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## Glenn Safety Manual – Chapter 21

# Mishap and Close Call Reporting, Investigating and Recordkeeping w/Change 4 (5/24/2016)

*Approved by: QS/Chief, Safety and Health Division*

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**NASA - Glenn Research Center  
Cleveland, OH 44135**

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### Change Record

<b>Rev.</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>GRC25, Change Request #</b>	<b>Description</b>
A	6/8/2010	6/8/2015	129	Bi-annual review/revision
Change 1	4/15/2014	6/8/2015	N/A	Administrative change to add front cover and change history log to comply with NPR 1400.1 and deleted "This chapter complements" and inserted "The GRC shall follow the requirements of" in Section 4.0 Policy.
Change 2	6/30/2015	6/8/2016	N/A	Administrative change to extend the expiration date to June 8, 2016. This extension will permit inclusions of anticipated updates to NPR 8621.1B involving Contract provisions and technology use. Both of these items have had significant inclusion in the GRC Mishap Program and is important that we align our updates to the Agency changes.
Change 3	9/30/2015	6/8/2016	N/A	Administrative change to remove hyperlinks.
Change 4	5/24/2016	6/8/2017		Administrative change to extend the expiration date to June 28, 2017, due to anticipated changes will allow orderly and effective transition to new policy requirements without lapse in overall safety policy.

*\*\*Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*

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## Chapter 21—Mishap and Close Call Reporting, Investigating, and Recordkeeping

*NOTE: The current version of this chapter is maintained and approved by the Safety and Health Division (SHeD). The last revision date of this chapter was May 2010. The current version is located on the Glenn Research Center intranet within the BMS Library. Approved by Chief of Safety and Health Division.*

### 1.0 PURPOSE

The purpose of this chapter is to provide requirements to report, investigate, and document mishaps, close calls, and previously unidentified workplace hazards to prevent recurrence of similar accidents. The safety investigation shall not be used to direct or justify disciplinary action for mishaps or close calls. This chapter provides requirements for classifying mishaps, establishing investigation authorities, and performing investigations.

### 2.0 APPLICABILITY

This chapter is applicable to all civil servant and support service contractor employees, construction contractors, students, and visitors at NASA Glenn Research Center (GRC) sites. This chapter is applicable to mishaps and close calls that occur at GRC's Lewis Field and Plum Brook Station.

### 3.0 BACKGROUND

The Occupational Safety and Health Administration (OSHA) requires employers to record and report work-related fatalities, injuries, and illnesses to the Government. Recording or reporting a work-related injury, illness, or fatality does not necessarily mean that an employer or employee was at fault, that an OSHA rule has been violated, or that the employee is eligible for workers' compensation or other benefits. OSHA's injury and illness recordkeeping and workers' compensation are independent of each other.

The records provide base data for the Bureau of Labor Statistics survey of occupational injuries and illnesses, the Nation's primary source of occupational injury and illness statistics. The records are also used by employers and employees to manage safety and health programs at individual workplaces. Analysis of the data is a widely recognized method for discovering workplace safety and health problems and for tracking progress in solving those problems. The data are also used by OSHA.

Injury and illness records are critical indicators of safety and health—both for employers and for OSHA. They tell us how we are doing in our efforts to keep workers safe. They pinpoint weaknesses—breakdowns in machinery, inadequate personal protective equipment, failures in communication, and insufficient training. When a worker gets sick or hurt, something has gone wrong. Employers need to look at these cases to see if they can take action to prevent future problems.

There is also great value in reviewing the records as a whole to identify patterns and trends. What's happening in specific departments and across the facility? How does your injury and illness experience stack up against others in your industry? Is it clear that your employees understand the need to wear protective equipment and follow safety rules? Asking these questions and taking action in response to the answers can prevent future injuries and illnesses and improve a company's bottom line. Whenever OSHA visits a workplace, injury and illness records are the first thing that the inspectors want to see. These records provide a starting point for identifying where problems may lie. Of course, if a company has been tracking its experience and addressing these issues, what may be found is that the site has corrected hazards and resolved concerns.

A mishap is an undesired and unexpected event that results in injury requiring more than first aid, occupational illness to personnel, and/or damage to property of at least \$1,000. Mishaps also include injuries or occupational illnesses resulting from repetitive stresses or exposures over a prolonged period of time. Mishaps resulting in damage to aircraft, space hardware, or ground support equipment that meet these criteria are included, as are test failures where the damage was unexpected or unplanned.

Mishaps and close calls can impact budget, schedule, and mission success. From the time of an initiating event until it becomes a closed case, each event passes through various steps and then recycles to become a case of interest.

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Mishaps, close calls, and hazards are all considered to be safety incidents. Some of these have already occurred, and others are potential incidents that we are working to the greatest extent possible to prevent.

Of the more than 50,000 incidents entered into NASA’s Incident Reporting Information System (IRIS) since 1984, fewer than 200 have benefited from the indepth examination and Agency-wide exposure associated with investigation boards. The majority of the cases are Type C and D mishaps and close calls that go unnoticed unless they draw public attention. Some of the cases show precursors to catastrophic events; others indicate common problems across the Agency—minor mishaps that repeat themselves because they do not draw the same attention as dramatic incidents. The NASA Safety Center (NSC) recently developed cases of interest to address these concerns. Each month the NSC analyzes recent IRIS data and selects a mishap or close call that merits special attention. The incident might represent a significant unrecognized hazard or typify a common Agency problem. Selected cases are developed into cases-of-interest “knowledge bundles”; these narrate the incident, provide relevant background information, link to related NASA standards and training resources, and introduce discussion points and potential corrective actions.

#### **4.0 POLICY**

GRC policy requires prompt reporting and documenting of NASA mishaps (including mission failures and incidents) and close calls (including serious workplace hazards) that occur during any GRC operation. The GRC shall follow the requirements of NASA Procedural Requirement (NPR) 8621.1B, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping, by providing additional details governing reporting and investigating mishaps and close calls to determine their causes, implement corrective actions, and document and disseminate lessons learned to prevent incidents.

#### **5.0 RESPONSIBILITIES**

##### **5.1 Safety and Health Division Chief or Designee**

The Safety and Health Division (SHeD) Chief or designee

- Serves as the Center focal point for receiving all oral and written mishap reports and for notifying the Office of Safety and Mission Assurance, Safety and Assurance Requirements Division, at NASA Headquarters of such incidents in a timely manner
- Ensures that the policies and procedures for reporting, investigating, and documenting incidents and for taking corrective action are implemented at the Center
- Determines the type of investigation required and who will be involved in the investigation of a mishap.
- Shall monitor corrective action activities to determine if they were carried out according to the plan and shall report noncompliance
- Shall verify that all actions are correctly recorded in IRIS
- Is responsible for signing off that the mishap investigation and report are completed

SHeD is responsible for verifying all corrective actions that were implemented.

##### **5.2 Community and Media Relations Office**

The Community and Media Relations Office is responsible for disseminating significant mishap information to the media and the general public. This office releases, as appropriate and in coordination with the Center Director, information to the press and media (i.e., potential hazards that may affect the public, interim reports, and the authorized mishap report).

##### **5.3 Office of Human Capital Management**

The Office of Human Capital Management establishes the requirements and procedures for notifying families when a mishap results in an injury or a fatality.

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The Procurement Division provides guidance to ensure that mishap reporting and investigation requirements are included in all GRC prime contracts and that these requirements are levied to each prime contractor's subcontracts.

#### **5.5 Office of the Chief Counsel**

The Office of the Chief Counsel

- Reviews issues with contractors
- Identifies conflicts of interest
- Ensures compliance with statutes such as the Freedom of Information Act and the Health Insurance Portability and Accountability Act (HIPAA)
- Develops nondisclosure agreements, if the investigating authority uses a contractor as administrative support, to analyze interview data or participate in interviews
- Provides legal advice and counsel as requested by the mishap investigation board (MIB) chair
- Attends the interview if the interviewee is accompanied by a lawyer during the interview process
- Reviews the final mishap report, identifies and marks sections that are not releasable to the public, and signs the reports

#### **5.6 Occupational Medicine Services**

Occupational Medicine Services

- Provides the medical or pathological information required to fulfill requirements of this chapter under the Privacy Act of 1974
- Provides any necessary occupational health and industrial hygiene support required by other GRC organizations to fulfill any of the responsibilities of this chapter
- Retains medical reports in confidential or privileged files to prevent inadvertent release
- Informs the employee's supervisor and the SHeD Chief immediately of a fatality or of a suspected disabling injury or illness
- Notifies SHeD and the employee's supervisor within 24 hours of the occurrence via IRIS when an employee has an injury or illness on the job

#### **5.7 Incident Commander**

The incident commander implements the procedures outlined in Glenn Procedural Requirements (GLPR) 1270.1, Center Mishap Preparedness and Contingency Plan, to coordinate rescue activities, mitigate hazards, and secure the mishap site.

#### **5.8 Investigating Authority**

The investigating authority shall conduct a comprehensive investigation within the defined scope of the appointment letter or appointment orders, generate the products indicated in paragraph 1.7 and Figure 5 of NPR 8621.1B, prepare a mishap report, and sign the report.

#### **5.9 Office of Protective Services**

The Office of Protective Services supports the incident commander, SHeD, and the interim response team (IRT) in securing the mishap site and impounding data, records, equipment, and facilities.

#### **5.10 Interim Response Team**

The IRT

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- Preserves evidence, documents the scene, identifies witnesses, and collects debris
- Supports SHeD in impounding data and collecting witness statements
- Advises the supervisor if drug testing should be initiated
- Provides all available mishap data and evidence to the investigating authority

### 5.11 Responsible Organization

The responsible organization

- Develops the corrective action plan (CAP)
- Implements the CAP
- Shall track the corrective action performance and completion in IRIS and update the status every 30 days
- Supports SHeD as they verify that the CAP has been completed and effective
- Generates the lessons learned when tasked to do so by the appointing official

### 5.12 Supervisor

The supervisor is responsible for

- Ensuring immediate notification of emergency personnel (by dialing 911 at either Lewis Field or Plum Brook) and SHeD  
Notification is required for any incident or close call resulting in a potential hazard or risk to personnel even though no personal injury or property damage may have occurred
- Investigating the incident to obtain causal information and then reporting such information to SHeD; providing complete and accurate information in a timely manner by using the quick incident menu on the IRIS login page
- Taking necessary actions to correct hazards discovered during the investigation, including temporary measures to protect employees while building or equipment corrective action is implemented
- Improving on corrective action periodically
- Supporting MIBs as necessary
- Always reminding employees that reporting close calls and mishaps is necessary
- Reviewing mishap information; then reporting to employees lessons learned and corrective actions to be taken
- Monitoring the recovery of any employee with a lost-time injury; arranging for that employee to return to work on light or restricted duty as soon as possible
- Addressing any and all recommendations in the CAP

### 5.13 Employees

Employees are responsible for

- Reporting any incident that occurs during GRC operations if NASA, contractor, or construction contractor personnel; students; the public; and/or NASA property are involved
- Reporting immediately to their supervisors any mishaps, close calls, or other unsafe situations
- Providing incident information as requested
- Entering contractor mishaps and associated corrective actions into the IRIS database, updating the IRIS information as required, and tracking the incidents to closure

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## 6.0 REQUIREMENTS

### 6.1 Reporting Mishaps and Close Calls (*NPR 8621.1B, 29 CFR 1904*)

Initial reporting requirements for mishaps and close calls are based on a preliminary, worst-case assessment of actual or potential severity and visibility. Refer to Appendix A for the definitions and terms.

#### 6.1.1 Emergency Reporting, and Notification

In case of an emergency, please reference the Emergency Preparedness Plan.

#### 6.1.2 NASA’s Incident Reporting Information System Database

When an incident occurs, many people and organizations may have initial information about the case. Each NASA and contractor employee on NASA property, and each custodian of NASA assets elsewhere, is responsible for reporting mishaps.

All incidents shall be entered into the IRIS database within 24 hours of the event. As much information as is available at this time shall be entered by completing (at a minimum) all of the bold fields. When a safety incident occurs, it is important to gather details about the incident as quickly as possible so you can figure out what happened and prevent it from escalating or occurring again. The supervisor of the injured employee or the manager in charge of the area where damage or a hazardous material release or spill occurred should report the mishap. However, anyone who witnesses a mishap may report it using the quick incident menu on the IRIS login page. To report an incident anonymously, simply leave the “Recorded By: (Submitter)” field empty.

The quick incident report is, in most cases, where a safety incident record begins. Items on the quick incident menu are located outside of IRIS so that anyone can report incidents. The objective of the quick incident report is to make it as easy as possible for individuals to submit information to SHeD as soon as possible without actually logging in to IRIS.

Once the quick incident report is saved, it is assigned an incident number. IRIS cases shall be continuously updated as new information becomes available and, at a minimum, at least every 30 days until the incident is closed by an IRIS user.

Figure 6.1 shows a screen capture of the quick incident menu. The quick incident report is accessed through this menu, which displays on the IRIS login screen. This screen can be accessed by typing “IRIS” in the blank next to the word “Transport” on the top right of the NASA Web Intranet at Glenn (WING) homepage.

The “Click here to Track Report Status” option on the quick incident menu allows you to check the status of safety incidents already entered in the system. The quick incident status report shows whether or not the case is open, what types of investigations are underway, the report type, and a one- line description of the incident. The report tracking option is only available for safety incidents because of privacy considerations associated with injury and illness cases.



Figure 6.1.—Quick incident menu.

SHeD is notified automatically once an incident record has been created,. After data have been entered into the system, SHeD is responsible for reviewing each incident to eliminate multiple IRIS safety incidents created for a single mishap event.

#### 6.1.3 Type A and B Mishaps and Other Highly Visible Mishaps and Close Calls

In order to facilitate the timely investigation of mishaps and close calls, and other notification requirements of NPR 8621.1B, the responsible civil service or contractor program, project, or directorate organization shall, within 1 hour, provide initial notification by telephone or in person to SHeD. Initial notification shall include the time, the location, a description of the event, the organization(s) involved in the event, and a preliminary worst-case estimate of the injuries or illness and/or a cost estimate of the damage resulting from the event.

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NASA Headquarters notification must be acknowledged verbally, by e-mail, or by fax. Information to be reported includes the center name, location of the incident, time of the incident, number of fatalities (if known), number of hospitalized employees (if known), type of injury (if known), type of damage (if known), contact person, contact person's phone number, and a brief description of the mishap. In addition, within 24 hours, the SHed Chief or designee shall follow up the initial phone notification to NASA Headquarters by sending an electronic notification.

Within 8 hours of a work-related mishap involving the death of a Federal employee or the hospitalization for inpatient care of three or more employees (provided at least one is a Federal employee) within 30 workdays after the mishap, the SHed Chief or designee shall notify OSHA. After OSHA is notified, the Director of the Safety and Mission Assurance Directorate or the Director's designee shall inform NASA Headquarters that an oral report has been provided to OSHA. Contractors are responsible for reporting directly to OSHA when a mishap as described in this section involves contractor personnel only.

For Type A and B mishaps and for highly visible mishaps and close calls, a formal MIB (contractor and/or civil servant) shall be formed per Section 6.2.

#### **6.1.4 Type C and Type D Mishaps and Close Calls**

Type C and D mishaps and close calls shall be reported within 1 hour to the responsible supervisor and the organizational (NASA or contractor) safety office and shall be investigated by the supervisor to determine the root cause(s), to develop and implement corrective actions to prevent recurrence, and to document and share lessons learned.

#### **6.1.5 Drug Testing**

If the mishap results in a fatality or a serious injury requiring immediate hospitalization, or substantial damage to property estimated to exceed \$10,000, postaccident unsafe-practice drug testing may be warranted in accordance with NPR 3792.1, Plan for a Drug-Free Workplace, and NPR 8715.3, NASA General Safety Program Requirements.

#### **6.1.6 Criminal Activity**

If it is suspected that a reported mishap resulted from criminal activity, the Office of Inspector General and the Center's Office of the Chief Counsel shall be notified. Criminal activity, by definition, is not a mishap.

#### **6.1.7 Reporting Days Away From Work (Civil Service and Contractor)**

OSHA 29 CFR 1904, Recording and Reporting Occupational Injuries and Illness, requires employers to record and report work-related fatalities, injuries, and illnesses. Recording or reporting a work-related injury, illness, or fatality does not mean that the employer or employee was at fault, that an OSHA rule was violated, or that the employee is eligible for workers' compensation or other benefits. OSHA injury and illness recordkeeping and workers' compensation are independent of each other.

Any recordable work-related injuries or illnesses that involve employee days away from work that result in long-term, permanent disability; restricted work; or a transfer to another job shall be reported by the supervisor to SHed via their notification e-mail address.

- A day away from work is defined as a full work day if it results from a nonfatal traumatic injury or from a nonfatal nontraumatic illness that causes one or more days away from work beyond the day or shift on which the event occurred.
- Restricted work activity is evaluated by looking at two components: time and job functions. If, because of a work-related injury or illness, an employee is unable to work the full shift he or she was scheduled to work, then that worker is considered to be on restricted work activity. For example, if the employee was scheduled to work an 8-hour day, but is only able to work 4 hours, the work activity is restricted. Job functions are those activities the employee regularly performs at least once per week.
- Most job transfers involve some type of restriction. Even if they do not, job transfers due to an injury or illness are recordable events. If an injured or ill employee is transferred to another job for half days, this is also a job transfer. If a permanent job transfer is made immediately, that is, on the day of the injury or illness, at least one day of restricted work activity must be recorded.

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In calculating total days away from work, count the number of calendar days that the employee was unable to work because of the work-related injury or illness, regardless of whether or not the employee would have been scheduled to work on those calendar days (e.g., weekends, holidays, or scheduled days off).

Workers' compensation provides benefits to employees who sustain job-related injuries or illnesses as a result of their employment with the Federal Government. Workers' compensation and safety have essentially the same goals and objectives. Employees must keep their supervisors and the Office of Workers' Compensation Programs advised of their status and must submit reports as required. Supervisors should advise employees of their responsibilities in filing a claim and about their rights and benefits, and should instruct them to use the quick incident menu on the IRIS login page to report all injuries promptly .

GRC follows the Federal agency recordkeeping and reporting requirements outlined in 29 CFR 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, Subpart I, and in OSHA Publication 2014. SHeD is responsible for maintaining the occupational injury and illness logs for civil servants. Any work-related injury or illness is logged onto OSHA Form 300, Log of Work-Related Injuries and Illnesses.

SHeD and workers' compensation ensure communication and reconciliation between the two systems. Our goal is to have a closed loop in managing cases that involve reporting days under a workplace restriction or lost time.

### **6.1.8 Other NASA Centers Performing Work at GRC**

For work performed at GRC that is exclusively under the control of another (or other) NASA center(s) (i.e., without the participation of GRC employees or contractors), initial and followup mishap and close-call reporting will include notification of the host GRC program or project and SHeD. This requirement is in addition to GRC's own mishap and close-call reporting and follow-on investigation, corrective action, and lessons-learned requirements.

Per NPR 8621.1B, the centers should provide the following services:

- A courtesy investigation should be conducted by the center where the mishap occurred.
- The loss is attributed to the center that owned the person on their rolls.
- The corrective action for the hazard must come from the center where the hazard exists because the condition could also affect resident employees.
- Lessons learned must be of value to both centers or to all of NASA.

When SHeD receives a notification of an incident of an employee who is on temporary duty at another center, they will e-mail the center about the incident as well as e-mail the IRIS Global Administrator to transfer the incident to that center or to associate the injury or illness incident with the safety incident.

### **6.1.9 Reporting Unsafe Activity or Condition**

An unsafe and/or unhealthful condition or act is a safety or health hazard and/or hazardous act that could cause a close call or a mishap, although neither has occurred.

For simple unsafe and/or unhealthful conditions or acts that are within your control (such as wiping up a beverage spill), immediately eliminate it, if it can be done safely. If another person is performing an unsafe and/or unhealthful act, advise the person to reevaluate what they are doing. Otherwise, render the area safe if needed by temporary means such as barricades or other means of restricting access, if it can be done safely.

Whenever possible, unsafe and/or unhealthful conditions or acts shall be reported at the lowest local organizational level possible. The usual means of reporting an unsafe and/or unhealthful condition or act is to report it to the supervisor responsible for the affected area or to the facility manager if an unsafe and/or unhealthful condition or act is located in a common area.

There may be any number of reasons why an individual does not wish to report to the supervisor or facility manager, including fear of reprisal and not knowing who the responsible person or organization is. Anonymity can be maintained when creating a quick incident report—simply leave the "Recorded By: (Submitter)" field empty.

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The report will be evaluated for validity (whether it is a safety or health issue and whether it is reasonably correctable). GRC uses IRIS to record and document safety and health concerns and to track remediation and closure.

If you are not satisfied with the corrective actions taken (or lack thereof), you have the following additional options (in preferred order). Report the incident to the

- NASA Safety Reporting System (NSRS) online or by using forms that can be found in a designated area in each building.
- OSHA online or at 1-800-321-OSHA.

## **6.2 Mishap Investigations (NPR 8621.1B)**

### **6.2.1 Investigations**

Investigations shall be conducted to determine the actual or probable cause(s), to determine appropriate actions for avoiding recurrence, and to document the investigations and lessons learned so that others can learn from the findings. For mishap prevention, the facts learned shall be made available to and discussed with all appropriate employees. Mishap investigations shall be conducted separately from any collateral investigation conducted to determine fault or the need for disciplinary action.

When directed by the SHED Chief or designee, the IRT will immediately deploy to the mishap site to initiate and support the investigation until a determination can be made as to the need for and selection of an investigating authority. The IRT will support rescue efforts and conduct initial investigation activities. The IRT shall preserve evidence and obtain witness statements for the MIB.

Depending on the severity of the incident, different groups of people may be involved in mishap investigations. At a minimum, the immediate supervisor of the injured party or area involved should be included, and SHED should assist. In addition, trained investigators chosen by SHED, union representatives, or the NASA Headquarters Investigation Board may be involved. The addition of other parties to the investigating committee does not relieve the supervisor of the responsibility for creating a quick incident report in a timely manner.

The procedures for investigating mishaps or close calls are defined in NPR 8621.1B and will depend on the type of mishap (A, B, C, or D).

NASA Headquarters usually appoints the investigation team for Type A and B mishaps.

The responsibility for any investigation of Type C and D mishaps and close calls belongs to the supervisor of the individual affected and/or the work area or process involved.

There are 10 steps involved in all formal NASA mishap investigations (reference NPR 8621.1B for specific details):

1. Prepare for the investigation.
2. Verify that the mishap site is secured, and ensure that any associated evidence is secured.
3. Gather physical evidence and facts.
4. Interview witnesses.
5. Review and analyze data.
6. Draw conclusions and document findings.
7. Generate a CAP.
8. Develop and document the CAP.
9. Ensure that the corrective action is implemented and effective.
10. Attach the completed mishap report to the IRIS case.

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## 6.2.2 How to Investigate Incidents

All incidents require an investigation. When investigating an incident, find the causes and decide what actions should be taken to prevent the incident from happening again. The investigation should not be used to find fault, determine disciplinary action, or defend GRC from lawsuits. The purpose is only to prevent the incident from happening again.

- Start the investigation as soon as all emergencies are under control; ask SHed for assistance. GRC's Center Director may appoint an MIB to investigate the incident. If the Center Director appoints an MIB, stop the investigation, keep the incident scene and evidence secure, and cooperate with the MIB. If there is a question about whether or not an MIB should investigate the incident, contact the SHed Chief or designee.
- Refer any news media to the Community and Media Relations Office.
- Consult with experts to sample the incident scene or analyze the data.
- Interview witnesses. Keep witness statements confidential.
- Examine all evidence and analyze all incident data to the appropriate investigation level. Use the current version of NPR 8621.1B.
- Document the results of the investigation and action plan or actions taken in IRIS. If an MIB is formed, submit its results to SHed.
- Have the facility or building manager concur on the proposed action if the incident involved any building, area, or hazardous materials.
- Document the lessons learned.
- Work the action plan and track it to closure in the IRIS database.

## 6.2.3 Mishap Investigation Boards

### 6.2.3.1 NASA Mishap Investigation Boards

NASA MIBs shall be formed for all Type A and B mishaps. MIBs also may be formed for other mishaps or close calls as deemed necessary by the Center Director or SHed Chief. MIB investigations shall be accomplished in accordance with the requirements of NPR 8621.1B.

### 6.2.3.2 Contractor Mishap Investigation Boards

For NASA mishaps resulting from NASA contractor operations, the NASA board-appointing official, with the concurrence of the SHed Chief, may delay the formation of a separate NASA MIB (or activity) pending the review and acceptance of the contractor report. In this case, a letter signed by the NASA board-appointing official shall be sent to the contractor notifying them of NASA's intent to delay formation of a separate NASA MIB. NASA also retains the option of providing a Government representative for contractor-managed MIBs.

## 6.2.4 Mishap Investigation Board Reports

The MIB report shall contain a description of the structured analytical techniques used to identify causal factors, detailed documentation of mishap data, a discussion of root cause(s), and significant observations, findings, and recommendations. The report shall also include a proposed CAP to be used as a framework for further development and implementation. Witness statements shall be kept separate from the main portion of the report so that they can be easily separated and withheld from release and from distribution with the report. NPR 8621.1B contains detailed information on report requirements and format. Within 75 workdays of the mishap or close call, the MIB shall submit the completed and signed mishap report to the appointing official. Once the report is approved, the MIB chair shall ensure that the SHed Chief or designee and IRIS Site (GRC) Administrator are sent the MIB report and the proposed CAP and shall distribute the final report in accordance with NPR 8621.1B.

SHed is the official repository for all MIB reports and associated documentation. Witness statements and medical records shall be sealed and retained by the SHed Chief in a locked file and are not part of the distributed MIB report.

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Contractor reports shall undergo a formal review by NASA, and once accepted, a formal letter of acceptance from the NASA board-appointing official will be provided to the contractor.

### 6.2.5 Nonboard Mishap Investigation Reports

An incident report documenting investigation results shall be entered into the IRIS database within 30 days of the event and include

- Identification of root cause(s)
- Significant observations
- Findings
- Recommendations

### 6.2.6 Nonboard Type C and D Mishap and Close-Call Investigations

All mishaps and close calls shall be investigated to identify the root cause(s) and other contributing cause(s). Within 30 working days of the mishap or close call, the results of the investigation shall be documented in the IRIS database.

#### 6.2.6.1 Civil Service Nonboard Mishap and Close-Call Investigations

For mishaps or close calls with damage to property exclusively under the control of NASA civil service personnel or when an injury or illness to civil service personnel is involved, the NASA supervisor is responsible for conducting the investigation.

#### 6.2.6.2 Contractor Nonboard Mishap and Close-Call Investigations

Contractor organizations are responsible for investigating their own non-MIB mishaps. For any mishaps or close calls (including environmental mishaps) that involve only contractor personnel or equipment as described in their contracts, the contractor supervisor is responsible for conducting the investigation. The contractor supervisor shall communicate any investigation results, corrective actions, root causes, and contributing factors to the designated contractor points of contact for that contract. The contractor points of contact will be required to enter the results of the investigation and track progress directly into IRIS.

SHeD shall maintain involvement and oversight in the investigation and analysis and shall provide consultation on an as needed basis.

### 6.3 Investigation Timeline

From the initial report to concurrence with the final report, a typical mishap investigation timeline for Type A and B mishaps and other high-visibility events normally is not to exceed 145 days in accordance with NPR 8621.1B. The following list provides a notional timeline for an investigation:

- Immediately to within 24 hours, the mishap is recorded using the quick incident menu on the IRIS login page, the mishap site is placed in a safe condition, the SHeD Chief is notified, and the mishap type is determined.
- Within 48 hours of the mishap, an appointing official is determined based on the mishap types as defined in Appendix A. The appointing official appoints an investigating authority (an MIB, mishap investigation team (MIT), or a mishap investigator (MI)) based on the mishap type.
- Within 75 workdays of the mishap, the investigating authority (MIB, MIT, or MI) completes the investigation and prepares the mishap report for review and approval.
- Within 105 workdays of the mishap, the appointing official receives the mishap report for review and approval.
- Within 110 workdays of the mishap, the appointing official approves or rejects the mishap report.
- Within 120 workdays of the mishap, the appointing official and the Community and Media Relations Office authorize the report to be released to the public.

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- Within 130 workdays of the mishap, the mishap report is distributed according to the mishap type.
- The mishap investigation timeline for Type C and D mishaps and low-visibility events is determined by the appointing official with concurrence from SHED. These investigations are to follow the sequence of steps for Type A and B mishaps, but with a different timeline.

#### **6.4 Corrective Action**

Corrective action(s) shall be determined and implemented to prevent the recurrence of similar events. Within 45 working days of the incident (or approval of the report in the case of MIB investigations), the responsible program or project, directorate organization, or contracting organization shall develop the CAP (or further develop the proposed CAP in the case of MIBs). The CAP shall provide corrective action(s) for the root cause(s) identified and for all other contributing factors to the mishap or close call. The CAP shall describe the corrective action(s) and identify (to the lowest level possible) the organization(s) responsible for implementation and the organization(s) responsible for ensuring completion of the action item(s). If there are no corrective actions that could reasonably be taken, a statement stating this shall be entered into the IRIS database in the Investigation Notes tab. The approved CAP shall be entered into the IRIS database in the Action Request tab. The action request is designed to document, assign, and track the effort required to complete activities and other scheduled or unscheduled closed-loop requirements. The responsible organization, contractor, and SHED are responsible for monitoring corrective action activities for mishaps and close calls and for determining if corrective actions have been carried out according to plan.

#### **6.5 Lessons Learned from Mishaps and Close Calls**

Knowledge and understanding are gained by experience. The experience may be positive, as in a successful test or mission, or negative, as in a mishap or failure. A lesson learned must be significant, in that it has a real or assumed impact on operations; valid, in that it is factually and technically correct; and applicable, in that it identifies a specific design, process, or decision that will reduce or eliminate the potential for failures and mishaps or will reinforce a positive result.

When the investigation is finished, decide if there are any lessons learned to share with other organizations that would prevent a similar safety, health, or environmental mishap.

#### **6.6 Training**

All individual MIs, all ex officio members, and at least one voting member of each MIB or MIT shall have NASA Introduction to Mishap Investigations (or equivalent) and NASA Root Cause Analysis training. Training is required every 3 years to maintain currency in accordance with NPR 8621.1B. The NSC is responsible for obtaining and scheduling these classes and offering them at least once a year.

- The ex officio and safety investigator shall complete Introduction to Mishap Investigations in SATERN, or an equivalent mishap investigation training course, and shall be familiar with this chapter of the Glenn Safety Manual.
- The human factors MI shall, at a minimum, be knowledgeable of the methods for identifying unsafe acts and errors; know the types of errors, factors causing and contributing to errors, and performance-shaping factors; know how to interview witnesses, analyze data, create timelines, perform fault tree analysis and barrier analysis, create event and causal factor trees, draw conclusions and generate recommendations to reduce human error or mitigate negative consequences of human actions; and have basic knowledge of physical and psychological processes and the limitations of humans.
- Upon assignment to a board, the investigating authority (MIB, MIT, or MI) shall receive onsite orientation training that includes (at a minimum) brief familiarization of roles and responsibilities, NASA policy and procedures, and a description of root cause analysis. The SATERN course Introduction to Mishap Investigations is used to supplement this training.
- The investigating authority (MIB, MIT, MI, and ex-officio) shall have knowledge of the NASA mishap investigation process; be able to collect and impound data, records, equipment, and facilities; and have the knowledge and skills to secure the site, preserve the mishap scene, interview witnesses, create time lines,

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document facts, generate fault trees, perform barrier analysis, integrate evidence, draw conclusions, generate recommendations, and generate mishap reports.

- Mishap investigation refresher training shall be provided to an MI when determined necessary. The NSC maintains the official list of people who have taken the training. SHeD will coordinate this with the NSC.

### 6.7 Mishap and Incident Processing for Classified Projects

To be determined (TBD)

### 6.8 The following items are to be determined

- The supervisor of the summer intern or any other temporary employee entering GRC is responsible for the that student or employee while they are onsite at GRC.
- **Incidents during a contract transition.**—If an injury or illness is sustained during a contract transition (prior to the actual contract start) TBD.
- **Transferring cases to the proper contractor or to a NASA directorate, division, or branch (TBD)**
- **Action request (corrective actions).**—If an action request needs to be sent to another organization, it may not be clear who should receive it or even if it is permissible for a contractor to provide direction to the Government or another contractor (TBD).
- **Corrective actions.**—Notify SHeD when the responsible organization no longer meets the remediation timeline for corrective actions (TBD).
- **SHeD points of contact, contractor points of contact, and directorate and division points of contact.**—Responsibilities need to be defined. What is their role in regards to IRIS?
- **Timeline determination for Type C and D mishaps and close calls (TBD).**—The approving authority determines the timeline.

## 7.0 RECORDS

GRC must keep the following records. Records are kept in a central location for easy access, and many records have backup copies stored at a Federal records-retention center. GRC must keep records back to the beginning of the fiscal year of the last OSHA Voluntary Protection Program review or longer if required by OSHA or NPR 1441.1, NASA Records Retention Schedules. Any format that includes the pertinent information is acceptable unless noted otherwise. GRC must protect all safety and health records under the Privacy Act of 1974.

- **OSHA Form 300A.**—Maintained by SHeD.  
This annual summary of work-related injuries and illnesses must follow OSHA publication OMB No. 1220–0029). Copies of the summary employee notices are posted from February 1 to April 30 of the year following the year covered by the form. NASA Headquarters obtains a copy from IRIS.
- **Mishap board reports and records.**—Maintained by SHeD in IRIS.  
These reports include supporting evidence, transcripts, meeting agendas, minutes of board meetings, and other documentation of the investigation process, as well as copies of all data and records that are used in evaluation and analysis of the mishap; must follow NPR 8621.1B, Chapter 6.
- **NASA medical reports.**—Maintained by Occupational Medicine Services and by Office of Human Capital Management; excluded from mishap report.
- **Witness statements.**—Maintained by SHeD Chief and by Office of Human Capital Management; marked confidential and privileged; excluded from mishap report.
- **Contractor medical reports and witness statements.**—Maintained by contractor organization.
- **CAPs.**—Maintained by SHeD in IRIS; follow NPR 8621.1B, Chapter 6.

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- Mishap reports.—Maintained by SHeD; follow IRIS and NASA Form (NF) 1627.
- Records to support Center-level trend analysis (such as minutes where trends are discussed and committee reports on trends are analyzed).—Maintained by SHeD.

## 8.0 REFERENCES

<b>Document number</b>	<b>Document name</b>
NPR 8621.1B	NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping.
NPR 1441.1	NASA Records Retention Schedules.
NPR 3792.1	Plan for a Drug-Free Workplace.
NPR 8715.3	NASA General Safety Program Requirements.

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## APPENDIX A.—DEFINITIONS AND ACRONYMS

**Building or area.**—This could include parking lots, sidewalks, walkways, tunnels, gardens, steps, and docks.

**Close call.**—An occurrence or a condition of employee concern in which there is no injury or only minor injury requiring first aid and no significant equipment or property damage or mission failure (less than \$1,000) but which possesses a potential to cause a mishap.

- For close calls, the worst-case potential mishap severity and probability of occurrence shall be assessed. The mere existence of a hazard does not constitute a close call: there must be an undesired and unexpected event that could cause a mishap or negative mission impact, even though neither occurred, or an event that has caused minor damage less than \$1,000 or a minor injury requiring only first aid. For example, a sidewalk that is buckled and uneven is classified as a hazard by its mere existence. If someone was to trip or fall and escapes injury or only requires first aid, the event is classified as a close call if the event had significant potential to have been any type of mishap. All close calls shall be entered into the NASA Incident Reporting Information System (IRIS) database.

### Code of Federal Regulations (CFR)

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

**Corrective action plan (CAP).**—Plan addressing each finding of an investigation with an emphasis on correcting the proximate and root causes of the mishap.

**Exposure to hazardous substance.**—Personnel exposure, or suspected exposure, to a hazardous substance exceeding allowable limits (quantity level or exposure time) shall be reported immediately to Occupational Medicine Services or, if after hours, to a licensed medical physician. All exposures shall go through Occupational Medicine Services or a licensed medical physician for medical evaluation and treatment. Confirmed exposures exceeding allowable limits shall be reported and documented as a mishap or close call.

### Glenn Procedural Requirements (GLPR)

#### Glenn Research Center (GRC)

#### Health Insurance Portability and Accountability Act (HIPAA)

**High-visibility mishaps and close calls.**—Mishaps or close calls that may draw media attention, cause embarrassment to NASA, or other events deemed important by NASA management are considered to be high-visibility mishaps or close calls and may warrant a full NASA mishap investigation board

**Incident Reporting Information System (IRIS).**—A NASA mishap database that contains mishap reports and investigation data and that provides tools to track corrective action plans to completion, to submit status and closure data to NASA Headquarters, and to perform mishap trend analysis.

**Incident.**—Occurrence considered to be a mishap or close call.

#### Interim response team (IRT)

**NASA mishaps.**—Unplanned event that results in at least one of the following:

- Injury to non-NASA personnel caused by NASA operations. (Activities of construction projects are considered to be NASA operations. If a contractor has an incident at their own facilities, that is a non-NASA operation (e.g., incident during a maintenance action within the contractor-owned facilities).
- Damage to public or private property (including foreign property) caused by NASA operations or NASA-funded development or research projects.
- Occupational injury or occupational illness to NASA personnel.
- NASA mission failure before the scheduled completion of the planned primary mission.

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- 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. (An incident involving a construction project supporting a NASA project but using contractor-owned equipment, on NASA property constitutes a mishap and shall be reported into the Incident Reporting Information System (IRIS).)

#### **Mishap investigation board (MIB)**

#### **Mishap investigation team (MIT)**

#### **Mishap investigator (MI)**

**NASA mishap.**—Unplanned event that results in an injury to non-NASA personnel, caused by a NASA operation; damage to public or private property caused by NASA operations or NASA-funded development or research projects, occupational injury or illness to NASA personnel, NASA mission failure before scheduled completion of the planned primary mission, or destruction or damage to NASA property.

#### **NASA Procedural Requirement (NPR)**

#### **NASA Safety Center (NSC)**

**Natural phenomenon mishaps.**—Damage resulting from natural phenomena or acts of nature (e.g., flooding, hurricanes, tornados, lightning strikes, and wild fires), without human intervention, shall be classified as a NASA mishap by the organization owning or controlling the damaged or lost property. An assessment of all damages incurred shall be performed, and the cost of repairs and/or replacement shall be tracked and entered in the Incident Reporting Information System (IRIS) database. Natural phenomenon damage resulting from or made worse by failure of personnel to follow established procedures or standard practices, such as damage caused by animals as a result of personnel failing to properly secure and protect facilities and equipment, is not considered to be damage from natural phenomena, but it is still classified as a NASA mishap or close call.

**Occupational illness.**—For cases of occupational illness due to long-term exposure to hazards, such as asbestosis, silicosis, or hearing loss, the date of diagnosis by a licensed physician or the first official lost time day, whichever occurs first, is the date that shall be entered into the Incident Reporting Information System (IRIS) database.

#### **Occupational Safety and Health Administration (OSHA)**

**Property damage.**—Reported damage shall include the direct cost of replacement of damaged equipment and parts, plus labor, as well as the cost of cleanup and environmental investigation activity and restoration of property as required by environmental regulations. The reportable cost also includes replacement of any lost commodity (i.e., compressed gases, coolants, or propellants). In cases where replacement parts are available from salvaged or excess equipment at little or no cost to NASA, the actual costs of replacement parts may be used plus labor. The cost of the safety mishap investigation is not included.

**Quick incident menu.**—Employees may create a quick safety incident report or quick injury illness incident report without actually logging onto the Incident Reporting Information System (IRIS). The quick incident menu can be accessed from the Web Intranet at Glenn (WING) homepage under Glenn Workplace (or type “IRIS” in the blank next to the word “Transport” at the upper right of the WING homepage). This quick reporting capability helps to ensure that all incidents are entered into the system in a timely fashion. Once the initial report is saved, it is assigned an incident number and may be updated as more information becomes available by logging into the system.

**Responsible organization.**—Organization responsible for the activity, people, operation, or program where a mishap occurred or the lowest level organization where corrective actions will be implemented.

**Root cause.**—One of multiple factors (events or conditions that are 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.

#### **Safety and Health Division (SHeD)**

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**To be determined (TBD)**

**Type A mishap.**—Mishap resulting in one or more of the following: (1) an occupational injury or illness resulting in a fatality, a permanent total disability, or the hospitalization for inpatient care of three or more people within 30 workdays of the mishap; (2) a total direct cost of mission failure and property damage of \$1 million or more; (3) a crewed aircraft hull loss; (4) an unexpected aircraft departure from controlled flight (except high-performance jet or test aircraft (such as the F-15, F-16, F/A-18, T-38, and T-34) when engaged in flight test activities).

**Type B mishap.**—A mishap that caused an occupational injury or illness that resulted in a permanent partial disability, the hospitalization for inpatient care of one or two people within 30 workdays of the mishap, or a total direct cost of mission failure and property damage of at least \$250,000 but less than \$1 million.

**Type C mishap.**—A mishap resulting in a nonfatal occupational injury or illness that caused any days away from work, restricted duty, or transfer to another job beyond the day or shift on which it occurred, or a total direct cost of mission failure and property damage of at least \$25,000 but less than \$250,000.

**Type D mishap.**—A mishap that caused any nonfatal OSHA recordable occupational injury and/or illness that does not meet the definition of a Type C mishap, or a total direct cost of mission failure and property damage of at least \$1,000 but less than \$25,000.

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