

**BY ORDER OF THE COMMANDER
50TH SPACE WING**

**50TH SPACE WING INSTRUCTION
91-205**



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Safety

SYSTEM SAFETY PROGRAM

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This instruction implements Air Force Instruction (AFI) 91-202, *The US Air Force Mishap Prevention Program*, 05 August 2011 (Incorporating Change 2 [20 August 2013]). It gives overall System Safety Program guidelines for implementing system safety within the 50th Space Wing. This instruction applies to commanders, managers, supervisors and safety staffs at all levels. Refer recommended changes and questions about this publication to the OPR listed above using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. 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 Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). 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.

1. Scope This wing system safety program instruction specifies the processes used by the 50th Space Wing (50 SW) to manage the system safety risks of 50 SW mission systems, the associated ground systems and integrated operations to an acceptable risk level. This plan is not intended to cover industrial or occupational safety issues.

2. Background

2.1. 50 SW operates numerous high-value, mission-critical systems, including on-orbit assets and the Air Force Satellite Control Network (AFSCN). The Air Force Mishap Prevention Program strives to prevent loss of such resources. A safety program addresses the risk not only to 50 SW personnel, but also to 50 SW critical resources and missions. AFI 91-202, *US Air Force Mishap Prevention Program*, 05 August 2011 (Change 2 [20 August 2013]) requires that such systems operate under a system safety program that emphasizes risk mitigation throughout the lifecycle of the system.

2.2. AFI 91-202, **Chapter 11**, defines system safety for all major programs. It states “System Safety Officers, Managers and engineers monitor operational experience, mission changes, environmental effects or system modifications to identify and correct hazards throughout the life cycle of a system or facility.” This instruction implements this requirement.

3. Program Overview

3.1. The wing system safety program consists of a full-time safety professional who reviews 50 SW systems and programs for system safety considerations and contracted system safety professionals who conduct system safety facilities assessments. Additionally, the program includes trained unit personnel (i.e., Orbital Safety Officers [OSO] and Unit Safety Representatives [USR]) who monitor unit activities and programs for system safety issues and work with the 50 SW Safety Office (50 SW/SE) to identify and resolve system hazards.

3.2. The wing system safety program will consist of three major elements:

3.2.1. System safety review and safety oversight for operation, upgrades and modifications of existing 50 SW programs.

3.2.2. System safety review and safety oversight of future 50 SW programs.

3.2.3. Implementation of a lessons learned program to collect safety lessons learned from the operations of 50 SW systems to ensure they are addressed in future systems.

3.3. The program establishes the Wing System Safety Engineer (WSSE) as the full-time safety professional, and ensures key personnel in 50 SW units receive system safety training to increase awareness of system safety issues.

4. Wing System Safety Engineer Assigned to 50 SW/SES, the WSSE is responsible for managing the 50 SW System Safety Program. The WSSE will be familiar with system safety engineering principles and techniques and will maintain professional currency in the system safety engineering discipline. The WSSE is responsible for the following activities:

4.1. Review configuration change documentation including Engineering Change Proposals, Temporary Configuration Changes, etc., as required.

- 4.2. Review program and system documentation including program plans, test plans, implementation plans, initial/follow-on operational capability plans and program support agreements, as required.
- 4.3. Participate in planning meetings, anomalies, Operational Review Boards (ORBs), Situation Assessment and Response Teams (SARTs), Critical Design Reviews, Test Readiness Review Boards, etc., as required.
- 4.4. Function as Contracting Officer Representative (COR) for contracted system safety support.
- 4.5. Train and interface with unit personnel on system safety issues.
- 4.6. Advise and assist unit personnel on identifying and mitigating hazards.
- 4.7. Interface with HQ AFSPC/SE, SMC/SE and appropriate joint and system program offices on system safety issues.
- 4.8. Ensure wing systems' safety lessons learned are tracked in a database.

5. Trained Unit Personnel

- 5.1. 50 SW units actively involved in wing programs and mission operations should identify key personnel whose duties would benefit from system safety awareness training provided by the 50 SW/SES. Squadron commanders should support training for the following personnel:
 - 5.1.1. Personnel involved in the acquisition of new programs or major program upgrades.
 - 5.1.2. Personnel involved in the technical or engineering aspects of system operations or testing.
 - 5.1.3. Personnel involved in the technical aspects of maintenance and sustainment.
 - 5.1.4. Unit Safety Representatives (USR).
 - 5.1.5. Orbital Safety Officers (OSO).
- 5.2. These trained individuals should:
 - 5.2.1. Identify and mitigate system safety hazards.
 - 5.2.2. Notify 50 SW/SE of system safety incidents, issues and hazards.
 - 5.2.3. Assist 50 SW/SE in conducting hazard assessments and risk management activities.
 - 5.2.4. Participate in system safety meetings and design reviews, as needed.

6. Incoming programs

- 6.1. System safety is best implemented during the design and development of a program. The 50 SW System Safety Program should be active during this phase, providing operational input and lessons learned from previous systems to the system developer to ensure operational safety hazards are identified and mitigated in the design.

6.2. 50 SW/XP, 50 SW/PMD and 50 SW CONS will advise 50 SW/SE of all meetings and milestones for new programs. 50 SW/XP will coordinate all system documents and plans for future systems with 50 SW/SE.

6.3. Unit personnel will review new programs for operational hazards and identify pertinent lessons learned from related systems. They will work with the WSSE to raise these issues to wing leadership and the system's program office, as appropriate.

6.4. The WSSE and unit personnel will participate in program-related System Safety Groups (SSGs) and System Safety Working Groups (SSWGs) conducted for incoming programs.

7. Existing Programs

7.1. The WSSE will review changes and modifications to existing systems for system safety implications. Wing program POCs will coordinate such activities and documents with 50 SW/SE prior to implementation.

7.2. Units will monitor daily operations and activities for system safety issues. When necessary, unit personnel will consult with the WSSE to resolve issues.

7.3. The WSSE and units will continuously monitor activities for lessons-learned which may be valuable in designing future systems.

7.4. The WSSE and units will participate in program-related SSGs and SSWGs conducted for existing programs, as required.

8. Contract System Safety Support

8.1. 50 SW/SE has contracted technical system safety support to assist in conducting system safety activities for 50 SW mission systems.

8.2. In accordance with (IAW) the contract statement of work, contract system safety personnel will conduct facility system safety inspections of 50 SW mission-critical facilities/systems, and produce System Safety Assessment Reports (SSAR) for Government review/acceptance.

8.3. The WSSE will act as Contracting Officer Representative (COR) for this task.

9. Facility System Safety Assessments

9.1. 50 SW/SES will conduct system safety assessments of all mission-critical facilities at the wing, including its geographically-separated units (GSUs), to establish system safety baselines. Afterwards, the 50 SW/SES will conduct additional assessments at facilities with system modifications that could impact mission assurance. These assessments may be performed with the assistance of contracted system safety personnel IAW the contract statement of work. If possible, the system safety assessment will be conducted in conjunction with the wing's ground safety inspections to reduce the impact to unit operations.

9.2. System safety assessments will focus on hazards to the unit mission and equipment and will cover the following areas:

9.2.1. System hazards resulting from modifications, changes or upgrades.

9.2.2. System hazards resulting from single failure points in mission-critical areas such as air conditioning, communications and power distribution.

9.2.3. Visual inspections of infrequently visited/assessed areas such as underfloor, electrical panels and ceiling areas for system hazards.

9.2.4. Unique, site-specific hazards associated with geography, mission, associated facilities or other characteristics.

9.3. 50 SW/SE will provide an assessment report to the appropriate facility commander at the squadron level after the inspection.

9.4. The focus of facility system safety assessment is not occupational, industrial or environmental safety hazards. However, 50 SW/SE will bring violations in these areas to the attention of the facility manager and the appropriate AF organization.

10. System Safety Hazard Management

10.1. Unit personnel, the WSSE, or system safety assessments can identify system safety hazards.

10.1.1. Once identified, system safety hazards will be assessed and assigned a Risk Assessment Code (RAC).

10.1.2. Commanders and functional managers will receive formal notification of the hazard.

10.1.3. Hazard abatement action will be taken and documented accordingly.

10.2. 50 SW/SES will oversee the wing system safety hazard database that will include all open system safety hazards. The database will include the hazard description, the risk assessment code and mitigating action.

11. Lessons Learned Program

11.1. The WSSE is responsible for overseeing a 50 SW Lessons Learned Database that identifies lessons learned from operations on previous and existing programs. 50 SW/SES will provide these lessons learned to HQ AFSPC/SE for dissemination to appropriate agencies in the development of future systems, as appropriate.

11.2. The database will include lessons learned from mishaps and anomalies, including findings and recommendations from reportable mishaps and High Accident Potential incidents. It can also include findings and recommendations from non-reportable incident investigations such as SARTs and ORBs.

11.3. Due to the privileged nature of reportable AF mishap reports, some data from the Lessons Learned Database may be restricted and should be appropriately protected.

12. System Safety Meetings

12.1. The WSSE will brief status of system safety issues and hazards to the wing commander or designated delegate, as required.

12.2. System Safety Groups/Working Groups. These are program-specific meetings held by program offices to address system safety issues. 50 SW personnel should attend these meetings to provide operational input to system designers.

12.2.1. 50 SW/SES will notify operational units of these meetings. 50 SW personnel familiar with the respective program(s) should attend these meetings.

12.2.2. 50 SW/SES will attend these meetings, when possible.

12.2.3. 50 SW participants will identify and mitigate system safety hazards.

DEANNA M. BURT, Colonel, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 91-202, *US Air Force Mishap Prevention Program*, 5 August 2011 (Change 2 [20 August 2013])

MIL-STD-882E, *Department of Defense Standard Practice: System Safety*, 11 May 2012

Abbreviations and Acronyms

AF—Air Force

AFI—Air Force Instruction

AFOSH—Air Force Occupational and Environmental Safety, Fire Protection and Health

AFPD—Air Force Policy Directive

AFSPC—Air Force Space Command

GSU—Geographically Separated Unit

HQ—Headquarters

IAW—In Accordance With

ORB—Operational Review Board

COR—Contracting Officer Representative

RAC—Risk Assessment Code

SART—Situation Assessment and Response Team

SE—Safety Office

SES—System Safety Office

SSG—System Safety Group

SW—Space Wing

SSWG—System Safety Working Group

WSSE—Wing System Safety Engineer

Terms

Assessments—Safety assessments identify hazards and measure compliance with safety program requirements.

Hazard or Deficiency—A condition, procedure or practice that creates a potential for producing death, injury, occupational illness or equipment damage.

Hazard or Deficiency Abatement—Eliminating or permanently reducing a hazard by complying with applicable safety requirements or taking equivalent protective measures.

Hazard or Deficiency Severity—An assessment of the expected consequences if a hazard or deficiency results in a mishap. Severity is based on the degree of injury, illness or resource damage that can result from a specific mishap.

High-Interest Areas—These areas have the greatest risk to life or property damage, have experienced repeated mishaps, or in the judgment of 50 SW/SE, require increased monitoring. They can also be work areas or operations that need additional attention or assessments because of increased mishap potential due to the nature of work performed, physical conditions or type of materials handled. These assessments may be no-notice or scheduled.

Interim Control Measure—Temporary action taken to reduce the degree of risk associated with a hazard or deficiency pending completion of an abatement project.

Mishap—An unplanned or unsought event, or series of events, resulting in death, injury, occupational illness or damage to (or loss of) equipment or property.

Risk Assessment—An evaluation of possible loss in terms of hazard or deficiency severity and mishap probability of occurrence.

Risk Assessment Code—An expression of the degree of risk in terms of hazard or deficiency severity and probability of occurrence.

Risk Management—The application of a systematic process or thinking to detect, assess and control risk to enhance total organizational performance.

System Safety—The optimum level of safety within the constraints of operational effectiveness, schedule and cost attained through specific application of system safety management and engineering principles where hazards are identified and safety risk is minimized throughout all phases of the system life cycle.

System Safety Engineering—Identification of hazards in products and operations, determination of the optimum hazard control(s) within program constraints, application and verification of hazard controls and assuring residual risks are acceptable.

Attachment 2

SYSTEM SAFETY (SPACE-RELATED) SELF-INSPECTION CHECKLIST

5.5. CRITICAL ITEMS	YES	NO	N/A
5.5.1. Does the wing have a process to evaluate high-risk hazards to appropriate levels of management? (AFI 91-202)			
5.5.2. Does the wing participate in System Safety Groups/Working Groups run by program offices for systems under the wing's operational control, to identify hazards and provide operational insight? (AFI 91-202)			
5.6. NON-CRITICAL ITEMS	YES	NO	N/A
5.6.1. Does the wing review wing documents (including program, implementation and initial operational capability and follow-on operational capability plans and program support agreements) for future wing systems to ensure system safety requirements are included? (AFI 91-202)			
5.6.2. Does the wing provide system safety training to Unit Safety Representatives (USR) and Orbital Safety Officers (OSO) and other key wing personnel participating in system design processes and operations including those involved with future programs, testing, engineering, maintenance and sustainment?			
5.6.3. Does the wing review test plans and documentation for safety hazards to systems during testing using operational assets? (AFI 91-202)			
5.6.4. Does the wing provide system safety review and oversight for operations, upgrades and modifications of existing programs? (AFI 91-202)			
5.6.5. Does the wing periodically assess mission-critical failures for system safety hazards?			
5.6.6. Does the wing identify and track the correction of operational hazards and lessons learned for 50 SW systems? (AFI 91-202)			