter to accompany the request.

5.6.5. Underwater Salvage. If recovery or salvage of floating debris or submerged wreckage is required but is beyond the capabilities of the base concerned, the SIB will request the CA contract with commercial salvage operations or request help from the US Navy. The SIB will not undertake procuring salvage assets without first coordinating with the CA. Failure to

do so may contractually obligate the Air Force without proper approval resulting in individual disciplinary action.

5.6.6. Cleanup, restoration, and security of the mishap scene are not SIB functions. Refer all questions to the IC/ROC.

5.7. Disposition of Evidence.

5.7.1. All non-privileged evidence not included in Tabs A through S will be transferred to the AIB and acknowledged in writing by the AIB BP or Legal Advisor. The SIB will transfer all non-privileged evidence and Part 1 documents to the AIB. The legal board is responsible for final disposition of all material released to them by the SIB. If there is no follow on legal board, contact the CA staff judge advocate for guidance on disposing of materials that may be needed in potential claims or litigation. An example Tab Q transmittal letter can be found on the AFSEC Portal page (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support). If there are no such requirements, make enough copies of pertinent evidence for the safety report and then return the original documents and records to their proper custodian. These copies will be disposed of IAW guidance in paragraph 5.7. of this manual.

5.7.2. All hardware sent for analysis must include disposition instructions. The SIB/SIO must remind the laboratory to not destroy or release the hardware to anyone until receiving written approval from the SIB, a follow-on AIB, or owning unit as applicable. The SIB must document the disposition of all evidence that has been shipped for analysis in a MFR and provide this listing as an item in Tab Q for handoff to the AIB.

5.7.3. Ensure the AIB President knows the disposition of all non-privileged evidence, to include wreckage and components shipped for analysis. The AIB must acknowledge their custodial responsibility in writing. Inform the host installation commander of the transfer. If the AIB President is not available and the SIB is prepared to release the evidence, release it to the host installation staff judge advocate (SJA), who will maintain custody until the AIB President is able to accept. If there is not a follow on AIB, transfer custody of the evidence to the host installation commander or, if directed by the host installation commander, to the SJA. Transfer may be made to tenant units, as appropriate, with written agreement between the installation commander and tenant unit commander. For additional information refer to AFI 51-503, *Aerospace Accident Investigations*.

5.7.4. Evidence used by the SIB to construct Part 1 of the report such as pilot training records, aircraft maintenance records, etc., must be retained for handover to the AIB. Oftentimes the wing will ask that certain records be returned so they can put an aircraft back in service, return a pilot to the cockpit, etc. If they require documentation to conduct these types of activities, give them copies of the applicable forms and retain the originals for the AIB. Before turning anything back over to the wing, contact the AIB President and get his/her approval first and document the transaction/conversations in a MFR. Follow these same procedures for any servicing equipment tested and ready to be returned to the wing. Have the MM draft an MFR and add it to the SIB files after getting approval from the AIB President. If an AIB has not been assigned, document the condition of the equipment via an MFR and return it to the owning agency.

5.7.5. When the SIB is done with usable personal equipment or protective gear that is USAF property, return it to the possessor of record or to the issuing authority. Prior to release by the SIB, coordinate with the AIB President for approval and document the release via a Memo for Record. Clearly mark the item to indicate its involvement in a mishap to ensure the necessary inspections are accomplished prior to reissue. Examples include flight helmets, g-suits, flight publications, etc.

5.7.6. Quickly analyze personal items impounded as investigative evidence and return them to the owner, summary court officer, or next of kin. Coordinate the releasing of these items through the AIB President and document the release via a Memo for Record when no longer needed for the investigation. If there is not an AIB, coordinate with the CA. Contact HQ AFSEC/JA for assistance if necessary.

5.7.7. Privileged evidence will not be handed over to the AIB or the host wing. Transfer this data (SIB working files, tapes containing privileged witness interviews, staged photographs, etc.) to the AFSEC Rep, if assigned to the SIB, or the MAJCOM/SEF. Files will be destroyed after the Memorandum of Final Evaluation (MOFE) is released.

5.8. Technical Analysis.

5.8.1. If a premature failure of a component or other deficiency is suspected, submit a deficiency report (DR) IAW T.O. 00-35D-54, *USAF Deficiency Reporting and Investigating*, or other MDS-specific reporting system. Do not attempt field disassembly of the suspect components without prior coordination with HQ AFSEC/SEFE. The SIB or SIO must enter the DR number in the appropriate field in the Object section of the AFSAS report. This will ensure proper tracking throughout the investigation and after the close out of the report.

5.8.2. Reference T.O. 00-35D-54 for proper classification and instructions. Consider initiating a Category I DR for any mishap if a potential exists for the item to cause a future Class A mishap. Request priority teardown of suspect components by coordinating with HQ AFSEC/SEFE.

5.8.2.1. If a DR cannot be completed before the final report is to be submitted, confer with the convening authority to determine if the SIB should extend in place or de-convene until the analysis is complete. If a preliminary DR report is available, consideration may be given to submit this report with the investigation final report in AFSAS. If the final DR report is significantly different, changes to findings, causes, and recommendations can be addressed in the MOFE comments or the investigation can be reopened to make changes.

5.8.3. To determine where to send a DR exhibit, contact HQ AFSEC/SEFE. In most cases, teardown and analysis will be conducted by a DoD facility. Do not directly contact contractors or vendors for teardown and analysis without first speaking to HQ AFSEC/SEFE (DSN 246-5867 or (505) 846-5867). Failure to do so may contractually obligate the Air Force without proper approval resulting in individual disciplinary action.

5.8.4. Handle and ship exhibits IAW T.O. 00-35D-54. In some cases, exhibits will be shipped via alternate means and to locations other than identified in the DR system. Additionally, T.O. 00-85-20, *Engine Shipping Instructions***,** explains how to ship mishap engines. Take follow-up actions to ensure exhibits were received and teardowns progress in a timely manner.

5.8.5. FOD Analysis. If damage occurred from a known foreign object, do not submit a DR. Determine mishap costs IAW AFI 91-204 and continue the investigation. If, after a thorough investigation, the source of damage is unclear and there is no obvious failed engine part upstream, SIBs/SIOs should consult HQ AFSEC/SEFE (DSN 246-5867 or (505) 846-5867) for assistance with submitting accessible damaged blades, vanes, or other flow path surfaces to a lab for analysis. If damaged blades, vanes, or other flow path surfaces are inaccessible, consult HQ AFSEC/SEFE for determination of DR submittal to the Air Force Life Cycle Management Center (AFLCMC). AFLCMC will respond to the DR with their analysis of the source of the damage, whether from a foreign or domestic object. In the case of FOD, they will administratively close the DR and include a written statement on their determination of the source of damage. If their determination includes a domestic object as a possible source of the damage, the DR should not be closed without an investigation to confirm the source.

5.8.6. Place a copy of all teardown reports, including all supporting documents (e.g., metallurgical analyses, photographs, test reports, etc.) provided in response to DRs in the formal report in Tab J or Tab W, as applicable.

5.9. Coordinating with an AIB. Following a Class A mishap, an AIB is often convened IAW AFI 51-503, *Aerospace Accident Investigations,* as the SIB investigation is being closed out (see paragraphs 5.6 and 6.6 for further instructions regarding information on how to turn over evidence to the AIB at SIB conclusion).

5.9.1. Concurrent SIB and AIB. On some rare occasions an AIB and SIB will be working concurrently (high visibility mishaps, mishaps with fatalities, etc.). In those situations IAW AFI 91-204, Chapter 1, SIBs take priority over any corresponding AIB investigations and the SIB has "exclusive first rights" to witnesses and all physical evidence. **Note:** IAW AFI 91-204, Chapter 1, if initiated, OSI investigations take precedence over safety investigations until criminal activity, natural causes, and suicide have been ruled out as possible causes of damage, injury, or death. Additionally, the SIB must conduct its investigation independent of the AIB investigation. However, the SIB BP should coordinate certain activities with the AIB BP if there will be an AIB occurring concurrently with the SIB. This includes facilitating the initial visit of the mishap site by the AIB or next of kin.

5.9.1.1. The SIB BP refers all media matters and next of kin matters to the AIB BP (including requests from these parties to obtain access to the wreckage or the personal property of the deceased). All releases of factual information regarding the status of the ongoing safety and/or accident investigation to the media must be coordinated with the AIB President IAW AFI 51-503, Chapter 7. The SIB President and AFSEC Representative (if appointed) will ensure that any information provided to the AIB President for public release does not contain any privileged safety information or documents. Ensure the Public Affairs Officer clearly understands that all future releases are to be coordinated with the AIB President versus the SIB.

5.9.1.2. The SIB BP may provide factual (non-privileged) information to the AIB BP or Legal Advisor as it becomes available, but not to the detriment of the safety investigation. This information includes aircraft maintenance records, toxicological results, flight records, non-privileged technical analysis reports, publications, directives, non-privileged photographs, and medical records. Additional examples include recordings and

transcripts of air-to-air, air-to-ground, ground-to-air voice transmissions, as well as CVR/FDR tapes, other digital recording media (if available), GCS data and other information captured at the time of the mishap. All information turned over to the AIB prior to the formal signing of Tab Q, AIB Transfer Documents, (see paragraph 6.4.4.17) will be documented with a MFR. Additionally, the SIB will not brief AIB personnel on whether the content of the data being turned over was or was not a factor in the mishap. This is a violation of safety privilege handling protocol. When determined they are no longer needed by the SIB, the SIB President will release witnesses, participants, and interviewees (e.g., mishap pilot, mishap maintainer, mishap flight engineer, etc.) to the AIB President.

5.9.1.3. The SIB BP provides certain factual information to the AIB legal advisor as soon as possible, as specified in AFI 51-503. However, every effort should be made to limit these activities so the efforts of the SIB are not impeded. Do not release SIB analysis, findings, causes, recommendations, or references to privileged witness statements. Do not release videotapes of simulated, computer-generated, animated, or re-enacted portions of the mishap flight if they involved SIB analysis. Do not release the SIB medical analysis or any other privileged evidence.

5.9.2. CVR and other aircrew recordings and transcripts are not privileged. The audio recording will be transcribed. Limit the transcript included in Part 1 of the report to conversation relevant to the mishap sequence of events. Deletions or omissions will be indicated. Do not summarize, paraphrase, or otherwise alter the recording when transcribing. AFLOA/JACC determines when the audio from a mishap is releasable under Air Force policy. However, the transcripts of these recordings are considered factual and may ultimately be released to the public in an AIB report or through the Freedom of Information Act.

5.9.2.1. For fatal mishaps and certain non-fatal mishaps, non-privileged audio recordings will be provided to the AIB, and AFSEC/JA (not the CA) will be the authority for release. It is Air Force policy that the audio recordings of the voices of the mishap crew are not releasable to the public due to the privacy interests of the crewmembers or the surviving family members.

5.9.3. If the recorded voices of the mishap crew are incorporated into an animation, simulation, or reenactment video which is not otherwise privileged, the video is provided to the AIB for investigative purposes.

5.9.4. Provide original films, videotapes, or animations created using only factual data to the AIB. This includes videotape recordings (VTR) of the HUD. Include copies of non-official videotapes or films made by individuals and return originals to the owner (these are personal, private property). Ensure the documents are appropriately marked if classified.

5.9.5. If any SIB analysis was used to produce simulated, computer-generated, animated, or re-enacted portions of a mishap flight, those products are privileged. Do not release them to the AIB.

5.9.6. Provide a complete list of all witnesses to the AIB regardless of whether the statements of the witnesses were in the safety report. Do not indicate which witnesses were offered a promise of confidentiality. Include contact information such as addresses and

telephone numbers. Provide the names of witnesses to the AIB only after the SIB has completed all interviews of the witnesses (Contact HQ AFSEC/JA for guidance in unusual mishaps where the SIB may release witnesses to the AIB before completing interviews of all witnesses).

5.9.7. Notify the AIB in writing if any aircraft parts have not been returned from AF or contractor laboratories and provide the AIB with contact and tracking information so they may retrieve the parts or track their location.

5.9.8. Release medical information as discussed below. Properly label and protect information subject to the Privacy Act or HIPAA. Do not release medical analyses by the SIB. Do not release medical interview narratives gathered by ISB or SIB members if a promise of confidentiality was offered. Release the following medical information to the AIB BP or Legal Advisor separately from other evidence:

5.9.8.1. Non-privileged factual photos showing human remains and the autopsy.

5.9.8.2. Original toxicological test results, coroner's or autopsy reports, and death certificates. If originals are not available, copies may be used.

5.9.8.3. Medical records, dental records, and other pertinent medical information.

5.9.8.4. Factual post-mishap radiographs (X-ray, MRI, CT Scan), factual lab reports (including toxicology), and factual post-mishap physical examinations (SF88, Medical Record – Report of Medical Examination and other appropriate factual medical documentation).

5.9.8.5. 72-hour and 14-day medical histories may or may not be privileged. If not obtained with the promise of confidentiality, 72-hour and 14-day medical histories will be handed over to the AIB.

5.9.8.6. If the AIB convenes without a medical officer, return all medical records and HIPAA protected medical information to the medical facility responsible for maintenance of this information. The AIB can request access to medical records and HIPAA protected medical information through the Military Treatment Facility (MTF).

5.9.9. See paragraph 6.4.4.17 and AFI 91-204, Chapter 5, for additional information on coordinating with the AIB.

5.10. Mortuary Affairs. Provide copies of any records or materials required or used in the identification process and copies of requested photographs of the deceased to the mortuary officer. Either the Armed Forces Medical Examiner System (AFMES) or the local medical examiner may generate these products. HQ Air Force Personnel Center (AFPC)/MPCCM carefully controls and maintains these documents on permanent file.

Chapter 6

REPORTS AND BRIEFINGS

6.1. Mishap Reporting.

6.1.1. The following reports and messages are required IAW AFI 91-204, Chapter 6:

6.1.1.1. 24-Hour (Preliminary) Message. For Class A and B mishaps, drafted and input into AFSAS by the mishap wing or the ISB. Fully releasable and non-privileged, it will contain factual information only and will not contain safety-protected or privileged safety information such as speculation as to why the mishap occurred, privileged witness statements taken from mishap participants, etc. **Note:** This report is independent of OPREP reporting requirements and timelines.

6.1.1.1. **(AETC)** For Class A and B preliminary messages, mishap wing or ISB will designate AETC as the Convening Authority in AFSAS and will select the checkbox next to "Air Education and Training Command (AETC)" under the "Optional Approval" section to route preliminary message to HQ AETC/SEF for approval.

6.1.1.2. 10-Day Status Message. For Class A and B mishaps, this is usually the first privileged report released by the appointed SIB. The intent is for the SIB to communicate the status of the investigation and to relay any pertinent information, privileged or not, that the SIB deems necessary to report at this time.

6.1.1.3. Final Message. Upon investigation completion for any class of mishap, this message is input into AFSAS and provides a narrative of the mishap/event sequence, states the mishap cause, and recommends preventive actions. It contains the investigation, analysis, and conclusions of the SIB or SIO. It is written so the reader clearly understands how the findings and causes were determined and clearly states who or what was found causal in the mishap sequence and the procedures (if applicable) taken to mitigate future occurrences. The final message is privileged.

6.1.1.3.1. For Class A and B mishaps, Tab T sections T2, T3, T4, T5, T6, and T7, minus any pictures, figures, or diagrams, will become the narrative section of the final message. Ensure all narrative references to any pictures, figures, and diagrams have been deleted. Additionally, the report shall not refer to any portion of the formal report (e.g., "see Tab W"), nor refer to persons/companies/products mentioned by specific name (rather use references such as: mishap pilot, original equipment manufacturer, prime/sub-contractor, abraidable coating, etc.). Only plain text (no bolding or italics) formatting will be used and all acronyms will be spelled out when first introduced due to the stand-alone nature of this message.

6.1.1.3.2. When entering mishap message narrative data in AFSAS for other than Class A or B mishaps, follow the format in Attachment 5, Class C/D/E Sample Report Format.

6.1.1.3.2. **(AETC)** When preparing final messages for Class C/D/E investigations, select the checkbox next to "Air Education and Training Command (AETC)" under the "Optional Approval" section to ensure HQ AETC/SEF reviews message prior to release..

6.1.1.4. Timeline extensions and Status Messages. If the SIB/SIO was granted a timeline extension, a status message is still required at the end of 30 days (and every 30 days after that until the investigation is complete). If the investigation cannot be completed within the 30 day period or for timeline exemptions as noted below in paragraphs 6.1.1.4.1. and 6.1.1.4.2., the SIB/SIO will request an extension from the CA. The SIB/SIO will annotate the extension and who it was approved by (office symbol) in each status message.

6.1.1.4. **(AETC)** When preparing status messages for Class C/D/E investigations, select the checkbox next to "Air Education and Training Command (AETC)" under the "Optional Approval" section to ensure HQ AETC/SEF reviews message prior to release.

6.1.1.4.1. When an engine or engine module is processed through depot maintenance using the Joint Deficiency Reporting System (JDRS), the final report due date is initially extended to 90 days for Class B, C, and D mishaps. 30-day status messages are still required in AFSAS. All subsequent extensions require CA approval and regular status message updates.

6.1.1.4.2. For all classes of RPA mishaps, investigations should be completed within 45 days if the mishap occurred in the CONUS or 60 days if the mishap occurred at an OCONUS deployed location. 30-day status messages are still required in AFSAS.

6.1.1.5. Formal reports. A formal report contains all applicable Tabs (A-Z) and is uploaded into AFSAS as one individual .pdf file per tab. A detailed explanation of each tab's contents and OPRs is found in paragraph 6.4. Exceptions to the single .pdf file per tab rule can be found in paragraph 6.4.3.1. SIBs will ensure that files uploaded to AFSAS are not password protected. See paragraph 6.4.2. for formal report and tab waiver procedures.

6.1.1.6. One-liner. The one-liner should be a brief statement that provides a quick synopsis about the mishap that can be used for database queries in AFSAS (i.e., what happened, what was damaged/broken/injured, and what was the outcome). When entering the one line description into AFSAS, ensure it contains no safety privileged information and is strictly a factual description of the event. Example of a non-privileged one-liner: Aircraft Right Landing Gear Collapsed On Landing; No Injuries (simply describes the facts of the mishap, contains no analysis).

6.1.2. Changes to Reports. For Class A and B or other mishaps where a formal report is prepared, only the primary members of the safety board can make changes to the formal report or the SIB final message. This includes the report narrative, findings, causes, recommendations, and other findings and recommendations of significance as determined by the SIB. Concerns and issues raised by the CA will be considered during the review process to produce the MOFE via the CA's comments message input into AFSAS. If the CA determines the final SIB message or formal report needs to be changed after it is completed and signed by the board, the BP or IO will coordinate changes with all the primary members of the SIB. For changes to reports as a result of AFSEC/SEFO final message rejections, see paragraph 6.7.1.6.

6.1.2.1. For Class C and D mishaps and Class E events, convening authorities and MAJCOM safety staffs may make non-substantive changes to the reports to improve

quality and ensure a thorough investigation. However, the intent of findings, causes, recommendations, or the SIB's deliberations will not be changed in this process.

6.1.3. Rejecting Reports. Reports will be rejected through AFSAS if they do not meet the requirements of AFI 91-204 and this AFMAN. AFSEC and MAJCOM/SE have the authority to reject all classes of reports. Additionally, Class B, C, D, and E reports can be rejected by the NAF/SE unless investigative authority was retained at the MAJCOM.

6.1.4. For Class A and B mishaps, SIBs will forward draft copies of Tab T and Tab Y (as soon as available) to the CA/SEF for review. Additionally, for Class A and B mishaps that are supported by AFSEC (on-site or telephonically), SIBs will forward draft copies of Tab T and Y to HQ AFSEC/SEF for review. The target day for this review should be on or before day 25 of the investigation. Delays beyond this are an indication the SIB should consider requesting an extension from the CA. This review is solely for quality control purposes. The SIB should allow two duty days for the CA/SEF and HQ AFSEC/SEF review and comments and at least two days to address the recommended changes if they are substantial. Quality control will determine if the conclusions reached are adequately substantiated in the narrative and that the findings, cause(s), and recommendation(s) are subsequently supported and comply with the requirements of AFI 91-204 and this manual. Reviewing safety specialists are to provide suggestions for accuracy and effectiveness and will not supersede the judgment of the SIB/SIO or mandate changes to the report, findings, recommendations, etc. Other than AFSEC involvement, the investigation will not be staffed outside of the CA safety office during this review process.

6.1.4.1. When e-mailing information that contains privileged safety information (e.g., draft reports/findings to CA or AFSEC for review, specific mishap related questions to the AFLCMC for their analysis, etc.), all privileged attachments must be password protected and the e-mail should be encrypted if the capability exists. Send the applicable password in a separate message or by another mode of transmission. Another option is to use the file sharing function of AFSAS, in which case files do not need to be password protected. As a last resort, fax the document ensuring that the recipient will receive the faxed document immediately upon receipt.

6.1.5. Unless delegation is withheld by higher authority, the mishap wing commander or designated representative is normally the CA for Class C and D mishaps and Class E events.

6.1.6. The SIB should write an unclassified report if possible. If any portion of a safety report contains classified information, the SIB is responsible for marking all documents, including Secure Internet Protocol Router (SIPR) message traffic, IAW classification rules. Ensure the proper security classification markings from AFI 31-401, *Information Security Program Management,* are applied. All appropriate security requirements must be met in the handling and shipment of classified data. Consult the servicing wing's information security officer or intel unit for assistance with determining marking requirements such as: Original Classification Authority, Declassify On date, and Classification Rule when the material is not derivatively classified.

6.2. AFSAS.

6.2.1. AFSAS is the primary means for distributing messages. If AFSAS is not available or not appropriate due to classification, safety reporting will be via secure, encrypted e-mail. If

the mishap is classified, release via secure means to the MAJCOM/SE, AF/SE, COMAFFOR/SE (if applicable), recommendation office of primary responsibility (OPR), and other agencies that have a need to know.

6.2.1.1. Investigators will need an AFSAS account to accomplish safety messages. Contact the CA safety office for access.

6.2.1.2. AFSAS login is available at **https://afsas.kirtland.af.mil/Home.do**.

6.2.1.3. Reference the AFSAS Guide, which can be accessed in AFSAS under the "Help" top menu tile. Additional AFSAS help is available through the AFSAS Help Desk by phone (DSN 263-8200 or Comm 505-863-8200) or via email (**AFSASHelpdesk@kirtland.af.mil**).

6.2.1.4. AFSAS mishap number. The AFSAS mishap number is vital to tracking safety reports. The AFSAS number should be referenced on all related correspondence, Joint Deficiency Reporting System (JDRS), and endorsements. The AFSAS mishap number is a randomly generated six digit number assigned to a mishap report upon initiation in the AFSAS database.

6.3. Life Sciences Safety Reporting.

6.3.1. Report aeromedical, AFE, egress, injury, injury mechanisms, and human factors related to a mishap as life sciences safety information. Life sciences safety information is required for all classes of mishaps and events for all involved personnel (those who are injured or whose actions or inactions contributed to the mishap sequence).

6.3.1.1. Complete physical exams must be performed and documented in the Armed Forces Health Longitudinal Technology Application (AHLTA) or other electronic medical record for all involved personnel for all Class A manned mishaps. A post mishap AF IMT Form 1042, *Medical Recommendation for Flying or Special Operational Duty*, is required to be completed after all mishaps per AFI 48-123, *Medical Examinations and Standards*. Physical examinations for other mishap and event classes may be focused physical exams appropriate for the mishap. The extent of these examinations is at the discretion of the ISB medical officer (or SIB medical officer if there is no ISB). Do not put privileged safety information into these medical records.

6.3.1.2. For RPA mishaps, directed post-mishap medical history, 72-hour and 14-day history, examination, and toxicological testing are only mandatory for the RPA crew or associated personnel (including instructors or evaluators performing "over the shoulder" duties and technicians who performed maintenance or troubleshooting on the ground control station) which operated the RPA during and immediately preceding the mishap sequence. This is defined as the last two crews to operate the aircraft. This does not negate a commander's prerogative, IAW AFI 91-204, Chapter 2, to test any other person involved whose actions or inactions, in their judgment, may have been factors in the mishap.

6.3.1.3. Most USAF medical facilities have personnel with additional life sciences expertise (AOP officers, psychologists, etc.) who are valuable resources for ensuring accurate interpretation of life sciences safety information. These individuals should be

consulted to support aviation safety investigations unless they have close connections with mishap personnel.

6.3.2. Life sciences information is reported in Tab T and Tab Y of the formal report in AFSAS.

6.3.3. For mishaps and events without a formal report, report life sciences information by populating the appropriate life sciences data fields in AFSAS.

6.3.4. Classifying Injuries: See AFI 91-204 Attachment 1, Terms, for definitions of injuries.

6.3.5. Report Class E Physiological Events per paragraph 1.3.2.1. Include lab test results and toxicological test results (when determined necessary by the commander or flight surgeon) for involved personnel. For decompression sickness/evolved gas disorders, trapped gas disorders, and in-flight incapacitation, also include a 72-hour and 14-day history.

6.3.5.1. The AF flight surgeon/AOP officer responding to the physiological event will assist with the report. In situations where an AF physician does not initially treat the mishap individual, the AF flight surgeon with final aeromedical disposition of the case will assist the investigator.

6.3.5.2. Any AFE failure or malfunction contributing to a physiological mishap must be documented in the formal report and AFSAS. Describe corrective action taken as appropriate.

6.3.6. Consider human factors from individual human performance, supervisory, and organizational influence perspectives. The SIB identifies human factors IAW DoD Human Factors Analysis and Classification System (DoD HFACS) in AFI 91-204 Attachment 6. Medical officers and human factors representatives are tasked with accomplishing the human factors narrative. The human factors analysis is not limited to crew actions but should consider all personnel involved in fielding, training, supervising, and maintaining aircraft systems. The human factors conclusions must reflect the SIB consensus.

6.4. Formal Reports.

6.4.1. General Information. Formal reports present both factual and analytical information for Class A and Class B mishaps. The SIB normally produces a formal safety report with two parts: Part 1, Facts, and Part 2, Board Analysis, Conclusions, and Privileged Material. If an out-brief is required, it will be uploaded to Part 3. Part 4 is the Classified Annex, if required.

6.4.1.1. Part 1, Tabs A – S, contains factual non-privileged information collected and used in support of the Safety Investigation. The finalized tabs of Part 1 are produced for safety purposes. The SIB will conform to this manual in creating Part 1 tabs and will only provide finalized tabs to the AIB.

6.4.1.2. Part 2, Tabs T – Z, contains the privileged portions of the formal report as well as portions that are protected for other reasons (proprietary, International Traffic in Arms Regulations (ITARS), HIPAA, etc.). Disclosure outside Air Force safety channels requires proper authorization and sanitization IAW AFI 91-204, Chapter 3, and other applicable guidance. See paragraph 6.4.5.11. for exceptions in Tab Y.

6.4.1.3. Part 3 will only contain the final version of the out-brief to the CA and a version of the out-brief with proprietary and privacy act information removed (if available).

6.4.1.4. Classified Appendices. If at all possible, safety reports should be written as unclassified. However, if classified information is relevant to the mishap, contact the CA for assistance in properly marking documents. The classified appendices must use the same formatting as the unclassified tab. Ensure the non-classified tabs reference the classified appendices. **Note:** classified information will not be entered into AFSAS; however, it will be sent to HQ AFSEC/SEF. All appropriate security requirements must be met in the handling and shipment of classified data.

6.4.2. Formal report/tab waivers. AF/SE is the waiver approval authority for formal reports. Formal report waivers are processed through AFSAS. A formal report waiver does not relieve the SIB/SIO of their responsibility to conduct a thorough investigation and write a comprehensive final message. Investigations with no data for certain tabs (except Tab T and Tab Y) do not require waivers for those tabs (e.g., the aircraft was not equipped with a flight data recorder, hence no data was available for Tab L). However, the SIB will include a memorandum in the tab signed by the SIB BP documenting why no information was included and upload it into the appropriate tab in AFSAS. Tab T is always required unless the entire formal report is waived. If a SIB determines human factors were not applicable to a mishap and no Tab Y is required, the SIB will request a waiver in AFSAS and provide supporting justification using the tab waiver feature.

6.4.2.1. SIBs will forward their requests for waivers to formal reports/tabs through their CA to HQ AFSEC/SEF using AFSAS. SIBs must continue preparation of a formal report until receipt of AF/SE approved waiver. Include the following information to clearly satisfy the waiver criteria:

6.4.2.1.1. Known and documented material deficiencies with established corrective actions. The formal report/tab may be waived if properly justified by the SIB/SIO. This waiver is not automatic and is determined on a case-by-case basis.

6.4.2.1.1.1. In AFSAS, state the materiel characteristics or mishap attributes that were similar to previous mishaps. Summarize any technical analysis done and upload supporting documentation. Provide AFSAS numbers of similar mishaps. One prior occurrence does not generally constitute a known deficiency.

6.4.2.1.1.2. In general, a corrective action is considered established if it is funded or was considered for funding but consciously unfunded (accepted risk) by the appropriate decision authority. State the corrective action, including reference information (e.g., Time Compliance Technical Order (TCTO) number), and the organization responsible for implementing the action. State the status of the corrective action and the implementation plan or progress, as applicable. Additionally, reference AFSAS numbers of previous mishaps showing this is a known failure mode, with corrective action in place, or accepted risk.

6.4.2.1.2. Engine-Confined FOD. A mishap in which an aircraft or RPA engine experiences reportable foreign object damage (Class D or higher) that is confined to the engine and integral engine components. Damage is considered FOD if it is caused by inanimate objects external to the engine (e.g., rocks, tools, safety wire, ice,

etc.). Damage is considered confined to the engine if there is less than Class D damage external to the engine. If the total cost of all damage external to the engine is equal to or greater than the Class D upper damage cost threshold, then the mishap is not engine-confined.

6.4.2.1.2.1. Although a formal report is not required, use the waiver process in AFSAS to provide supporting documentation. Within the waiver request, summarize any technical analysis performed and upload supporting documentation into AFSAS to confirm the engine-confined FOD.

6.4.2.2. Only by exception, with strong justification from the SIB, will a formal report waiver be granted without fully satisfying either of these criteria (known material deficiency or engine confined FOD). Elapsed time since the mishap or the anticipated quality of the final message will not be considered in the approval process.

6.4.3. Assembling The Formal Report. The formal report will be assembled from the various tabs that the SIB/SIO uploads into AFSAS. The following instructions will be followed in the production of the electronic tabs. Each tab file within the formal report will be a single .pdf file containing all information for that tab. For example, Tab R will be an individual .pdf document of all the releasable witness testimonies with proper formatting and annotations as defined in this manual. Ensure tabs uploaded into AFSAS are not password protected.

6.4.3.1. Exceptions to the single .pdf file per tab rule are:

6.4.3.1.1. Tab L may contain digital data files (e.g., RPA data logger files). **Note:** if uploading multiple files, do not use the term "AFSAS" in the Tab L table of contents for the location of the respective files (e.g., "See Attachment L1.1. Data Logger Files.xls.").

6.4.3.1.2. Tabs S (non-privileged) and X (privileged) may contain pertinent videos and/or final versions of animations. Ensure that files are named so the reader can quickly understand what the file contains (e.g., LandingAnime.wmv rather than OS1234.wmv). Do not upload pictures as individual files in Tabs S or X. If the SIB desires to keep the original format of the photos, use the Adobe Portfolio option within Adobe to consolidate individual files into a single .pdf tab. **Note:** if uploading multiple files, do not use the term "AFSAS" in the Tab S table of contents for the location of the respective files (e.g., "See Attachment S4.1. Non-privileged Animation.wmv.")

6.4.3.1.3. Tab U will contain the complete audio/video files for pertinent interviews that are only partially transcribed.

6.4.3.2. Tab Format. Use Times New Roman, 12 point, for text documents. Use past tense throughout. Set top, bottom, and side margins to 1.0 inch. Set header margin to 0.5 inches and ensure the following appears on each page of the report in the header block: "Aircraft Type, Aircraft Serial Number, Class, Date, and AFSAS number" (e.g., F-15C, 85-1717, Class A, 10 February 2009, AFSAS #123456). The header will be in 10 point Times New Roman, italicized and page centered.

6.4.3.2.1. Place a footer on each page in Part 2 of privileged safety reports using the *Privilege Warning Statement* from AFI 91-204 Attachment 3.

6.4.3.2.2. Place the appropriate statement in the footer on each page for all tabs containing FOUO IAW AFI 31-401 or Privacy Act information IAW AFI 33-332, *Air Force Privacy Program*.

6.4.3.2.3. The best way to produce each tab is to use the templates found on the AFSEC Portal page (found on the AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support). See paragraphs 6.4.4. and 6.4.5. for what is required in order to complete each individual tab.

6.4.3.2.3.1. Download the templates for each individual tab.

6.4.3.2.3.2. Do all work on the tab template as a Word document.

6.4.3.2.3.3. Copy and paste Word documents (Tab R and Tab U transcribed interviews, Tab T, etc.) directly into the applicable portion of the tab template. This will work for e-mails as well. Copy the e-mail and paste into the document.

6.4.3.2.3.4. For hard copy documents such as the pilot's training folder for Tab G, the orders appointing the SIB for Tab A, the aircraft maintenance records for Tab D, engine analysis received from the manufacturer for Tab W, etc., scan the document as a .jpg and insert (Insert>Picture>From File) into the tab template at the appropriate location. Ensure the scanner function is set to the highest resolution possible.

6.4.3.2.3.5. Photos, as well as other .jpg files, can be inserted directly into the .pdf tab by using Insert/Picture. Make sure not to compress photos so that the quality of the photo becomes grainy or unusable.

6.4.3.2.3.6. Tabs Created in Single (in-line) .pdf Format: When finished, add page numbers and build the finalized Table of Contents for each tab. Number all pages in order within the tab. Center page numbers at the bottom of each page. Pages should be numbered consecutively through each tab. Numbering will be the tab letter followed by a hyphen and the page number (e.g., J-1, J-2, J-3, etc., or U-1, U-2, U-3, etc.). Number the page even if there is only one page in the tab.

6.4.3.2.3.7. Tabs Created in .pdf Portfolio Format: When finished, build the finalized Tab Header with Table of Contents for each tab. Name each tab file according to the name used in the Tab Header (e.g., "D2. AIRCRAFT AFTO 781 FORMS"). For Tabs that have 2nd level contents (e.g., "K2.1. FORM F WEIGHT AND BALANCE"), create sub-headers and insert them within the Portfolio at the appropriate location. If a file is not in a .pdf-convertible format or the SIB desires to keep the source document within the Portfolio (e.g., a Flight Data Recorder spreadsheet), be sure to create the Portfolio and then convert each document to .pdf that needs to be converted.

6.4.3.3. Sample Tabs (A through Z) and Tab Headers (for .pdf Portfolio format) are available in AFSAS and can be found on the AFSEC Portal page (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support) and will be used as the template for the formal report.

6.4.4. **Formal Report Part 1 Contents. Factual Information and Releasable Material.**

6.4.4.1. Tab A. Safety Investigator Information.

6.4.4.1.1. A1. Orders appointing SIB. Include one copy of the orders appointing the SIB or SIO. The orders must contain the SIB position, full name, rank/grade, organization, assigned base, and whether they are a primary or secondary for each appointed person. Do not include administrative specialists or SIB observers on SIB orders.

6.4.4.1.2. A2. Contact Information for SIB members and all technical advisors who participated in the SIB. Include DSN and commercial telephone numbers and e-mail addresses for all SIB members and advisors. Use "permanent" rather than TDY contact information.

6.4.4.1.3. A3. SIB Presidents/SIOs will ensure everyone working on their team is briefed on the restriction that all information, privileged or not, collected by safety investigators is not releasable outside safety channels except in accordance with this instruction or upon approval of the CA. The SIB President/SIO is the final point of release for all information (including electronic/digital media, photographs, etc.) from the safety investigation. Every member of a SIB will sign the memorandum at AFI 91-204 Attachment 3, *Memorandum Documenting Guidance to Investigators on Controlling Information*, acknowledging the guidance and restrictions. Additionally, include non-disclosure agreements for all technical advisors or additional members that do not sign the memorandum at AFI 91-204 Attachment 3.

6.4.4.1.4. The Investigating Officer and Recorder complete this tab.

6.4.4.2. Tab B. This tab is currently not used for aviation mishap investigations.

6.4.4.3. Tab C. This tab is currently not used for aviation mishap investigations.

6.4.4.4. Tab D. Maintenance Report, Records, and Data.

6.4.4.4.1. D1. Use AF IMT Form 711C, *Aircraft/UAV Maintenance and Materiel Report*, for Class A, B, and C Aircraft and RPA mishaps if a formal report is prepared. Use one form for each aircraft or RPA involved.

6.4.4.4.2. D2. Aircraft Air Force Technical Order (AFTO) Forms 781. If they add to the report, include copies of the AFTO Form 781K, *Aerospace Vehicle Inspection, Engine Data, Calendar Inspection, and Delayed Discrepancy Document*, and any other AFTO 781 series form, or provide a factual summary of the information contained in them. Do not simply state that review of maintenance documentation determined it was or was not a factor in the mishap. 781 data is also archived in the G081/Mobility Air Force Logistics Command & Control (G081/MAF LOG C2) and other electronic data storage systems. Ensure this data is reviewed as well as existing 781 series forms. Include copies of the following if they add to the report:

6.4.4.4.2.1. AFTO 781A, *Maintenance Discrepancy and Work Document*.

6.4.4.4.2.2. AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance Document*.

6.4.4.4.3. D3. Additional aircraft maintenance records that add to the report.

6.4.4.4.4. D4. Maintenance records from other involved equipment. Include records from equipment such as AGE, fuel servicing equipment, etc., if they were factors in the mishap.

6.4.4.4.5. The Maintenance Member completes this tab.

6.4.4.5. Tab E. This tab is currently not used for aviation mishap investigations.

6.4.4.6. Tab F. Weather and Environmental Records and Data.

6.4.4.6.1. F1. Weather briefings provided to flight crews. Include a copy of the actual flight crew weather briefing if available.

6.4.4.6.2. F2. Actual weather observations and conditions for the event. Include weather radar data, Automated Terminal Information System (ATIS), and other appropriate weather data if available.

6.4.4.6.3. The Pilot Member completes this tab.

6.4.4.7. Tab G. Personnel Records.

6.4.4.7.1. G1. Flight Records. Include a copy of the flight record pages (Individual Flight Data and Flying History Report) showing the most recent flight time in all aircraft the individual was qualified in and the grand total time. Do not include the mishap flight time. The record should be closed out as of the mishap date. Include a recap of sorties and hours flown in the last 30, 60, and 90 days. Add an additional breakout by "Flight Time Categories" (primary/secondary/instructor/etc.) and "Flight Condition Time" (night/instrument/night vision goggle/etc.). Use the "Flight Time Categories" and "Flight Condition Time" as defined in AFI 11-401, *Aviation Management*.

6.4.4.7.2. G2. Flight evaluation and training records. Include a copy of the Record of Evaluation (AF Form 942) from the flight evaluation folder. Also include a summary of pertinent training records if flight crewmembers are students, were recently upgraded in their crew position, or it adds to the report.

6.4.4.7.3. G3. Maintenance training records if maintenance was a factor in the mishap.

6.4.4.7.4. G4. Other personnel evaluation and training records. Include these if they were factors in the mishap. Examples could include records from personnel in career fields such as Air Traffic Control, Airfield Management, Crash-Fire-Rescue, etc.

6.4.4.7.5. The Pilot Member and/or Maintenance Member completes this tab as applicable.

6.4.4.8. Tab H. Egress, Aircrew Flight Equipment (AFE), Impact, and Crashworthiness Analysis. This analysis is accomplished by the AFE member or technical experts and is not a product of the SIB's deliberative efforts. Privileged analysis regarding AFE, egress, impact, and crashworthiness will be included in Tab T in Part 2.

6.4.4.8.1. H1. Egress Analysis. This analysis is accomplished by an egress systems specialist if aircrew egress may have been attempted, was attempted, or was completed.

6.4.4.8.2. H2. AFE Analysis. Include a detailed evaluation of performance of AFE and protection systems as they pertain to the injuries. Reference the egress specialist's report and identify, where possible, specific injury mechanisms as a result of AFE. If there were no injuries due to AFE, simply state so.

6.4.4.8.3. H3. Impact Analysis. Include technical specialist analysis of impact, wreckage, and burn patterns at the crash site, if applicable.

6.4.4.8.4. H4. Crashworthiness Analysis. Include technical specialist analysis as needed. Ejection seat equipped aircraft typically do not need this evaluation.

6.4.4.8.5. The AFE Member completes this tab if applicable.

6.4.4.9. Tab I. Deficiency Reports. Include all DRs or equivalent submitted in conjunction with the mishap investigation. Include a copy of the submitted DR report containing the following information: Report Control Number (RCN), Cognizant Official, name of part (nomenclature), and part number.

6.4.4.9.1. The Maintenance Member completes this tab.

6.4.4.10. Tab J. Releasable Technical Reports and Engineering Evaluations.

6.4.4.10.1. Technical support to the SIB will typically come from two sources, the manufacturer/contractor that designed, built, or maintained the equipment (such as GE, Lockheed Martin, etc.) and from DoD military/civilian personnel (Air Logistics Complex (ALC), System Program Office (SPO), AF Labs, etc.). AFI 91-204 Attachment 4 provides a suggested format for Tab J reports.

6.4.4.10.2. If DoD military/civilian personnel provided written reports or on-scene evaluations, include them in this tab. Do not provide them a promise of confidentiality. Instead, DoD personnel sign the *Safety Investigation Non-Disclosure Agreement* (AFI 91-204 Attachment 3) that is kept on file with the SIB.

6.4.4.10.3. Factual reports or information provided by a contractor/manufacturer without a promise of confidentiality are also placed in this tab. The SIB will ensure they sign the *Memorandum for Contractor Representatives Serving as Technical Experts to Safety Investigations* (AFI 91-204 Attachment 3) and it is on file with the SIB, but it does not need to be included in Tab J.

6.4.4.10.4. SIBs/SIOs should make every effort to have their technical experts (government or contractor) write a non-privileged report for Tab J. Technical experts are included in all SIB proceedings; therefore, access and exposure to privileged information during the investigation is routine. However, technical experts may not use privileged information in a Tab J non-privileged report. Tab J reports are factual and should detail observations (what parts are bent, broken, or burned, etc.), analysis (whether it happened before, during, or after the mishap, and how), conclusions (effect on system function, etc.), and recommendations (methods to prevent the observed condition from re-occurring, etc.). Analysis, conclusions, and recommendations will be based on physical evidence, other factual data, and statements made without a promise of confidentiality. Do not include any opinion as to whether or not a particular failure contributed to or caused the mishap, i.e., these reports will not state that certain systems or parts "did or did not cause the mishap."

This does not preclude stating a conclusion that a failure would likely create a certain condition, even if the mishap was inevitable under such a condition. For example, a conclusion could be expressed that a widget failure would have caused trim to move to the full nose up position, without making the connecting statement that such a trim position would inevitably cause a crash. Analysis that includes or was based on privileged information (e.g., privileged witness testimony, board deliberations, etc.) or includes speculative opinion of the mishap cause by the technical expert is considered privileged and will be placed as an addendum in Tab W. The SIB will determine what caused the mishap, and that will appear in Tab T. The SIB/SIO will thoroughly review all Tab J reports to ensure they do not contain and are not based upon privileged information. For questions contact AFSEC/SEFF, DSN 246-1404.

6.4.4.10.4.1. Prior to placing any reports completed by contractors/manufacturers in Tab J, ensure they have identified whether the reports contain proprietary or arms export controlled information. If this type of information is present, ensure that the contractor has indicated which portions are so protected from public disclosure.

6.4.4.10.4.2. When the SIB requests analysis of a part at the ALC or contractor facility, provide disposition instructions for the component after completion of analysis. Normally, the component should be returned and placed with the rest of the wreckage.

6.4.4.10.4.3. Ensure none of the information/reports/analysis in Tab J is marked with the Privileged warning as found at AFI 91-204 Attachment 3 *Privilege Warning Statement*.

6.4.4.10.4.4. The Investigation Officer and Maintenance Member complete this tab.

6.4.4.11. Tab K. Mission Records and Data.

6.4.4.11.1. K1. Flight Plan and Flight Orders. DD Form 175, DD Form 1801, Military Flight Plan, or authorized substitute flight plan forms. Include flight orders of the pilot or crew if prepared. Include a passenger manifest if the mishap aircraft was carrying passengers during the mishap flight. If there was no manifest, provide a list giving the complete name and grade of all crew and passengers.

6.4.4.11.2. K2. Aircraft Weight and Balance. Include DD Form 365-4, Weight and Balance Clearance Form F-Transport/Tactical. Include a copy of the weight and balance computations on file for the flight involved. If the SIB prepared a separate weight and balance form using available data to determine weight and center of gravity (CG) at the time the mishap occurred, do not include it here. Instead, place it in Tab V of the report.

6.4.4.11.3. The Pilot Member completes this tab.

6.4.4.12. Tab L. Factual Parametric, Audio, and Video Data from On-board Recorders.

6.4.4.12.1. L1. Parametric Data. This can include, but is not limited to, Crash Survivable Flight Data Recorders (CSFDR), Quick Access Recorders (QAR), Ejection Seat Data Recorders, and other on-board data sources. Relevant data should

be included. It is not necessary to upload the entire data run from the device. However, the entire electronic file will be given to the AIB, if applicable, as evidence. If additional digital data files are uploaded (in accordance with paragraph 6.4.3.), make a reference in the Tab L .pdf document. Do not upload classified information into AFSAS.

6.4.4.12.2. L2. Audio Recordings. Insert relevant audio recordings that are not privileged. If available, these should be included as digital audio files, preferably in a common format such as .mp3. If additional digital data files are uploaded (in accordance with paragraph 6.4.3), make a reference in the Tab L .pdf document. A Privacy Act Warning Statement will accompany all recordings of voice communications. Do not upload classified information into AFSAS. Do not include transcripts in this tab; they will be in Tab N.

6.4.4.12.3. L3. Video Recordings. Some aircraft and RPA GCS have devices that record flight displays and voice communications. If available, these should be included as digital video files, preferably in a common format such as .mpg. If additional digital data files are uploaded (in accordance with paragraph 6.4.3), make a reference in the Tab L .pdf document. A Privacy Act Warning Statement will accompany all recordings of voice communications. Do not upload classified information into AFSAS.

6.4.4.12.4. L4. Reports generated using parametric data. Data generated by the aircraft may be used for many purposes, such as structural integrity analyses and MFOQA. Standard, periodic analysis reports (e.g., fleet-wide trends) will be uploaded here. Analysis reports requested by the SIB for specific data (e.g., over-Gs by tail number or unstable approaches at a particular location) show the deliberative process and will be placed in Tab V.

6.4.4.12.5. The Maintenance Member completes this tab.

6.4.4.13. Tab M. Data from Ground Radar and Other Sources.

6.4.4.13.1. M1. Air Traffic Control Radar data and plots. Print ATC plots and include them if available and applicable to the mishap.

6.4.4.13.2. M2. Military Ground Radar, Airborne Warning and Control System (AWACS), and Telemetry Data. This data can be an invaluable aid to the investigator if available. As a reminder, if this data is altered based on SIB analysis or overlaid with other communications such as a separate voice recording, it is considered privileged SIB analysis and will be placed in Tab X. Coordinate with HQ AFSEC/SEFE and 84th Radar Evaluation Squadron (RADES) at Hill AFB (DSN 777-5251 or DSN 586-7900/Comm 801-586-7900) for availability of radar data to aid the investigation.

6.4.4.13.3. The Pilot Member completes this tab.

6.4.4.14. Tab N. Transcripts of Voice Communications. These are written transcripts of recorded aircraft-to-ground, aircraft-to-aircraft, or any other voice communications that aid the investigation. Limit the transcript to the conversation relevant to the mishap sequence of events and end the transcript when all damage and injury has occurred. Long

term search and rescue transmissions need not be included. Do not include actual voice recordings in Tab N.

6.4.4.14.1. N1. Cockpit Voice Recording Transcripts. Ensure that CVR transcripts do not include any internal communication that may divulge aircraft/weapons capabilities, employment/execution capabilities, read-backs/transmissions of messages from secure means, or other information which may be considered within the realm of For Official Use Only or higher classification

6.4.4.14.2. N2. Air Traffic Control Transcripts. ATC radio transmissions are recorded by control position and radio frequency. Safety investigators should request ATC recordings according to which aircraft transmissions, control positions, or specific radio frequencies are required. See AFI 13-204 V3, *Airfield Operations Procedures and Programs*, Chapter 5, for details about obtaining ATC recordings.

6.4.4.14.3. N3. Command and Control Transcripts. Transcripts of tapes from Command Posts and other Command and Control agencies that may aid the investigation. Do not post any material that was discussed, transmitted, or received via secure means in this section.

6.4.4.14.4. N4. Other available transcripts (e.g., Crash-net, Security Forces, civilian police/rescue forces, etc.).

6.4.4.14.5. The Investigating Officer and Pilot Member complete this tab.

6.4.4.15. Tab O. Any Additional Substantiating Data and Reports. Provide a listing of the documents or records reviewed by the SIB and their effective dates. They can include local operating instructions (OI), AFIs, T.O.s, Work Packages, directives, approach and landing charts, and other forms as applicable. Do not list specific pages referenced or include copies of pages; those will be included in Tab V1 as appropriate.

6.4.4.15.1. The Investigating Officer completes this tab.

6.4.4.16. Tab P. Damage Summaries.

6.4.4.16.1. P1. Environmental Clean-up Costs. Obtain these costs from the local civil engineering environmental section. The end cost of this type of clean-up may not be available inside the nominal 30-day investigation timeframe. Use the best estimate available at the time of the final message. Environmental clean-up costs include costs for:

6.4.4.16.1.1. Clean-up.

6.4.4.16.1.2. Environmental decontamination.

6.4.4.16.1.3. Restoration of private and government property.

6.4.4.16.2. P2. Non-DoD Property Damage Costs. Briefly describe the non-DoD property damage, but do not include estimated costs in Tab P. Include cost estimates in AFSAS only. Determine estimated non-DoD property damage costs using official estimates such as security forces reports, civilian police reports, or logistics readiness offices. Include the Statement of Damage to Private Property. The local JA office can assist in obtaining this statement.

6.4.4.16.3. P3. Itemized DoD Property Damage Costs. This certificate lists the total damage to all government property, materiel, and equipment. See AFI 91-204, Chapter 1, for damage cost guidelines. Provide a detailed statement that includes acquisition, replacement, or repair costs (as applicable) for all property, materiel, or equipment damaged. Include nomenclature and national stock number (NSN) if available. Do not include injury cost in the Certificate of Damage. This certificate is generated using costing data from the SPO.

6.4.4.16.3.1. Example Certificate of DoD Damage.

Table 6.1. Example Certificate of DoD Damage.

Item (Stock Number)	Cost
F-16D 90-XXXX	$16,200,000
Centerline Pylon (NSN XXXX-XX-XXX-XXXX)	$12,000
Flare Mod (NSN XXXX-XX-XXX-XXXX)	$1,500
30 X M206 Flare (NSN XXXX-XX-XXX-XXXX)	$880
Destroyed GMV (NSN: XXXX-XX-XXX-XXXX)	$9,500
Total Direct DoD Damage Cost	$16,223,880

6.4.4.16.3.2. Determining destroyed aircraft or RPA cost. The CA will consider an aircraft or RPA destroyed when the man-hours required to repair the aircraft or RPA exceed the maximum stated in the "major repair man-hours" column of T.O. 1-1-638, *Repair and Disposal of Aerospace Vehicles*. If the aircraft or RPA is destroyed, flyaway cost from AFI 65-503, *US Air Force Cost and Planning Factors*, Table A10-1, Unit Flyaway Costs, is used by Financial Management. Contact AFCAA/FMFF (DSN 222-6013, Comm 703-692-6013) for an official compilation of Table A10-1 data. Contact the System Manager to get the cost of all modifications done to the aircraft or RPA up to the mishap date. For aircraft and RPAs not listed, contact the appropriate System Manager for cost information.

6.4.4.16.3.3. A damaged aircraft or RPA not repaired is not necessarily a "destroyed" aircraft or RPA. The asset may still be required to be reported as “repairable.” The decision to not return a damaged aircraft or RPA to service is independent of the mishap class. When the aircraft or RPA will not be returned to service, classify the mishap damage according to the total estimated repair cost as if it had been returned to service. In this case, calculate repair cost IAW AFI 91-204, Chapter 1. If an aircraft or RPA will not be returned to service but is not considered destroyed, the SIB must submit itemized repair cost estimates through MAJCOM channels to HQ AFSEC/SEF for validation.

6.4.4.16.3.4. Only include direct costs when determining the cost of the mishap.

Direct mishap costs ONLY include property damage costs (DoD and Non-DoD), associated repair labor costs, and environmental cleanup costs. Classify the mishap repair cost according to the total estimated repair cost IAW AFI 91-204, Chapter 1. All other costs are considered indirect costs. Do not include indirect costs related to the mishap such as the TDY costs of the SIB, costs of recovery of the mishap aircraft to a site where the mishap investigation is conducted, costs of ISB members and mishap site support personnel, etc.

6.4.4.16.3.5. Do not include the cost of an "opportunity" upgrade or outstanding tech order compliance items performed in conjunction with the repairs. If a precautionary replacement is made due to the unknowns from the mishap event, it is an additional cost the AF must pay as a direct result of the mishap and should be included in the mishap cost. If the precautionary replacement is based on an observed condition that can be traced to deterioration over time and clearly disassociated from the mishap, it is an opportunity upgrade not related to the mishap and should not be included in the mishap cost. If the parts were returned to service, do not include them in the mishap cost. If a part is condemned as a result of the mishap, even though the part is undamaged, the cost of the part will be included in the cost of the mishap.

6.4.4.16.3.6. The Maintenance Member completes this tab.

6.4.4.17. Tab Q. AIB Transfer Documents. Include a memorandum from the SIB President to the AIB President regarding the location and disposition of all non-privileged evidence, wreckage, and components involved in the mishap sequence including items sent to an Air Logistics Complex or other locations for analysis and not returned to the SIB. The evidence disposition list should include the POC for the part and a phone number/email address. Additionally, the SIB will provide the AIB with a witness list that includes Name, Grade, Role in the Mishap (e.g., MP, etc.), Organizational Address, Duty Phone, and Date (of first interview). The mishap preliminary message, evidence disposition list, and witness list should be provided to the AIB and documented in Tab Q. For Class B mishaps, or Class A mishaps where no AIB is convened or the AIB President is not available, contact the CA staff judge advocate office for guidance on how to accomplish the transfer. Work through the CA Safety office for contact information. A sample transmittal letter can be found in the SIB Support Documents on the AFSEC Portal (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support). See paragraph 5.9 and AFI 91-204, Chapter 5, for coordinating the turnover to the AIB. The AIB will be responsible for final disposition of all material released to them by the SIB.

6.4.4.17.1. The Investigating Officer and Recorder complete this tab.

6.4.4.18. Tab R. Releasable Witness Testimony. Investigators take testimony from all individuals involved in the mishap and those who were witnesses to the mishap. Testimony includes both written statements and recorded interviews. Place testimony from individuals and witnesses that were not granted a promise of confidentiality in this tab. Pertinent recorded interviews placed in this tab will be completely transcribed verbatim. Do not include audio recordings in this tab.

6.4.4.18.1. Non-Privileged Interviews. For non-privileged interviews, whether written or recorded, all witnesses sign the form from AFI 91-204 Attachment 3, *Non-Privileged Witness Statement*. This only needs to be accomplished once for recorded interviews but must be done for ALL written statements whether initial or subsequent follow-up.

6.4.4.18.2. For recorded interviews ensure all interviewees are read the *Notice to Witness that Recorded Statement is not Confidential*, AFI 91-204 Attachment 3, and it is recorded and transcribed. This must be done for ALL recorded interviews whether initial or subsequent follow-up interviews.

6.4.4.18.3. It is not necessary to transcribe or publish all testimony. If the testimony does not provide any insight into the mishap, do not include it in Tab R, but provide it to the AIB. Place the statements and transcribed interviews from applicable witnesses together in chronological order starting with the first accomplished. The mishap participants are placed first followed by other witnesses.

6.4.4.18.4. 72-hour and 14-day histories can be either privileged or non-privileged. Include 72-hour and 14-day histories obtained without a promise of confidentiality in this tab. The non-privileged 72-hour and 14-day history form available as part of the AFSEC SIB Support documents includes a non-privileged witness written statement. If the 72-hour and 14-day histories are obtained via recorded interview, follow the procedures in paragraph 6.4.4.18.2.

6.4.4.18.5. The Investigating Officer completes this tab.

6.4.4.19. Tab S. Releasable Photographs, Videos, Diagrams, and Animations.

6.4.4.19.1. S1. Releasable Photographs. Do not upload pictures as individual files. A representative sample of well-defined non-privileged photographs can help in mishap documentation. Use them to show damage, impact areas, metal fractures, flight path, vehicle travel, etc. Only include photographs that aid in understanding of the mishap. Do not unnecessarily show evidence of human injury (e.g., bloody aircraft parts). If the SIB absolutely needs to disseminate an injury photo to illustrate the mishap, consider using a black and white photo if it will meet the needs of the investigation. Label each image to aid reviewers. Do not refer to privileged safety information on the page captions or in comments on the index. Where applicable, the title should include which direction the photograph is facing (e.g., Debris field looking to the west). Photographs are considered privileged if they are staged for the board's analysis and will be placed in Tab X. Pointing with a finger or other device at a portion of wreckage does not necessarily make the photograph staged. Depictions of cockpit indications for a given set of assumptions made by the SIB or described in witness testimony are staged photographs. Photographs of deceased personnel or injuries are not placed in Tab S due to their sensitivity. They can be placed in Tab Y if they support findings or recommendations. Medical pictures, however, can be given to the AIB.

6.4.4.19.2. S2. Releasable videos. Only upload non-privileged videos (e.g., videos shot by eye witnesses, etc.) relevant to the investigation (in accordance with paragraph 6.4.3) and make a reference in the Tab S .pdf document. Not all videos

received by the SIB will be relevant. All non-privileged videos will be handed over with other evidence to the AIB.

6.4.4.19.3. S3. Releasable Diagrams (e.g., Fallout, Impact Area, Route-of-Flight, etc.). Ensure diagrams are self-explanatory. Format of the tab is up to the SIB President. This tab can be accomplished using Civil Engineering plots, aerial photographs, topographical maps, etc. Include only those diagrams that add to the report. Indicate direction with a northward pointing arrow on each diagram. If practical, indicate scale. Ensure the diagrams do not depict the location of human remains. If they do, they should be placed in Part 2 (Tab Y2) to protect the privacy interests of the decedent's family.

6.4.4.19.4. S4. Releasable Animation. If applicable, include the final version of the non-privileged animation (in accordance with paragraph 6.4.3), and make a reference in the Tab S .pdf document.

6.4.4.19.5. The Investigating Officer completes this tab.

6.4.5. **Part 2. Board Conclusions and Non-releasable Privileged Material.**

6.4.5.1. Tab T. Investigation, Analysis, and Conclusions. The Tab T is the most important part of the report. The investigation and analysis in formal reports and final messages must support the findings and causes. Clearly show how findings and causes were determined and support the logic behind the recommendations. The Tab T draws on all of the other Tabs to provide a complete picture of what happened, how it happened, and why it happened. Analyze data collected from witness testimony, technical evaluations, and other information. Describe each area investigated and discuss its significance if it is a factor in the mishap. This section records the opinions of the SIB, and it either accepts or rejects scenarios or theories as to the causes and factors in the mishap. Only in the case of a minority report are there differing findings, causes, or recommendations. Summarize conclusions at the end of each factor or non-factor worthy of discussion. Use the guidance below for documenting the investigation and analysis. See Figure 6.1 for the Tab T format.

6.4.5.2. Boards need to pay particular attention to six critical aspects when developing the Tab T.

6.4.5.2.1. The investigation needs to be done in a sequential and consistent manner so all relevant facts are collected and analyzed before any conclusions are drawn. SIBs need to ensure the facts lead to the conclusion, rather than the other way around.

6.4.5.2.2. Assessing mishap factors, non-factors and non-factors worthy of discussion (NFWODs).

6.4.5.2.3. Thoroughly and accurately documenting the results of the investigation in the Tab T and the final message.

6.4.5.2.4. Developing concise findings (see AFI 91-204, Chapter 5).

6.4.5.2.5. Assigning "cause" at the correct points in the mishap sequence (see AFI 91-204, Chapter 5).

6.4.5.2.6. Developing well-considered recommendations, assigned to the correct OPR, to prevent recurrence (see AFI 91-204, Chapter 5).

6.4.5.3. Factors. A factor is any deviation, out-of-the-ordinary or deficient action, or condition discovered in the course of a mishap investigation that in the board's opinion contributed to the eventual outcome. Determining mishap factors (and eliminating non-factors) enables the investigators to focus the investigation from all the issues under examination to those specific areas that are significant in the mishap sequence. Mishap factors explain why causes, such as pilot error, supervision, or equipment failure occurred. Factors are not mutually exclusive but are often interrelated and in some cases influence each other. When applicable, include a discussion of related human factors. For example, in a spatial disorientation mishap include the human factors that contributed to the disorientation, such as channelized attention or distraction and how these were manifested. **Note**: The human factors codes in the Tab T, Tab Y, and AFSAS must all match. A partial listing of possible factors to consider in a mishap includes Supervision, Qualifications, Weather, Logistics, Maintenance, Mission Planning, Flight Discipline, Currency/Experience, Aircraft Design, Quality Assurance, Aircraft Forms Documentation, Maintenance Supervision, etc. Factors are the basis for findings and recommendations. Most mishaps involve multiple factors which may be causal or non-causal. Examples of non-causal conditions which could be considered factors:

6.4.5.3.1. Unit leadership failed to correct breaches of flight discipline by unit personnel other than the mishap pilot, leading the pilot to attempt an unauthorized maneuver ("Unit supervision was a factor in the mishap").

6.4.5.3.2. Deteriorating weather conditions resulted in a rushed, inadequate preflight, and the mishap flight engineer failed to ensure an engine cowling was properly secured ("Weather was a factor in the mishap").

6.4.5.3.3. Mishap crewmembers' sleep was interrupted several times during the night by a loud party, and their subsequent poor performance could be at least partially attributable to fatigue ("Inadequate billeting and crew rest were factors in the mishap").

6.4.5.4. Non-Factors Worthy of Discussion. NFWODs typically fall into one of three categories: areas uncovered during the investigation that did not cause the mishap or influence the outcome but that should be fixed due to the potential to be a factor in a future mishap (e.g., incorrect information in a maintenance tech order); areas that were thoroughly investigated and subsequently ruled out as factors (in order to provide context to the audience on why these areas are not factors); and areas that may be considered an interest item to the CA (e.g., RM, CRM, etc.). NFWODs usually become OFS which will result in an ORS**.**

6.4.5.4.1. The following example highlights the difference between Factors and NFWODs. A trainer aircraft has an unrecoverable in-flight engine shutdown when the student pilot inadvertently pulls the throttle to cutoff at low altitude while reducing the power to idle. Poor throttle finger lift design allowed the possibility of inadvertent shutdown of engine. After ejection the pilot was unable to contact Search and Rescue due to survival radio battery failure but was successfully recovered by local police helicopter. "Operations: Survival radio battery" is a Non-Factor Worthy

of Discussion and would generate an Other Finding and Recommendation of Significance because it did not influence the outcome of the mishap. "Logistics: Aircraft Design" is a factor because the throttle finger lift design allowed possibility of inadvertent engine shutdown. This factor would be a causal finding in the mishap and warrant a recommendation to fix the design.

6.4.5.5. The following conventions will be used in developing the specific language of Tab T:

6.4.5.5.1. Identifying Involved Personnel/Equipment. Do not identify involved personnel by name or personal call sign in the narrative; instead, use such terms as "the mishap aircraft (MA)," "the mishap maintainer (MM)," " the mishap pilot 1 (MP1)," etc. Define the acronym the first time it is used. This applies to both the narrative discussion and the findings and recommendations.

6.4.5.5.2. Write findings as full sentences, not bullet points. Use past tense for writing both the Tab T and the findings, since the events occurred in the past. Figure 6.1 is an outline of Tab T.

Figure 6.1. Tab T Outline (See Attachment 4 **for an example Tab T).**

T1. Glossary of Terms and Acronyms.

T2. Mishap Overview.

T2.1. History of Mishap. The history of the mishap is a narrative, in chronological order, of all pertinent events from briefing, ground operations, takeoff, etc., through the mishap sequence, search and rescue, recovery of the pilot, and recovery of the aircraft for analysis, etc. For maintenance mishaps that do not involve flight, start the mishap sequence from when the maintainers were assigned the task that resulted in the mishap and continue until the damage is identified and the aircraft is safe. Times of significant events should be integrated into the write-ups. The history explains what occurred, but not why.

T2.2. SIB Conclusions. This section contains a brief summary of why the mishap occurred. Think of this as a "bottom line up front" paragraph(s). This section does not include detailed explanations; those will be included in the appropriate factors sections of the Tab T. If human factors are issues in the mishap, be sure to include the name of the human factor (as defined by the HFACS) and the specific HFACS code (see examples below). It is not necessary to include the factor definition as listed in HFACS. *This will likely be the last part of the Tab T accomplished after the rest of the Tab T analysis has been written.*

T3. Background Information. Provide background information on the mishap crewmembers, maintenance personnel, leadership, or others that were factors in the mishap. Do not place analysis in this section; analysis is included in the appropriate factors section of the Tab T. Simply describe the facts of the personnel involved in the mishap and do not use names. Background information includes but is not limited to information on training, upgrades, promotions, deployments, 30/60/90 day totals, and summary of 72-hour/14-day histories. Include information on maintenance or logistics personnel if they were factors in the mishap.

Include information on others who may have been factors in the mishap, such as Air Traffic Controllers, as appropriate. Also always include background information on the mishap aircrew and mishap aircraft. The level of detail should provide sufficient background to understand the condition of the vehicle and any significant events in its design, manufacture, procurement, maintenance, or overhaul.

T3.1. Mishap Pilot (MP).
T3.2. Mishap Instructor Pilot (MIP).
T3.3. Mishap Maintainer (MM).
T3.4. Mishap Aircraft (MA).

If any of the above are not applicable to the mishap, do not include them in the Tab T and re-number the section. Add others that were factors in the mishap such as Air Traffic Controllers, AM personnel, Crash/Fire/Rescue, etc., as applicable.

T4. Operations Areas Investigated.

T4.1 Investigative Sources of Data. Explain the sources of data used by the SIB to determine the operations factors in the mishap. For example: flight data recorder, interviews, training, mission preparation, technical assistance provided by contractors, ATC communications, etc.

T4.2. Description of Systems, Processes, Organizations. Describe in narrative format the normal operation of complex aircraft systems, the process involved in the mishap, or the organizational structures as required. For unusual operational environments involved in the mishap, such as test or RPA organizations, provide a detailed description. This description may include organizational charts, etc. Describe what should happen and what went wrong that led to the subsequent analysis in the factor section below. Do not describe processes, systems, etc., that had no influence on the outcome of the mishap. This section will contain enough detail so the reader can understand the SIB's investigative processes. If operations was not a factor in the mishap sequence this section can simply state it was not a factor in the mishap.

T4.3. Factors. Analyze the operational factors that influenced the mishap or its outcome. This section is written in narrative format. Each operations factor will be analyzed in a separate write-up. Topics presented should flow in order from what factors the SIB considered most important to those the SIB considered least important in contributing to the mishap. Incorporate operations human factors from Tab Y but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. In collaboration with the MO or HF member (if applicable), integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the operations factors analysis section under discussion. Provide a detailed analysis and rationale of how human factors contributed to the factor under discussion. For example, if the SIB is reviewing incomplete checklist guidance available to the pilot as a factor under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The mishap pilot used the T-156CL-1 which did not specifically state to pull the fire shutoff T-handle when responding to an engine fire [OP003 – Procedural Guidance/Publications]" and then explain how the human factor manifested itself or the result "…which allowed fuel to continue to flow unabated to the burning engine." (**Note**: The human

factors codes in the Tab T, Tab Y, and AFSAS must all match.) If there are no operational factors for the mishap write "The SIB determined there were no operational factors in this mishap."

T4.3.1. Area to be discussed (e.g., "Mission Planning").

Analysis: Provide a detailed analysis of the factor's influence on the mishap. Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.

Conclusion: State whether the issue was a factor and if causal state "causal in this mishap." If a clear determination cannot be made, avoid statements such as "may have been a factor." Instead the SIB will use judgment to indicate the area was most likely a factor or not. For example, "Conclusion: The SIB determined that Mission Planning was a causal factor in this mishap" or "Conclusion: The SIB determined that Mission Planning was a factor in this mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.

T4.4. Non-Factors.

List out those areas/items the SIB considered but determined not to be factors in the mishap and not worthy of additional discussion. It is not an all-encompassing list, but rather a list of areas/items the SIB looked at and ruled out. Those areas/items determined not to be factors in the mishap but warrant command attention and/or may contribute to a future mishap should be included in section T7, Non-Factors Worthy of Discussion.

T5. Maintenance Areas Investigated.

T5.1. Investigative Sources of Data. Explain the sources of data used by the SIB to determine the maintenance factors in the mishap. For example: the mishap aircraft's history, records, engine history, relevant maintenance performed, maintenance training, results of technical teardowns, maintenance supervision, etc.

T5.2. Description of Systems, Processes, Organizations. Describe in narrative format the normal operation of complex aircraft systems, the process involved in the mishap, or the organizational structures as required. For aircraft systems involved in the mishap, provide a detailed description of how the system should work. This description may include photographs, diagrams, technical order quotes, etc. Describe what should happen and what went wrong that led to the subsequent analysis in the factor section below. Do not describe processes, systems, etc., that had no influence on the outcome of the mishap. This section will contain enough detail

so the reader can understand the SIB's investigative processes. If maintenance was not a factor in the mishap sequence this section can simply state it was not a factor in the mishap.

T5.3. Factors. Analyze the maintenance factors that influenced the mishap or its outcome. This section is written in narrative format. Each maintenance factor will be analyzed in a separate write-up. Topics presented should flow in order from what factors the SIB considered most important to those the SIB considered least important in contributing to the mishap. Incorporate maintenance human factors from Tab Y but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. In collaboration with the MO or HF member (if applicable), integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the factors analysis section under discussion. Provide a detailed analysis and rationale of how human factors contributed to the maintenance factor under discussion. For example if the SIB is reviewing incomplete Technical Order Guidance available to the Crew Chief as a factor under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The Crew Chief used the T.O. 1C-2A-5-01JG-69-2, Task 07-7, which did not state to pull the widget safety pin after the widget was installed [OP003 – Procedural Guidance/Publications]" and then explain how the human factor manifested itself or the result "…which allowed the widget to vibrate loose during flight resulting in the wing panel being ingested into the mishap engine." (**Note**: The human factors codes in the Tab T, Tab Y, and AFSAS must all match.) If there are no maintenance factors for the mishap write "The SIB determined there were no maintenance factors in this mishap." Each separate maintenance factor should be formatted in the following manner:

T5.3.1. Area to be discussed (e.g., "Technical Data Compliance").

Analysis: Provide a detailed analysis of the factor's influence on the mishap. Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.

Conclusion: State whether the issue was a factor and if causal state "causal in this mishap." If a clear determination cannot be made, avoid statements such as "may have been a factor." Instead the SIB will use judgment to indicate the area was most likely a factor or not. For example, "Conclusion: The SIB determined that Technical Data Compliance was a causal factor in this mishap" or "Conclusion: The SIB determined that Technical Data Compliance was a factor in this mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.

T5.4. Non-Factors.

List out those areas/items the SIB considered but determined not to be factors in the mishap and not worthy of additional discussion. It is not an all-encompassing list, but rather a list of

areas/items the SIB looked at and ruled out. Those areas/items determined not to be factors in the mishap but warrant command attention and/or may contribute to a future mishap should be included in section T7, Non-Factors Worthy of Discussion.

T6. Logistics Areas Investigated.

T6.1. Investigative Sources of Data. Explain the sources of data used by the SIB to determine the logistical factors in the mishap. For example: depot overhaul, depot quality assurance procedures, depot training, acquisition processes, supervision, etc.

T6.2. Description of Systems, Processes, Organizations. Describe in narrative format the normal operation of complex aircraft systems, the process involved in the mishap, or the organizational structures as required. For logistics processes involved in the mishap, provide a detailed description of how the process should work. This description may include photographs, diagrams, work package quotes, etc. Describe what should happen and what went wrong that led to the subsequent analysis in the factor section below. Do not describe processes, systems, etc., that had no influence on the outcome of the mishap. This section will contain enough detail so the reader can understand the SIB's investigative processes. If logistics was not a factor in the mishap sequence this section can simply state it was not a factor in the mishap.

T6.3. Factors. Analyze the logistical factors that influenced the mishap or its outcome. This section is written in narrative format. Each logistics factor will be analyzed in a separate write-up. Topics presented should flow in order from what factors the SIB considered most important to those the SIB considered least important in contributing to the mishap. Incorporate logistics human factors from Tab Y but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. In collaboration with the MO or HF member (if applicable), integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the logistics factors analysis section under discussion. Provide a detailed analysis and rationale of how human factors contributed to the logistics factor under discussion. For example if the SIB is reviewing incomplete Work Package Guidance available to logistics center personnel as a factor under a <u>Procedural Guidance/Publications</u> heading, the write-up should include words to the effect that "The ALC worker used T.O. 2J-F510-5-4 SWP 017-17, which did not state to pull the widget safety pin after the widget was installed on the turbine disk [<u>OP003 – Procedural Guidance/Publications</u>]" and then explain how the human factor manifested itself or the result "…which allowed the widget to vibrate loose during flight resulting in failure of the turbine blade and second and third stage High Pressure Turbine (HPT) damage." (**Note**: The human factors codes in the Tab T, Tab Y, and AFSAS must all match.) If there are no logistical factors for the mishap write "The SIB determined there were no logistical factors in this mishap." Each separate logistical factor should be formatted in the following manner:

T6.3.1. Area to be discussed (e.g., "Depot Quality Assurance Procedures").

<u>Analysis</u>: Provide a detailed analysis of the factor's influence on the mishap. Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or

inactions, results of technical analysis, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.

Conclusion: State whether the issue was a factor and if causal state "causal in this mishap." If a clear determination cannot be made, avoid statements such as "may have been a factor." Instead the SIB will use judgment to indicate the area was most likely a factor or not. For example, "Conclusion: The SIB determined that Depot Quality Assurance Procedures was a causal factor in this mishap" or "Conclusion: The SIB determined that Depot Quality Assurance Procedures was a factor in this mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.

T6.4. Non-Factors.

List out those areas/items the SIB considered but determined not to be factors in the mishap and not worthy of additional discussion. It is not an all-encompassing list, but rather a list of areas/items the SIB looked at and ruled out. Those areas/items determined not to be factors in the mishap but warrant command attention and/or may contribute to a future mishap should be included in section T7, Non-Factors Worthy of Discussion.

T7. Non-Factors Worthy of Discussion (NFWOD). NFWODs typically fall into one of three categories: areas uncovered during the investigation that did not cause the mishap or influence the outcome but should be fixed due to the potential to be a factor in a future mishap (e.g., incorrect information in a maintenance tech order); areas that were thoroughly investigated and subsequently ruled out as factors (in order to provide context to the audience on why these areas are not factors); and areas that may be considered an interest item to the CA (e.g., RM, CRM, etc.). NFWODs usually become Other Findings and Recommendations of Significance for section T10. If an issue contributed to the mishap, even minimally, it is a factor and should not be placed in this section. Use the same format (analysis and conclusion) discussed for factors above in paragraph T4.2.1. Also group NFWODs together by operations, maintenance, and logistics. In collaboration with the MO or HF member (if applicable), integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the NFWODs section. Provide a detailed analysis and rationale of how human factors contributed to the factor under discussion. For example if the SIB is reviewing incomplete checklist guidance available to the pilot as a factor under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The mishap pilot used the T-156CL-1 which did not specifically state to pull the fire shutoff T-handle when responding to an engine fire [OP003 – Procedural Guidance/Publications]" and then explain how the human factor manifested itself or the result "…which allowed fuel to continue to flow unabated to the burning engine." (**Note**: The human factors codes in the Tab T, Tab Y, and AFSAS must all match.). Each separate NFWOD should be formatted in the following manner:

T7.1. Area to be discussed (e.g., "AN-PRC-112 Survival Radio Antenna Cracking/Failure").

Analysis: Provide a detailed analysis of the issue found during the investigation that led to the NFWOD. Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each NFWOD analysis will be a brief summary that ties the discussion together.

Conclusion: State the issue was a non-factor worthy of discussion in this mishap, and if it could lead to future mishaps, state "but could be a factor in a future mishap." For example, "Conclusion: AN-PRC-112 Survival Radio Antenna Cracking/Failure was a non-factor worthy of discussion in this mishap, but could be a factor in a future mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.

T8. Findings and Causes. This section is a chronological list of all the SIB's findings and causes. Findings are a single event or condition that sustains the mishap sequence. Ensure all findings and causes are supported by the investigation and analysis section. For additional guidance reference AFI 91-204, Chapter 5. Number the findings consecutively using the following convention: "Finding 1, Finding 2, etc." Each finding should be a single, active voice sentence concisely describing the event that sustains the mishap sequence. Writing in the active voice means constructing sentences where the subject "acts." For example: Passive – No safety pins were installed in the widget. Active – The crew chief failed to install safety pins in the widget as required by tech orders. Passive – Mission planning did not cover en-route obstacles. Active – The crew failed to address en-route obstacles in mission planning as required.

Causal findings are further identified with the word "Causal" in parenthesis immediately after the number. Human factors related causes should include those specific human factors attributed as causal in a "due to" statement. For example: The mishap pilot failed to lower the landing gear due to channelized attention. When there is no definitive cause, the SIB must use its experience and knowledge to determine the "most likely" cause of the mishap. When entering findings into AFSAS, copy only the narrative, not the "Finding 1 (Causal)." AFSAS automatically populates the finding number and whether it is causal into the final message.

T9. Recommendations.

T9.1. Entering Recommendations into Tab T.

T9.1.1. This is a list of the SIB's primary recommendations. Each recommendation must correspond to a finding. However, each finding is not required to have a recommendation. For example, a finding may be the sortie was uneventful from takeoff until recovery for pattern work. This finding would not warrant a recommendation. Number the recommendations consecutively using the following convention: "Recommendation 1, Recommendation 2, etc."

Most causal findings should have recommendations for future prevention or mitigation. Likewise, findings that are not causal may also have recommendations written against them. For additional guidance reference AFI 91-204, Chapter 5.

T9.1.2. When recommending changes to publications, be specific on the area to be updated. For example, "Add a 'Caution' to T.O. 1T-5A-39-2-6, Task 8-1 after Step 9. Caution should read: 'It is possible for the widget pin lever to be in the full locked position and the widget pins not properly engaged. Damage will result when closing the gear doors if the widget pins are not engaged.'" Do not simply state "Add a Caution to the tech order for widget pin installation."

T9.1.3. Prior to finalizing any recommendation for any class of mishap, investigators must contact the proposed OPR and OCR (if applicable) to ensure the correct action agency is identified. If assistance is required to identify OPRs and OCRs, contact the CA safety office. The OPR and OCR (if applicable) must be listed immediately following each recommendation in Tab T. AFSAS will also require the office symbol, name, rank, and phone number or e-mail address for each OPR/OCR.

T9.1.4. If an AF Form 847 or AFTO 22 was completed, place its tracking number after the corresponding recommendation in Tab T with the statement "AFTO Form 22 (or AF Form 847) submitted, tracking # XXXX."

T9.2. Entering Recommendations into AFSAS.

T9.2.1. After Recommendations are finalized, they are entered into AFSAS for the final message. AFSAS requires several additional fields beyond what the Tab T requires related to the specific recommendations to be filled in for the final message. The items below (this is how the Recommendation will look in the final message) are areas to determine when developing Recommendations to fulfill the requirements of the final message. A recommendations worksheet is available in the SIB Support documents on the AFSEC Portal page (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support) that provides information on how to organize the information required for each Recommendation/ORS.

T9.2.1.1. Related Findings: X. This reflects the Finding(s) that precipitated the Recommendation.

T9.2.1.2. Hazard/Deficiency: A one-liner related to what hazard precipitated the Recommendation. The hazard/deficiency should describe a persistent or common hazard, not merely repeat a finding or unusual one-time occurrence.

T9.2.1.3. Recommendation X. To assist with recommendations validation, see AFI 91-204, Chapter 5.

T9.2.1.4. AF Form 847: Enter Tracking Number. AFSAS has fields to input AF Form 847 tracking numbers, so do not include them when copying the recommendation narrative.

T9.2.1.5. AFTO Form 22: Enter Tracking Number. AFSAS has fields to input AFTO 22 tracking numbers, so do not include them when copying the recommendation narrative.

T9.2.1.6. OPR: XXX. AFSAS requires the office symbol, name, rank, and telephone number or e-mail address of an action officer for each OPR.

T9.2.1.7. OCRs: XXX. AFSAS requires the office symbol, name, rank, and telephone number or e-mail address of an action officer for each OCR.

T9.2.1.8. Baseline Risk Hazard Index (RHI): X. RHIs for each recommendation are determined by the SIB using the guidance found in AFSAS at the Help Link associated with RHI block for the Recommendation being input and expert assistance (e.g., the Program Office Safety Engineer). This represents the RHI BEFORE the applicable Recommendation is implemented, i.e., the RHI as it existed at the time of the mishap.

T9.2.1.9. Residual RHI: X. This represents the RHI AFTER the applicable Recommendation is implemented. This number should be higher than the number in T9.2.1.8 to reflect the reduced risk.

T10. Other Findings and Recommendations of Significance (OFS/ORS). Ensure the rationale for all OFS and ORS is fully discussed in the narrative section (Non-Factors Worthy of Discussion) of the report and final message. To assist with OFS and ORS validation, reference AFI 91-204, Chapter 5.

T10.1. Unlike primary findings and recommendations (where not all findings have an associated recommendation) each OFS must have at least one ORS. This is because some primary findings only support the mishap sequence. However, since each OFS has the potential to contribute to another mishap it needs an associated corrective action in the form of an ORS. Additionally, if the SIB has an OFS with no corresponding ORS, AFSAS will not allow it to be entered.

T10.2. Entering Other Findings and Recommendations of Significance (OFS/ORS) into Tab T.

T10.2.1. For Tab T, list the OFS, immediately followed by the ORS. Number the OFS/ORS consecutively using the following convention: "OFS 1, ORS 1, OFS 2, ORS 2, etc."

T10.2.2. Prior to finalizing any ORS for any class of mishap, investigators must contact the proposed OPR and OCR (if applicable) to ensure the correct action agency is identified. If assistance is required to identify OPRs and OCRs, contact the CA safety office. The OPR and OCR (if applicable) must be listed immediately following each ORS in Tab T. AFSAS will require the office symbol, name, rank, and phone number or e-mail address for each OPR/OCR.

T10.2.3. If an AF Form 847 or AFTO 22 was completed, place its tracking number after the corresponding ORS in Tab T with the statement "AFTO Form 22 (or AF Form 847) submitted, tracking # XXXX." When recommending changes to publications, be specific on the area to be updated. For example, "Add a 'Caution' to T.O. 1T-5A-39-2-6, Task 8-1 after Step 9. Caution should read: 'It is possible for the widget pin lever to be in the full locked position and the

widget pins not properly engaged. Damage will result when closing the gear doors if the widget pins are not engaged.'" Do not simply state "Add a Caution to the tech order for widget pin installation."

T10.3. Entering ORS into AFSAS.

T10.3.1. After the ORSs are finalized, they are entered into AFSAS for the final message. AFSAS requires several additional fields beyond what the Tab T requires related to the specific ORSs to be filled in for the final message. The items below (this is how the ORS will look in the final message) are areas to determine when developing ORSs to fulfill the requirements of the final message.

T10.3.1.1. Hazard/Deficiency: A one-liner related to what hazard precipitated the Recommendation.

T10.3.1.2. ORS X. To assist with recommendations validation, see AFI 91-204, Chapter 5.

T10.3.1.3. AF Form 847: Enter Tracking Number. AFSAS has fields to input AF Form 847 tracking numbers, so do not include them when copying the ORS narrative.

T10.3.1.4. AFTO Form 22: Enter Tracking Number. AFSAS has fields to input AFTO 22 tracking numbers, so do not include them when copying the ORS narrative.

T10.3.1.5. OPR: XXX. AFSAS also requires the office symbol, name, rank, and phone number or e-mail address of an action officer for each OPR.

T10.3.1.6. OCRs: XXX. AFSAS also requires the office symbol, name, rank, and phone number or e-mail address of an action officer for each OCR.

T10.3.1.7. Baseline RHI: X. This number is determined by the SIB using the guidance found in AFSAS at the Help Link associated with RHI block for the ORS being input. This represents the RHI BEFORE the applicable ORS is implemented, i.e., the RHI as it existed at the time of the mishap. OPRs can assist in computing severity and probability as required.

T10.3.1.8. Residual RHI: X. This number is determined by the SIB. This represents the RHI AFTER the applicable ORS is implemented. This number should be higher than the number in T10.3.1.7 to reflect the reduced risk. OPRs can assist in computing severity and probability as required.

T11. Authentication Page. Type each primary SIB member's name, rank, and board role on the last page of this section. Have each concurring member, including primary members from other services on joint investigations, sign above their name for authentication of the report or for any changes to the report. If the formal SIB report needs to be changed after it is completed and signed by the board, all primary members of the SIB will reconvene. However, the CA may allow the SIB to make minor changes without reconvening the board.

T12. Minority Reports (if applicable). The primary members determine findings, causes, and recommendations. Primary members who disagree with the results may submit a separate minority report. Minority reports must include reasons for disagreement in a narrative format and will list suggested findings, causes, and recommendations if different from those contained in the original report. If a SIB member submits a minority report, their signature block still appears on the Tab T authentication page but they do not sign above it. Instead, they sign the minority report.

6.4.5.6. All members of the SIB contribute to this tab as applicable. The Investigating Officer is responsible to complete this tab.

6.4.5.7. Tab U. Witness Testimony Provided Under a Promise of Confidentiality. If testimony was provided under a promise of confidentiality, it will be placed in this tab. Select only meaningful testimony (written or verbal). Only pertinent sections of interviews need be transcribed. If any interviews are only partially transcribed, the audio file must also be uploaded to this tab in AFSAS. See AFI 91-204, Chapter 3 for a discussion of promise of confidentiality.

6.4.5.7.1. Privileged Interviews. For privileged interviews, whether written or recorded, all witnesses sign the form from AFI 91-204 Attachment 3, *Witness Promise of Confidentiality and Non-Disclosure Agreement.* This only needs to be accomplished once for recorded interviews but must be done for ALL written statements whether initial or subsequent follow-up.

6.4.5.7.2. For recorded interviews ensure all interviewees are read the *Notice to Witness Documenting Promise of Confidentiality of Recorded Statements,* AFI 91-204 Attachment 3, and it is recorded and transcribed. This must be done for ALL recorded interviews whether initial or subsequent follow-up interviews.

6.4.5.7.3. Place the statements and transcribed testimony of each witness together in chronological order starting with the first accomplished. The mishap participants are placed first followed by other witnesses.

6.4.5.7.4. 72-hour and 14-day histories can be either privileged or non-privileged. Include 72-hour and 14-day histories given under a promise of confidentiality in this tab. The privileged 72-hour and 14-day history form available as part of the AFSEC SIB Support documents includes a privileged witness written statement. If the 72-hour and 14-day histories are obtained via recorded interview, follow the procedures in paragraph 6.4.5.7.2.

6.4.5.7.5. The Investigating Officer completes this tab.

6.4.5.8. Tab V. Other Supporting Privileged Products. This tab contains supporting privileged products not otherwise defined.

6.4.5.8.1. V1. Applicable Portions of Publications. Whenever findings or recommendations involve deficiencies in or changes to technical orders, flight manuals, checklists, local IOs or directives, place highlighted pages or publication extracts revealing the deliberative process of the board in this tab. The SIB's conclusion that a particular paragraph of a document was or was not a factor is privileged.

6.4.5.8.2. V2. AFTO Forms 22 or AF Forms 847. Include copies of SIB submitted AFTO Forms 22, *Technical Manual Change Recommendation and Reply*, or AF Forms 847. *Recommendation for Change of Publication*, in this tab. Without disclosing the contents of the requested change, obtain a local control number from the unit quality assurance (QA) office for AFTO Forms 22 and a MAJCOM/HQ control number from the MAJCOM Standardization and Evaluation office for AF Forms 847. Additionally, place the mishap's AFSAS number on the AF Form 847. Ensure no privileged safety information generated by the SIB is referenced on or included in the forms.

6.4.5.8.3. V3. SIB Surveys. If a survey was administered by the SIB, include a copy and the results. Coordinate with HQ AFSEC/SEH (DSN 246-0880 or (505) 846-0880) prior to conducting any survey.

6.4.5.8.4. V4. Copies of Opportunity to Submit Additional Comments Letters. These are memorandums sent to individuals, but not organizations, found causal during the course of a mishap investigation, allowing them the opportunity to provide comments for the MOFE process. Place copies signed by the Board President of these letters in this section of Tab V. Do not have the causal individual sign a copy before departing for the CA briefing; this will be accomplished by the CA safety staff following the out-brief. Reference AFI 91-204, Chapter 6, for guidance.

6.4.5.8.5. V5. Aircraft Weight and Balance. Include DD Form 365-4, *Weight and Balance Clearance Form F-Transport/Tactical*, only if the SIB recreated a weight and balance form using available data to determine weight and CG at the time the mishap occurred. If a copy of the aircrew's planned weight and balance was on file, it is factual data and will be placed in Tab K.

6.4.5.8.6. V6. Other supporting privileged products. Place any privileged documents used by the SIB but not included in other Tabs in this section.

6.4.5.8.7. The Investigating Officer completes this tab.

6.4.5.9. Tab W. Privileged Technical Reports and Engineering Evaluations. If technical reports or engineering analysis are provided under a promise of confidentiality or its contents are based on privileged material, include the evaluation in this tab. See AFI 91-204 Attachment 4, *Suggested Technical Expert Report Format*, Part 2, for Tab W report format. The signed memorandums of acknowledgment, *Memorandum for Contractor Representatives Serving as Technical Experts to Safety Investigations*, AFI 91-204 Attachment 3, must be placed in this tab in front of the respective technical reports. Additionally, include a copy of the report coversheet documenting promises of confidentiality to contractor representatives.

6.4.5.9.1. The Maintenance Member completes this tab.

6.4.5.10. Tab X. Privileged Photographs, Videos, Diagrams, and Animations.

6.4.5.10.1. X1. Privileged Photographs. These photos, supporting analysis in Tab T, may be included here or imbedded in Tab T for clarity. These typically include photos showing deliberative SIB analysis of aircraft parts, photos showing parts

involved in the mishap with imbedded analysis on the photo, photos showing reenactments, parts reconstruction, etc.

6.4.5.10.2. X2. Privileged Videos. Only upload videos relevant to the investigation (in accordance with paragraph 6.4.3) and make a reference in the Tab X .pdf document.

6.4.5.10.3. X3. Privileged Diagrams.

6.4.5.10.4. X4. Privileged Animations. If applicable, include the final version of the privileged animation (in accordance with paragraph 6.4.3), and make a reference in the Tab X .pdf document.

6.4.5.10.5. The Investigating Officer completes this tab.

6.4.5.11. Tab Y. Human Factors Analysis, Medical Reports, and Protected Health Information (PHI). Tab Y is broken up into 2 sub-Tabs: Y1 and Y2. Y1 is Human Factors Life Sciences and Medical Analysis and is privileged. Y2 is usually non-privileged factual information and may contain PHI. The SIB shall protect PHI with prudent safeguards to unauthorized release. Factual non-privileged information, to include PHI, is releasable to the AIB; however, PHI should not be released to the public. Safety personnel should consult AFSEC/JA or AFSEC/SEH for questions on PHI release. Tab Y contains the data substantiating the human factors summaries in the factors sections of Tab T. Tab Y templates are available on the AFSEC Portal page (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support). Figure 6.2 is an outline of Tabs Y1-Y2.

Figure 6.2. Tab Y Outline.

Tab Y1. Human Factors Analysis. The analysis in Tab T will include all relevant human factors. DoD HFACS nano-codes will be cited in Tab T. Identify causal factors, factors, and NFWODs using DoD HFACS nano-codes listed AFI 91-204 Attachment 6. The MO and HF member will provide an analysis of all human factors and contribute to the SIB's efforts in writing the factors in Tab T4.2 and/or T5.2 and/or T6.2.

Y1.1. Summary of Injuries. This section is a brief narrative describing the type and mechanism of injuries.

Y1.1.1. Limit PHI in Tabs T and Y1 to the minimum required to adequately describe the role of a diagnosis or medication in the mishap sequence. PHI will be placed in Y2. For example, a mishap member is found to have a previously undisclosed irregular heartbeat being treated by a civilian doctor with a calcium-channel blocking medication. If this condition did not contribute to the mishap, this might be mentioned as a NFWOD in Tabs T and Y1, but can be summarized as "member found to have a previously undisclosed heart condition being treated with a medication that may reduce heart rate and blood pressure." Tab Y2 can spell out the diagnosis and exact medication in detail. However, if this condition directly contributed to the member's loss of consciousness and the mishap, then the details may be needed in T and Y1 to more explicitly explain the mishap sequence. For questions on where PHI may be placed, contact AFSEC/SEH.

Y1.1.2. In rare instances and with HQ AFSEC approval, photos of human remains may be included in Tab Y1 if deemed necessary to define injuries; otherwise, include photos in Y2 as an attachment to the autopsy report. Injury pattern diagrams are preferred over photos in Y1.

Y1.2. DoD HFACS. This section will contain only a list of all DoD HFACS nano-codes that appear in Tab T and will also include the definition. The analysis of the human factor that was involved in the factor will be included in the Tab T. The nano-code will be identified either as a causal factor, factor, or non-factor worthy of discussion as written in Tab T. Cross-reference the related factor or non-factor worthy of discussion by referencing the number in parenthesis. For instance, if "inattention" was causal to the mishap, write:

> PC101- Inattention (Causal – T4.3.1): Inattention is a factor when the individual has a state of reduced conscious attention due to a sense of security, self-confidence, boredom or a perceived absence of threat from the environment which degrades crew performance. (This may often be a result of highly repetitive tasks. Lack of a state of alertness or readiness to process immediately available information).

Y1.2.1. Causal Factors. The SIB should indicate which HFACS were associated with mishap causal factors.

Y1.2.2. Factors. The SIB should indicate which HFACS were associated with mishap factors.

Y1.2.3. Non-Factors Worthy of Discussion (NFWOD). The SIB should indicate which HFACS were associated with mishap NFWODs.

Y1.3. Human factors consultant reports. If an HF member (i.e. aerospace and operational physiologist, psychologist) is on the SIB (either as a primary member or consultant), place the report here. The consultant report only speaks for the consultant's point of view.

Y1.3.1. If the SIB disagrees or discounts a significant portion of a consultant report this should be annotated in this section.

Y1.4. Additional Consultant Reports. Include other consultant reports here if applicable.

Tab Y2. Protected Medical Documents. This is usually non-privileged information and might be given to the AIB. If provided to the AIB, only give the entire record or unmarked factual documents, but NOT sections, pages deemed appropriate to the mishap, or marked-up records as those would be considered the workings of the board and privileged. Non-safety privileged medical documents are protected by other laws and regulations (HIPAA, Privacy Act, etc.). Include the following in this section:

Y2.1. Toxicology Reports. Scan and paste in the reports from relevant toxicology tests.

Y2.2. Physical Examinations And Medical Condition. Include scanned copies or AHLTA print-outs of all physical exams, the most recent PHA, the DD Form 2766, any active waivers, and the person's current serial profile.

Y2.2.1. Post Mishap Physical and/or Autopsy Report. Factual post-mishap physicals and/or autopsy reports must be included here. Photos of human remains highlighting fatal injuries may be included as an attachment to the autopsy report. Also include factual radiology reports, statements of prognosis, and prescribed medications.

6.4.5.11.1. The Medical Officer and/or Human Factors Member complete this tab.

6.4.5.12. Tab Z. SIB Proceedings and BP Comments. Use this tab to provide reviewing agencies an assessment of investigation difficulties and make recommendations for improving reporting and investigating procedures.

6.4.5.12.1. The Board President and Investigating Officer complete this tab.

6.4.6. **Part 3.** Part 3 is a part of the formal report and is provided to upload the final SIB out-brief slides in AFSAS.

6.5. Temporarily De-convening a SIB

6.5.1. There may be occasions when a SIB is waiting on technical analysis for a part or for wreckage recovery and/or transportation. The CA may elect to temporarily de-convene the SIB and have the SIB members return to their home station. However, this does not relieve the SIB members of their investigative responsibilities and the SIB remains their primary duty when needed for SIB duties.

6.5.2. Before temporarily de-convening a SIB, the CA/SE office will ensure that the CA has approved the temporary de-convening and will release a status message detailing this approval. However, the SIB will not de-convene until the investigation is complete up to the point that they need the specific part or wreckage to continue further. All tabs and draft final message should be finalized or written with placeholders awaiting the results of analysis or wreckage recovery.

6.5.3. Prior to de-convening, a reconvene plan should be developed to allow the SIB ample time to finish the investigation and complete the tabs, briefing, and update the final message. The SIB must reconvene to deliberate in person or via VTC. If it is more convenient to reconvene just prior to the out-brief, the SIB must allow enough time to finish deliberations and finalize the tabs, briefing, and final message before the out-brief.

6.5.4. The CA/SE office should continue to obtain extensions as appropriate and release status messages indicating the extension with comments on the status of the delay. Additionally, unless board members change, the original SIB orders are valid until the SIB has completed the investigation.

6.6. Briefing Investigation Results.

6.6.1. Once the SIB completes the investigation and finalizes the formal report (if required), the SIB will provide a briefing on the results of the investigation to the CA for Class A and B mishaps. All SIB primary members should attend the CA out-brief in-person unless video teleconference or a slides-only out-brief has been approved by the CA. SIBs will contact the CA safety office for example briefings, briefing templates, and to coordinate the out-brief. The out-brief should occur within 15 days after the SIB completes the investigation to avoid minimizing the urgency of the safety investigation and to begin implementation of recommendations that are aimed at mitigating hazards to avoid future mishaps. For Class A

or B mishaps that involve aircraft/equipment or personnel from more than one MAJCOM (including the ARC), the MAJCOM that is not the convening authority will be allowed to have access to the formal mishap report and limited representation at the CA formal out-brief.

6.6.2. All briefings will be given with no prior screening of content except as noted. Board independence is critical to the integrity of the SIB process. Historically, SIB independence is a Congressional interest item, periodically reviewed by Government Accountability Office (GAO) and DoD/IG.

6.6.3. Per AFI 91-204, Chapter 6 the only briefings authorized for Class A mishaps are to the NAF commander and MAJCOM commander (or equivalent such as the Air Warfare Center Commander, the affected COMAFFOR, etc.). With MAJCOM/CC approval, the SIB may brief the NAF/CC (or equivalent such as the Air Warfare Center Commander) and the affected COMAFFOR for a contingency mishap, for INFORMATIONAL PURPOSES ONLY, prior to briefing the MAJCOM/CC. The NAF/CC (and COMAFFOR) and those invited to the informational briefing will not direct changes to the SIB report or direct further investigation. The briefing must be free from the appearance of undue command influence that advice and directions can sometimes create. There will be no intermediate or pre-briefings given to MAJCOM or NAF staffs, directorates, the mishap wing commander, etc., except as noted in paragraph 6.6.3.1. No pre-briefing or informational slides will be distributed prior to the CA out-brief. However, a read-ahead copy of the briefing may be forwarded directly to the CA provided this copy is not coordinated or shared with staff members outside the safety staff.

6.6.3.1. The CA safety staff may be pre-briefed prior to the CA briefing to provide suggestions for improved accuracy and effectiveness. These inputs will not override the SIB's deliberations, results, and judgment. This briefing will not include any other CA staff members, directorates, etc.

6.6.4. When CA briefings are accomplished for Class B flight mishaps, no pre-briefings will be given to NAF staff, mishap wing staff, etc. However, the SIB may pre-brief the NAF safety office per paragraph 6.6.3.1. above.

6.6.5. SIBs must ensure a copy of the briefing does not remain on the computer used for the presentation following any briefings given to the CA, NAF/CC, MAJCOM/SE staff, etc.

6.7. SIB Close-out.

6.7.1. At conclusion of a SIB, the SIB/SIO will upload Part 1, Part 2, and Part 3 (as required) of the investigation results into AFSAS and accomplish the following actions:

6.7.1.1. The IO or BP will keep an electronic copy of all SIB working files, tabs, etc., on a portable hard drive, DVDs, or other suitable media from the SIB's computers in case any material is needed between when the SIB de-convenes and the out-brief is complete. The IO or BP copy will be erased or destroyed after the CA accepts the results of the SIB's investigation and the final message is accepted by the AFSEC.

6.7.1.2. SIBs will bring the AFTO Forms 22 and AF Forms 847 to the CA out-briefing. CA safety staff will submit them to appropriate agencies at the conclusion of the briefing, unless previously submitted for critical safety actions. In the absence of a CA briefing,

the CA safety staff will coordinate with the SIB to submit the forms to the appropriate agencies.

6.7.1.3. SIBs will bring the Tab V, Opportunity To Submit Additional Comments (if applicable) to the CA out-brief. Once the CA accepts the formal report and releases the final message, the CA will send a copy of the memorandum to the mishap unit safety office.

6.7.1.4. SIBs will do the following prior to the scheduled out-brief. In AFSAS, load the .pdf tabs for Part 1 and Part 2 of the formal report along with any Part 3 materials. Prepare the final message in AFSAS, but do not select "Submit for Release" to the CA. Notify the CA safety office once the Part 1, Part 2, and Part 3 materials and final message are loaded.

6.7.1.5. The CA safety office will review, but not staff, all products for quality control purposes (including accuracy and completeness of the investigation) and notify the SIB if changes are required to meet AFI 91-204 or AFMAN 91-223 guidance. The SIB will make changes prior to de-convening. Following the out-brief, and after any necessary changes are made, the SIB will forward the final message to the CA by selecting "Submit for Release" in AFSAS. The CA's safety office will release the final message within three duty days of the out-brief.

6.7.1.6. Following release of the final message, HQ AFSEC/SEF conducts a quality control review of the formal report for compliance with AFI 91-204/AFMAN 91-223 and accuracy/completeness of the investigation. This process may take up to 10 days to accept or reject the final message. If the final message is rejected, further coordination between the SIB and the CA will be required. Following a rejection, corrections must be completed and a final supplemental message must be released within 10 days.

6.7.1.7. Signing Tab Q, AIB Transfer Document: Include a memorandum from the SIB President to the AIB President (see paragraph 6.4.4.17) regarding the location and disposition of all non-privileged (Part 1) evidence (listing of witnessed interviewed, photographs, wreckage, other components sent off for analysis, etc.) and place in Tab Q of the formal report. A template of this memorandum can be found in the SIB Support Documents on the AFSEC Portal (AF Portal : FOAs : AFSEC - Air Force Safety Center : Products and Services : SIB Support). This is usually one of the last items completed by the SIB and occurs as the SIB is concluding. Ensure the AIB President knows the disposition of all non-privileged evidence (including wreckage and components shipped for analysis) and acknowledges custodial responsibility in writing. The AIB will be responsible for final disposition of all material released to them by the SIB.

6.7.1.7.1. If the AIB President is not available and the SIB is prepared to release the non-privileged evidence, consult with the CA's SJA to coordinate release to the host installation SJA, who will maintain custody until the AIB President is able to accept. Transfer may be made to tenant units, as appropriate, with written agreement between the installation commander and tenant unit commander. For additional information refer to AFI 51-503, *Aerospace Accident Investigations*.

6.7.1.8. Privileged (Part 2) evidence (working files, tapes containing privileged witness interviews, draft Tab Ts, staged photographs, etc.) will be sent or hand carried to the CA

safety office. This evidence must be handled IAW AFI 91-204, Chapter 3, and will be destroyed by CA safety personnel or AFSEC Representative, as appropriate, upon release of the MOFE message.

6.7.1.9. Reformat the host wing supplied computers used by the SIB immediately prior to the SIBs departure. Alternatively, military approved "wiping" software can be used on properly partitioned hard-drives.

6.7.1.10. Delete all network files, folders, e-mail, and backup copies used by the SIB once the investigation is complete.

MARGARET H. WOODWARD, Major General, USAF
Chief of Safety

(AETC)

JAMES L. FISHER, Col, AETC/SE
Director of Safety

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 10-2501, *Air Force Emergency Management (EM) Program Planning & Operations,* 24 January 2007

AFI 11-401, *Aviation Management,* 10 December 2010

AFI 13-202, *Overdue Aircraft,* 11 March 2010

AFI 13-204V3, *Airfield Operations Procedures and Programs,* 1 September 2010

AFI 16-402, *Aerospace Vehicle Programming, Assignment, Distribution, Accounting, and*

Termination, 1 December 2009

AFI 24—203, *Preparation and Movement of Air Force Cargo,* 02 November 2010

AFI 31—401, *Information Security Program Management,* 1 November 2005

AFI 33—332, *Air Force Privacy Program,* 16 May 2011

AFI 34—217, *Air Force Aero Club Program,* 1 February 1997

AFI 34—242, *Mortuary Affairs Program,* 2 April 2008

AFI 35—104, *Media Operations*, 22 January 2010

AFI 35—109, *Visual Information*, 12 March 2010

AFI 44—153, *Traumatic Stress Response,* 29 August 2011

AFI 48—123, *Medical Examinations and Standards,* 24 September 2009

AFI 48—139, *Laser and Optical Radiation Protection Program*, 25 July 2012

AFI 51—503, *Aerospace Accident Investigations,* 26 May 2010

AFI 65—503, *US Air Force Cost and Planning Factors,* 4 February 1994

AFI 91—202, *The US Air Force Mishap Prevention Program*, 05 August 2011

AFI 91—204, *Safety Investigations and Reports,* 24 September 2008

AFI 91—206(I), *Participation in a Military or Civil Aircraft Accident Investigation,* 8 July 2004

AFI 99—151, *Air-Launched Munition Analysis Group (ALMAG),* 10 August 2005

AFMAN 10—2504, *Air Force Incident Management Guidance for Major Accidents and Natural Disasters,* 1 December 2009

AFMAN 23—110, *USAF Supply Man, Vol 6, Excess & Surplus Personal Property,* 1 April 2009

AFMAN 33—363, *Management of Records,* 1 March 2008

AFMAN 48—125, *Personnel Ionizing Radiation Dosimetry*, 04 October 2011

AFPD 10—2, *Readiness,* 6 November 2012

AFPD 10—9, *Lead Command Designation and Responsibilities for Weapons Systems*, 08 March 2007

AFPD 91—2, *Safety Programs,* 24 July 2012

DoD 6025.18—R, *DoD Health Information Privacy Regulation,* 24 January 2003

DoDI 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping,* 6 June 2011

NATO STANAG 3531 (Ed 8), *Safety Investigation and Reporting of Accidents/Incidents involving Military Aircraft and/or UAVs,* 8 April 2010

T.O. 00—35D-54, *USAF Deficiency Reporting, Investigation, and Resolution,* 1 November 2011

T.O. 2J—1-18, *Engine Shipping Instructions,* 1 September 2010

Adopted Forms —AF Form 847, *Recommendation for Change of Publication*

AF IMT Form 457, *USAF Hazard Report*

AF IMT Form 651, *Hazardous Air Traffic Report (HATR)*

AF IMT Form 711B, *USAF Mishap Report*

AF IMT Form 711C, *Aircraft/UAV Maintenance and Materiel Report*

AF IMT Form 853, *Air Force Bird Strike Report*

AF IMT Form 2519, *All Purpose Checklist*

AFTO Form 22, *Technical Manual Change Recommendation and Reply*

AFTO Form 350, *Repairable Item Processing Tag*

AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document*

AFTO Form 781A, *Maintenance Discrepancy and Work Document*

AFTO Form 781H, *Aerospace Vehicle Flight Status and Maintenance*

AFTO Form 781K, *Aerospace Vehicle Inspection, Engine Data, Calendar Inspection and Delayed Discrepancy Document*

DD Form 175, *Military Flight Plan*

DD Form 1751, *Flight Weather Briefing*

DD Form 250, *Material Inspection and Receiving Report.*

DD Form 3654, Weight and Balance Clearance Form F—*Transport/Tactical*

DD Form 1575, Suspended Tag—*Materiel*

DD Form 1801, *DoD International Flight Plan*

DD Form 2766, *Adult Preventative and Chronic Care Flow Sheet*

DD Form 2807—1, *Report of Medical History*

Abbreviations and Acronyms

ACC—Air Combat Command

AETC—Air Education and Training Command

AF—Air Force

AFE—Aircrew Flight Equipment

AFFSA—Air Force Flight Standards Agency

AFGSC—Air Force Global Strike Command

AFI—Air Force Instruction

AFLCMC—Air Force Life Cycle Management Center

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFMES—Armed Forces Medical Examiner System

AFORMS—Air Force Operations Resource Management System

AFOTEC—Air Force Operational Test and Evaluation Center

AFPAM—Air Force Pamphlet

AFPC—Air Force Personnel Center

AFPD—Air Force Policy Directive

AFREP—Air Force Representative

AFRL—Air Force Research Lab

AFSAS—Air Force Safety Automated System

AFSEC—Air Force Safety Center or Air Force Specialty Code

AFSPC—Air Force Space Command

AFTO—Air Force Technical Order

AGE—Aerospace Ground Equipment

AGL—Above Ground Level

AIB—Accident Investigation Board

ALC—Air Logistics Complex

ALERTS—Automated Life-Sustainment Equipment Records

AM—Airfield Management

AMC—Air Mobility Command

AMIC—Aircraft Mishap Investigation Course

AMIP—Aircraft Mishap Investigation and Prevention Course

ANG—Air National Guard

AOF—Airfield Operations Flight

AOP—Aerospace and Operational Physiology

AOR—Area of Responsibility

ARC—Air Reserve Component

ARTCC—Air Route Traffic Control Center

ATC—Air Traffic Control

ATIS—Automated Terminal Information System

AWACS—Airborne Warning and Control System

BASH—Bird/Wildlife Aircraft Strike Hazard

BP—Board President

BPC—Safety/Accident Investigation Board President Course

C2—Command & Control

CA—Convening Authority

CAA—Civil Aviation Authority

CAMS—Core Automated Maintenance System.

CAP—Civil Air Patrol

CEMP—Comprehensive Emergency Management Plan

CENTCOM—Central Command

CFR—Crash Fire Rescue

CG—Center of Gravity

CMA—Controlled Movement Area

CMAV—Controlled Movement Area Violation

COMAFFOR—Commander, Air Force Forces

CONUS—Continental United States

CoS—Chief of Safety

CSFDR—Crash Survivable Flight Data Recorder

CSMU—Crash Survivable Memory Unit

CRM—Crew Resource Management

CRT—Cathode Ray Tube

CSAF—Chief of Staff of the Air Force

CVR—Cockpit Voice Recorder

DoD—Department of Defense

DRF—Disaster Response Force

DRU—Direct Reporting Unit

DSN—Defense Switched Network

DTC—Data Transfer Cartridge

EAL—Entry Access List

ESP—Emergency and Special Program

FAA—Federal Aviation Administration

FAST—Failure Analysis Service Technology

FCB—Flight Crew Bulletin

FCF—Functional Check Flight

FCIF—Flight Crew Information File

FDR—Flight Data Recorder

FEF—Flight Evaluation Folder

FLIP—Flight Information Publication

FOA—Field Operating Agency

FOD—Foreign Object Damage

FOUO—For Official Use Only

FSDO—Flight Standards District Office

FSNCO—Flight Safety Non-commissioned Officer

FSO—Flight Safety Officer

FY—Fiscal Year

GCI—Ground Control Intercept

GSC—Ground Control Station

GLOC—G induced loss of consciousness

GMV—Government Motor Vehicle

GPS—Global Positioning System

HAP—High Accident Potential

HATR—Hazardous Air Traffic Report

HF—Human Factors

HFACS—Human Factors Analysis and Classification System

HIPAA—Health Insurance Portability & Accountability Act

HPT—High Pressure Turbine

HUD—Head Up Display

IAW—In Accordance With

IC—Incident Commander

ICAO—International Civil Aviation Organization

IFE—In Flight Emergency

IO—Investigation Officer

ISB—Interim Safety Board

ITARS—International Traffic in Arms Regulations

JDRS—Joint Deficiency Reporting System

JEMIC—Jet Engine Mishap Investigation Course

JPC—Joint Pathology Center

KIAS—Knots Indicated Airspeed

LAN—Local Area Network

LOSA—Line Operations Safety Audit

LOX—Liquid Oxygen

MA—Mishap Aircraft

MAF—Mobility Air Force

MAAF—Mishap Analysis and Animation Facility

MARE—Major Accident Response Exercise

MDS—Mission Design Series

MFOQA—Military Flight Operations Quality Assurance

MM—Maintenance Member

MO—Medical Officer

MOFE—Memorandum of Final Evaluation

MRP—Mishap Response Plan

MSL—Mean Sea Level

NAF—Numbered Air Force

NAVAID—Navigation Aid

NFWOD—Non-Factor Worthy of Discussion

NLT—Not Later Than

NCC—Network Control Center

NCO—Non-commissioned Officer

NM—Nautical Miles

NMAC—Near Mid Air Collision

NOTAM—Notice to Airman

NSN—National Stock Number

NTSB—National Transportation Safety Board

OCONUS—Outside the Continental United States

OCR—Office of Collateral Responsibility

OFS—Other Finding of Significance

OI—Operating Instruction

OJT—On the Job Training

OPCON—Operational Control

OPR—Office of Primary Responsibility

ORS—Other Recommendations of Significance

PA—Public Affairs

PAO—Public Affairs Officer

PEO—Program Executive Offices

PHA—Preventive Health Assessment

PHI—Protected Health Information

PM—Pilot Member

POC—Point of Contact

QA—Quality Assurance

RHI—Risk Hazard Index

RM—Risk Management

RA—Resolution Advisory

RADES—Radar Evaluation Squadron

RCN—Report Control Number

ROC—Recovery Operations Chief

ROE—Rules of Engagement

RPA—Remotely Piloted Aircraft

RTB—Return to Base

SE—Safety

SEF—Flight Safety

SEH—Safety Human Factors

SGP—Chief, Aeromedical Services

SIB—Safety Investigation Board

SID—Standard Instrument Departure

SIO—Single Investigating Officer

SIPR—Secure Internet Protocol Router

SNCO—Senior Non-commissioned Officer

SPO—System Program Office

STANAG—Standardization Agreement NATO

SUPT—Specialized Undergraduate Pilot Training

TACON—Tactical Control

TCAS—Traffic Collision Avoidance System

TCTO—Time Compliance Technical Order

TFR—Terrain Following Radar

T.O. —Technical Order

UPT—Undergraduate Pilot Training

USA—United States Army

USCG—United States Coast Guard

USMC—United States Marine Corps

USN—United States Navy

VTR—Videotape Recording

Attachment 1 (AETC)

REFERENCES

(Added) AFI 21-101, Aircraft and Equipment Maintenance Management, 26 July 2010

Adopted Forms
(Added) AETC Form 645-4, *Trend Data Report*

Attachment 2

SIB SUPPORT REQUIREMENTS LIST

A2.1. Purpose: This SIB support requirements list is included in this instruction to outline the recommended type and quantity of support items that are normally required to accomplish a formal safety investigation of a mishap. This list affords the potential units a chance to assess their internal capability and their ability to acquire non-possessed items from other sources, as well as identification of equivalent/alternative sources. **Note:** This list is extensive, but it is not all-inclusive. Because of the nature of aircraft mishaps, terrain and local conditions may drive other requirements. Be prepared to meet SIB requirements as they arise.

A2.2. Facilities.

A2.2.1. One large room capable of seating 10 to 12 people in a conference-style seating plan. This room must also provide desk/computer workspace (around the outside walls) for eight personnel plus room for printers, white boards, etc. This is the main SIB room.

A2.2.2. One or two office(s) for three to five admin personnel (including the Recorder), two to three computers, a SIB networked high volume scanner/printer/photocopier, a full-sized photocopier, a fax machine, a shredder, two filing cabinets, a safe, office supplies, a refrigerator, and a coffeepot with accessories.

A2.2.3. One small office for the Board President (BP).

A2.2.4. One small room for interviews.

A2.2.5. All rooms must be located reasonably close to one another, and all must have their locks changed with the several sets of keys being delivered to the BP. No one outside the SIB should have copies.

A2.3. Computers.

A2.3.1. The SIB can get up and running immediately if the computer requirements are met before SIB members arrive. All items below can be acquired/installed/configured in the several days before the SIB members arrive. Computer support must ensure everything works before the SIB arrives.

A2.3.2. Minimum of one computer for each permanent SIB member plus two to three computers in the Admin section. To ensure the computers are fast enough, they must be no more than one generation old; do not give the SIB anything older. Notebooks or PCs are acceptable. A minimum of four of the computers must have internal or external CD writers. Two portable Hard Drives (500GB) for backing-up SIB shared hard drive every night. All computers must have Word, Excel, Power Point, Outlook, Adobe PRO, WinZip, a graphics manipulation program, and virus scanning software.

A2.3.2.1. Option 1: Allocate the SIB a temporary “Shared Drive” on one of the base servers. Configure the shared drive such that only SIB members have access. The capacity of the shared drive must be at least 10 GB.

A2.3.2.2. Option 2: Create a mini-LAN with the SIB computers. Network all computers to each other such that any hard drive can be accessed by any of the other computers. **Note:** If this option is used computers must still be connected to the Internet.

A2.3.3. All computers must be configured exactly the same way. Comm must configure your computer setup and must also understand that the SIB requires 30-minute computer support 24 hours a day seven days a week.

A2.3.3.1. All computers must be connected to the Internet. The SIB will also need a computer that is not connected to the network to connect civilian (e.g., tech support) USB devices, camera cards, and other evidence.

A2.3.3.2. Local e-mail accounts set up for all SIB members if necessary.

A2.3.3.3. Two (2) duplexing (two-sided) laser printers with spare ink cartridges (one in Admin section, one in main SIB room).

A2.3.3.4. One duplexing color laser printer with spare ink cartridges (main SIB room). Notes: (1) All peripherals should be plug and play (e.g., USB).

A2.3.3.5. High quality scanner with Optical Character Recognition Software. Connect to one of the Admin computers.

A2.3.3.6. Optional: Two or three approved portable hard drives.

A2.4. Phones.

A2.4.1. Six to Eight Class A lines:

A2.4.1.2. Three in the admin office: two for phones, one for a Fax machine.

A2.4.1.3. One in the BP's office

A2.4.1.4. Four in the main SIB room

A2.4.2. Four speakerphones, all with mute and hold capabilities:

A2.4.2.1. One for the BP

A2.4.2.2. Three in the main SIB room

A2.4.3. Two phones in the admin office, both with mute and hold capabilities.

A2.4.4. All phones interconnected so any other phone in the SIB can answer a ringing line or call forward to another line.

A2.4.5. DSN (immediate access needed) without going through the operator.

A2.4.6. For overseas, need immediate access without going through operator.

A2.4.7. Commercial long distance authorized without going through the operator.

A2.4.8. Letter from Comm SQ/CC authorizing the above and priority for repair needs.

A2.4.9. Conference call capability.

A2.4.10. Voice mail on all phones or answering machines for the BP and the Recorder.

A2.5. Copy/Fax/Scanner Machines.

A2.5.1. One black and white photocopier capable of two-sided (duplex) printing/collating/stapling. Don't take "No!" or "you can share the existing copier" for an answer - it never works!!! The SIB absolutely needs sole use of a B&W copier.

A2.5.2. One color photocopier capable of two-sided (duplex) printing/collating/stapling.

A2.5.3. Contract for 24-hour service seven days a week on all copiers.

A2.5.4. One plain paper fax machine.

A2.5.5. One high quality color scanner with Optical Character Recognition Software. Connect to one of the Admin computers.

A2.6. Audio-Visual.

A2.6.1. Four digital high quality, portable recorders w/headphones suitable for interview transcribing.

A2.6.2. Stand-alone laptop for downloading interviews from digital recorders.

A2.6.3. Blank tapes for the above tape recorders if not using digital recorders.

A2.6.4. Digital video camera and tripod for interviewing witnesses.

A2.6.5. 20 blank videotapes for the above video camera if not digital.

A2.6.6. Video players and monitors compatible with any videotapes that may be used by the SIB (i.e., compatible with system used in mishap aircraft).

A2.6.7. Portable computer projector (and screen) for presentations (e.g., an In-Focus machine).

A2.6.8. Projector or wall-mounted TV connected to computer with LAN Access.

A2.7. Vehicles.

A2.7.1. Depending on location, funding, and special location requirements, you may or may not have to provide staff vehicles, a small truck, and a multistop vehicle (bread van). Be prepared to provide at least some vehicles, and get with the BP to discuss further arrangements. **Note:** Vehicles will be returned as the need declines, usually around day seven.

A2.8. Office Equipment.

A2.8.1. Two four-drawer file cabinets.

A2.8.2. One large shredder (not a wastebasket type).

A2.8.3. One large refrigerator, coffee pot/urn, plastic plates/ware, and garbage bags.

A2.8.4. Work stations for the admin office, BP office, and main SIB room.

A2.8.5. Tables for the interview rooms and admin office.

A2.8.6. Swivel, wheeled office chairs.

A2.8.7. Four large white erase boards (three mounted on the walls in the main SIB room, one in the admin office).

A2.8.8. One small white erase board (mounted on the wall in the BP's office).

A2.8.9. One easel w/paper.

A2.8.10. Several three-hole punches (at least one with large holes).

A2.8.11. Three staplers, two of them regular desk-type, one heavy duty.

A2.8.12. One paper cutter plus scissors.

A2.8.13. Re-writable CDs, Post-It notes, Scotch tape, three (3) permanent markers.

A2.8.14. Several boxes of chart tape.

A2.8.15. Seventy-five (75) minimum hanging file holders.

A2.8.16. Three each of red, blue, black, green, orange, purple, brown dry erase markers.

A2.8.17. Twenty (20) each of blue ink pens, black ink pens, red ink pens, green ink pens and mechanical pencils.

A2.8.18. Ten (10) steno pads.

A2.8.19. Two cases of 8" x 11" printer paper.

A2.8.20. One roll of butcher paper.

A2.8.21. Eight waste baskets.

A2.9. Supply.

A2.9.1. Letter from Supply CC authorizing SIB priority for equipment such as engine hoists, special tools, and any other needed equipment; have letter sent to the Maintenance Operations Center.

A2.9.2. Covered heated/air conditioned space for MX personnel to work in.

A2.9.3. Authorization for special use space such as labs, a hush house, etc.

A2.9.4. Have CE build any special stands or workstations MX needs.

A2.10. Photography Support.

A2.10.1. 24 hour, seven days a week photo support.

A2.11. Services Support.

A2.11.1. Letter from Services CC authorizing billeting for all board members in the same building.

A2.11.2. Might need contract for hotel at crash site if in an expensive area (e.g., a resort community).

A2.11.3. Get a contracting officer on call.

A2.12. Travel Orders.

A2.12.1. Ensure travel orders include “variations authorized” due to the nature of travel or change in days required for the TDY.

A2.12.2. Ensure to select “full rate” per diem, unless directed otherwise by MAJCOM guidance, since the schedule that SIB members may work won’t necessarily align with the schedule of the base dining facility. EXCEPTION: If the SIB convenes at a location under “field conditions” (e.g., AOR location with billeting and meals provided) they will receive same per diem as other personnel deployed to that location.

A2.12.3. Ensure SIB members are authorized for “dual lodging” in the event that travel is required from the main investigation site.

A2.12.4. Ensure a rental car is authorized for each SIB member. However, the rental car may not be required due to availability of vehicle support as discussed in paragraph A2.8.

Attachment 3

SUGGESTED SIB CONVENING ORDERS FORMAT

SPECIAL ORDER: M-K4 18 Sep XX

Pursuant to AFI 91-204, chapters 2 and 4, and the authority of COMXXX to convene aircraft safety investigations under that instruction, the following individuals, organization indicated, are appointed as Safety Investigation Board members to investigate the Class X aircraft mishap, A-10A, XX-XXXX, from the 4FW/23FG/75FS, Pope AFB, NC, which occurred on 15 Sep XX. They will determine the cause(s) of this mishap, make recommendations to prevent recurrence, and prepare a formal mishap report as prescribed by AFI 91-204 and AFMAN 91-223. Board members report to the board president and their SIB duties will take precedence until the investigation is complete. The investigation is complete when the board is released by COMXXX and formal report is accepted by HQ AFSEC.

PRIMARY MEMBERS

COL XXXXXX X. XXXXX SIB PRESIDENT	33 OG EGLIN AFB, FL
CAPT XXXXX X. XXXXX INVESTIGATING OFFICER	71 FS LANGLEY AFB, VA
CAPT XXXXXX X. XXXX PILOT MEMBER	358 FS DAVIS-MONTHAN AFB, AZ
1LT XXXXXX X. XXXXX MAINTENANCE MEMBER	354 FS DAVIS-MONTHAN AFB, AZ
CAPT XXXXX X. XXXX MEDICAL OFFICER	99 AMDS NELLIS AFB, NV
MAJ XXXXXX XXXXXX HQ AFSEC REPRESENTATIVE	HQ AFSEC / SEFF KIRTLAND AFB, NM
CAPT XXXXXX XXXXX HUMAN FACTORS CONSULTANT	99 AMDS NELLIS AFB, NV
TSGT XXXXX XXXXXX AIRCREW FLIGHT EQUIPMENT MEMBER	75 FS DOVER AFB, DE

SECONDARY MEMBERS

LT XXXXXXX XXXXX RECORDER	43 AMX POPE AFB, NC
MAJ XXXX XXXXX COMMANDER'S REP	58 SOW KIRTLAND AFB, NM

FOR THE COMMANDER

//signed//
XXXXXX X. XXXXXX, Colonel, USAF
Chief of Safety

Attachment 4

SAMPLE TAB T

The purpose of every safety investigation is to determine all factors (human, materiel, and environmental) that directly or indirectly contributed to the mishap. This information is used by aircrews, equipment operators, supervisors, commanders, staffs, and designers to eliminate cause factors and thus help prevent recurrence of similar mishaps. Each safety investigation adds to the overall USAF mishap experience, providing a basis for corrective actions and reduced mishap potential. Investigative findings and recommendations may determine the requirements for additional training, validate a need for increased frequency of maintenance, justify improvements to materiel, establish future design criteria, and achieve other long-range results. This places a premium on the accuracy and thoroughness of each investigation to determine the ultimate actions to be taken to remove or eliminate factors that cause or contribute to mishaps.

Overall writing tips:

Your goal in Tab T is to clearly show the following:

1. Areas investigated.
2. Significant possible factors considered and rejected, with rationale.
3. Factors accepted, with rationale as to why they are considered most credible as appropriate.

When writing to this, it is important to plainly detail why you considered something as a potential mishap factor, the tools you used for analysis (e.g., parts analysis at XXX laboratory, simulator tests, human factors consultants, etc.), and how the SIB came to its conclusions. It is important to provide full disclosure in your rationale (e.g., the Flight Data Recorder did not record the exact airspeed for a specific event, but the SIB was able to reasonably estimate the airspeed based on videotape analysis performed by XYZ laboratory and simulator testing). Try to anticipate questions that may arise from your conclusions and do your best to answer them up front. Do not leave the reader guessing. Try to fully develop the logic chain used to reach your conclusion. Always remember you are writing for someone who has no previous knowledge of the mishap and likely not knowledgeable of the specific aircraft/mission in question. Above all, use plain English whenever possible.

Writing should be in Times New Roman 12. Use past tense throughout ("The SIB determined," "The mishap aircraft departed"). Be consistent with terms and acronyms used throughout (e.g., "pounds" or "lbs"). The first time you use an acronym, spell it out followed by the acronym in parenthesis (e.g., Safety Investigation Board (SIB)). Any time after that you can simply use the acronym.

Fill in details as much as possible. You can quote applicable regulations/instructions (but don't include the entire document in Tab T; include applicable pages in Tab V), interview statements from mishap participants, etc. If pictures and diagrams help build your case, use them where appropriate. Don't forget to research and reference past mishaps if applicable (e.g., The SIB

determined there have been seven in-flight engine shutdowns for malfunctioning Manifold Oscillators (MO) in the last four years.).

Above all, try to keep answering the “why” questions until you come to a logical point where the mishap chain started, and more importantly, one where you can make recommendations to fix the deficiency/deficiencies to keep the mishap from happening again.

For example:
The Mishap aircraft declared an IFE and recovered to home station uneventfully.
Why?
The Mishap Engine (ME) Manifold Oscillator (MO) failed.
Why?
The ME MO fractured lengthwise abeam the mounting clamp due to high cycle fatigue.
Why?
The ME MO was not properly installed during phase maintenance 6.8 hours prior to the mishap.
Why?
The Technical Order 1-F109JG-2 paragraph 13, Step A, for installing the MO is incomplete and does not include steps to properly torque the mounting clamp following reassembly.
Why?
The Program Office did not incorporate a Technical Service Bulletin from the ME manufacturer detailing the proper steps to follow in order to install the MO. (This is where the SIB would make a recommendation to correct this condition.)

TAB T
INVESTIGATION, ANALYSIS, AND CONCLUSIONS

T1. GLOSSARY OF TERMS AND ACRONYMS

T2. MISHAP OVERVIEW

T2.1. HISTORY OF MISHAP

T2.2. INVESTIGATION, ANALYSIS, AND CONCLUSIONS

T3. BACKGROUND INFORMATION

T3.1. MISHAP PILOT (MP)

T3.2. MISHAP INSTRUCTOR WEAPONS SYSTEMS OFFICER (MWSO)

T3.3. MISHAP MAINTAINER (MM)

T3.4. MISHAP AIRCRAFT (MA)

T4. OPERATIONS AREAS INVESTIGATED

T4.1. INVESTIGATIVE SOURCES OF DATA

T4.2. DESCRIPTION OF SYSTEMS, PROCESSES, ORGANIZATIONS

T4.3. FACTORS

T4.3.1. MISSION PLANNING

T4.3.2. FAILURE TO OBTAIN UPDATED BIRD CONDITIONS

T4.4. NON-FACTORS

T5. MAINTENANCE AREAS INVESTIGATED

T5.1. INVESTIGATIVE SOURCES OF DATA

T5.2. DESCRIPTION OF SYSTEMS, PROCESSES, ORGANIZATIONS

T5.3. FACTORS

T5.3.1. TECHNICAL DATA COMPLIANCE

T5.3.2. TERRAIN FOLLOWING RADAR (TFR) MALFUNCTION

T5.4. NON-FACTORS

T6. LOGISTICS AREAS INVESTIGATED

T6.1. INVESTIGATIVE SOURCES OF DATA

T6.2. DESCRIPTION OF SYSTEMS, PROCESSES, ORGANIZATIONS

T6.3. FACTORS

T6.3.1. DEPOT QUALITY ASSURANCE PROCEDURES
T6.3.2. LACK OF BIRD DETECTION AND WARNING SYSTEM
T6.4. NON-FACTORS
T7. NON-FACTORS WORTHY OF DISCUSSION
T7.1. AN-PRC-112 SURVIVAL RADIO ANTENNA CRACKING/FAILURE
T7.2. TFR KANUTER RADAR RELAY (KRR) DOCUMENTATION
T7.3. TERRAIN FOLLOWING RADAR (TFR) SYSTEM RELIABILITY
T8. FINDINGS AND CAUSES
T9. RECOMMENDATIONS
T10. OTHER FINDINGS AND RECOMMENDATIONS OF SIGNIFICANCE
T11. AUTHENTICATION PAGE
T12. MINORITY REPORTS

T1. GLOSSARY OF TERMS AND ACRONYMS

AOR	Area of Responsibility
ATC	Air Traffic Control
ATO	Air Tasking Order
CAMS	Core Automated Maintenance System
CAOC	Combined Air Operations Center
CL	Command Link
Dash-one	Air Force T.O. 1Q-1(M)B-1
DO	Director of Operations
EP	Emergency Procedures
ERS	Expeditionary Reconnaissance Squadron
FOL	Forward Operating Location
GA	General Atomics
GCS	Ground Control Station
GDT	Ground Data Transmitter
HDD	Heads Down Display
HHQ	Higher Headquarters
HUD	Head Up Display
IAW	In Accordance With
IOC	Initial Operating Capabilities
IP	Instructor Pilot
ISR	Intelligence, Surveillance, and Reconnaissance
KIAS	Knots Indicated Air Speed
L	Local (time)
LCD	Liquid Crystal Display
LOS	Line of Sight
LRE	Launch and Recovery Element
MA	Mishap Aircraft
MAP	Manifold Air Pressure
MC	Mishap Crew
MDS	Mission Design Series
MGCS	Mishap Ground Control Station
MPPSL	Mishap Predator Primary Satellite Link
MP	Mishap Pilot
MS	Mishap Sortie
MSO	Mishap Sensor Operator
MSL	Mean Sea Level

MWS	Major Weapons System
NM	Nautical Miles
OCR	Office of Collateral Responsibility
OIF	Operation Iraqi Freedom
OFS	Other Findings of Significance
OPR	Office of Primary Responsibility
Ops Tempo	Operations Tempo
PCM	Primary Control Module
PPE	Personal Protective Equipment
PPSL	Primary Predator Satellite Link
PSO	Pilot/Sensor Operator
RL	Return Link
RPA	Remotely Piloted Aircraft
RPV	Remotely Piloted Vehicle
RTB	Return to Base
RX	Receiver
SATCOM	Satellite Communication
SIB	Safety Investigation Board
SOF	Supervisor of Flying
SPO	System Program Officer
SWA	Southwest Asia
TCI	Time Change Item
TCTO	Time Compliance Technical Order
T.O.	Technical Order
T/O	Takeoff
TX	Transmitter
UAV	Unmanned Aerial Vehicle
VIT	Variable Information Table
VPP	Variable Pitch Propeller
Z	Zulu (time)

Note: *Sections T2, T3, T4, T5, T6, and T7, minus any pictures, figures or diagrams, will become the narrative section of the final message in AFSAS. Ensure all narrative references to any pictures, figures, and diagrams have been deleted.*

T2. MISHAP OVERVIEW

T2.1. HISTORY OF MISHAP

The history of the mishap is a narrative, in chronological order, of all pertinent events from briefing, ground operations, takeoff, etc., through the mishap sequence, search and rescue, recovery of the pilot, and recovery of the aircraft for analysis, etc. Do not include analysis, just the facts in the mishap sequence. For maintenance mishaps that do not involve flight, start the mishap sequence from when the maintainers were assigned the

task that resulted in the mishap and continue until the damage is identified and the aircraft is safe. Times of significant events should be integrated into the write-ups. Remember to define an acronym the first time it is used in the Tab T (e.g., The mishap sortie (MS)). The history explains what occurred, but not why.

The mishap flight (MF) was scheduled as a two-ship F-15E surface attack (SA), Continuation Training (CT) sortie to the BT-69 bombing range. The MF accomplished mission planning the day prior to the mishap sortie. The mishap flight lead (MFL) selected VR-069. Bird Avoidance Model (BAM) and Aviation Hazard Advisory System (AHAS) were forecasting LOW bird activity during the planned flight period. The mission profile included a formation takeoff, enroute navigation to the low-level route, VR-069 points A – G, Terrain Following Radar (TFR) operations, radar and visual bombing events on the range, and return-to-base (RTB) for a formation landing.

The MFL re-checked AHAS prior to the briefing and verified the bird LOW condition was still in effect. The mission briefing was unremarkable and discussed bird hazard and avoidance procedures on the low level route. The MFL challenged all members of the flight not to allow low-level entry unless an updated bird condition was obtained within 30 minutes of entering the low altitude structure. The mishap pilot (MP) provided a full crew briefing to the mishap weapons systems officer (MWSO) to include bird strikes, emergency procedures, and ejection topics. At the step briefing, the squadron Top-3 briefed bird LOW conditions for VR-069 for the scheduled flight time. The mishap crew (MC) stepped on time. During ground operations, the MFL developed a hydraulic leak that required maintenance actions. No spare aircraft were available so the MFL directed the MC to take off single ship in order to meet their scheduled range time. The MC took off uneventfully at 1015L.

Enroute to the low-level entry point, the MC initiated medium altitude TFR checks. The mishap aircraft (MA) would not pass initial TFR checks so the MC continued to troubleshoot the system. The MC also noticed weather building around the low level entry point. The MC cancelled Instrument Flight Rules (IFR) and continued under Visual Flight Rules (VFR) while attempting to avoid the building weather. The MC detected a small rain shower both visually and on the Air-to-Ground (A/G) radar along the intended route of flight. The MC deviated around the rain shower until they found a suitable opening in the clouds for their descent. The MC also continued to work the TFR problems. Unable to fix the TFR problems, the MC elected to fly the low-level route visually, without TFR assistance.

At 1020L, the bird condition for VR-069 points B through D changed from LOW to SEVERE.

The MC entered VR-069 at 1100L at 500 ft above ground level (AGL). The MC did not re-check AHAS with either squadron operations or the Supervisor of Flying (SOF) as required by the Operations Group (OG) In-Flight Guide (IFG). The IFG requires aircrew to check current bird conditions within 30 minutes of low-level or range entry. At the second turn point of VR-069 (point C), the MC encountered numerous blue footed

boobies. An unknown number of birds impacted the MA. In response to the initial impact, the MC began an immediate climb reaching approximately 30 degrees nose high. Shortly after beginning the climb, the MC noticed both engine fire lights illuminated. The MWSO noticed fire and smoke trailing the MA. The MC also noticed both engines winding down and began to feel the MA shake violently. As the MA airspeed began to decay, and as the MA vibrations increased, the MC elected to eject passing through approximately 3000 ft AGL. Both aircrew ejected successfully and landed in a plowed field approximately three minutes later. The MA impacted the ground in a remote, forested area and was destroyed.

After ejection, both the MP and MWSO retrieved their AN/PRC-112 survival radios and attempted to extend the "whip" antenna. Both antennas had fatigue cracking where the antenna is attached to the radio unit and broke off as they attempted to extend them. This did not delay their recovery as local law enforcement officials driving on a remote country road saw the MC parachuting to the ground and arrived within five minutes. The MC was transported to a local hospital where they were treated and released for minor injuries (scrapes and bruises) experienced during the ejection.

T2.2. SIB CONCLUSIONS

This section contains a brief summary of why the mishap occurred. Think of this as a "bottom line up front" paragraph(s). This section does not include detailed explanations; those will be included the appropriate factors sections of the Tab T. If human factors are issues in the mishap, be sure to include the name of the human factor (as defined by the HFACS) and the specific HFACS code (see examples below). It is not necessary to include the factor definition as listed in HFACS. This will likely be the last part of the Tab T accomplished after the rest of the Tab T analysis has been written.

The SIB determined that the MC failed to adhere to OG procedures and "obtain a current AHAS update (from squadron TOP 3, RCO, or SOF) within 30 minutes of low level entry" due to two human factors. First the crew channelized their attention [PC102 – channelized attention] on troubleshooting the TFR problem. Due to what was eventually determined to be a failed transmitter, the MC experienced a continual fly up any time the system was turned on. The MC attempted to solve this problem for approximately eight minutes by accomplishing numerous system and component built-in tests (BITs) and by turning the system off and back on to try to reset it. None of these actions were successful (or would be with a bad transmitter).

MC eventually decided to stop working the TFR problem and turn it off, however they admitted they were distracted [PC108 – distraction] from their normal habit patterns by the building weather. These two human factors (distraction and channelized attention) contributed to the MC's failure to remember to obtain a revised bird condition update.

In 2008 ACC tested a bird detection and warning system called BIRDFINDER for use on USAF aircraft that routinely operate in low level environments. Testing revealed that although the system was very successful in detecting most birds, at speeds between 480

and 540 Knots Indicated Airspeed (KIAS), detection times varied between 1 and 5 seconds depending on the size of bird formations. Testing also revealed anything less than 2 seconds was insufficient for avoidance. COMACC decided not to procure the system. Although the BIRDFINDER system was not procured, ACC had funded testing of the BIRDFINDER II system which included improvements on detection ranges/times. At the time of this mishap, the system was not yet ready for testing.

T3. BACKGROUND INFORMATION

Provide background information on the mishap crewmembers, maintenance personnel, leadership, or others (Air Traffic Controllers, Airfield Management, etc.) that were factors in the mishap. Do not place analysis in this section; analysis is included in the appropriate factors section of the Tab T. Simply describe the facts of the personnel involved in the mishap and do not use names. Background information includes but is not limited to information on training, upgrades, promotions, deployments, 30/60/90 day totals, and summary of 72-hour/14-day histories. Include information on additional crew members, maintenance, or logistics personnel if they were factors in the mishap. Include information on others who may have been factors in the mishap, such as Air Traffic Controllers, as appropriate. Also always include background information on the mishap aircrew and mishap aircraft. The level of detail should provide sufficient background to understand the condition of the vehicle and any significant events in its design, manufacture, procurement, maintenance, or overhaul.

T3.1. Mishap Pilot (MP).
T3.2. Mishap Instructor Pilot (MIP).
T3.3. Mishap Maintainer (MM).
T3.4. Mishap Aircraft (MA).

If any of the above are not applicable to the mishap, do not include them in the Tab T, and re-number the section. Add others as applicable.

T3.1. MISHAP PILOT (MP)

*You can **either** provide the background information in a narrative **or** list style. Examples of both are included below. If there is anything unusual (e.g., significant gaps in training) briefly explain the reason.*

Narrative example:

The MP was a 34 year old F-15E Instructor Pilot (IP). He was a 1997 graduate of the Air Force Academy. He attended Undergraduate Pilot Training (UPT) at Vance AFB, OK, graduating in June 1998. From July to December 1998 he attended the F-15E basic course at Seymour Johnson AFB, NC. Upon graduation, he was assigned to RAF Lakenheath, UK. In January 2002, he was assigned as an Air Liaison Officer (ALO) to Camp Red Cloud, Korea. In January of 2003 he was assigned to the 69 FS at Seymour Johnson AFB, NC, where he was an Assistant Director of Operations (ADO).

The MP had 1517.4 total hours, of which 1200.4 were in the F-15E. He upgraded to IP in August of 2003 and had accumulated 469.2 Instructor hours. His 30/60/90 day sortie and flying hour total were: 7/12.9, 15/24.5, 26/38.2. He was current and qualified in all areas of the F-15E.

The MP's medical history, 14-day and 72-hour history was unremarkable. His flight physical was current with no waivers required. His physiological training was current.

T3.2. MISHAP INSTRUCTOR WEAPONS SYSTEMS OFFICER (MWSO)

List example:

Duty History:

USAFA, CO	Graduated 1999
Student JUNT, Pensacola NAS, FL	Jan 00 – Dec 00
FTU Student, Seymour Johnson AFB, NC	Feb 01 – Jul 01
F-15E WSO, Elmendorf AFB, AK	Aug 01 – Dec 03
F-15 WSO, Seymour Johnson AFB, NC	Jan 04 – Present

Time Totals:

F-15E Total	610.5
Overall Career Total	750.4

F-15E 30/60/90 Day History:

30 Day:	10.2 hrs	7 sorties
60 Day:	21.5 hrs	15 sorties
90 Day:	34.0 hrs	28 sorties

Medical History:

The MWSO's medical history was unremarkable. His flight physical was current with no waivers required. His physiological training was current.

T3.3. MISHAP MAINTAINER (MM)

If maintenance personnel (or other personnel such as Air Traffic Controllers, Airfield Management, ABMs, etc.) were factors in the mishap, include their information. If any of the above are not applicable to the mishap, do not include them in the Tab T, and re-number the section.

The MM was a 26 year old, SSgt avionics specialist. He entered the Air Force in 2001 and completed technical school the same year. His first assignment was to RAF Lakenheath and he has been assigned to the 69 AMU since 2004. He is a fully qualified 7-level on current Red X orders.

T3.4. MISHAP AIRCRAFT (MA)

Provide the background information in a narrative style. If there is anything unusual such as significant gaps in flying status for cannibalization status, repeating write-ups, ground aborts, etc., briefly explain the reason and, if applicable, the corrective action. Include time since major inspection or overhaul. Do not include analysis, just the facts as related to the MA history/background.

The SIB reviewed all aircraft records for unusual trends, discrepancies, or circumstances. The MA's last major phase inspection was completed on 23 Mar 09 where the only significant issue was the engine was replaced due to a leaking oil tank. Since 1 Apr 2009, the MA flew a total of 37 sorties consisting of 21 Code-1, 11 Code-2, and 5 Code-3 sorties. On 13 May the MA ground aborted for a Flight Control System (FLCS) self-test failure where the digital flight control computer was replaced as the corrective action. Two days later, the MA again ground aborted for a FLCS self-test failure. This time maintenance found the right stab integrated servo-actuator intermittent and replaced it. On 19 May the MA again ground aborted for FLCS failure and the left main landing gear weight-on-wheels (WOW) switch was found to be intermittent and was replaced. The FLCS problem has not repeated since.

Additionally, the MA experienced a recurring Terrain Following Radar (TFR) malfunction. On 2 Apr the TFR was inoperative and the Sensor Processor Intervelometer Key Encryption (SPIKE) unit was replaced. The write-up repeated on 6 Apr and the SPIKE 2751K2 relay was replaced. On 24 Apr the TFR was inoperative in the "hard ride" mode and this was signed off as Could Not Duplicate (CND) the malfunction. That write-up repeated the next day and maintenance found a wire in the left main landing gear WOW switch crimped and repaired the splice area. On 18 May the TFR system was inoperative one hour into the flight and the SPIKE unit was again replaced. On 22 May the TFR inoperative write-up recurred and the #1 Kanuter Radar Relay (KRR) was replaced. The following day the write-up repeated and the #2 KRR was replaced.

T4. OPERATIONS AREAS INVESTIGATED

T4.1. INVESTIGATIVE SOURCES OF DATA

Explain the sources of data used by the SIB to determine the operations factors in the mishap. For example: flight data recorder, interviews, training, mission preparation, technical assistance provided by contractors, air traffic controller communications, etc.

The SIB analyzed data from numerous sources. The SIB recovered the MA's Head Up Display (HUD) videotape from the wreckage, and although damaged in the post-impact

fire, was able to retrieve valuable footage through help from the Air Force Safety Center (AFSEC) Mishap Analysis and Animation Facility (MAAF). The SIB also retrieved bird forecast information from both BAM and AHAS as well as independent regional wildlife data from the Regional Observatory Directorate of Environmental Nesting Tendencies (RODENT). The SIB conducted multiple interviews with the MC, MFL, wing and squadron supervision, and wing aircrew that had flown VR-069 in the hour preceding the mishap. The SIB collected bird remains and sent them to the Smithsonian Institution for analysis. The SIB conducted a survey among 5th Fighter Wing (5FW). The SIB received on-site technical support from the AFSEC Bird/Wildlife Strike Hazard (BASH) branch, egress expertise from Hill AFB, Utah, and human factors expertise from the AFSEC Life Sciences branch.

T4.2. DESCRIPTION OF SYSTEMS, PROCESSES, ORGANIZATIONS

Describe in narrative format the normal operation of complex aircraft systems, the process involved in the mishap, or the organizational structures as required. For unusual operational environments involved in the mishap, such as test or RPA organizations, provide a detailed description. This description may include organizational charts, etc. Describe what should happen and what went wrong that led to the subsequent analysis in the factor section below. Do not describe processes, systems, etc., that had no influence on the outcome of the mishap. This section will contain enough detail so the reader can understand the SIB's investigative processes. If operations was not a factor in the mishap sequence, this section can simply state it was not a factor in the mishap.

T4.3. FACTORS

Analyze the operational factors that influenced the mishap or its outcome. This section is written in narrative format. Each operations factor will be analyzed in a separate write-up. Multiple factors (e.g., procedures, training, experience, currency, etc.) need to be analyzed and discussed in separate write ups and should not be grouped within a single factor. Topics presented should flow in order from what factors the SIB considered most important to those the SIB considered least important in contributing to the mishap. Incorporate operations human factors from Tab Y but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. Integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the operations factors analysis section under discussion. Provide a detailed analysis and rationale of how human factors contributed to the factor under discussion. For example, if the SIB is reviewing incomplete checklist guidance available to the pilot as a factor under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The mishap pilot used the T-156CL-1 which did not specifically state to pull the fire shutoff T-handle when responding to an engine fire [OP003 – Procedural Guidance/Publications]" then explain how the human factor manifested itself or the result "…which allowed fuel to continue to flow unabated to the burning engine." If there are no operational factors for the mishap write "The SIB determined there were no operational factors in this mishap." Each separate operations factor should be formatted in the following manner:

T4.3.1. MISSION PLANNING

Analysis: *Provide a detailed analysis of the factor's influence on the mishap (see paragraph T4.3.2.below for an example). Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State whether the issue was a factor and if causal state "causal factor in this mishap." For example, "Conclusion: The SIB determined that Mission planning was a causal factor in this mishap" or "Conclusion: The SIB determined that Mission Planning was a factor in this mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.*

T4.3.2. FAILURE TO OBTAIN UPDATED BIRD CONDITIONS

Analysis:

According the 6 OG IFG, aircrew are required to "obtain a current AHAS update (from squadron TOP 3, RCO, or SOF) within 30 minutes of low level entry." (FigureT4.1.).

FigureT4. 1. AHAS update requirement.

Low Fly Area Restrictions

- SOF can establish any altitude restriction for any area/low level or portions of low levels
- A SOF increased BWCs on a Low level will remain in effect until:
  - The SOF lowers the BWC back to AHAS; based on another flight's input
  - A higher AHAS condition is reported
  - One-half hour after sunset
- Aircrew will notify the SOF ASAP after route aborting for birds or if a change of bird condition is recommended.
- On low level routes, cross ALL coastal areas at or above 2000' AGL; in other SUA, use AHAS restrictions.

AHAS operational (www.usahas.com):

AHAS will be checked prior to briefing low level or range flights. Flights will get the current AHAS update (from squadron TOP 3, RCO, or SOF) within 30 minutes of low level entry. Flights are permitted according to the following restrictions:

LOW:	No restrictions on low-level flight.
MODERATE:	Flights are restricted to no lower than 1500 feet AGL (to remain within the confines of the route structure) and no faster than 450C. If the route structure allows flight above 3000 feet AGL, normal low level speeds may be flown.
SEVERE:	Flight is prohibited below 4500 AGL in areas reported severe.

The MC planned to fly VR-69 due to bird condition LOW at the planned time of flight. They also checked the AHAS just prior to brief, at step brief, and just before takeoff. Although they took off on time, they were not planning on entering the low level until 40-45 minutes after takeoff which would require them to obtain an AHAS update after takeoff. The MC, TOP 3, and SOF all testified that this was not accomplished. The SIB determined that the MC failed to do so for two reasons. First, the MC was having trouble with its TFR system. The crew developed channelized attention [PC102 – channelized attention] with trying to fix the problem prior to low level entry. The MP stated in interviews "We were trying to get the TFR system fixed to complete the sortie. The last thing I wanted was to airbort." Additionally, there was building weather near the low level entry point. Although the MC eventually decided to stop working the TFR problem and turn it off, they admitted they were distracted [PC108 – distraction] from their normal habit patterns by the building weather. These two human factors (distraction and channelized attention) contributed to the MC's failure to remember to obtain a revised bird condition update.

Conclusion: The SIB determined that the failure to obtain an AHAS update IAW 6 OG IFG procedures was a causal factor in this mishap.

T4.4. NON-FACTORS

List out those areas/items the SIB considered but determined not to be factors in the mishap and not worthy of additional discussion. It is not an all encompassing list, but rather a list of areas/items the SIB looked at and ruled out. Those areas/items determined not to be a factor in the mishap but warrant command attention and/or may contribute to a future mishap should be included in section T7, Non-Factors Worthy of Discussion.

Pilot/Crew Qualifications
Training
Crew Rest
Publications
Weather
Supervision

T5. MAINTENANCE AREAS INVESTIGATED

T5.1. INVESTIGATIVE SOURCES OF DATA

Explain the sources of data used by the SIB to determine the maintenance factors in the mishap. For example: the mishap aircraft's history, records, engine history, relevant maintenance performed, maintenance training, results of technical teardowns, maintenance supervision, etc.

The maintenance areas investigated for this mishap include technical order compliance, maintenance documentation, inspections, supervision, tool control, and job performance. The Safety Investigation Board (SIB) concentrated on what maintenance could have done to prevent this mishap and what, if anything, they did to cause the mishap.

The SIB investigated maintenance documentation and repair actions for troubleshooting the Terrain Following Radar (TFR) system. This task was made more difficult since the active aircraft forms were inside the cockpit and destroyed when the MA crashed. However, the SIB was able to use the Core Automated Maintenance System (CAMS) to research maintenance performed on the TFR system.

Although the SIB found the MA's historical documentation of TFR system maintenance was in both CAMS and the historical 781As, the documentation was lacking. Specifically, the Job Standard (JST) for Kanuter Radar Relay (KRR) replacement requires the maintainer to identify which position (left or right) was changed. The SIB found only 44% of KRR changes in the last 6 months had the position annotated.

The SIB analyzed Fault Isolation Manuals and Job Guides to determine if they were sufficient for troubleshooting and maintaining the TFR system and found them to be adequate for the tasks.

T5.2. DESCRIPTION OF SYSTEMS, PROCESSES, ORGANIZATIONS

Describe in narrative format the normal operation of complex aircraft systems, the process involved in the mishap, or the organizational structures as required. For aircraft systems involved in the mishap, provide a detailed description of how the system should work. This description may include photographs, diagrams, technical order quotes, etc. Describe what should happen and what went wrong that led to the subsequent analysis in the factor section below. Do not describe processes, systems, etc., that had no influence on the outcome of the mishap. This section will contain enough detail so the reader can understand the SIB's investigative processes. If maintenance was not a factor in the mishap sequence, this section can simply state it was not a factor in the mishap.

T5.3. FACTORS

Analyze the maintenance factors that influenced the mishap or its outcome. This section is written in narrative format. Each maintenance factor will be analyzed in a separate write-up. Topics presented should flow in order from what factors the SIB considered most important to those the SIB considered least important in contributing to the mishap. Incorporate maintenance human factors from Tab Y but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. Integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the factors analysis section under discussion. Provide a detailed analysis and rationale of how human factors contributed to the maintenance factor under discussion. For example, if the SIB is reviewing incomplete Technical Order Guidance available to the Crew Chief as a factor under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The Crew Chief used the T.O. 1C-2A-5-01JG-69-2, Task 07-7, which did not state to pull the widget safety pin after the widget was installed [OP003 - Procedural Guidance /Publications]" then explain how the human factor manifested itself or the result "…which allowed the widget to vibrate loose during flight resulting in the wing panel being ingested into the mishap engine." If there are no maintenance factors for the mishap write "The SIB determined there were no maintenance factors in this mishap." Each separate maintenance factor should be formatted in the following manner:

T5.3.1. TECHNICAL DATA COMPLIANCE

Analysis: *Provide a detailed analysis of the factor's influence on the mishap (see paragraph T5.3.2.below for an example). Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State whether the issue was a factor and if causal state "causal in this mishap." For example, "Conclusion: The SIB determined that Technical Data*

Compliance was a causal factor in this mishap" or "Conclusion: The SIB determined that Technical Data Compliance was a factor in this mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.

T5.3.2. TERRAIN FOLLOWING RADAR (TFR) MALFUNCTION

Analysis: The MC began performing TFR functionality checks approximately 10 minutes prior to low level entry. Due to what was eventually determined to be a failed transmitter, the MC experienced a continual fly up any time the system was turned on. The MC attempted to solve this problem for approximately eight minutes by accomplishing numerous system and component built-in tests (BITs) and by turning the system off and back on to try to reset it. None of these actions were successful (or would be with a bad transmitter). As mentioned previously, the MC became channelized with fixing the problem to the exclusion of other required actions (such as obtaining a bird condition update prior to low level entry).

The SIB also considered whether an operable TFR system may have detected the concentration of birds on the low level and provided a fly-up and avoided them. Numerous aircrew surveyed responded that they had received fly-ups for bird concentrations although it was not normal. The system was not designed to detect or avoid birds and would take a large concentration to make the system react. Although the bird concentration size could not be determined for this mishap, TFR technical experts at the SPO concluded it was highly unlikely it would have detected them and provided a fly-up. Even if it did provide a fly-up, it may not have precluded the MA hitting birds in the vicinity.

The SIB investigated the background of the MA's TFR system and determined the system had been fully operational with no write-ups for 12 sorties prior to the mishap sortie. The squadron was in a phase of training where the TFR system was used on each of these sorties. The transmitter was considered a fly-to-fail component and simply failed on the mishap sortie. The SIB determined all MX actions and inspections were compliant and could not have precluded the failure.

Conclusion: The SIB determined that the malfunctioning TFR system was a factor in this mishap.

T5.4. NON-FACTORS

List out those areas/items the SIB considered but determined not to be factors in the mishap and not worthy of additional discussion. It is not an all encompassing list, but rather a list of areas/items the SIB looked at and ruled out. Those areas/items determined not to be a factor in the mishap but warrant command attention and/or may contribute to a future mishap should be included in section T7, Non-Factors Worthy of Discussion.

Working Conditions
Manning
Training
Qualifications
Quality Assurance

T6. LOGISTICS AREAS INVESTIGATED

T6.1. INVESTIGATIVE SOURCES OF DATA

Explain the sources of data used by the SIB to determine the logistical factors in the mishap. For example: depot overhaul, depot quality assurance procedures, depot training, acquisition processes, supervision, etc.

The SIB interviewed personnel from the F-15E SPO and ACC/A8. They also obtained technical documents on the BIRDFINDER and BIRDFINDER II systems and consulted with the AFSEC BASH team.

T6.2. DESCRIPTION OF SYSTEMS, PROCESSES, ORGANIZATIONS

Describe in narrative format the normal operation of complex aircraft systems, the process involved in the mishap, or the organizational structures as required. For logistics processes involved in the mishap, provide a detailed description of how the process should work. This description may include photographs, diagrams, work package quotes, etc. Describe what should happen and what went wrong that led to the subsequent analysis in the factor section below. Do not describe processes, systems, etc., that had no influence on the outcome of the mishap. This section will contain enough detail so the reader can understand the SIB's investigative processes. If logistics was not a factor in the mishap sequence, this section can simply state it was not a factor in the mishap.

T6.3. FACTORS

Analyze the logistical factors that influenced the mishap or its outcome. This section is written in narrative format. Each logistics factor will be analyzed in a separate write-up. Topics presented should flow in order from what factors the SIB considered most important to those the SIB considered least important in contributing to the mishap. Incorporate logistics human factors from Tab Y but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. Integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the logistics factors analysis section under discussion. Provide a detailed analysis and rationale of how human factors contributed to the logistics factor under discussion. For example, if the SIB is reviewing incomplete Work Package Guidance available to logistics center personnel as a factor under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The ALC worker used T.O. 2J-F510-5-4 SWP 017-17, which did not state to pull the widget safety pin after the widget was installed on the turbine disk [OP003 – Procedural Guidance/Publications]"

then explain how the human factor manifested itself or the result "…which allowed the widget to vibrate loose during flight resulting in failure of the turbine blade and second and third stage HPT damage." If there are no logistical factors for the mishap write "The SIB determined there were no logistical factors in this mishap." Each separate logistical factor should be formatted in the following manner:

T6.3.1. DEPOT QUALITY ASSURANCE PROCEDURES

Analysis: *Provide a detailed analysis of the factor's influence on the mishap (see paragraph T6.3.2.below for an example). Include enough information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State whether the issue was a factor and if causal state "causal factor in this mishap." For example, "Conclusion: The SIB determined that Depot Quality Assurance Procedures was a causal factor in this mishap" or "Conclusion: The SIB determined that Depot Quality Assurance Procedures was a factor in this mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.*

T6.3.2. LACK OF BIRD DETECTION AND WARNING SYSTEM

Analysis: In 2007 a USAF F-16C hit a bird while flying a low level in Florida. This resulted in a Class A mishap and destroyed aircraft (AFSAS #696968). The SIB from that investigation recommended that ACC procure a commercially available bird detection and warning system called BIRDFINDER for use on USAF aircraft that routinely operate in low level environments. ACC funded the program for testing on the F-16 which was accomplished the following year. Testing revealed that although the system was very successful in detecting most birds, the range at which it detected them was often insufficient to allow avoidance measures at speeds most tactical fighters operate. At speeds between 480 and 540 Knots Indicated Airspeed (KIAS), detection times varied between 1 and 5 seconds depending on the size of bird formations. Testing also revealed anything less than 2 seconds was insufficient for avoidance. In light of these tests, and due to the estimated $5M installation cost per aircraft, COMACC decided not to procure the system. Although the BIRDFINDER system was not procured, ACC had funded testing of the BIRDFINDER II system which included improvements on detection ranges/times. At the time of this mishap, the system was not yet ready for testing.

Although it is unknown whether the BIRDFINDER system would have alerted the MC in time to avoid the bird strike, its absence certainly lessened the opportunity for timely

detection. The SIB determined this was not a causal factor in the mishap due to this uncertainty and the fact the MC should have known they were flying in an area determined to be BIRD SEVERE.

Conclusion: The SIB determined the decision to not procure a bird detection and warning system was factor in this mishap.

T6.4. NON-FACTORS

List out those areas/items the SIB considered but determined not to be factors in the mishap and not worthy of additional discussion. It is not an all encompassing list, but rather a list of areas/items the SIB looked at and ruled out. Those areas/items determined not to be a factor in the mishap but warrant command attention and/or may contribute to a future mishap should be included in section T7, Non-Factors Worthy of Discussion.

Technical Data
Depot modifications
TCTO Compliance

T7. NON-FACTORS WORTHY OF DISCUSSION

NFWODs did not contribute to the mishap, but could contribute to future mishaps and/or warrant command attention. NFWODs frequently provide the background information for OFSs. For Class A and B mishaps, NFWODs should also include factors significantly deliberated and rejected, with rationale. Incorporate human factors but do not simply paste human factors codes and definitions directly from the Tab Y into the Tab T. Integrate DoD HFACS nano codes (don't give definitions) and talk about the applicable human factor in the NFWODs section. Provide a detailed analysis and rationale of how human factors contributed to the NFWOD under discussion. For example, if the SIB is reviewing incomplete Work Package Guidance available to logistics center personnel as a NFWOD under a Procedural Guidance/Publications heading, the write-up should include words to the effect that "The ALC worker used T.O. 2J-F510-5-4 SWP 017-17, which did not state to pull the widget safety pin after the widget was installed on the turbine disk [OP003 – Procedural Guidance/Publications]" then explain how the human factor manifested itself or the result "…which allowed the widget to vibrate loose during flight resulting in failure of the turbine blade and second and third stage HPT damage." NFWODs may become OFS and ORS for section T10. If an issue contributed to the mishap, even minimally, it is a factor and should not be placed in this section. Use the same format (analysis and conclusion) discussed for factors above in paragraph T4.2.1. Also, group NFWODs together by operations, maintenance, and logistics.

T7.1. AN-PRC-112 SURVIVAL RADIO ANTENNA CRACKING/FAILURE

Analysis: *Provide a detailed analysis of the issue found during the investigation that led to the NFWOD (see paragraphs T7.2. and T7.3. below for examples). Include enough*

information so the reader can logically follow the SIB's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, human factors, etc. Use photos or diagrams as necessary. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each NFWOD analysis will be a brief summary that ties the discussion together.

Conclusion: *State the issue was a non-factor worthy of discussion in this mishap, and if it could lead to future mishaps state "but could be a factor in a future mishap." For example, "Conclusion: AN-PRC-112 Survival Radio Antenna Cracking/Failure was a non-factor worthy of discussion in this mishap, but could be a factor in a future mishap." Do not provide further analysis or explanation in the conclusion. Do not write the conclusion as a recommendation.*

T7.2. TFR KANUTER RADAR RELAY (KRR) DOCUMENTATION

Analysis: It was recommended in the F-15 18 Sep 02 mishap that the remove/replace Joint Systems Test (JST) should include the specific position be annotated when a KRR is changed. Although the JST provides a space for such documentation, the SIB discovered that KRR changes were not adequately documented in CAMS or aircraft 781As. The KRR maintainers failed to check to ensure that the documentation was correct due to inattention [PC101 – Inattention]. Many corrective actions simply stated a KRR change occurred without identifying the specific relay. Six months of history was reviewed for KRR changes. The SIB determined 44% of KRR change documentation did not include specific position number in the provided space in the KRR change JST.

Conclusion: The SIB determined that KRR maintenance documentation was a non-factor worthy of discussion in this mishap.

T7.3. TERRAIN FOLLOWING RADAR (TFR) SYSTEM RELIABILITY

Analysis: During the mishap sequence the MC spent approximately 8 minutes trying to identify why they experienced a continual fly up indication any time the TFR system was turned on. They spent this time because the MA had a history of TFR discrepancies and the MC wanted to ensure the system worked correctly prior to entering the low level route. The SIB researched the MA's history of TFR discrepancies and found it had several write-ups since it returned to flying status after the last phase inspection. Even though there were some repeat write-ups the SIB determined the MA's TFR system had been troubleshot and repaired in compliance with technical orders.

The SIB then contacted the TFR System Program Office (SPO) to obtain a fleet-wide history. In the early 2000s, the F-15 TFR system experienced an inordinate amount of discrepancies. This continued until 2006 when Operational Flight Profile (OFP) 4 was released to the field. Since 2006 the F-15 TFR system has had the same reliability as the F-16 (only 1% of write-ups are TFR related).

Conclusion: The SIB determined the reliability of the TFR system was a non-factor worthy of discussion in this mishap, but could be a factor in a future mishap.

T8. FINDINGS AND CAUSES

This section is a chronological list of all the SIB's primary findings and causes. Ensure all findings and causes are supported by the investigation and analysis section. Reference AFI 91-204, Chapter 5. Number the findings consecutively using the following convention: "Finding 1, Finding 2, etc." Each finding should be a single, active voice sentence concisely describing the event that sustains the mishap sequence. Writing in the active voice means constructing sentences where the subject "acts." For example: Passive – No safety pins were installed in the widget. Active – The crew chief failed to install safety pins in the widget as required by tech orders. Passive – Mission planning did not cover en-route obstacles. Active – The crew failed to address en-route obstacles in mission planning as required. Causal findings are further identified with the word "Causal" in parenthesis immediately after the number. Human factors related causes should include those specific human factors attributed as causal in a "due to" statement. For example: The mishap pilot failed to lower the landing gear due to distraction. When putting findings into AFSAS, copy only the narrative, not the "Finding 1 (Causal)." AFSAS automatically populates the finding number and whether it's causal into the final message. Remember to define an acronym the first time it is used in the Findings (e.g., The mishap crew (MC)).

FINDING 1 COMACC accepted the risk of not procuring a bird detection and warning system on the F-15E.

FINDING 2 During mission planning for a two-ship surface attack continuation training sortie, the Mishap Crew (MC) selected a visual route due to forecast BIRD LOW conditions.

FINDING 3 The MC took off single ship due to flight lead's ground abort.

FINDING 4 The bird condition for points B through D changed from BIRD LOW to BIRD SEVERE shortly after takeoff.

FINDING 5 (Causal) The MC failed to obtain current bird conditions for the low level route IAW In-Flight Guide procedures due to distraction with building weather at the low level start point and channelized attention on a malfunctioning Terrain Following Radar system.

FINDING 6 The MC entered the low level at 500 ft AGL and unaware of the bird condition.

FINDING 7 At point C, the Mishap Aircraft (MA) struck an unknown number of blue footed boobies causing significant damage to both engines.

FINDING 8 The MC began to climb as both engine fire lights illuminated.

FINDING 9 The MC successfully ejected as both engines began winding down and the MA shook violently.

FINDING 10 The MA impacted the ground and was destroyed.

T9. RECOMMENDATIONS

This is a list of the SIB's primary recommendations. Each recommendation must correspond to a finding. However, each finding is not required to have a recommendation. For example, a finding may be the sortie was uneventful from takeoff until recovery for pattern work. This finding would not warrant a recommendation. Number the recommendations consecutively using the following convention: "Recommendation 1, Recommendation 2, etc." Each recommendation should be a single, active voice sentence concisely describing the action to be taken. It will not include analysis. Reference AFI 91-204, Chapter 5. Prior to finalizing any recommendation for any class of mishap, investigators must contact the proposed OPR and OCR to ensure the correct action agency is identified. If assistance is required to identify OPRs and OCRs, contact the CA safety office. AFSAS requires the office symbol, name, rank, and phone number or e-mail address of an action officer for each OPR and OCR. If an AF Form 847 or AFTO 22 was completed, place its tracking number next to the corresponding recommendation. AFSAS has fields to input AF Form 847 or AFTO 22 tracking numbers, so do not include them when copying the recommendation narrative. When recommending changes to publications, be specific on the area to be updated. For example, "Add a 'Caution' to T.O. 1T-5A-39-2-6, Task 8-1 after Step 9. Caution should read: 'It is possible for the widget pin lever to be in the full locked position and the widget pins not properly engaged. Damage will result when closing the gear doors if the widget pins are not engaged.'" Do not simply state "Add a Caution to the tech order for widget pin installation." Additionally, the SIB must assess the RHI and input this information into AFSAS. OPRs can assist in computing severity and probability and AFSAS also has a tutorial on how to determine RHIs.

Recommendation 1: Require aircrew to communicate any route aborts for birds, or any bird concentrations that would require a change to bird conditions to both squadron operations and the Supervisor of Flying (SOF).

OPR: 6 OG/CC

This recommendation would not require an OCR as the OPR would be solely responsible for making the required changes. This recommendation would obviously require a corresponding finding as well.

If the SIB found out there was a technically/economically feasible solution to warn aircrew of large bird concentrations, an example recommendation would be:

Recommendation 2: Develop and install a bird detection and warning system on the F-15E.

OPR: ACC/A8 **OCR:** 830 ASG

Once again, the OPR is who would fund this; the OCR would do the work on it. Realize you may have more than one OCR doing this work, so include as appropriate.

T10. OTHER FINDINGS AND RECOMMENDATIONS OF SIGNIFICANCE

Reference AFI 91-204, Chapter 5. Ensure the rationale for all OFS and ORS is fully discussed in the narrative section (Non Factors Worthy of Discussion) of the report and final message. Unlike primary findings and recommendations where not all findings have an associated recommendation, each OFS must have at least one ORS. This is because some primary findings only support the mishap sequence. However, since each OFS has the potential to contribute to another mishap it needs an associated corrective action in the form of an ORS. Prior to finalizing any ORS for any class of mishap, investigators will contact the proposed OPR and OCR to ensure the correct action agency is identified. If assistance is required to identify OPRs and OCRs, contact the CA safety office. AFSAS requires the office symbol, name, rank, and phone number or e-mail address of an action officer for each OPR and OCR. If an AF Form 847 or AFTO 22 was completed, place its tracking number next to the corresponding recommendation. AFSAS has fields to input AF Form 847 or AFTO 22 tracking numbers, so do not include them when copying the recommendation narrative. When recommending changes to publications, be specific on the area to be updated. For example, "Add a 'Caution' to T.O. 1T-5A-39-2-6, Task 8-1 after Step 9. Caution should read: 'It is possible for the widget pin lever to be in the full locked position and the widget pins not properly engaged. Damage will result when closing the gear doors if the widget pins are not engaged.'" Do not simply state "Add a Caution to the tech order for widget pin installation." Additionally, the SIB must assess the RHI and input this information into AFSAS. OPRs can assist in computing severity and probability and AFSAS also has a tutorial on how to determine RHIs.

Example:

OFS 1: The AN/PRC-112 Survival Radio antenna is prone to fatigue cracking at the base attachment.

ORS 1: Procure a crack-resistant antenna for the AN/PRC-112 Survival Radio.

OPR: ACC/A4

T11. AUTHENTICATION PAGE

Type each primary SIB member's name, grade, and position on the last page of this tab. Have each concurring member, including primary members from other services on joint investigations, sign above it for authentication of the report or for any changes to the report. If the formal SIB report needs to be changed after it is completed and signed by the board, all primary members of the SIB will be reconvened. If a SIB primary member completed a minority report, insert the text, "SEE MINORITY REPORT" (see below) instead of a signature.

(signature)
XXXX X. XXXXXX, Brig Gen, USAF
SIB President

(signature)
XXXX X. XXXXXX, Maj, USAF
SIB Investigating Officer

(signature)
XXXX X. XXXXXX, Maj, USAF
SIB Medical Member

(signature)
XXXX X. XXXXXX, Capt, USAF
SIB Pilot Member

SEE MINORITY REPORT
XXXX X. XXXXXX, Capt, USAF
SIB Maintenance Member

(signature)
XXXX X. XXXXXX, Capt, USAF
SIB Life Support Member

(signature)
XXXX X. XXXXXX, Maj, USAF
AFSEC Representative

T12. MINORITY REPORTS

(If Applicable)

The primary members determine findings, causes, and recommendations. Primary members that disagree with the results may submit individual minority reports. Minority reports must include reasons for disagreeing, and will include suggested findings, causes, and recommendations if different from those contained in the report. The minority report should be signed and placed in Tab T and should be included as part of the final mishap message. Members submitting a minority report will not sign the authentication page and the text "SEE MINORITY REPORT" will be inserted in lieu of a signature.

Attachment 5

CLASS C/D/E SAMPLE REPORT FORMAT

When writing message narratives for Class C or D mishaps, or Class E events, use the following format; Factual History of the Mishap, Investigation and Analysis, and Conclusions.

4.1. Factual History of the Mishap.

The factual history of the mishap is a narrative, in chronological order, of all pertinent events from briefing, ground operations, takeoff, etc., through the mishap sequence. For maintenance mishaps that do not involve flight, start the mishap sequence from when the maintainers were assigned the task that resulted in the mishap and continue until the damage is identified. The history explains what occurred, but not why. Analysis of why the mishap occurred is in section 4.2.

4.2. Conclusions.

This is a short paragraph summarizing mishap cause and provides a bottom line up front for the reader.

4.3. Investigation and Analysis.

Investigation and Analysis. This section contains a summary of what the SIB/SIO investigated, areas determined to be factors, and why the mishap occurred. It should be broken down into the following sections: 4.2.1 Operations Factors, 4.2.2 Maintenance Factors, 4.2.3 Logistics Factors, 4.2.4 NFWODs. It describes why supervision, pilots, maintainers, logistic centers processes, etc., were factors in the mishap. This section must be written so the reader clearly understands how the findings and causes were determined and clearly states the role of the factors found causal. It also includes descriptions of what equipment may have broken, T.O.s that were inadequate, guidance that was not followed, etc., and why. Report aeromedical, AFE, egress, and other human factors related to a mishap as life sciences safety information. Life sciences safety information is required for all classes of mishaps and events for all involved personnel. Most USAF medical facilities have personnel with additional life sciences expertise (AOP officers, psychologists, etc.) who are valuable resources for ensuring accurate interpretation of life sciences safety information. These individuals should be consulted to support aviation safety investigations. Report life sciences information by populating the appropriate life sciences data fields in AFSAS. See paragraph 6.3. for more information.

4.3.1. Operations Factors.

For each factor use the outline below and title it appropriately based on the subject (replace the words "Factor #1," etc.). If there were no operations factors state so.

Analysis: *Provide a detailed analysis of the factor's influence on the mishap. Include enough information so the reader can logically follow the SIO's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State whether the issue was a factor and if causal state "causal in this mishap." For example, "Conclusion: Mission planning was a causal factor in this mishap" or "Conclusion: Mission Planning was a factor in this mishap." Do not write the conclusion as a recommendation.*

4.3.1.1. *Factor #1.*

Analysis:

Conclusion:

4.3.1.2. *Factor #2.*

Analysis:

Conclusion:

OR

There were no operations factors in this mishap.

4.3.2. Maintenance Factors.

For each factor use the outline below and title it appropriately based on the subject (replace the words "Factor #1," etc.). If there were no maintenance factors state so.

Analysis: *Provide a detailed analysis of the factor's influence on the mishap. Include enough information so the reader can logically follow the SIO's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State whether the issue was a factor and if causal state "causal in this mishap." For example, "Conclusion: Mission planning was a causal factor in this mishap" or "Conclusion: Mission Planning was a factor in this mishap." Do not write the conclusion as a recommendation.*

4.3.2.1. *Factor #1.*

Analysis:

Conclusion:

4.3.2.2. *Factor #2.*

Analysis:

Conclusion:

OR

There were no maintenance factors in this mishap.

4.3.3. Logistics Factors.

For each factor use the outline below and title it appropriately based on the subject (replace the words "Factor #1," etc.). If there were no logistics factors state so.

Analysis: *Provide a detailed analysis of the factor's influence on the mishap. Include enough information so the reader can logically follow the SIO's rationale for conclusions. It will include, as appropriate, references to specific technical orders, publications, training, personnel actions or inactions, results of technical analysis, quotes from interviews, human factors, etc. Often it is helpful to organize this section into a discussion of how the particular action should have been accomplished, how it actually occurred during the mishap, and how this contributed to the mishap. The last portion of each factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State whether the issue was a factor and if causal state "causal in this mishap." For example, "Conclusion: Mission planning was a causal factor in this mishap" or "Conclusion: Mission Planning was a factor in this mishap." Do not write the conclusion as a recommendation.*

OR

There were no logistics factors in this mishap.

4.3.4. Non-Factors Worthy of Discussion

NFWODs did not contribute to the mishap, but could contribute to future mishaps and/or warrant command attention. NFWODs frequently provide the background information for OFSs. For each non-factor worthy of discussion use the outline below and title it appropriately based on the subject (replace the words "NFWOD #1," etc.).

Analysis: *Provide a detailed analysis of the issue and why it did not influence the mishap. Include enough information so the reader can logically follow the SIO's rationale for conclusions. The last portion of each non-factor analysis will be a brief summary that ties the discussion together.*

Conclusion: *State the issue was a non-factor worthy of discussion in this mishap, and if it could lead to future mishaps, state "but could be a factor in a future mishap." For example, "Conclusion: Mission planning was a non-factor worthy of discussion in this mishap, but could be a factor in a future mishap."*

4.3.4.1. *NFWOD #1*

Analysis:

Conclusion:

4.3.4.2. *NFWOD #2*

Analysis:

Conclusion:

OR

Note: There were no non-factors worthy of discussion in this mishap.