

**BY ORDER OF THE
SECRETARY OF THE AIR FORCE**

**DEPARTMENT OF THE AIR FORCE
MANUAL 91-221**



12 SEPTEMBER 2024

Safety

**WEAPONS SAFETY INVESTIGATIONS
AND REPORTS**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: This publication is available for downloading or ordering on the e-Publishing website at www.e-Publishing.af.mil.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: AFSEC/SEW

Certified by: AF/SE
(Col Michael A. Thomas)

Supersedes: AFMAN 91-221, 26 March 2020

Pages: 35

This manual implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*, and is consistent with AFPD 13-5, *Air Force Nuclear Mission*, and provides weapons unique guidance to support Department of the Air Force Instruction (DAFI) 91-204, *Safety Investigation and Reports*. This publication applies to all civilian employees and uniformed members of Regular Air Force (USAF), the Air National Guard, the Air Force Reserve, the United States Space Force (USSF), and those with a contractual obligation to abide by the terms of DAF publications. It directs procedures specific to investigating and reporting USAF and USSF weapons mishaps and events. This manual requires the collection and or maintenance of information protected by the Privacy Act of 1974 authorized by Department of Defense Instruction (DoDI) 5400.11, *DoD Privacy and Civil Liberties Program*. The applicable SORN (OPM/GOVT-1) is available at: <https://dpcl.d.defense.gov/privacy/SORNS.aspx>. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with Air Force Records Disposition Schedule located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the DAF Form 847, *Recommendation for Change of Publication*. Route DAF Form 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but all supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing or unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. Submit requests for waivers through the chain of command to the appropriate tier waiver approval authority, or alternately, to the requestor’s

commander for non-tiered compliance items. 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 DAF. This publication is subject to the Paperwork Reduction Act of 1995.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. This publication is updated to reflect changes in guidance and procedures for weapons safety investigations and reports to align with reporting requirements in AF Safety Automated System (AFSAS) <https://afsas.safety.af.mil>. This document modified criteria for DULL SWORD reporting requirements, updated the Reportable Mishap Flow Chart, provided additional guidance for classified safety reporting, modified report message criteria, updated report submission schedules, modified glossary and terms, and incorporated numerous administrative revisions.

| | |
|--|-----------|
| Chapter 1—GENERAL INFORMATION | 4 |
| 1.1. General..... | 4 |
| 1.2. Mishap Category..... | 4 |
| Figure 1.1. Reportable Mishap Flow Chart..... | 5 |
| 1.3. Mishap Severity Classification..... | 7 |
| 1.4. Flagwords..... | 7 |
| 1.5. DULL SWORD..... | 9 |
| 1.6. Mishap Costs..... | 12 |
| 1.7. Privileged Safety Information..... | 13 |
| 1.8. Determining Investigative Responsibility..... | 13 |
| Chapter 2—ROLES AND RESPONSIBILITIES | 14 |
| 2.1. General Information..... | 14 |
| 2.2. Safety Investigation Personnel..... | 14 |
| Chapter 3—SAFETY INVESTIGATIONS | 17 |
| 3.1. General Information..... | 17 |
| 3.2. Safety Investigation Personnel Requirements..... | 17 |
| Table 3.1. Minimum Safety Investigation Membership Requirements..... | 18 |
| 3.3. Test and Evaluation (T&E) Mishaps..... | 19 |
| 3.4. Obtaining and Using Technical Assistance..... | 19 |
| Chapter 4—REPORTS AND BRIEFINGS | 20 |
| 4.1. General..... | 20 |
| 4.2. Multiple Categories..... | 20 |

| | | |
|--|---|-----------|
| 4.3. | Preparing safety reports for weapons mishaps..... | 21 |
| 4.4. | Preliminary Message..... | 21 |
| 4.5. | Status Message:..... | 21 |
| 4.6. | Final Message. | 22 |
| 4.7. | Incidents and Hazards. | 22 |
| 4.8. | Safety Reports..... | 22 |
| 4.9. | Classified Safety Reporting. | 27 |
| 4.10. | Assembling Safety Mishap Reports..... | 27 |
| Chapter 5—FOLLOW-UP ACTIONS | | 28 |
| 5.1. | General Information..... | 28 |
| Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION | | 29 |
| Attachment 2—REPORT SUBMISSION SCHEDULES, ADDRESS LISTINGS AND DISTRIBUTION | | 34 |

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. This manual, in conjunction with DAFI 91-204, provides guidance for investigating and reporting weapons mishaps. The sole purpose of these safety investigations is to prevent future mishaps. Investigations to gather evidence for claims, litigation, disciplinary, and adverse administrative actions, and for all purposes other than mishap prevention are not covered by this manual.

1.1.2. Weapons mishaps will be reported and classified in accordance with DAFI 91-204 Class A, B, C, D, and E criteria. **(T-0)** Directed energy weapon mishaps will comply with additional reporting and classification requirements directed by DAFI 91-401, *Directed Energy System Safety*.

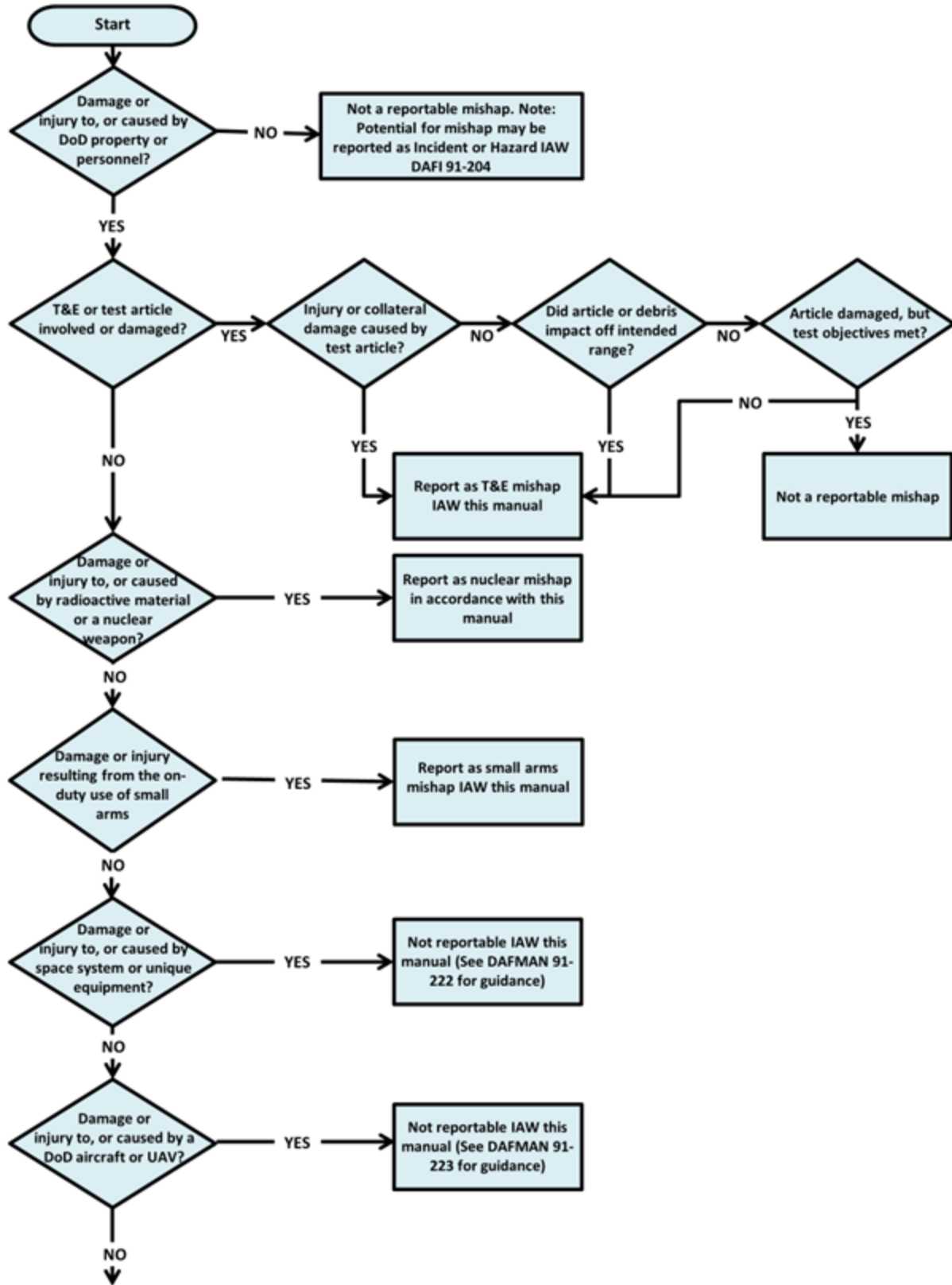
1.1.3. Nuclear Accidents, Incidents, and Deficiencies.

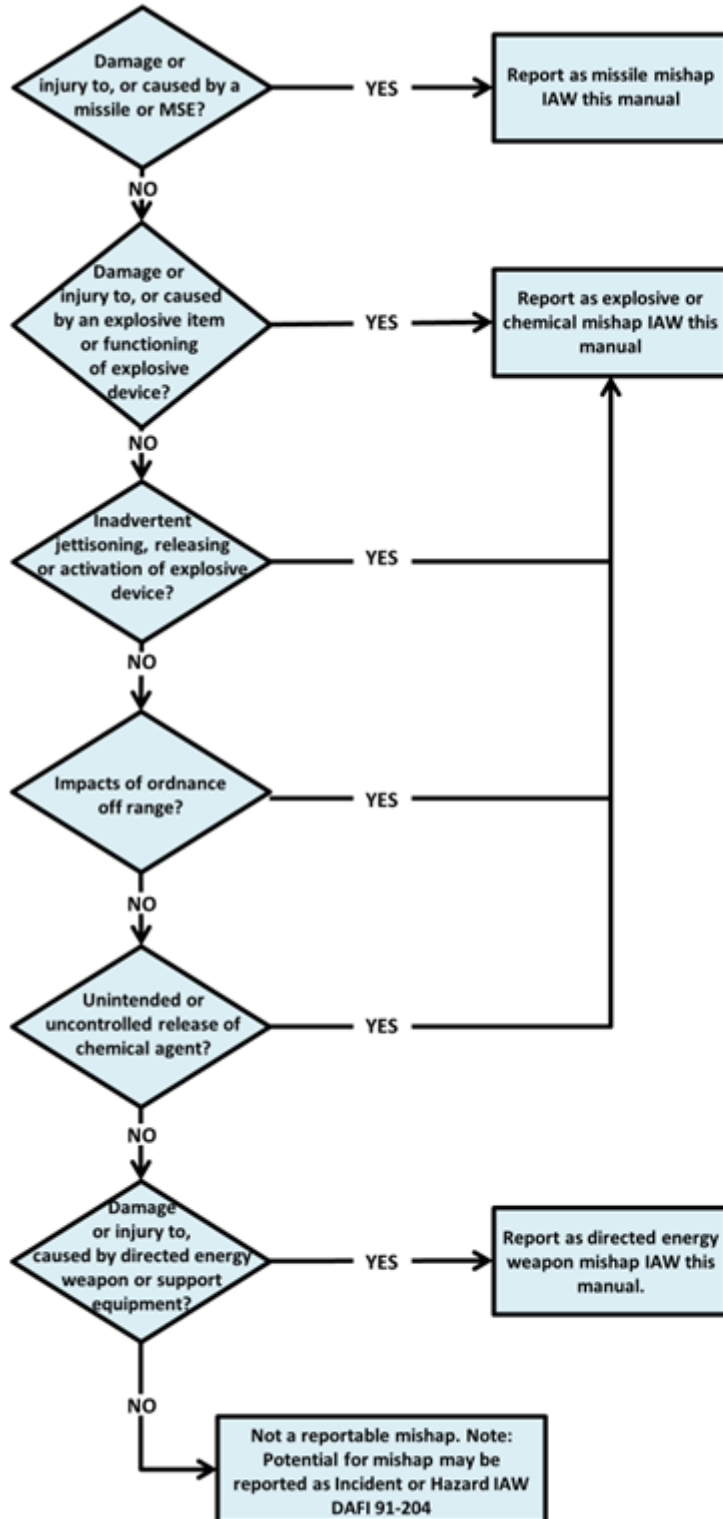
1.1.3.1. Nuclear accidents and incidents will be reported using flagwords and associated mishap class in accordance with DAFI 91-204. **(T-0)**

1.1.3.2. Deficiencies. Deficiencies involving damage and/or injury will be classified as mishaps. Non-damaging/non-injuring deficiencies that meet any of the DULL SWORD criteria listed within this manual will be classified apart from mishaps.

1.2. Mishap Category. Reference **Figure 1.1** below to determine if the mishap should be reported in accordance with this manual.

Figure 1.1. Reportable Mishap Flow Chart.





1.3. Mishap Severity Classification.

1.3.1. Once it is determined that a non-nuclear mishap is reportable, classify mishap by total direct mishap cost and the severity of injury or occupational illness.

1.3.2. When determining the mishap severity classification for nuclear mishaps, be sure to reference the appropriate security classification guide and mark the report appropriately.

1.3.3. Reference [paragraph 1.4](#) and [paragraph 1.5](#) for criteria requiring flagword reporting of a nuclear accident, incident, or deficiency.

1.4. Flagwords.

1.4.1. Flagwords are used to identify nuclear accidents (e.g., BROKEN ARROW) and nuclear incidents (e.g., BENT SPEAR). The safety investigator (as determined by DAFI 91-204 and [Table 3.1](#) of this manual) will determine the best flagword to describe the event. **(T-1)**

1.4.1.1. If the event status changes after submitting an original report, the investigator should submit another report using the new flagword. Flagwords are listed below from most severe (NUCFLASH) to least severe (BENT SPEAR). Investigators should upgrade the flagword only when time-critical responses are required. Do NOT downgrade the flagword of nuclear mishap reports without the concurrence of AFSEC/SEW. **(T-1)**

1.4.1.2. Safety reporting of flagwords is a separate report from operational reporting and should be conducted in addition to, not in place of requirements outlined in Air Force Manual (AFMAN) 10-206, *Operational Reporting (OPREP)*.

1.4.2. NUCFLASH. Includes accidental, unauthorized, or unexplained events that could create the risk of war, meeting any of the following criteria:

1.4.2.1. Accidental, unauthorized, or unexplained actual or possible nuclear detonation by United States (US) forces or US-supported allied forces.

1.4.2.2. Accidental or unauthorized launch of a nuclear-armed or nuclear-capable missile by US forces or US-supported allied forces.

1.4.2.3. Unauthorized flight or deviation from an approved flight plan by a nuclear-armed or nuclear-capable aircraft of US forces or US-supported allied forces that could be perceived as a hostile act.

1.4.3. BROKEN ARROW. Accidental, unauthorized, or unexplained events that could not create the risk of war, but meets any of the following criteria:

1.4.3.1. Accidental or unauthorized launching, firing, or use by US forces or US-supported allied forces of a nuclear capable weapons system.

1.4.3.2. An accidental, unauthorized, or unexplained nuclear detonation.

1.4.3.3. Non-nuclear detonation (no nuclear yield) or burning of a nuclear weapon or nuclear component.

1.4.3.4. Plutonium or uranium contamination from a US nuclear weapon or component.

1.4.3.5. Public hazard, actual or perceived.

1.4.3.6. Jettisoning of a nuclear weapon or nuclear component.

1.4.4. EMPTY QUIVER. Nuclear weapon is lost, stolen, or seized.

1.4.5. BENT SPEAR. Includes mishaps not in the accident category but meeting any of the following criteria:

1.4.5.1. Radioactive contamination from burning, theft, seizure, abnormal release of content, or destruction of a radioactive limited-life component (e.g., neutron generator, gas reservoir(s)) or radioisotope thermal generators.

1.4.5.2. Inadvertent initiation of a limited-life component (except parachutes), or evident damage to a nuclear weapon or nuclear component that requires major rework, replacement, or examination or re-certification by the US Department of Energy.

1.4.5.3. Events requiring immediate action in the interest of nuclear surety (such as render safety procedures or failed positive measures) or which could result in adverse national or international public reaction or premature release of information (such as attempted theft or seizure of a nuclear weapon). **Note:** Includes damage to a nuclear weapon carrier that could lead to loss of, or damage to, nuclear components.

1.4.5.4. An event indicating a nuclear weapon or nuclear warhead has been armed without proper authorization.

1.4.5.5. Abnormal readings encountered during Non-Nuclear Verification procedures of Joint Test Assemblies.

1.4.5.6. Events which could lead to a nuclear weapon system accident and thus warrant the informational interest of, or action by, any of the following agencies:

1.4.5.6.1. Appropriate military service.

1.4.5.6.2. Office of the Assistant to the Secretary of Defense (Nuclear, Chemical and Biological Defense Programs).

1.4.5.6.3. Office of the Assistant Secretary of Defense (Threat Reduction and Arms Control).

1.4.5.6.4. Office of the Assistant Secretary of Defense (Public Affairs).

1.4.5.6.5. Federal Emergency Management Agency (within the continental US).

1.4.6. PINNACLE FADED GIANT. Used to report a radiological accident as defined by any of the following criteria:

1.4.6.1. Release of radioactive material such that, had an individual been present for 24 hours, the individual could have received a dose of 25 rem (internal dose portion is 50-year committed from an intake).

1.4.6.2. Exposure of an individual's whole body to 25 rem or more of radiation, exposure of the eye to 75 rem or more of radiation; or exposure of any extremity to 250 rem or more of radiation.

1.4.6.3. Immediate public hazard or widespread coverage in news media.

1.4.7. BEELINE FADED GIANT. Used to report any event or incident that requires Air Force-level interest, but not requiring a PINNACLE FADED GIANT report. A BEELINE FADED GIANT is a radiological incident as defined by any of the following criteria:

1.4.7.1. Release of radioactive material so that, had an individual been present for 24 hours, the individual could have received an intake with an estimated 50-year committed effective dose equivalent in excess of 5 rem.

1.4.7.2. Exposure of an individual's whole body to 5 rem or more of radiation, exposure of the eye to 15 rem or more of radiation; or exposure of any extremity to 50 rem or more of radiation.

1.4.7.3. Possible public hazard, actual or perceived, or coverage in news media.

1.5. DULL SWORD.

1.5.1. The flagword DULL SWORD is used to report nuclear safety or nuclear surety deficiencies not falling into the accident or incident categories, but meeting any of the criteria listed below. **Note:** Nuclear deficiencies may be associated with mishaps if the deficiency resulted in damage to equipment or injury to personnel. See [paragraph 4.1.1](#).

1.5.1.1. Abnormal Exposure.

1.5.1.1.1. Actual or suspected exposure of a nuclear weapon or component to sources of electrical or electromagnetic energy.

1.5.1.1.2. Damage from electrical or electromagnetic energy (e.g., lightning, over voltage and power fluctuations). This includes malfunction, failure, or any anomaly that directly results in damage or has the potential to damage the nuclear weapon system or component.

1.5.1.1.3. Exposure of a nuclear weapon, nuclear component, or nuclear weapon system to an abnormal environment (such as, but not limited to, flood, earthquake, shock) whereby there is a possibility of damage to the nuclear weapon. Report the incident if there is any doubt as to the condition or serviceability of the nuclear weapon, component, or system.

1.5.1.2. Operational.

1.5.1.2.1. Malfunction, failure, or anomaly involving the command and control system which results in indications (suspected, false, or actual) of any critical function (such as, but not limited to, release, launch, or arming) activation.

1.5.1.2.2. Malfunction, failure, or anomaly during operations or testing of a nuclear weapon or nuclear weapon system, potentially resulting in a safety or coded device to arm or be left in an unsafe condition (such as, but not limited to, safety control switch, safe and arm devices).

1.5.1.2.3. Malfunction, failure, or anomaly that results in suspected or unconfirmed tritium release.

1.5.1.2.4. Minor damage to a nuclear weapon or nuclear component resulting from errors committed during the assembly, testing, loading, or transporting of the nuclear weapon while in Air Force custody (includes electrical components, mechanically activated components, explosives, or radioactive materials). **Note:** Technical Order (TO) 00-35D-54, *USAF Deficiency Reporting Investigation and Resolution (DRI&R)*, or TO 11N-5-1, *Unsatisfactory Reports* may contain reporting guidance regarding

material deficiencies/failures (e.g., dents, scratches, scuffs, chips, rips, tears, cuts, splits) which are not safety related and should be referenced.

1.5.1.2.5. Use of uncertified equipment/hardware or software on a nuclear weapon or weapon system that requires nuclear certification.

1.5.1.3. Personnel.

1.5.1.3.1. Nuclear surety violations, where there is the opportunity to tamper with or damage the nuclear weapon, component, or system. A report is not required for a momentary loss of two-person concept control if the event does not permit tampering with a certified critical component or removal of codes without detection.

1.5.1.3.2. Nuclear weapon system technical order procedure inadequacies that the unit perceives could lead to a violation of nuclear weapon system safety rules. **Note:** TO 00-5-1, *AF Technical Order System*, (using Air Force Technical Order (AFTO) Form 22, *Technical Manual (TM) Change Recommendation and Reply*) and/or TO 11N-5-1, *Unsatisfactory Reports* may contain additional guidance on reporting procedural deficiencies and should be referenced.

1.5.1.4. Security. Catastrophic failures or major malfunctions to an intrusion detection system monitoring equipment or software, and any failure/malfunction trends of the intrusion detection system occurring at a nuclear weapon operational, maintenance, or storage facility. Reference Department of Defense Manual DoDM S-5210.41_AFMAN 31-108-S, *Nuclear Weapon Security Manual: General Nuclear Weapon Security Procedures*, for definitions of catastrophic failures and major malfunctions. **Note:** Do not include false or nuisance alarms.

1.5.1.5. Nuclear Surety.

1.5.1.5.1. Violations involving nuclear weapon system safety rules as published in applicable regulations (i.e., AFI 91-111, *Safety Rules for US Strategic Bomber Aircraft*; AFI 91-112, *Safety Rules for US/NATO Dual Capable Aircraft*; AFI 91-114, *Safety Rules for the Intercontinental Ballistic Missile System*; AFI 91-115, *Safety Rules for Nuclear Airlift Operations*; AFI 91-116, *Safety Rules for Long-Term Storage and Maintenance Operations for Nuclear Weapons*; and AFI 91-117, *Safety Rules for the Airborne Launch Control System*). If the reportability of a violation involving a weapon system safety rule regulation is in question, submit a request to AFSEC/SEW for determination.

1.5.1.5.2. Event or trend with an item that could have an adverse effect on nuclear surety or certification of nuclear weapon systems. This applies to items listed in the following:

1.5.1.5.2.1. Master Nuclear Certification List (MNCL) located online at the AF Nuclear Weapons Center website. New users must register for an account at: <https://login.lcmp.af.mil/logincore/MNCL/request-account>

1.5.1.5.2.2. TO 21M-LGM30F-12-1, *Minuteman Nuclear Surety Procedures*.

1.5.1.5.3. Known damage, malfunction, failure, or anomaly to items listed in the MNCL or TO 21M-LGM30F-12-1 that could have an adverse effect on nuclear surety of a nuclear weapon system.

1.5.1.6. Ground-Launched Missile Systems. Loss or compromise of certified critical components listed in TO 21M- LGM30F-12-1. The DULL SWORD should indicate whether loss or compromise is actual or suspected and should identify follow-on actions required to recertify compromised critical components or to conduct a code change for a compromised code. AFSEC/SEW makes the final determination if appropriate action was taken. If recertification procedures are not provided in appropriate technical orders, or doubt exists regarding what action to take, request guidance from AFSEC/SEW before submitting a DULL SWORD report.

1.5.1.7. Aircraft and Air-Launched Missile Systems.

1.5.1.7.1. Inadvertent release, launch, or jettison of a training weapon or non-nuclear store from any nuclear-capable station of a nuclear certified aircraft.

1.5.1.7.2. Damage, malfunction, failure, or anomaly involving:

1.5.1.7.2.1. Cargo restraint systems, winching systems, or procedures that affects the positioning or securing of cargo on non-combat delivery vehicles (C-17 cargo aircraft). **Note:** Does not include normal wear and tear as identified in equipment technical orders or guidance.

1.5.1.7.2.2. A missile's arming and control, or propulsion system when mated with a nuclear warhead.

1.5.1.7.2.3. A nuclear combat delivery vehicle's aircraft monitor and control.

1.5.1.7.2.4. Equipment installed in aircraft to permit nuclear weapon monitoring and control of the critical functions: safing, pre-arming, arming, and fuzing functions of nuclear weapons or nuclear weapon systems that could have an adverse affect on the nuclear certification of the aircraft.

1.5.1.8. Nuclear Certified Equipment.

1.5.1.8.1. Stability, steering or brake system problems that affect the safe steering, stopping, towing, or holding in park of a tow or transport vehicle (cargo, loading, or lifting). **Note:** Does not include minor problems such as dents, flat tires, corrosion, or electrical accessory malfunctions.

1.5.1.8.2. Defects or failures in vehicle structural members (including the pintle hooks and mounting structure, fifth wheels) that support the load or transmit the towing or braking force.

1.5.1.8.3. Inadequate restraint of loads attributed to trailer tiedown points or tiedown patterns.

1.5.1.8.4. Unsafe condition, malfunction, or improper operation of the hydraulic, mechanical, and structural components of lift vehicles (e.g., forklifts) resulting in unresponsive operation, uncontrolled raising or lowering, or improper cargo restraint.

1.5.1.8.5. Unsafe condition, malfunction, or improper operation of installed equipment lifting devices (e.g., overhead hoists, cranes, load frames, monorail hoist systems, and storage vaults) resulting in situations such as limit switch failure, restraint of load failure, over-speed operation, or uncontrolled raising or lowering operations.

- 1.5.1.8.6. Exceeding the rated load-capacity of any nuclear certified equipment/vehicle listed in the MNCL.
- 1.5.1.9. Nuclear Certified Test Equipment. Damage, malfunction, failure, or anomaly involving test equipment listed in the MNCL. **Note:** Failures of normal functional tests or self-testing that have correction procedures or turn in procedures listed in technical guidance do not need to be reported as a DULL SWORD.
- 1.5.1.10. Other criteria.
- 1.5.1.10.1. Abnormal or unknown status of any nuclear weapon, weapons system, or MNCL item where the applicable technical publication does not provide guidance.
- 1.5.1.10.2. Loss, theft, seizure, or destruction of a training weapon.
- 1.5.1.10.3. When directed by AFSEC, major command (MAJCOM)/field command (FLDCOM), or the unit commander for any problem or situation that affects nuclear safety.
- 1.5.1.10.4. Recognizable faults or failures where specific diagnostic and corrective actions are outlined in current technical data need not be reported as a DULL SWORD unless deemed necessary by the Weapons Safety Manager.
- 1.5.2. DULL SWORD reporting and trend analysis.
- 1.5.2.1. Surety deficiencies shall be reported in accordance with **Table A2.3** by all Air Force and Space Force organizations owning/using nuclear certified equipment through the Air Force Safety Automated System (AFSAS) website located at <https://afsas.safety.af.mil>. Reference **paragraph 4.9** for guidance regarding classified safety reporting. **(T-1)**
- 1.5.2.2. Reports will include the applicable human factor code(s) in the latest version of the DoD Human Factors Analysis and Classification System (HFACS). **(T-0)**
- 1.5.2.3. DULL SWORD reports are used to identify deficiencies through cross-tell communication and/or trend analysis to enhance nuclear surety by identifying the potential for a nuclear mishap.
- 1.5.2.4. AFSEC/SEW will prepare a quarterly informational summary of deficiencies and identified trends. The summary will be posted to the AFSAS website for access.

1.6. Mishap Costs.

- 1.6.1. Use the guidance in Department of Defense Instruction DoDI 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping*, and DAFI 91-204 with the following additions to determine mishap costs for mishap classification.
- 1.6.2. Dropped Weapons. For weapons or their components dropped a distance that exceeds the drop criteria in the specific item technical order, estimate the mishap cost at 15 percent of the item replacement cost in the current stock catalog for initial mishap class determination. **(T-1)** Upgrade or downgrade the mishap class and report all changes when actual cost is determined. **(T-1)** Upgrade or downgrade after completion of final evaluation. **(T-1)** For dropped conventional ammunition and explosives (AE) where there is no damage to property

(other than the dropped AE) or injury to personnel, the Convening Authority may determine to meet only Class C Safety Investigation Board (SIB) requirements.

1.6.3. **Prelaunch Damage.** Compute all ground-launch weapon prelaunch damage occurring without the weapon being launched, to include transportation and storage cost. **(T-1)**

1.6.4. **Unintentional Functioning.** If a weapon or explosive was functioned unintentionally (e.g., a bomb exploded), include the cost of the item (not including intentionally jettisoned items). **(T-1)**

1.6.5. **Intentional Functioning.** If a weapon or explosive was intentionally functioned, do not include the cost of the item. **(T-1)** For test missions where recovery was expected, but not accomplished, include the cost of these items to determine classification, unless test objectives were met, or the risk of non-recovery had been anticipated and accepted. **(T-1)**

1.6.6. **Parachute-recovered weapons.** Include the repair/replacement costs of all components where recovery was expected, but not accomplished, related to abnormal events or clearly excessive damage. **(T-1)** Abnormal events include torn parachutes, late recovery initiation, failure of a parachute to blossom or release, high winds, etc. Excessive damage includes buckling of the main fuselage, fire at impact, destruction of the payload section, etc. The cost of expected damage to parachute-recovered weapons resulting solely from surface impact during an otherwise normal recovery sequence is an operational expense and not reportable. Do not include cost of recovery since recovery is normally a mission objective for recoverable weapons. **(T-1)**

1.7. Privileged Safety Information. Follow guidance listed in DAFI 91-204. There is no additional guidance specific to this manual.

1.8. Determining Investigative Responsibility. Follow guidance listed in DAFI 91-204. There is no additional guidance specific to this manual.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. General Information. In addition to the responsibilities outlined in DAFI 91-204, the following responsibilities apply when conducting a weapons safety investigation and report.

2.2. Safety Investigation Personnel.

2.2.1. Primary Members. Primary Safety Investigation Board (SIB) members determine findings, causes, and recommendations, and are authorized to submit a minority report. Only primary members authenticate safety reports.

2.2.1.1. Board President (BP). The BP is in charge of the SIB, is the final decision authority, and reports directly to the Convening Authority (CA). The SIB BP should coordinate site access requirements directly with the Incident Commander or Recovery Operations Chief. The BP will not assume the role of Incident Commander/Recovery Operations Chief at any point during the investigation.

2.2.1.2. 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).

2.2.1.3. 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.

2.2.1.4. AFSEC Representative. The AFSEC representative acts as the investigation process expert to guide SIB procedures and analysis efforts. 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.

2.2.1.5. Weapon Operations Officer. The weapon operations officer analyzes operations factors, to include: qualifications, proficiency, training, communications, crew actions throughout mishap sequence, mission-specific concerns, performance data, all operations-related publications, and crew stressors.

2.2.1.6. Maintenance Member. The maintenance member analyzes maintenance factors, to include: pre-mishap status of mishap weapon, weapon systems, records, and maintenance personnel qualifications, proficiency, and training. The maintenance member also evaluates depot and quality assurance actions, as well as possible design or engineering deficiencies.

2.2.1.7. Medical Officer. The medical officer analyzes medical data to evaluate medical histories, records, laboratory, radiologic, and pathology reports; and determines the cause(s) and mechanisms of injuries or death. The medical officer may be assisted by a separate human performance member.

2.2.2. Conditional Members. SIB BPs may request these members from the CA depending on the circumstances of the mishap as either primary or secondary members. 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.

2.2.2.1. Human Performance Member. If the SIB suspects significant, complex human factors issues were present in the mishap, a human performance member should be assigned to the SIB as a primary member. Human Performance members include, but are not limited to, aerospace physiologists, aviation psychologists, pilot physicians, human factors engineers, aerospace medicine specialists or aerospace medicine providers which include flight surgeons, aeromedical physicians, aeromedical nurse practitioners or aeromedical physician assistants with mishap training.

2.2.2.2. Air Force Operational Test and Evaluation Center (AFOTEC) Representative. Assign this member anytime AFOTEC personnel 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.

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

2.2.2.4. Weapons Safety Manager. Assign this member when weapons or associated weapon systems are suspected factors in the mishap.

2.2.2.5. Health Physicist. Assign this member if radiation exposure has occurred, or if radioactive sources are involved.

2.2.2.6. Civil Engineering Environmental Representative. Assign this member to analyze data and reports to determine environmental impacts and clean-up estimates.

2.2.2.7. Fire & Emergency Services Member. Assign this member if fire & rescue response, actions, or failures were suspected to have played a major role or contributed significantly to the extent of damage or injuries.

2.2.2.8. Security Forces Member. Assign this member if security response, actions, or failures were suspected to have played a major role or contributed significantly to the mishap.

2.2.2.9. Vehicle Maintenance Officer. Assign this member if vehicle operations or maintenance actions were suspected to have played a major role or contributed significantly to the mishap.

2.2.2.10. 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.

2.2.2.11. Department of Energy Representative. Assign this member if DoD agreements with the Department of Energy apply for the weapon system involved.

2.2.2.12. Munitions/Explosives Representative. Assign a qualified maintenance officer with munitions experience, explosive ordnance disposal officer or non-commissioned officer (NCO), or nuclear safety officer to assist with munitions/explosives analysis.

2.2.2.13. Other Service Representatives (US Navy, Army, Marine Corps, Space Force, and Coast Guard). Assign this member when systems/equipment, 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 DAF 91-series guidance. The CA determines whether they are accorded primary member status in accordance with 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.

2.2.2.14. Additional Representatives. Include additional representatives from other federal agencies to serve as advisors or consultants, if appropriate.

2.2.3. 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 authenticate the report. 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 technical engineering 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.

2.2.3.1. Recorder. An officer or NCO familiar with administrative procedures and experienced in the use of typical office computer software. The recorder manages the work center, control access, filing and security. The recorder also assists with report preparation and distribution.

2.2.3.2. Technical Engineering Member. If an investigation requires a significant level of technical expertise, 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.

2.2.3.3. 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.

2.2.3.4. Program Office Representative. If a Class A or B mishap involves a system where engineering control resides with a program office, (e.g., the program office owns the system Technical Orders) the program office must be represented on the SIB in order to be able to provide relevant and meaningful inputs as required by DoDI 5000.02, *Operation of the Adaptive Acquisition System*, DoDI 6055.07, and DAFI 91-204. **(T-0)**

2.2.3.5. 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.

2.2.3.6. Additional Personnel. Personnel determined by AF Chief of Safety (AF/SE) to be necessary and appropriate under cooperative agreements.

2.2.3.7. Administrative Specialists. NCOs or airmen that assist the SIB with administrative tasks such as building safety report exhibits, transcribing interviews, answering phones, or filing.

Chapter 3

SAFETY INVESTIGATIONS

3.1. General Information. Conduct the safety investigation using a SIB or a SIO. Follow guidance listed in DAFI 91-204 with the addition of the minimum safety investigation membership requirements that are established in [Table 3.1](#) of this manual.

3.2. Safety Investigation Personnel Requirements.

3.2.1. The BP or SIO are as follows:

3.2.1.1. Must meet minimum rank requirements.

3.2.1.1.1. For Class A mishaps, the BP must be a Colonel (O-6), GS-15 or higher rank. **(T-1)**

3.2.1.1.2. For Class B mishaps, the BP must be a Lieutenant Colonel (O-5), GS-14, or higher rank. The SIO must be a GS-11 (0017 or 0018) or higher, or a 7-skill level or higher. **(T-1)**

3.2.1.1.3. For all other class mishaps, the BP/SIO will be a safety NCO, civilian, or officer. **(T-1)**

3.2.1.2. Must meet training requirements.

3.2.1.2.1. For Class A and B mishaps, the BP must be a graduate of the AFSEC Board President Course. The SIO must be a graduate of the Mishap Investigation Non-Aviation course. **(T-1)**

3.2.1.2.1.1. Contact the AFSEC Training Management Branch (AFSEC/SETM) at afsec.setm@us.af.mil for course schedules and locations.

3.2.1.2.1.2. Contact AFSEC/SEW for exceptions to the course requirements.

3.2.1.2.2. For Class C, D, and E mishaps, experience in the weapon system and safety mishap investigation training is preferred.

3.2.1.3. Must be independent from the organization. **(T-1)**

3.2.1.3.1. For Class A mishaps, the BP/SIO must be appointed from outside the wing (or equivalent organization) experiencing the mishap and must neither be attached to the mishap organization nor anticipating an assignment to the mishap organization within the next six months. **(T-1)**

3.2.1.3.2. For Class B mishaps, the BP/SIO must be appointed from outside the mishap unit. **(T-1)**

3.2.2. Requirements for the IO are as follows:

3.2.2.1. Must have experience with the weapon system. **(T-1)**

3.2.2.2. Must be a graduate of the Mishap Investigation Non-Aviation Course. **(T-1)**

3.2.2.2.1. Contact AFSEC/SETM at afsec.setm@us.af.mil for course schedules and locations.

- 3.2.2.2.2. Contact AFSEC/SEW for exceptions to the course requirements.
- 3.2.2.3. Must be independent from the organization. **(T-1)**
- 3.2.2.3.1. For Class A mishaps, the IO will not be assigned to the wing (or equivalent organization) experiencing the mishap. **(T-1)**
- 3.2.2.3.2. For all other Class mishaps, the IO will not be assigned to the mishap unit. **(T-1)**
- 3.2.3. Requirements for the weapon operations officer are as follows:
- 3.2.3.1. Must be qualified in the operational use of the weapon system. **(T-1)**
- 3.2.3.2. Must be independent from the organization. **(T-1)**
- 3.2.3.2.1. For Class A mishaps, the weapon operations officer will not be assigned to the wing (or equivalent organization) experiencing the mishap. **(T-1)**
- 3.2.3.2.2. For all other class mishaps, the weapon operations officer will not be assigned to the mishap unit. **(T-1)**
- 3.2.4. Requirements for the maintenance member are as follows:
- 3.2.4.1. Must be a fully qualified maintenance officer, civilian equivalent, or senior NCO, with maintenance experience on the type of weapon system involved. **(T-1)**
- 3.2.4.2. Must be independent from the organization. **(T-1)**
- 3.2.4.2.1. For Class A mishaps, the maintenance member must not be assigned to the wing (or equivalent organization) that experienced the mishap. **(T-1)**
- 3.2.4.2.2. For all other class mishaps, the maintenance member will not be assigned to the mishap unit. **(T-1)**

Table 3.1. Minimum Safety Investigation Membership Requirements.

| MISHAP | MINIMUM REQUIREMENTS |
|------------------|---|
| Class A | Board President AFSEC Representative Investigating Officer Weapon Operations Officer (see note 4) Maintenance Member Medical Officer (see note 2) Technical Expert on item involved Other members as required (see note 3) |
| Class B | Board President / Single Investigation Officer (see note 1) Investigating Officer Other members as required (see note 3) |
| Class C, D and E | Single Investigation Officer |

Notes:

1. Investigation can be conducted using a SIB or SIO.
2. Required when investigation involves a fatality, otherwise the requirement is optional.
3. For mishaps that involve certain focus areas (e.g., human factors, fire & rescue, program office engineering control, test representative), assign primary members experienced/qualified in that focus area in order to thoroughly investigate the mishap.
4. Not required for mishaps that only involve dropped ammunition and explosives.

3.3. Test and Evaluation (T&E) Mishaps.

3.3.1. Mishaps involving weapon test articles undergoing T&E will be reported per this manual. If test objectives were met, a mishap report is NOT required. Qualifying test events may be investigated using a SIB, Launch Analysis Group (LAG) or Air Launched Munitions Analysis Group (ALMAG). LAG investigations will be handled IAW MAJCOM guidance. ALMAG investigations will be handled IAW AFMAN 99-151, *Air Launched Munitions Analysis Group*. **(T-1)** The report class will be determined IAW DAFI 91-204 classification guidance for the direct cost of the loss incurred. **(T-0)**

3.3.2. The CA will determine if T&E mishaps may be reported via LAG or ALMAG by utilizing the decision tree in AFMAN 99-151.

3.4. Obtaining and Using Technical Assistance. If technical assistance is required to conduct the safety investigation, the SIB should request technical assistance through the CA. The CA then contacts AFSEC/SEW who will answer directly to the SIB.

Chapter 4

REPORTS AND BRIEFINGS

4.1. General.

4.1.1. In addition to the requirements of this chapter, nuclear accidents, incidents, and deficiencies will require the submission of a nuclear flagword report and associated mishap class A-E, if injury or damage occurs. Follow guidance listed in DAFI 91-204, with the following additions:

4.1.2. Report submission schedule. Use [Table A2.1](#) through [Table A2.3](#) to determine report submission schedule. Reports required by these tables are in addition to any operational reporting requirements that may be outlined in AFMAN 10-206. **(T-1)**

4.1.3. Use the following examples for writing subject line of weapons reports, or if AFSAS cannot be accessed:

4.1.3.1. CLASS B, GUIDED MISSILE, 19980307ZQKL003B.

4.1.3.2. CLASS C, EXPLOSIVES AND CHEMICAL AGENTS, EXPLOSIVE, 19991225ZQKL123C.

4.1.3.3. CLASS D, EXPLOSIVES AND CHEMICAL AGENTS, EXPLOSIVE, 19981122ZQKL005D.

4.1.3.4. CLASS E, NUCLEAR, NUCLEAR WEAPON, 19990927FTFA005E.

4.2. Multiple Categories.

4.2.1. When reporting multiple categories, refer to appropriate manuals that implement DAFI 91-204 to provide all required information, and include necessary addressees in the reports.

4.2.2. The objectives for reporting weapons deficiencies are to prevent accidents and incidents, minimize their effects should they occur, and reduce the occurrence of safety deficiencies. The requirement for reporting nuclear weapon system safety deficiencies supports the objectives of DAFI 91-101, *Air Force Nuclear Weapons Surety Program*. The requirements for reporting radiological safety deficiencies support the objectives of Department of the Air Force Manual (DAFMAN) 40-201, *Radioactive Materials (R&M) Management*.

4.2.3. While the results of safety investigations play a direct role in the mishap prevention process, the indiscriminate use of statistical comparisons between units can jeopardize accurate reporting and are inappropriate due to the rare nature of mishaps. DO NOT make statistical comparisons of different commands or units using mishap reports as a source. **(T-1)**

4.2.4. Because the criteria for the submission of safety deficiency reports are so broad, comparing nuclear safety statistics between commands and operating units may NOT provide accurate trend information for managerial analysis. Use safety deficiency reports only to identify potential problems and corrective measures. Do NOT publish statistical comparisons of different commands or units using safety deficiency reports as a source. **(T-1)**

4.3. Preparing safety reports for weapons mishaps.

4.3.1. Safety reporting will be through the AFSAS website. **(T-1)** If AFSAS is not available, units will report IAW DAFI 91-204. **(T-1)**

4.3.1.1. For nuclear investigations, only unclassified DULL SWORD nuclear deficiencies will be reported in AFSAS. **(T-1)**

4.3.1.2. Classified nuclear accidents, incidents and deficiencies will be submitted via SECRET Internet Protocol Network (SIPRNet) or other secure means. **(T-1)**

4.3.2. MAJCOMs and FLDCOMs may supplement their addressees to include any internal organizations with a need-to-know. They may use addressee indicator groups to add addressees, within the command, as recipients of selected safety reports. Do not include addressees outside of MAJCOM or FLDCOM addressee indicator group listings. Do not use an address list for reports that contain little or no information of worldwide mishap prevention potential. Use routine handling procedures for address list addressees.

4.3.3. Send reports conveying significant safety information peculiar to the nuclear weapon system to other MAJCOMs or FLDCOMs possessing like systems.

4.4. Preliminary Message.

4.4.1. Unless otherwise noted, AFSAS is the primary means for documenting and distributing all messages. If AFSAS is not available, mishap reporting may be delayed until it is accessible. Transmit preliminary messages in accordance with (IAW) DAFI 91-204. **(T-1)** For Class A and B on-duty mishaps, send a fully releasable preliminary message within 24 hours ([Table A2.1](#)) **(T-1)**

4.4.2. If possible, safety reports should be written as unclassified. However, if classified information is relevant to the mishap, see DAFI 91-204, paragraph 8.11 for guidance. The classified appendices shall use the same formatting as the unclassified appendices. Ensure the unclassified exhibits reference the classified appendices.

4.4.3. The message should include a narrative description of what happened (but not why), stating the best and most complete information available in simple and direct terms. Reports should not be delayed for lack of information. If complete data is not available, it should be provided in a status report.

4.5. Status Message:

4.5.1. Follow guidance in DAFI 91-204. Status messages may be sent at any time to update information prior to final message when awaiting results from deficiency reports, analyses, toxicology tests, etc. The purpose is to relay the status of the mishap investigation and any new information discovered since the initial status report. Findings, causes, and recommendations may be made in a status report if a delay is anticipated in receiving results and the investigator believes that enough information is available to reach a conclusion. In this case, a status report should be issued no later than 30 days after the mishap with as much information as is known. A final message should be published when the results are known and revise the status report's findings, causes, and recommendations if required.

4.5.2. If new information is found and the information makes significant changes to the final message, a message should be sent updating findings, causes, or recommendations.

4.6. Final Message.

4.6.1. Follow guidance in DAFI 91-204. Complete the investigation and prepare the final message within the specified time limits. **(T-1)** The CA will release the final message, unless this responsibility is delegated to the SIB or Single Investigating Officer (SIO). **(T-1)**

4.6.2. The principles for writing the narrative portion of the final message are the same as for the safety report below.

4.7. Incidents and Hazards.

4.7.1. Incident and hazard reports provide information on events and trends that do not meet Class A-E reporting but have the potential to do so. Incident and hazard reports that have the potential to create a reportable mishap should be reported in accordance with this manual (See [Figure 1.1](#) and [Table A2.1](#)) and DAFI 91-204 incident and hazard reporting. **(T-1)**

4.7.2. If an incident or hazard event involves materiel failure, malfunction, or design deficiency, the program manager forwards corrective action taken or contemplated to AFSEC/SEW, Air Force Materiel Command Chief of Safety, and the investigating MAJCOM/FLDCOM by message within 60 days following the date of the associated deficiency report or combined mishap deficiency report. Replies to deficiency reports by the agency with engineering responsibility suffice for the Air Logistics Complex action message if the incident or hazard event number is included.

4.8. Safety Reports.

4.8.1. Safety reports present privileged and/or non-privileged safety information in a structured format. A safety report is comprised of the narrative, findings, recommendations, exhibits, and AFSAS data entries. In addition to DAFI 91-204 guidance, the information in this chapter provides content and formatting requirements for the safety report.

4.8.2. Report Narrative. The narrative is the culmination of the investigation and provides a complete picture of what happened and why it happened. It is based on the weight of evidence, professional knowledge, and good judgment of the SIB. AFSAS provides SIBs a step-by-step process for entering relevant information and a framework for providing consistent and quality report requirements. AFSAS will combine appropriate information to create the narrative and streamline the entry process for investigators. SIBs will not refer to exhibits in the report narrative. **(T-1)** The safety report narrative includes the following sections: Sequence of Event, Background Information, Factors, Investigation Conclusions, Acronyms, Documents Reviewed, and Referenced Reports. For directions on how to complete the narrative, see DAFI 91-204, the Detailed Instructions in AFSAS, the SIB Go Package, and the following information:

4.8.2.1. The Sequence of Event section is a chronological narrative of significant events and/or actions that led to the mishap. The SIB will not include analysis in this section. **(T-1)**

4.8.2.2. The Background Information section includes three sub sections: General Background Information, Object Background Information, and Person Background Information.

4.8.2.2.1. SIBs should use the General Background Information section to provide context and understanding of the systems, processes, or unusual organizations involved in the mishap. SIBs will not include systems, processes or organizations that are not

discussed in factors. **(T-1)** SIBs may add photographs, diagrams, publication screenshots, etc. if they aid in describing systems, processes, or organizations. SIBs will not include analysis in this section. **(T-1)**

4.8.2.2.2. In the Object Background Information section, SIBs will include details about the mishap weapon system and/or equipment that were damaged or caused damage or injury in the mishap. **(T-1)** SIBs will not include analysis in this section. **(T-1)**

4.8.2.2.3. SIBs will provide background information on personnel who were operating or maintaining the mishap weapon system or were factors in the mishap in the Person Background Information section. **(T-1)** SIBs will not include analysis in this section. **(T-1)**

4.8.2.2.3.1. The SIB will include duty history, significant training, and upgrades/skill level. **(T-1)**

4.8.2.2.3.2. AFSAS includes the question “Is the 72-hour/7-day History Remarkable?” If the SIB answers “yes” include factual data that made the history remarkable. **(T-1)** If the SIB answers “no,” no other medical information should be included in this section.

4.8.2.3. The Factors section includes factors, causal factors, and non-factors worthy of discussion.

4.8.2.4. The Investigation Conclusions section includes a brief summary of why the mishap occurred. SIBs will not include detailed information in this section. **(T-1)** Detailed information is written in the causal factors.

4.8.2.5. SIBs will include a list of all acronyms used in the narrative in the Acronyms section. **(T-1)**

4.8.2.6. SIBs will include any other AFSAS reports used during the investigation in the Referenced Reports section. **(T-1)**

4.8.3. Findings. See DAFI 91-204 for guidance on writing findings.

4.8.4. Recommendations. The purpose of mishap investigations is to prevent recurrence. This is accomplished by identifying causal factors and developing abatement actions that effectively control the identified hazards or deficiencies. Causal factors identified at the supervisor or organization levels usually lead to more effective recommendations. See DAFI 91-204 for guidance on writing recommendations.

4.8.5. HFACS. Mishaps may have HFACS associated with either a person(s) or at the event level. SIBs will input HFACS associated with factors or causal factors in AFSAS. **(T-0)** See the SIB Go Package for the latest HFACS guide.

4.8.6. Exhibit Groups. See DAFI 91-204 for a complete list of exhibit groups. For Class A and B mishaps most exhibit groups are required. However, for any mishap class or event, SIBs will upload exhibits to any exhibit group which supports their analysis and conclusions. **(T-1)**

4.8.6.1. Technical and Engineering Reports. Technical and engineering reports are produced by subject matter experts and detail observations, such as what components are bent, broken or burned, etc., and whether the damage happened before, during or after the

mishap. Reports may include the mechanism or cause of damage, conclusions and recommendations. Refer to DAFI 91-204 for details on technical reports and formatting.

4.8.6.1.1. If a SIB primary or secondary member writes one of these reports, it is considered analysis and is privileged safety information. When uploading a report written by a SIB primary or secondary member in AFSAS as an exhibit select the attribute “reflects Investigative Deliberations.” **(T-1)**

4.8.6.1.2. Subject matter experts who provide reports must sign the appropriate Non-Disclosure Agreement. **(T-1)** Military and government civilians sign the “Non-Disclosure Agreement – Safety Investigation.” Contractors sign the “Non-Disclosure Agreement – Contractor Reps Serving as Tech Experts to SIBs.” Use the templates located on AFSAS in the SIB Go Package.

4.8.6.1.3. SIBs should make every effort to have subject matter experts write non-privileged reports. A subject matter expert’s report is privileged if the analysis includes privileged input from the SIB, regardless of whether the report reveals that SIB analysis. If required/possible, experts can provide both non-privileged and privileged reports.

4.8.6.2. Testimony and Statements. Testimony and statements are derived from interviews with witnesses or involved individuals. These include statements solicited by the SIB or unsolicited statements voluntarily provided by individuals. **Note:** A Privacy Act Warning Statement will accompany all recordings of voice communications. **(T-1)**

4.8.6.2.1. Transcribing interviews is a time intensive task and should be started early in the investigation. If necessary, request additional personnel (including contracted services) to help with transcription. Avoid using DAF legal office personnel, including court reporters, whenever possible to avoid the appearance of a conflict of interest with any legal investigation or other action. SIBs must review and verify the accuracy of all transcripts. **(T-1)**

4.8.6.2.2. SIBs will not upload interview audio or video files as exhibits. **(T-1)** **Exception:** If a privileged interview (with a promise of confidentiality) is only partially transcribed SIBs will include the entire audio or video recording in the Testimony and Statements exhibit group. **(T-1)**

4.8.6.2.3. If non-privileged interviews (no promise of confidentiality) are transcribed, the SIB must transcribe the complete testimony. **(T-1)** SIBs will not summarize the witness’s testimony. **(T-1)**

4.8.6.2.4. SIBs will upload a signed Privileged or Non-Privileged Witness Agreement with each written statement or transcribed interview. **(T-1)** SIBs will use the most current documentation for interviews and written statements found in the Interim Safety Board (ISB) or SIB Go Packages. **(T-1)** Label each Witness Agreement file with the date of the interview and who was interviewed (e.g., 20200504 Mishap Person 1 Interview). **(T-1)** Combining the signed witness agreement with the associated written statement or transcribed interview into a single document is recommended. When uploading a signed privileged witness agreement, SIBs will select the attribute “obtained with a Promise of Confidentiality.” **(T-1)**

- 4.8.6.2.5. When uploading files as exhibits to AFSAS, a single .pdf is preferred, multiple .pdfs are acceptable, and when necessary, multiple file types are allowed. If two or more files are combined into a single file, SIBs should include a table of contents to aid reviewers. SIBs will not upload .zip files as exhibits. **(T-1)**
- 4.8.6.3. Diagrams, Photographs, and Videos. Include items that increase understanding by showing equipment layout, damage, impact areas, metal fractures, traffic pattern, etc. **(T-1)**
- 4.8.6.3.1. Do not upload every photograph provided to the SIB. Only upload photographs that are relevant to the mishap and aid the reader in understanding the analysis and conclusions. **(T-1)**
- 4.8.6.3.2. Do not unnecessarily show evidence of human injury, e.g., bloody car parts. Due to their sensitivity, upload photographs of deceased personnel or injuries in the Medical Information exhibit group only if they support findings or recommendations. **(T-1)**
- 4.8.6.3.3. Photographs and videos are considered privileged if they are staged for SIB analysis and should be marked as reflecting Investigative Deliberations. Depictions of mishap sequence for a given set of assumptions made by the SIB or described in witness testimony are staged photographs. Pointing with a finger or other device at a portion of wreckage does not necessarily make a photograph staged.
- 4.8.6.3.4. Include diagrams that add to the report such as location of wreckage, route of driver, etc. Ensure diagrams are self-explanatory and indicate direction with a northward pointing arrow. If practical, indicate scale. Use Civil Engineering plots, aerial photographs, topographical maps, etc. Do not include diagrams depicting the location of human remains in the Diagrams exhibit group. If they support findings or recommendations, upload such diagrams in the Medical Information exhibit group. **(T-1)**
- 4.8.6.4. Training Records. Include training records for all mishap members involved as applicable. **(T-1)**
- 4.8.6.5. Maintenance and Equipment Records. SIBs will include records that were in place at the time of the mishap. **(T-1)** If the mishap weapon system had any approved time change technical orders, the SIB will include them as exhibits. **(T-1)** If aircraft/weapon ground equipment was a factor in the mishap, SIBs will include the AFTO Form 244, *Industrial/Support Equipment Record*, as an exhibit. **(T-1)** Other than laboratory results of equipment tested after the mishap, SIBs will not include records that were accomplished after the mishap occurred (e.g., aircraft or equipment impoundments, corrective actions taken after the mishap). **(T-1)** SIBs will not include files describing post-mishap repair procedures or requests for repair procedures. **(T-1)** SIBs will not include files that support mishap cost information. **(T-1)**
- 4.8.6.6. Medical Data. If uploading reports/records containing medical treatment or assessment data specifically requested by investigators, ensure the document is marked with the appropriate warning statement. **(T-1)**
- 4.8.7. Exhibit Waivers. SIBs will request exhibit waivers when the SIB has exhausted all options for collecting the data for a required exhibit. **(T-1)** SIBs will use AFSAS to request

and route exhibit waivers through the CA to AFSEC/SEW. (T-1) AFSEC/SEW is the exhibit waiver authority.

4.8.8. Releasable Material. The SIB President/SIO is responsible for the release of all information (including electronic/digital media, photographs, etc.) from the safety investigation. 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. (T-1) Every member of a SIB will sign the *SIB Member Guidance and Non-Disclosure Agreement* located on AFSAS in the SIB Go Package, acknowledging the guidance and restrictions. (T-1) Additionally, include non-disclosure agreements for all technical advisors or additional members that do not sign the memorandum, also located on AFSAS in the SIB Go Package.

4.8.9. Authenticating Safety Reports. Primary members authenticate the safety report by concurring or non-concurring in AFSAS. If a primary member non-concurs in whole or in part with the safety report, the member will submit a Minority Report in AFSAS. (T-1) If the SIB report needs to be changed after it is completed and signed by the board, all primary members of the SIB shall be physically reconvened. (T-1)

4.8.10. Controlling the Safety Report. Once the SIB completes the investigation and finalizes the report, the SIB will notify the CA safety office. (T-1) The CA safety office will control access to the report until the CA is briefed on the results of the investigation. (T-1) Upon approval for release, the MAJCOM/FLDCOM safety office will control the distribution of the report. (T-1)

4.8.11. Forwarding Safety Reports.

4.8.11.1. Access to privileged reports is restricted to those with a need to know in the Department of the Air Force, Space Force, or unified commands. Do not provide access to, copies of, or extracts to agencies outside the Air Force, Space Force, or unified commands. (T-1) If an outside agency needs a copy of the safety report for corrective actions or has statutory jurisdiction, request and secure authorization from AFSEC Judge Advocate (AFSEC/JA) by message or memorandum before sending copies to these organizations.

4.8.11.2. If the safety report cannot be maintained in AFSAS, relevant portions of the safety report should be sent to all Air Force agencies or organizations tasked in the recommendations. If investigators conclude action needs to be taken by an agency outside the CA's command, but cannot specifically identify where it must be accomplished, the CA's safety office will:

4.8.11.2.1. Locate the responsible agency and provide the IO with a point of contact, or (T-1)

4.8.11.2.2. Accept initial responsibility for the action by being tasked as OPR in the safety report. (T-1) The CA's safety office should determine what portions of the safety report are relevant to recommendation action and closure, and facilitate appropriate access IAW DAFI 91-204 to the identified personnel, after securing required nondisclosure agreements.

4.8.11.3. If a Secretariat level or Air Staff office is the action agency for a validated recommendation, the MAJCOM/FLDCOM safety office will give access to the report to that

agency and the Issues Division, Office of the Chief of Safety (AF/SEI). (T-1) MAJCOM/FLDCOM safety offices are responsible for giving access to Field Operating Agencies (FOAs) or Direct Reporting Units (DRUs). (T-1)

4.8.11.4. Do not produce “information only” copies of safety reports. (T-1)

4.8.11.5. The SIB president may keep a complete copy of the safety report (for briefing purposes) for 60 days.

4.9. Classified Safety Reporting.

4.9.1. Classified reports will follow unclassified report schedules and will be submitted via SIPRNet to AFSEC/SEW (usaf.kirtland.afsec.list.sewn-dull-sword-reporting). (T-1)

4.9.2. Ensure all classified messages and reports are properly marked in accordance with DoDM 5200.01v2_DAFMAN 16-1404V2, *Information Security Program: Marking of Information*. (T-0)

4.9.3. Classified safety reports will be available for, or distributed to, the appropriate agencies for review and implementation of corrective actions. (T-1)

4.9.3.1. The CA has responsibility to distribute the safety report. Safety reports will be distributed to the Air Force Chief of Safety (AF/SE), Air Force Deputy Chief of Staff, Operations (AF/A3), Air Force Deputy Chief of Staff, Logistics, Engineering and Force Protection (AF/A4), Air Force Deputy Chief of Staff, Strategic Deterrence and Nuclear Integration (AF/A10), Air Force Safety Center, Weapons Safety Division (AFSEC/SEW), affected MAJCOM/FLDCOM commander, and the United States Strategic Command’s Command Center, at a minimum. Contact AFSEC/SEW for additional agencies requiring a copy of the safety report.

4.9.3.2. Classified DULL SWORD reports are available upon request to AFSEC/SEW.

4.9.4. Create a report number in AFSAS as a placeholder for any classified DULL SWORD report.

4.10. Assembling Safety Mishap Reports.

4.10.1. Prepare safety reports according to this instruction and DAFI 91-204. Additional guidance on report format and access to report templates are available in AFSAS under “Pubs and Refs.”

4.10.2. With the exception of nuclear flagword reports, the report will be assembled from various exhibits that the SIB or SIO uploads into AFSAS.

4.10.3. Ensure documents are marked with appropriate warnings in accordance with DAFI 91- 204. (T-1)

4.10.3.1. Place a footer on each page in Part 2 of privileged safety reports using the Privileged Warning Statement located in the AFSAS SIB Go Package.

4.10.3.2. Place the appropriate statement in the footer on each page for all exhibits containing “CONTROLLED UNCLASSIFIED INFORMATION.”

4.10.3.3. Do not stamp unclassified pages, which have no privileged information with markings indicating special handling requirements or identifying them as “CONTROLLED UNCLASSIFIED INFORMATION.”

Chapter 5

FOLLOW-UP ACTIONS

5.1. General Information. Follow guidance listed in DAFI 91-204, with the following additions.

5.1.1. Managing Preventive Action for Mishaps without Safety Reports. Class C and D mishaps and Class E events without a safety report do not go through the MOFE process. MAJCOMs will establish an internal program to effectively track and manage recommendations resulting from these mishaps. **(T-1)**

5.1.2. OT&E Mishaps. For Class A and B OT&E mishaps, a letter of administrative closure will be accomplished to document AF/SE coordination on report's recommendations.

SEAN M. CHOQUETTE, Maj Gen, USAF
Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

5 USC Section § 552a, *Record Maintained on Individuals* (Privacy Act of 1974), *as amended*, 11 October 2016

Title 29 CFR Part 1904, *Recording and Reporting Occupational Injuries and Illnesses*, 1 January 2015

DoDI 5000.02, *Operation of the Adaptive Acquisition Framework*, 23 January 2020

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

DoDM 5200.01V2_DAFMAN 16-1404V2, *Information Security Program: Marking of Information*, 7 January 2021

DoDM S-5210.41_AFMAN 31-108-S, *Nuclear Weapon Security Manual: General Nuclear Weapon Security Procedures*, 11 July 2023

AFPD 13-5, *Air Force Nuclear Mission*, 17 July 2018

AFPD 91-2, *Safety Programs*, 25 June 2024

AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020

AFI 51-307, *Aerospace and Ground Accident Investigations*, 18 March 2019

DAFI 91-101, *Air Force Nuclear Weapons Surety Program*, 26 March 2020

AFI 91-111, *Safety Rules for US Strategic Bomber Aircraft*, 26 January 2024

AFI 91-112, *Safety Rules for US/NATO Dual Capable Aircraft*, 22 September 2022

AFI 91-114, *Safety Rules for the Intercontinental Ballistic Missile System*, 6 January 2023

AFI 91-115, *Safety Rules for Nuclear Airlift Operations*, 1 November 2022

AFI 91-116, *Safety Rules for Long-Term Storage and Maintenance Operations for Nuclear Weapons*, 9 August 2022

AFI 91-117, *Safety Rules for the Airborne Launch Control System*, 29 August 2022

DAFI 91-204, *Safety Investigation and Reports*, 10 March 2021

DAFI 91-401, *Directed Energy System Safety*, 19 April 2024

AFMAN 10-206, *Operational Reporting (OPREP)*, 18 June 2018

AFMAN 40-201, *Radioactive Materials Management*, 29 March 2019

AFMAN 99-151, *Air-Launched Munitions Analysis Group*, 14 August 2019

TO 00-5-1, *Air Force Technical Order System*, 11 September 2023

TO 00-35D-54, *USAF Deficiency Reporting, Investigation, and Resolution (DRI&R)*, 15 February 2024

TO 11N-5-1, *Unsatisfactory Reports*, 30 April 2024

TO 21M-LGM30F-12-1, *Minuteman Nuclear Surety Procedures*, 27 April 2024

Prescribed Forms

None

Adopted Forms

DAF Form 847, *Recommendation for Change of Publication*

AFTO Form 22, *Technical Manual (TM) Change Recommendation and Reply*

Abbreviations and Acronyms

AE—Ammunition and Explosives

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFOTEC—Air Force Operational Test and Evaluation Center

AFPD—Air Force Policy Directive

AFSAS—Air Force Safety Automated System

AFSEC—Air Force Safety Center

AFTO—Air Force Technical Order

ALMAG—Air-Launched Munition Analysis Group

BP—Board President

CA—Convening Authority

DoD—Department of Defense

DoDI—Department of Defense Instruction

DoDM—Department of Defense Manual

DR—Deficiency Report

DRU—Direct Reporting Unit

FLDCOM—Field Command

FOA—Field Operating Agency

HFACS—Human Factors Analysis and Classification System

HQ—Headquarters

IAW—In Accordance With

IO—Investigating Officer

LAG—Launch Analysis Group

MAJCOM—Major Command

MNCL—Master Nuclear Certification List
MOFE—Memorandum of Final Evaluation
MSE—Missile Support Equipment
NATO—North Atlantic Treaty Organization
NCO—Non-commissioned officer
OPR—Office of primary responsibility
OT&E—Operational Test and Evaluation
PHI—Protected health information
SIB—Safety Investigation Board
SIO—Single Investigating Officer
SIPRNet—SECRET Internet Protocol Network
SF—Space Force
TDY—Temporary duty
TO—Technical Order
UAV—Unmanned Aerial Vehicle
UR—Unsatisfactory Report
US—United States
USAF—United States Air Force
USC—United States Code
USSF—United States Space Force

Office Symbols

AF/A3—Air Force Deputy Chief of Staff, Operations
AF/A4—Air Force Deputy Chief of Staff, Logistics, Engineering and Force Protection
AF/A10—Air Force Deputy Chief of Staff, Strategic Deterrence and Nuclear Integration
AF/SE—Air Force Chief of Safety
AF/SEI—Office of the Chief of Safety, Issues Division
AFSEC/CD—Air Force Safety Center Deputy Commander
AFSEC/JA—Air Force Safety Center Judge Advocate
AFSEC/SETM—Air Force Safety Center Training Management Branch
AFSEC/SEW—Air Force Safety Center Weapons Safety Division

Terms

BEELINE FADED GIANT—A reporting flagword used to identify a radiological incident that poses a hazard to life, health, or property as defined by the criteria in [paragraph 1.4.7](#).

BENT SPEAR—A reporting flagword identifying a nuclear weapon incident. This includes mishaps not in the accident category but meeting any of the criteria in [paragraph 1.4.5](#).

BROKEN ARROW—A reporting flagword used to identify a nuclear weapon accident that could NOT create the risk of war but meets any of the criteria in [paragraph 1.4.3](#).

Catastrophic—Occurs when the entire system or a major portion of it is inoperative. For example, failure of the annunciation and display subsystem.

DULL SWORD—A reporting flagword used to identify a nuclear safety deficiency. This includes mishaps not falling into the accident or incident categories, but meeting any of the criteria in [paragraph 1.5](#).

EMPTY QUIVER—A reporting flagword used to identify a nuclear weapon incident involving the loss, theft, or seizure of a nuclear weapon or component as outlined in [paragraph 1.4.4](#).

Hazard—Any real or potential condition that can cause injury, damage, or occupational illness.

Human Factors Analysis and Classification System (HFACS)—A body of scientific facts about human characteristics. The term covers all biomedical and psychosocial considerations; it includes, but is not limited to, principles and applications in the areas of human engineering, personnel selection, training, life support, job performance aids, and human performance evaluation.

Industrial Weapons Mishap—Mishaps occurring in the industrial environment that involve weapons (i.e., nuclear, guided missile, explosives and chemical agents, or directed energy weapons) or associated unique support equipment. Examples include bomb fin damage during handling or injury to a worker during a MJ-1 bomb lift operation.

Limited—Life Component—A weapon component that deteriorates in some respect over time and must be replaced periodically during weapon stockpile life: principle classes of limited-life components are reservoirs, neutron generators, radioisotope thermal generators and parachutes.

Missile—Systems that are propelled through the air that are unmanned, guided by internal or external systems, self-propelled, and designed to deliver ordnance to a target or act as a target. This definition includes training missiles. BQM-167 subscale aerial targets and ADM-160 Miniature Air-Launched Decoys will be considered subscale remotely piloted vehicles (i.e., Unmanned Aerial System) for mishap categorization purposes.

Missile Mishap—Unplanned damage to or functioning of a missile; or damage, illness, or injury caused by a missile; or when the missile fails to complete its intended mission.

NUCFLASH—A reporting flagword used to identify a nuclear weapon accident that could create the risk of war, meeting any of the criteria in [paragraph 1.4.2](#).

Nuclear Components—The part of a nuclear weapon composed of fissionable or fusionable materials that contribute substantially to nuclear energy released during detonation. Nuclear components include radioactive boosting materials.

Nuclear Weapons Surety—Policies, procedures, controls, and actions that encompass safety, security, and control measures, which ensure there will be no nuclear weapon accidents, incidents,

unauthorized detonation, or degradation of weapon effectiveness during its stockpile-to-target sequence.

Nuclear Weapon System—A nuclear weapon and the means to deliver it to its target, with associated support equipment, facilities, procedures, personnel, and any vehicles peculiar to the system used for nuclear weapon transport.

Nuclear Weapon System Accident—An unexpected event due to accidental circumstances involving US nuclear weapons or nuclear weapon components that may result in:

Errors committed in the assembly, testing, loading, or transportation of equipment or the malfunctioning of equipment and materiel that could lead to an unintentional operation of all or part of the weapon arming or firing sequence, or that could lead to a substantial change in yield or increased dud probability;

Accidental or unauthorized launching, firing, or use by US forces, or US-supported allied forces, of a nuclear-capable weapon system that could create the risk of an outbreak of war;

Loss or destruction of a nuclear weapon or nuclear weapon component, including jettisoning; An increase of the possibility of, or actual occurrence of, an explosion, a nuclear detonation, or radioactive contamination;

Non-nuclear detonation or burning of a nuclear weapon or nuclear weapon component;

Public hazard, actual or implied; or

Any act of God, unfavorable environment, or condition resulting in damage to the weapon, facility, or component.

Nuclear Weapon System Incident—An intentional act attempting damage, theft, unauthorized use, unauthorized movement, or loss of control of a nuclear weapon or nuclear weapon component involving suspected criminal or terrorist activity Source

Nuclear Weapon System Mishap—Nuclear accident, incident, or safety deficiency involving nuclear weapons, nuclear weapon systems, and associated equipment and procedures.

Nuclear Weapon System Safety Deficiency—A situation, event, or condition which could (or did) degrade nuclear surety but did not meet the criteria for an accident or incident.

PINNACLE FADED GIANT—A reporting flagword used to identify a radiological incident that poses a hazard to life, health, or property as defined by the criteria in [paragraph 1.4.6](#).

Attachment 2

REPORT SUBMISSION SCHEDULES, ADDRESS LISTINGS AND DISTRIBUTION

Table A2.1. Report Submission Schedule for Weapons, Explosives and Radiological Class A, B, C, D, and E Events.

| MISHAP | REQUIRED REPORT | SUSPENSE | METHOD |
|--|--|--|-------------------------------|
| Class A or B Mishap | Preliminary Message (see note 1) | Within 24 hours | Priority Message (see note 2) |
| | Status Message (see note 3) | Within 30 calendar days | AFSAS (see notes 3, 4) |
| | Final Message | Within 30 calendar days or 3 business days following Safety Report | AFSAS |
| | Safety Report | Within 30 calendar days | AFSAS |
| | Convening Authority Briefing (if required) | 15 calendar days after completing | CA direction |
| Class C, D, & E Mishaps, Hazards and Incidents | Status Message (see note 3) | Within 30 calendar days (see note 9) | AFSAS |
| | Final Message (see notes 6, 7, 8) | Within 30 calendar days | AFSAS |
| | Safety Report (see note 5) | Within 30 calendar days | AFSAS |

Notes:

1. Use non-privileged, unclassified format.
2. Overseas commands use IMMEDIATE precedence.
3. Include new information discovered since the preliminary message and identify SIB members. Place the safety privilege statement at the beginning of the message. Include the "Controlled Unclassified Information" statement unless classified. If classified, use required classification markings.
4. For subsequent reports, only add information not previously reported in initial status or preliminary messages.
5. When directed by MAJCOM/FLDCOM or AF/SE.
6. If the investigation will not be complete within the time frame, transmit 30-day status message on day 30 and every 30 days until investigation is complete. Include estimated completion date.
7. Do not delay final messages awaiting testing results. If the testing results significantly change the final message's outcome, reconvene the SIB (if necessary) and send a status message describing changes.
8. For extension of due date, send request to the investigating MAJCOM/FLDCOM/DRU/FOA with information copy to AFSEC/SEW
9. OSHA injury and illness information must be input to AFSAS within 7 days IAW 29 CFR 1904.29(b)(3). (T-0)

Table A2.2. Report Submission Schedule for Nuclear Accidents and Incidents.

| FLAGWORD | REQUIRED REPORT | SUSPENSE | METHOD |
|--|--|--|-------------------------|
| NUCFLASH, BROKEN ARROW, EMPTY QUIVER, BENT SPEAR, or FADED GIANT | Preliminary Message (see note 1) | Within 24 hours | SIPRNet (see note 2) |
| | Status Message | Within 30 days | SIPRNet (see note 2) |
| | Final Message | Within 30 calendar days or 3 business days following Safety Report | SIPRNet (see note 2) |
| | Safety Report (see notes 3, 4, 5) | Within 30 calendar days | CA direction |
| | Convening Authority Briefing (if required) | 15 calendar days after completing investigation | CA direction |

Notes:

1. Use non-privileged, unclassified format.
2. Send to AFSEC/SEW SIPRNet workflow address at usaf.kirtland.afsec.list.sewn-dull-sword-reporting
3. If the investigation will not be complete within the time frame, transmit status message on day 30 and every 30 days until investigation is complete. Include estimated completion date.
4. Do not delay final reports awaiting testing results. If the testing results significantly change the final report’s outcome, reconvene the SIB (if necessary) and send a status message describing changes.
5. For extension of due date, send request to the investigating MAJCOM/FLDCOM, DRU/FOA with information copy to AFSEC/SEW.

Table A2.3. Report Submission Schedule for DULL SWORDS.

| | REQUIRED REPORT | SUSPENSE | METHOD |
|------------|---------------------|---|---------------------------------|
| DULL SWORD | Preliminary Message | Within 5 calendar days of notification | AFSAS (see notes 1, 2, 3) |
| | Status Message | Within 30 calendar days | AFSAS (see notes 1, 3) |
| | Final Message | Within 30 calendar days | AFSAS (see notes 1, 2, 3, 4) |

Notes:

1. Use non-privileged, unclassified format.
2. Reports shall include any additional report (e.g., Deficiency Reports (DR), Unsatisfactory Reports (UR), AFTO Form 22) reference number, if applicable.
3. Include “Status” or “Final” in the subject line, as applicable.
4. For extension of due date, send request to the investigating MAJCOM/FLDCOM, DRU/FOA with information copy to AFSEC/SEW.