



Ames Procedural Requirements

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COMPLIANCE IS MANDATORY

Ames Health and Safety Manual

Chapter 4 - Mishap Reporting and Investigating

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4.1 Overview

In accordance with NPR 8621.1, "NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Record Keeping." This Chapter establishes the Ames Research Center (ARC) procedural requirements for reporting and investigating mishaps and close calls. The purpose of mishap investigation is to determine the cause(s) and implement effective corrective actions in order to prevent recurrence of similar mishaps at Ames.

This directive applies to all Ames Employees, Ames contractors and grantees as specified in their contracts or grants; and to other organizations (i.e., commercial partners, other Federal agencies, international parties, and Ames tenants) as specified and described in written operating agreements.

This Chapter does not apply to investigations concerning civil, criminal, or administrative culpability or legal liability. The safety investigative process shall not be used to direct or justify disciplinary action.

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4.2 Authority

NPD 8621.1, NASA Mishap Reporting and Investigating Policy.
NPR 8715.3, NASA Safety Manual

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4.3 References

NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Record keeping
29 CFR Part 1904, Recording and Reporting Occupational Injuries and Illnesses.

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4.4 Terms and Definitions

Ames Safety Office Occupational Safety, Health and Medical Services Division, Ames organization responsible for investigating, reporting and recording mishaps.

Appointing Official The official authorized to appoint the investigating authority for a mishap or close call, to accept the investigation of another authority, to receive endorsements and comments from endorsing officials, and to approve the mishap report.

Contributing Factor An event or condition that may have contributed to the occurrence of an undesired outcome but, if eliminated or modified, would not by itself have prevented the occurrence.

Corrective Actions Changes to design processes, work instructions, workmanship practices, training, inspections, tests, procedures, specifications, drawings, tools, equipment, facilities, resources, or material that result in preventing, minimizing, or limiting the potential for recurrence of a mishap.

Direct Cost of Mishap or Close Call (For the purpose of mishap classification). The sum of the costs (the greater value of actual or fair market value) of damaged property, destroyed property, or mission failure, actual cost of repair or replacement, labor (actual value of replacement or repair hours for internal and external/contracted labor), cost of the lost commodity (e.g., the cost of fluid that was lost from a ruptured pressure vessel, as well as resultant costs such as environmental decontamination, property cleanup, and restoration, or the best official estimate of these costs.

Ex Officio An individual authorized to participate in all investigation proceedings and tasked to assure that the investigation is conducted in conformance with NASA policy and NPR 8621.1. IRIS Incident Reporting Information System (<http://nasa.ex3host.com/IRIS/>)

IRIS Incident Reporting Information System. (<http://nasa.ex3host.com/IRIS/>)

Mishap Investigation Team (MIT) A NASA-sponsored team that:

- a. Is appointed by the Center Director, Director of Safety and Mission Assurance, Chief of Safety, or designee, for a Type B mishap, Type C mishap, Type D mishap, or close call investigation.
- b. Consists of an odd number of Federal employees (including the chairperson) where the majority of the members are independent from the operation or activity in which the mishap occurred. (The actual number of members chosen is determined by the appointing official.)
- c. Includes a safety officer and a human factors mishap investigator as members.
- d. Is tasked to investigate the mishap or close call and generate the mishap report per the requirements specified in NPR 8621.1.

Mishap Investigator (MI) A Federal employee who has expertise and experience in mishap or close call investigation; has knowledge of human error analysis in mishaps; serves as the sole investigator for a Type C mishap, Type D mishap, or close call; and is tasked to investigate the mishap or close call and generate the mishap report.

Note: A single mishap investigator may be assigned to a Type B mishap based upon mishap severity and with NASA headquarters approval.

Proximate Cause The event(s) that occurred, including any condition(s) that existed immediately before the undesired outcome, directly resulted in its occurrence and, if eliminated or modified, would have prevented the undesired outcome. Also known as the direct cause(s).

Root Cause One of multiple factors (events, conditions, or organizational factors) that contributed to or created the proximate cause and subsequent undesired outcome and, if eliminated or modified, would have prevented the undesired outcome. Typically, multiple root causes contribute to an undesired outcome.

SATERN System for Administration, Training, and Educational Resources for NASA <https://satern.nasa.gov>

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4.5 Description of Mishaps and Close Calls

4.5.1 A NASA Mishap is an unplanned event that results in at least one of the following:

- a. Injury to non-NASA personnel, caused by NASA operations.
- b. Damage to public or private property (including foreign property), caused by NASA operations or NASA-funded development or research projects.
- c. Occupational injury or occupational illness to NASA personnel.
- d. NASA mission failure before the scheduled completion of the planned primary mission.
- e. Destruction of, or damage to, NASA property except for a malfunction or failure of component parts that are normally subject to fair wear and tear and have a fixed useful life that is less than the fixed useful life of the complete system or unit of equipment, provided that the following are true: 1) there was adequate preventative maintenance; and 2) the malfunction or failure was the only damage and the sole action is to replace or repair that component.

4.5.2 Close Call description and mishap classification levels are listed in figure 1.

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4.6 Mishap Classification Levels and Investigation Types

The severity of the personnel injury and the direct cost of the mishap or close call (property damage and/or mission failure) shall determine the classification level of the mishap or close call (see Figure 1) and the corresponding type of investigation to be conducted.

Figure 1 Mishap Classification Levels and Investigation Types

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4.7 Responsibilities

4.7.1 Employees

- a. If witness to, or involved in a NASA mishap or close call, employees shall immediately notify emergency response, if required. From and internal NASA Ames phone dial 911, from a pay phone or cell phone dial (650) 604-5555. For non-emergency mishap and close call reporting contact the Ames Safety Office at 4-5602.
- b. Notify the Ames Safety Office after emergency response (if required) has been initiated.

4.7.2 Program/Project Managers

FIGURE 1	PROPERTY DAMAGE	INJURY
TYPE A MISHAP	Total direct cost of mission failure and property damage is \$1,000,000 or more, <i>or</i> Crewed aircraft hull loss has occurred, <i>or</i> Occurrence of an unexpected aircraft departure from controlled flight (except high performance jet/test aircraft such as F-15, F-16, F/A-18, T-38, OV-10, and T-34, when engaged in flight test activities).	Occupational injury and/or illness that resulted in: A fatality, <i>or</i> A permanent total disability, <i>or</i> The hospitalization for inpatient care of 3 or more people within 30 workdays of the mishap.
TYPE B MISHAP	Total direct cost of mission failure and property damage of at least \$250,000 but less than \$1,000,000.	Occupational injury and/or illness has resulted in permanent partial disability. <i>or</i> The hospitalization for inpatient care of 1-2 people within 30 workdays of the mishap.
TYPE C MISHAP	Total direct cost of mission failure and property damage of at least \$25,000 but less than \$250,000.	Nonfatal occupational injury or illness that caused any workdays away from work, restricted duty, or transfer to another job beyond the workday or shift on which it occurred.
TYPE D MISHAP	Total direct cost of mission failure and property damage of at least \$1,000 but less than \$25,000.	Any nonfatal OSHA recordable occupational injury and/or illness that does not meet the definition of a Type C mishap.
CLOSE CALL	An event in which there is no equipment/property damage or minor equipment/property damage (less than \$1000), but which possesses a potential to cause a mishap.	An event in which there is no injury or only minor injury requiring first aid but which possesses a potential to cause a mishap.

[REDACTED]

4.7.3 Supervisors

[REDACTED]

4.7.4 Organization Directors

[REDACTED]

4.7.5 Center Director

[REDACTED]



4.7.6 Ames Safety Office

- a. Serve as the Center's focal point for receiving all oral and written mishap and close call reports.
- b. Assist the appointing official to determine the mishap classification level.
- c. Notify Ames senior management and NASA Headquarters Within one hour of the occurrence of a Type A mishap, Type B mishap, high-visibility mishap, or high-visibility close call, per NPR 8621.1.
- d. Within eight (8) hours after the death of any employee from a work-related incident or the in-patient hospitalization of three or more employees as a result of a work-related incident, report the fatality/multiple hospitalization by telephone or in person to the Area Office of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor as required per 29 CFR Part 1904.39.
- e. Deploy an interim response team to collect written statements, take photos, and preserve evidence.
- f. Ensure the protection of personnel from residual hazard material prior to entry into the mishap site, if required.
- g. Impound all appropriate data, records, equipment, and facilities involved in the mishap.
- h. Verify that appropriate measures have been taken to secure the mishap scene, to protect personnel from hazards and to preserve evidence.
- i. Ensure that all mishaps and close call information is entered in the Incident Reporting Information System (IRIS) within 24 hours.
- j. Help the appointing official determine the type of investigation required and who will be involved in the investigation of a mishap.
- k. Maintain list of personnel trained in mishap investigations.
 - l. Review and approve mishap reports and corrective action plans.
- m. Verify that corrective actions have been effectively implemented.
- n. Perform trend analysis and other statistical analyses of mishap and close call data.

4.7.7 Mishap Investigator(s)

- a. All members of the assigned mishap investigation team will be required to successfully complete the web-based NASA introduction to mishap investigation training course (available on SATERN).
- b. At least one member of the assigned mishap investigation team will be required to successfully complete web-based NASA introduction to mishap investigation training course (available on SATERN) as well as the NASA Root Cause Analysis instructor led training course.
- c. Conduct all activities in accordance with this procedure and NPR 8621.1
- d. Ensure the control and safety of the mishap area and nearby occupants, visitors, etc.
- e. Obtain and analyze whatever evidence, facts, and opinions considered relevant.
- f. Conduct tests and any other activity deemed appropriate.
- g. Interview witnesses and receive statements from witnesses.
- h. Impound property, equipment, and records as considered necessary (consistent with the agreements with the international partners and contractors)
- i. Determine the proximate cause(s), root cause(s), and contributing factors relating to the mishap.
- j. Develop recommendations to prevent similar mishaps.
- k. Provide a final written report within NASA timelines, that will conform to all requirements referenced in NPR 8621.1
- l. Submit the completed signed mishap report to the appointing official within the timeframe identified by the appointing official in the appointment letter.

4.7.8 Ames Protective Services



4.7.9 Office of the Chief Counsel



4.7.10 Contracting Officers Technical Representative (COTR)

Ensure that ARC contractors understand and follow all NASA and ARC contract requirements for mishap investigation and reporting.

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4.8 Mishap Investigation Process

All Ames mishaps will be investigated per NPR:8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping

PROCESS PHASE	RESPONSIBLE ORGANIZATION	APPOINTING OFFICIAL	SMA RESPONSIBLE ORGANIZATION	MISHAP INVESTIGATION BOARD/MEMBERS
INITIAL REPORT OF MISHAP	◆ Report Mishap Occurance		◆ Notify HQ if Applicable	
SECURING MISHAP SITE	◆ Initially Secure the Site		◆ Impound Records, Secure Data	
APPOINT MISHAP INVESTIGATION BOARD/MEMBERS		◆ Determine Level of investigation ◆ Appoint Independent Investigation Board/Team Members	◆ Familiarize Members with Investigation Process	
INVESTIGATE MISHAP	◆ Support Investigation Data Requests	◆ Support Investigation ◆ Accept Investigation Report	◆ Support Investigation ◆ Distribute Findings to Other Organizations	◆ Evaluate Data ◆ Produce Findings
DEVELOP CORRECTIVE ACTION PLAN	◆ Develop Corrective Action Plan	◆ Approve Corrective Action Plan	◆ Support Appointing Official's Assessment of Corrective Action Plan	
IMPLEMENT CORRECTIVE ACTIONS	◆ Effectively Implement Corrective Actions	◆ Track Corrective Actions		
ASSURE CORRECTIVE ACTION COMPLETION	◆ Report Closure to Appointing Official	◆ Close Corrective Actions ◆ Produce Mishap Summary Report	◆ Verify completion of Corrective Action (sampling)	
ASSESS CORRECTIVE ACTION EFFECTIVENESS	◆ Address Ineffective Corrective Actions	◆ Submit the Corrective Actions and the Mishap Report to the Approving Official	◆ Assess Corrective Action Effectiveness	

within 15 work days from being tasked. Corrective action plan shall include the following:

- Description of the corrective actions along with a designation of the organization(s) responsible for implementing the corrective actions and a completion date for each corrective action.
- Identification of the NASA organization, contractor organization, or grantee organization (to the lowest level) that is responsible for ensuring completion of the corrective action.
- Matrix or other means of matching corrective actions to all findings and recommendation.
- Review of any process changes required based on corrective actions.

All findings and generated by mishap investigations will be entered into the Ames Safety Accountability Program (ASAP) Hazard Reporting system and tracked through closure.

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THIS DOCUMENT IS UNCONTROLLED WHEN PRINTED