NASA Procedural Requirements

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COMPLIANCE IS MANDATORY FOR NASA EMPLOYEES

NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping

Responsible Office: Office of Safety and Mission Assurance

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CHANGE HISTORY

Chg#	Date	Description/Comments
1	03/04/2021	Adding a note to paragraph 1.3.1 to provide a timeline of delivery of MPCPs ten business days prior to SMSR. Extended the training validity for the NASA mishap investigation process awareness and the NASA mishap invesitagation policy and process from two to five years. Increased the threshold for requiring drug testing after a mishap from $10,000 to $20,000 for damages

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Preface

P.1 Purpose

a. This NASA Procedural Requirements (NPR) provides requirements to report, investigate, and document mishaps, close calls, and resulting corrective actions to prevent occurrence of similar work-related injury, property damage, or mission failure. This NPR does not apply to investigative procedures concerning civil, criminal, or administrative culpability or legal liability. The investigation and resulting products outlined in this NPR will not be used to direct or justify disciplinary action. The NPR describes how NASA complies with the incident investigation and corrective action requirements of the Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, 29 CFR pt. 1960.

b. This NPR provides requirements that specify how to prepare for the possibility of and respond to mishaps and close calls from discovery through corrective action and closure. It contains requirements for classifying mishaps, establishing investigating authorities, and performing investigations. It formalizes notification, analysis, and reporting obligations; describes roles and responsibilities; provides an overview of release of information to the public; and specifies the relationship and interaction with the Occupational Safety and Health Administration (OSHA), the National Transportation Safety Board (NTSB), and other Government agencies.

P.2 Applicability

a. This directive is applicable to NASA Headquarters (HQ) and NASA Centers, including Component Facilities and Technical and Service Support Centers. This language applies to the Jet Propulsion Laboratory (a Federally Funded Research and Development Center), other contractors, recipients of grants, cooperative agreements, or other agreements only to the extent specified or referenced in the applicable contracts, grants, or agreements.

b. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms "may" denotes a discretionary privilege or permission, "can" denotes statements of possibility or capability, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.

c. In this directive, all citations of NASA directives are assumed to be the latest version unless otherwise noted.

P.3 Authority

a. Inspector General Act of 1978, 5 U.S.C. app. 3.

b. Federal Information Security Management Act (FISMA) of 2002, 44 U.S.C. ch. 35, subch. III.

c. Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, 29 CFR pt. 1960.

d. NPD 8700.1, NASA Policy for Safety and Mission Success.

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P.4 Applicable Documents and Forms

a. Protection of Human Subjects, 14 CFR pt. 1230.

b. Recording and Reporting Occupational Injuries and Illnesses, 29 CFR pt. 1904.

c. Federal Acquisition Regulations System, 48 CFR, NFS pt. 1807.

d. Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records, 49 CFR pt. 830.

e. Investigation Procedures, 49 CFR pt. 831.

f. NPD 1050.1, Authority to Enter into Space Act Agreement.

g. NPR 1441.1, NASA Records Management Program Requirements.

h. NPR 1600.1, NASA Security Program Procedural Requirements.

i. NPR 1800.1, NASA Occupational Health Program Procedures.

j. NPR 2190.1, NASA Export Control Program.

k. NPR 2810.1, Security of Information Technology.

l. NPR 3792.1, NASA's Plan for a Drug-Free Workplace.

m. NPR 7100.1, Protection of Human Research Subjects.

n. NPR 8735.1, Exchange of Problem Data Using NASA Advisories and the Government-Industry Data Exchange Program (GIDEP).

o. NRRS 1441.1, NASA Records Retention Schedules.

p. NAII 1050.1, Space Act Agreement Guide.

q. NAII 1050.2, Authority to Enter into Cooperative Research and Development Agreements.

r. NAII 1050.3, NASA Partnerships Guide.

s. Mishap Preparedness and Contingency Plan (MPCP) for International Space Station (ISS) SSP 50190, Commercial Resupply Services (CRS) SSP 50190 Annex A and Commercial Crew Program (CCP) CCT-PLN-1010.

t. NTSB Form 6120, Pilot/Operator Aircraft Accident/Incident Report.

u. OSHA's Form 301, Injury and Illness Incident Report.

v. AFI 91-204, Safety Investigation and Hazard Reporting.

w. DoDI 6055.07, Mishap Notification, Investigation, Reporting and Record Keeping.

P.5 Measurement/Verification

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Compliance with the requirements contained within this directive is continuously monitored by the Centers and by the Safety and Mission Assurance (SMA) Technical Authority. Compliance may also be verified as part of selected life-cycle reviews and by assessments, reviews, and audits of the requirements and processes defined within this directive.

P.6 Cancellation

NPR 8621.1C, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping dated May 19, 2016.

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Chapter 1. Readiness to Conduct Investigations

1.1 NASA Mishap and Close Call Descriptions

1.1.1 A NASA mishap is an unplanned event resulting in at least one of the following:

a. Occupational injury or occupational illness to non-NASA personnel caused by NASA operations or NASA-funded research and development projects.

b. Occupational injury or occupational illness to NASA personnel caused by NASA operations or NASA-funded research and development projects.

c. Destruction of or damage to NASA property, public or private property, including foreign property, caused by NASA operations or NASA-funded research and development projects.

d. NASA mission failure before the scheduled completion of the planned primary mission.

1.1.2 A close call is an event requiring first aid treatment or less, or property damage or mission failure with a direct cost of less than $20,000, based on a worst case estimate by the responsible organization, but has NASA mishap potential. For Unmanned Aircraft System (UAS) events where the UAS damage cost is below $20,000 NASA responsible organizations report the event in the NASA Mishap Information System (NMIS) as a “Non-NPR 8621 event” to document the potential hazards of UAS operations. This includes any engineering analysis, findings and corrective actions from the event.

1.2 Mishap or Close Call Classification

1.2.1 The severity of the personnel injury and the direct cost of the mishap or close call (property damage or mission failure) determine the classification level of the mishap or close call (Table A).

1.2.2 The MDAA, CHMO, CD, and the AA, MSD or designees shall, within 24 hours, determine the mishap classification level for all mishaps within their jurisdiction and obtain concurrence on this classification level from the Chief, SMA for Type A and Type B mishaps and high-visibility mishaps and close calls. For Type C, D, or close call incidents, the CD may elect to assign Center High Visibility classification status per procedures contained in the Center MPCP.

Table A. Mishap Classification Levels

Classification Level	Property Damage	Injury
	Total direct cost of mission failure and property damage of $2,000,000 or more, or Crewed aircraft or spacecraft hull loss,	

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Type A Mishap	or Unexpected aircraft or spacecraft departure from controlled flight for all aircraft except when departure from controlled flight has been pre-briefed (e.g., upset recovery training, high Angle of Attack (AOA) envelope testing, aerobatics, or Out of Controlled Flight (OCF) for training) or mitigated through the flight test process inherent at each Center.	Occupational injury or illness resulting in A fatality or A permanent total disability.
Type B Mishap	Total direct cost of mission failure and property damage of at least $500,000, but less than $2,000,000.	Occupational injury or illness resulting in A permanent partial disability or Hospitalization for inpatient care of three or more people within 30 workdays of the mishap.
Type C Mishap	Total direct cost of mission failure and property damage of at least $50,000, but less than $500,000.	Nonfatal OSHA-recordable occupational injury or illness resulting in days away from work, or restricted duty, or transfer to another job beyond the day or shift on which it occurred. or Hospitalization for inpatient care of one or two people within 30 workdays of the mishap.
Type D Mishap	Total direct cost of mission failure and property damage of at least $20,000, but less than $50,000.	Nonfatal OSHA-recordable occupational injury or illness that does not meet the definition of a Type C mishap.
Close Call	Total direct cost of mission failure and property damage of less than $20,000, but event has the mishap potential using a worst case estimate.	Injury requiring first aid or less, but event has the mishap potential using a worst case estimate.

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1.2.3 The CD or Program/Project Manager, with review and concurrence of the cognizant Safety Office, shall calculate the direct cost of a mishap or close call. Calculations are done by adding all of the actual or estimated costs of damaged or destroyed property, mission failure, lost commodity (e.g., the cost of the fluid lost from a ruptured pressure vessel), and resultant costs such as environmental decontamination, property cleanup, and restoration. Estimated costs are calculated by using the greater of the actual or the fair market value. Actual repair or replacement costs, labor (i.e., the actual value of replacement or repair hours for internal and external or contracted labor) should be included in calculations.

Note 1: The initial estimate of the direct cost is calculated in the first 24 hours because the Appointing Official (AO) uses this estimate to determine the classification of the incident and the resources to allocate to the investigation. The final direct cost is calculated as the damage assessments are completed and are incorporated into the mishap investigation report. The final mishap classification level could change based on the final estimate of the direct cost. The IA ex officio verifies interim costs upon completion of investigation and that cost has been included and meets the guidelines in this NPR. This figure is subject to correction or validation by the official responsible for authorizing closure of the mishap record. Upon mishap closure, the cognizant Safety Office either confirms final cost or modifies based on most current cost information. Note 2: Replacement cost to purchase commercially available part or manufacture custom part as needed is considered an equivalent replacement. Note 3: The direct cost of the mishap or close call includes the actual costs of replacement parts as if these were purchased new. Note 4: Indirect costs that would not be part of a direct cost calculation include:

1. Cost of expended emergency response or supplies.

2. Training and compensating replacement personnel.

3. Workers' compensation costs.

4. Medical treatment costs.

5. Lost productivity including lost use of damaged equipment.

6. Depreciation of damaged equipment.

7. Cost of the safety mishap investigation to include analysis, inspection, and travel.

8. Schedule delays.

9. Legal liability costs and fines.

10. Insurance costs.

11. Corrective or preventive action costs.

12. Costs associated with incident reporting and recordkeeping.

1.2.4 The responsible program manager or designee, in coordination with the cognizant Chief Financial Officer or designee, shall calculate the cost of a mission failure by determining the cost of

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the "unique" mission from Mission Approval (reference NPR 7120.5, Key Decision Point C) through project closeout, including consumables (e.g., fuel), launch costs, and dedicated institutional support costs such as the Deep Space Network, NASA Engineering and Safety Center, Independent Technical Authority, or others.

Note 1: Example of mission failure—The launch vehicle loses a main engine on ascent and fails to deliver its payload to its intended low-Earth orbit. The preapproved minimum mission success criteria are obviously unmet. The cost of this mission failure would be the cost of the launch vehicle processing and operations (labor and consumables) dedicated to this mission and the entire payload cost accrued since its approval (Key Decision Point C or equivalent). Note 2: Example of incident not considered a mission failure—The Mars Exploration Rover Spirit fails long after it has met its minimum success criteria (minimum mission objectives). This would not be classified as a mission failure, so no cost would be assigned. The program manager may choose to investigate this failure, but there would be no cost assigned.

1.2.5 The following situations are not considered NASA mishaps or close calls:

a. Illnesses or fatalities resulting from natural causes or those unrelated to the work environment when disease, not injury, is the cause of lost time (e.g., diabetes and resultant complications, loss of vision).

b. Intentional self-inflicted injuries or fatality.

c. Injuries or fatalities resulting from altercations, attack, assault—unless incurred in the performance of official duties such as criminal investigations—or homicide.

Note: Incidents involving personnel injured as a result of violence in the work environment will be reported to the Department of Labor in accordance with Recording and Reporting Occupational Injuries and Illnesses, 29 CFR pt.1904.

d. Destruction of or damage to any property (public, private, or Government) onsite at a Center or involving NASA property on grounds outside Center property (i.e., including contractor sites) as a direct result of:

(1) Weather conditions such as hurricane, lightning, tornado, high winds, dust storm, tidal wave, tsunami, waterspout, or ice or snow loads.

Note: Damage to aircraft or hazardous conditions encountered in flight as a result of any of the above-mentioned weather conditions, as well as a bird or animal strike will be treated as a mishap or close call. Non-damaging bird or wildlife strikes are entered into NMIS as a "Non-NPR 8621" event. All bird strikes, regardless of damage, are also reported to the Federal Aviation Administration (FAA) or the Department of Defense (DoD) for inclusion in the national bird strike database.

(2) Natural phenomena such as flood, landslide, earthquake, meteorite impact, or volcanic eruption.

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(3) Wildfire.

(4) Vandalism, riot, civil disorder, or felonious act such as arson or, in some cases, theft.

Note 1: In cases where weather, natural phenomenon, wildfire, vandalism, riot, civil disorder, or a felonious act is the proximate cause, the event is exempt from the mishap classification. However, if the weather, for example, was an intermediate cause or a contributing factor to a mishap, then this exemption to mishap classification does not apply. Note 2: Damage to NASA aircraft, vehicles, or other property occurring after an aircraft or vehicle has been stolen is not reportable as a mishap. Damage to NASA aircraft, vehicles, or other property occurring when an individual misappropriates an aircraft or vehicle not authorized to be flown or driven by the individual will not be reported as a NASA mishap.

e. An intentional and controlled jettison or intentional and controlled release during flight of canopies, cargo, doors, drag chutes, hoist cables, hatches, life rafts, auxiliary fuel tanks, missiles, drones, rockets, and externally carried equipment not essential to flight when there is no injury, illness, or reportable collateral damage. In the case of missiles or drones, when the reason for jettison is not malfunction or unintentional.

f. Incidents occurring during the non-space flight transportation of NASA material by commercial carriers when NASA or NASA contractors had no roles or responsibilities for packing, securing, or transporting the items.

Note: If NASA or a NASA contractor was responsible for the safety of the transport or performed any activities related to securing or transporting the material, the incident should be evaluated to determine if it was a NASA mishap or close calls.

g. Incidents involving aircraft operated as civil use, owned by civil operators, and accomplishing contract air missions for NASA where there is no NASA property damage or Federal employee injury.

h. For CubeSats/Deployers and NPR 8705.4 Class D Payloads, certain events are investigated at the discretion of the implementing Center or NASA Responsible Directorate:

(1) Damage or loss of data involving CubeSats/Deployers (secondary payloads) and NPR 8705.4 Class D projects, or data flown on launch services procured by the NASA Launch Services Program (LSP) and that do not affect the primary mission in any manner.

(2) Damage or loss of data involving CubeSats/Deployers and NPR 8705.4 Class D projects, flown on dedicated launch vehicles, where such hardware is considered experimental, and their success is not a critical factor in determining the success of the mission.

(3) Damage to or loss of CubeSats/Deployers and NPR 8705.4 Class D projects dedicated launch vehicle hardware.

i. Damage to NASA equipment residing offsite that is leased, on bailment, or loaned to contractors, commercial airlines, other Government agencies, or foreign governments when the lessee has

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assumed risk of damage or loss.

j. A malfunction or failure of component parts normally subjected to fair wear and tear and having a fixed useful life less than the fixed useful life of the complete system or unit of equipment, provided both of the following are true:

(1) Scheduled preventative maintenance was performed.

(2) The malfunction or failure of the component was the only damage, and the sole action is to replace or repair that component. (This does not apply to a malfunction or failure of a component part resulting in a fatality, injury, or damage to another component or a facility.)

k. Test-induced damage is not considered a mishap if all of the following are true:

(1) The test-induced damage did not result in:

(a) Injury, illness, or fatality.

(b) Damage to public property, other Government agency property, or private property (e.g., a privately owned vehicle) regardless of the property's location.

(c) Hazardous hardware debris leaving the test cell, test chamber, protected facility, pre-determined debris field, or test range unless the release could have resulted in injury, illness, or death.

(2) The facility and test equipment functioned properly except when the facility or test equipment functionality itself is being tested as part of approved test objectives.

(3) Damage is limited to test articles or test facilities, and the risk of damage was formally documented and accepted by signature before the test. The type or general category of test-induced damage (i.e., water damage, structural failure, or thermal overload) was documented as a designed and intended or potential outcome of the test, and the risk of the test-induced damage, including related uncertainties, was formally accepted by the appropriate authority. Depending on the test, the appropriate authority may be the owner of the damaged property or the person responsible for funding replacement of damaged equipment (e.g., the owner of the test article, test support equipment, test cell, chamber, pad, or protected facility, or the range, project, or program manager).

Note: Refer to Appendix C for more information on test-induced damages.

1.3 Mishap Preparedness and Contingency Plans

1.3.1 Center Directors (CDs) and Program/Project Managers shall address the following elements in their Mishap Preparedness and Contingency Plans (MPCPs):

Note: All space flight MPCPs and appropriate annexes should be delivered to OSMA, Missions and Programs Assessment Division, and the NASA Safety Center Mishap Program Executive at least ten business days prior to the Safety and Mission Success Review (SMSR), or equivalent milestone. OSMA will work with the Program/project to review and concur prior to SMSR. SMSR is generally held one month prior to launch.

a. An expiration date not to exceed five years from the effective date.

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b. Organizational responsibility for establishing mishap investigations.

c. Notification, reporting, investigating, recording, and preparedness policies and procedures for local and offsite mishaps and close calls.

Note: This includes, but is not limited to, contact information for the offices, individuals, or both with responsibility for performing required tasks listed in this NPR. Required tasks can include, for example, contacting the NASA Office of Safety and Mission Assurance (OSMA) after a mishap; gathering resources and securing a facility; placing reports in the NMIS; maintaining required data in this system; and retaining hardcopy records.

d. The relationship between the Center Emergency Management Plan, the Center MPCP, and any related Program/Project MPCPs and which plan takes precedence given specific conditions.

Note: Communication with local emergency responders regarding imminent danger and immediate response should be addressed in the Center Emergency Management Plan.

e. The frequency interval for mishap response simulations covered by the Center MPCP and the Program/Project MPCP. The simulation frequency for Center and Program plans should not exceed one year. The simulation of Project plans may be less frequent, depending on the complexity of the Project's MPCP.

f. Training requirements for an Interim Response Team (IRT) and Investigating Authority (IA) members consistent with paragraph 1.5 of this NPR.

g. Procedures to deploy an IRT.

Note: A NASA Federal employee will serve as IRT lead (cognizant safety representative) and impound coordinator and will initiate collection of witness statement documentation. Even as these duties may not require immediate presence at the mishap scene, they nevertheless include accountability for collected and preserved evidence.

h. The impoundment process for records and equipment that may be involved in the mishap including:

(1) A list of organizations authorized to impound such evidence and secure onsite at a Center and offsite mishap locations.

(2) The location where impounded data, records, and equipment, including electronic media, are stored and secured during an investigation of either onsite at a Center or offsite mishaps.

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(3) Steps for release of impounded data, records, equipment, facilities, and mishap site.

i. The appointment of an IA—a Mishap Investigator (MI), Mishap Investigation Team (MIT), or Mishap Investigation Board (MIB).

j. Delegation of authority and resources, including funding and funding organizations, for assigned IRT and potential IA members so they may expeditiously deploy to the mishap scene; effectively preserve mishap evidence; interview witnesses; and conduct an orderly investigation without administrative delay. Resources include, but are not limited to, travel, contractual authority, salaries, facilities, computer equipment, video equipment, and supplies.

k. Funding for the IRT or IA, advisors, consultants, interviewee travel, laboratory analysis, and others' support required by the IA.

l. Access to support and experts who can facilitate the immediate support, acquisition, or purchase of products needed by the IRT or IA (e.g., high-resolution cameras, recording devices, software, and others).

m. Mishap investigation report approval process for Center-processed Types C, D, and close call mishaps.

n. Medical jurisdiction for fatalities that may occur on NASA property.

Note 1: NASA Office of the General Counsel and local coroner need to be consulted to determine jurisdiction and arrangements for forensic analysis.

Note 2: Certain religious denominations forbid autopsies.

o. CD or Associate Administrator, Mission Support Directorate (AA, MSD) next of kin notification regarding fatalities and injuries. Only the Johnson Space Center CD will do astronaut next of kin notification.

p. Headquarters Office of Communications (OCOM) notification of the public for casualties, performed in accordance with local CD or AA, MSD protocols, involving NASA employees or military and other Federal personnel, including astronauts, detailed to NASA.

Note: For NASA aircraft incidents, refer to section 8.1.1.

q. For Type C/D/Close Call classification, a worst-case estimate of potential outcome from the responsible organization within 72 hours of occurrence to determine whether to conduct a Center High Visibility investigation.

r. For Center High Visibility investigations, additional Center-specific requirements for IRT and IA activities above and beyond routine Type C/D/Close Call investigations.

Note 1: To achieve full value in Center High Visibility investigations, a structured causal analysis method should be used, and a system/process description should be

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included with sufficient details to identify all safety controls and barriers in place as evidence at the time of the incident. Note 2: When the Project Manager conducts attempted recovery of lost on-orbit or extraterrestrial mission capabilities from an undesired event, multiple attempts to enact planned or unplanned contingency actions may occur before the project declares a mishap has occurred.

s. Investigation and debris collection process required for any mishap or close call occurring in or out of the country.

t. International, national, State, and local organizations and agencies that are most likely to take part in debris collection; identification of roles and responsibilities for each organization; and points of contact. Bilateral or multilateral agreements procedures for mishap investigation when the program involves international partners, program managers, and project managers.

u. Other Government agencies' resources possibly needed during a Type A or Type B mishap or high-visibility mishap or close call (Table A) investigation; points of contact and contact information for each of these agencies; procedures to acquire agency assistance; and probable roles and responsibilities for each agency (e.g., Federal Emergency Management Agency [FEMA], NTSB, Department of Defense, FAA, or Department of Justice).

v. The names of key personnel from NASA OCOM and the Office of International and Interagency Relations (OIIR) to be notified for all Type A and Type B mishaps.

w. For NASA aircraft owned by NASA Centers, the NASA response to incidents during project missions regardless of duration or distance away from the home Center.

1.4 Roles and Responsibilities

Note 1: The Administrator, Deputy Administrator, Associate Administrator (AA), Chief Health and Medical Officer (CHMO) Associate Administrator for the Office of International and Interagency Relations (AA/OIIR), Associate Administrator for the Office of Communications (AA/OCOM), and the Office of the General Counsel have unique responsibilities for international mishaps and contingencies, as specified in section 2.2.4. Note 2: OCOM, AA/OCOM, CD, Center Public Affairs Office (PAO), and AA, MSD have unique responsibilities for the release of public information, as specified in section 2.2.5.

1.4.1 CD and AA, MSD.

1.4.1.1 CD and AA, MSD shall develop the Center MPCP and include the content specified in section 1.3. The CD and AA, MSD are responsible for funding and supporting Center MPCPs in conformance with this NPR. This includes requirements to notify, report, investigate, and record mishaps and close calls that fall within CD and AA, MSD jurisdiction. The CD and AA, MSD (or delegate) are the approval authority for Center MPCPs.

1.4.2 The Mission Directorate Associate Administrator (MDAA).

1.4.2.1 The MDAA is responsible for developing an MPCP per 1.3.1 at the Mission Directorate

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(MD) level.

1.4.2.2 The MDAA is responsible for ensuring program/project managers develop and implement Program/Project MPCPs in conformance with this NPR. This includes procedures to notify, report, investigate, and record mishaps and close calls associated with programs and projects that fall under MDAA responsibility.

1.4.2.3 The MDAA is responsible for ensuring international partner joint program agreements and other Federal agency agreements incorporate the mishap and reporting elements of this NPR.

1.4.2.4 The MDAA is responsible for ensuring mishap plans are consistent and complementary across "loosely coupled" programs.

1.4.3 CD and Program/Project Managers shall:

1.4.3.1 Support and utilize Center and HQs requirements in the development of the Center MPCP, Program/Project MPCPs for programs and projects that have activities at the Center, contract clauses, and mishap investigation training.

1.4.3.2 Ensure Center employees are familiar with the roles and responsibilities, as documented in the Center MPCP and this NPR, and that IRT and IA personnel complete the training required in section 1.5.

1.4.3.3 Review and provide concurrence that all program/project plans include any required program/project-specific information and procedures not covered in the Center's MPCP (e.g., special procedures for safing, handling, or containing hazardous chemicals present in program or project hardware).

1.4.3.4 Maintain an updated list of all Center personnel who have training and experience in mishap investigation including information such as relevant training courses, dates of training, and recent participation in a mishap investigation.

1.4.3.5 Forward copies of Center and Program/Project MPCPs to the OSMA Mishap Investigation Program Executive as soon as the plans are approved.

1.4.4 The Program/Project Manager.

1.4.4.1 The Program/Project Manager is responsible for the implementation and funding of the Program/Project MPCP in coordination with applicable Centers' MPCPs and with the appropriate NASA HQ Offices, which include, at a minimum, the MDAA, General Counsel, OSMA, OCOM, and OIIR, before its final approval.

> *Note: Program approval of NASA spaceflight Program/Project MPCPs is required prior to each project's applicable readiness review as defined in NPR 7120.5, NASA Space Flight Program and Project Management Requirements.*

1.4.4.2 The Program/Project Manager shall develop the Program/Project MPCP and include the content specified in section 1.3. This includes requirements to notify, report, investigate, and record mishaps and close calls that fall within Program/Project jurisdiction.

1.4.5 The Office of Procurement.

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1.4.5.1 The Office of Procurement is responsible for incorporating applicable mishap and close call reporting and investigating procedures and corrective action requirements detailed in the Safety and Health Measures and Mishap Reporting, NFS 1852.223-70 into contracts, agreements, and grants covering NASA programs and operations.

1.4.5.2 The Office of Procurement shall consult the cognizant Safety Office in the acquisition strategy planning activities for proposed contracts as detailed in the Federal Acquisition Regulations System, 48 CFR , NFS pt. 1807.

Note: See Appendices E and F for detailed procedural and positional sequencing, respectively, for notification and investigation.

1.5 Training

1.5.1 CD and Program/Project Managers shall ensure IRT personnel complete training that consists of:

a. NASA IRT Training.

(1) Center/Program/Project IRT Responsibilities.

(2) General Hazard Awareness.

(3) Go-Kit Items and Use.

(4) Securing a Mishap Site.

(5) Witness Identification.

(6) Witness Statement Collection.

(7) Drug Testing Requirements and Procedures.

(8) Evidence Impoundment and Chain of Custody.

b. NASA Mishap Investigation Process Awareness.

Note: Satisfied by SMA-002-07 Overview of Mishap Investigations; SMA-002-08 Mishap Investigation Roles and Responsibilities; SMA-002-009 Completing the Investigation and Mishap Report; and SMA-002-10 Introduction to Root Cause Analysis (valid for five years); and SMA-002-11 Interim Response Team Training

c. Local Hazard Awareness.

Note: Each Center, Program, or Project should customize personnel training to address exposure to serious workplace hazards created by sources unique to local activities and conditions beyond general hazard awareness. Hazard awareness training may include, but is not limited to, blood-borne pathogens, confined space, working at heights, and hazardous materials.

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1.5.2 IA Training.

Note: It is recommended that IA members complete the total training in section 1.5.2.

1.5.2.1 IA members should be familiar with training in the NASA mishap investigation policy and process.

Note: The series of NASA online courses meets this requirement: SMA-002-07 Overview of Mishap Investigations; SMA-002-008 Mishap Investigation Roles and Responsibilities; SMA-002-009 Completing the Investigation and Mishap Report; SMA-002-11 Interim Response Team Training, and SMA-002-10 Introduction to Root Cause Analysis (within the last five years).

1.5.2.2 CD and Program/Project Managers shall ensure that at least one voting member and the ex officios have completed training in:

a. The content of this NPR (See note in 1.5.2.1).

b. Conducting witness interviews.

c. Creating timelines; documenting facts; generating fault trees; performing barrier analysis; conducting change analysis; creating event and causal factor trees; obtaining forensic analysis; integrating evidence; determining findings; generating recommendations; and producing mishap investigation reports.

Note: Course numbers SMA-SAFE-OSMA-4003 or SMA-002-14 in the System for Administration, Training, and Educational Resources for NASA (SATERN) NASA Root Cause Analysis within the last five years meet this requirement.

d. If appointed as a Mishap Investigation Board Chair with no prior NASA mishap training, the appointed chair is to take the MIB Chair course, SATERN course SMA-002-13.

1.5.2.3 CD and Program/Project Managers shall ensure Human Factors members and ex officios complete training in:

a. Human Factors Mishap Investigation Principles and Practices.

Note: The online course SMA-001-07 Introduction to Human Factors in Mishap and Close Call Investigation meets this requirement for all IA members except Human Factors investigator and ex officio. Classroom training SMA-SAFE-OSMA-4004 Human Factors in Mishap Investigation or SMA-002-15 (SATERN) within the last five years meets this requirement. The Mishap Investigation Program Executive or assignee may approve educational study or degree equivalent.

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b. Basic knowledge of physical and psychological processes, capabilities, skill levels, and limitations of humans, such as the science and practical application of cognitive psychology, human reliability, anthropometrics, biomechanics, and human factors engineering applications to design.

Note: SMA-SAFE-OSMA-4004 Human Factors in Mishap Investigation (within the last five years) meets this requirement. The Agency Mishap Investigation Program Executive or assignee may approve educational study or degree in Human Factors as equivalent.

1.5.2.4 CD and Program/Project Managers shall ensure:

a. The Safety member has completed training in maintaining the security of the mishap site.

b. All advisors and voting members have technical knowledge and completed training in areas required to support the IA.

Note: Refer to Appendix D for a summary of Mishap Required Training.

a. An expiration date not to exceed five years from the effective date.

b. Organizational responsibility for establishing mishap investigations.

c. Notification, reporting, investigating, recording, and preparedness policies and procedures for local and offsite mishaps and close calls.

Note: This includes, but is not limited to, contact information for the offices, individuals, or both with responsibility for performing required tasks listed in this NPR. Required tasks can include, for example, contacting the NASA Office of Safety and Mission Assurance (OSMA) after a mishap; gathering resources and securing a facility; placing reports in the NMIS; maintaining required data in this system; and retaining hardcopy records.

d. The relationship between the Center Emergency Management Plan, the Center MPCP, and any related Program/Project MPCPs and which plan takes precedence given specific conditions.

Note: Communication with local emergency responders regarding imminent danger and immediate response should be addressed in the Center Emergency Management Plan.

e. The frequency interval for mishap response simulations covered by the Center MPCP and the Program/Project MPCP. The simulation frequency for Center and Program plans should not exceed one year. The simulation of Project plans may be less frequent, depending on the complexity of the Project's MPCP.

f. Training requirements for an Interim Response Team (IRT) and Investigating Authority (IA) members consistent with paragraph 1.5 of this NPR.

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g. Procedures to deploy an IRT.

Note: A NASA Federal employee will serve as IRT lead (cognizant safety representative) and impound coordinator and will initiate collection of witness statement documentation. Even as these duties may not require immediate presence at the mishap scene, they nevertheless include accountability for collected and preserved evidence.

h. The impoundment process for records and equipment that may be involved in the mishap including:

(1) A list of organizations authorized to impound such evidence and secure onsite at a Center and offsite mishap locations.

(2) The location where impounded data, records, and equipment, including electronic media, are stored and secured during an investigation of either onsite at a Center or offsite mishaps.

(3) Steps for release of impounded data, records, equipment, facilities, and mishap site.

i. The appointment of an IA—a Mishap Investigator (MI), Mishap Investigation Team (MIT), or Mishap Investigation Board (MIB).

j. Delegation of authority and resources, including funding and funding organizations, for assigned IRT and potential IA members so they may expeditiously deploy to the mishap scene; effectively preserve mishap evidence; interview witnesses; and conduct an orderly investigation without administrative delay. Resources include, but are not limited to, travel, contractual authority, salaries, facilities, computer equipment, video equipment, and supplies.

k. Funding for the IRT or IA, advisors, consultants, interviewee travel, laboratory analysis, and others' support required by the IA.

l. Access to support and experts who can facilitate the immediate support, acquisition, or purchase of products needed by the IRT or IA (e.g., high-resolution cameras, recording devices, software, and others).

m. Mishap investigation report approval process for Center-processed Types C, D, and close call mishaps.

n. Medical jurisdiction for fatalities that may occur on NASA property.

Note 1: NASA Office of the General Counsel and local coroner need to be consulted to determine jurisdiction and arrangements for forensic analysis.

Note 2: Certain religious denominations forbid autopsies.

o. CD or Associate Administrator, Mission Support Directorate (AA, MSD) next of kin notification regarding fatalities and injuries. Only the Johnson Space Center CD will do astronaut next of kin notification.

p. Headquarters Office of Communications (OCOM) notification of the public for casualties, performed in accordance with local CD or AA, MSD protocols, involving NASA employees or military and other Federal personnel, including astronauts, detailed to NASA.

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Note: For NASA aircraft incidents, refer to section 8.1.1.

q. For Type C/D/Close Call classification, a worst-case estimate of potential outcome from the responsible organization within 72 hours of occurrence to determine whether to conduct a Center High Visibility investigation.

r. For Center High Visibility investigations, additional Center-specific requirements for IRT and IA activities above and beyond routine Type C/D/Close Call investigations.

Note 1: To achieve full value in Center High Visibility investigations, a structured causal analysis method should be used, and a system/process description should be included with sufficient details to identify all safety controls and barriers in place as evidence at the time of the incident.

Note 2: When the Project Manager conducts attempted recovery of lost on-orbit or extraterrestrial mission capabilities from an undesired event, multiple attempts to enact planned or unplanned contingency actions may occur before the project declares a mishap has occurred.

s. Investigation and debris collection process required for any mishap or close call occurring in or out of the country.

t. International, national, State, and local organizations and agencies that are most likely to take part in debris collection; identification of roles and responsibilities for each organization; and points of contact. Bilateral or multilateral agreements procedures for mishap investigation when the program involves international partners, program managers, and project managers.

u. Other Government agencies' resources possibly needed during a Type A or Type B mishap or high-visibility mishap or close call (Table A) investigation; points of contact and contact information for each of these agencies; procedures to acquire agency assistance; and probable roles and responsibilities for each agency (e.g., Federal Emergency Management Agency [FEMA], NTSB, Department of Defense, FAA, or Department of Justice).

v. The names of key personnel from NASA OCOM and the Office of International and Interagency Relations (OIIR) to be notified for all Type A and Type B mishaps.

w. For NASA aircraft owned by NASA Centers, the NASA response to incidents during project missions regardless of duration or distance away from the home Center.

1.4 Roles and Responsibilities

Note 1: The Administrator, Deputy Administrator, Associate Administrator (AA), Chief Health and Medical Officer (CHMO) Associate Administrator for the Office of International and Interagency Relations (AA/OIIR), Associate Administrator for the Office of Communications (AA/OCOM), and the Office of the General Counsel have unique responsibilities for international mishaps and contingencies, as specified in section 2.2.4. Note 2: OCOM, AA/OCOM, CD, Center Public Affairs Office (PAO), and

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AA, MSD have unique responsibilities for the release of public information, as specified in section 2.2.5.

1.4.1 CD and AA, MSD.

1.4.1.1 CD and AA, MSD shall develop the Center MPCP and include the content specified in section 1.3. The CD and AA, MSD are responsible for funding and supporting Center MPCPs in conformance with this NPR. This includes requirements to notify, report, investigate, and record mishaps and close calls that fall within CD and AA, MSD jurisdiction. The CD and AA, MSD (or delegate) are the approval authority for Center MPCPs.

1.4.2 The Mission Directorate Associate Administrator (MDAA).

1.4.2.1 The MDAA is responsible for developing an MPCP per 1.3.1 at the Mission Directorate (MD) level.

1.4.2.2 The MDAA is responsible for ensuring program/project managers develop and implement Program/Project MPCPs in conformance with this NPR. This includes procedures to notify, report, investigate, and record mishaps and close calls associated with programs and projects that fall under MDAA responsibility.

1.4.2.3 The MDAA is responsible for ensuring international partner joint program agreements and other Federal agency agreements incorporate the mishap and reporting elements of this NPR.

1.4.2.4 The MDAA is responsible for ensuring mishap plans are consistent and complementary across "loosely coupled" programs.

1.4.3 CD and Program/Project Managers shall:

1.4.3.1 Support and utilize Center and HQs requirements in the development of the Center MPCP, Program/Project MPCPs for programs and projects that have activities at the Center, contract clauses, and mishap investigation training.

1.4.3.2 Ensure Center employees are familiar with the roles and responsibilities, as documented in the Center MPCP and this NPR, and that IRT and IA personnel complete the training required in section 1.5.

1.4.3.3 Review and provide concurrence that all program/project plans include any required program/project-specific information and procedures not covered in the Center's MPCP (e.g., special procedures for safing, handling, or containing hazardous chemicals present in program or project hardware).

1.4.3.4 Maintain an updated list of all Center personnel who have training and experience in mishap investigation including information such as relevant training courses, dates of training, and recent participation in a mishap investigation.

1.4.3.5 Forward copies of Center and Program/Project MPCPs to the OSMA Mishap Investigation Program Executive as soon as the plans are approved.

1.4.4 The Program/Project Manager.

1.4.4.1 The Program/Project Manager is responsible for the implementation and funding of the

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Program/Project MPCP in coordination with applicable Centers' MPCPs and with the appropriate NASA HQ Offices, which include, at a minimum, the MDAA, General Counsel, OSMA, OCOM, and OIIR, before its final approval.

Note: Program approval of NASA spaceflight Program/Project MPCPs is required prior to each project's applicable readiness review as defined in NPR 7120.5, NASA Space Flight Program and Project Management Requirements.

1.4.4.2 The Program/Project Manager shall develop the Program/Project MPCP and include the content specified in section 1.3. This includes requirements to notify, report, investigate, and record mishaps and close calls that fall within Program/Project jurisdiction.

1.4.5 The Office of Procurement.

1.4.5.1 The Office of Procurement is responsible for incorporating applicable mishap and close call reporting and investigating procedures and corrective action requirements detailed in the Safety and Health Measures and Mishap Reporting, NFS 1852.223-70 into contracts, agreements, and grants covering NASA programs and operations.

1.4.5.2 The Office of Procurement shall consult the cognizant Safety Office in the acquisition strategy planning activities for proposed contracts as detailed in the Federal Acquisition Regulations System, 48 CFR , NFS pt. 1807.

Note: See Appendices E and F for detailed procedural and positional sequencing, respectively, for notification and investigation.

1.5 Training

1.5.1 CD and Program/Project Managers shall ensure IRT personnel complete training that consists of:

a. NASA IRT Training.

(1) Center/Program/Project IRT Responsibilities.

(2) General Hazard Awareness.

(3) Go-Kit Items and Use.

(4) Securing a Mishap Site.

(5) Witness Identification.

(6) Witness Statement Collection.

(7) Drug Testing Requirements and Procedures.

(8) Evidence Impoundment and Chain of Custody.

b. NASA Mishap Investigation Process Awareness.

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Note: Satisfied by SMA-002-07 Overview of Mishap Investigations; SMA-002-08 Mishap Investigation Roles and Responsibilities; SMA-002-009 Completing the Investigation and Mishap Report; and SMA-002-10 Introduction to Root Cause Analysis (valid for two years); and SMA-002-11 Interim Response Team Training

c. Local Hazard Awareness.

Note: Each Center, Program, or Project should customize personnel training to address exposure to serious workplace hazards created by sources unique to local activities and conditions beyond general hazard awareness. Hazard awareness training may include, but is not limited to, blood-borne pathogens, confined space, working at heights, and hazardous materials.

1.5.2 IA Training.

Note: It is recommended that IA members complete the total training in section 1.5.2.

1.5.2.1 IA members should be familiar with training in the NASA mishap investigation policy and process.

Note: The series of NASA online courses meets this requirement: SMA-002-07 Overview of Mishap Investigations; SMA-002-008 Mishap Investigation Roles and Responsibilities; SMA-002-009 Completing the Investigation and Mishap Report; SMA-002-11 Interim Response Team Training, and SMA-002-10 Introduction to Root Cause Analysis (within the last two years).

1.5.2.2 CD and Program/Project Managers shall ensure that at least one voting member and the ex officios have completed training in:

a. The content of this NPR (See note in 1.5.2.1).

b. Conducting witness interviews.

c. Creating timelines; documenting facts; generating fault trees; performing barrier analysis; conducting change analysis; creating event and causal factor trees; obtaining forensic analysis; integrating evidence; determining findings; generating recommendations; and producing mishap investigation reports.

Note: Course numbers SMA-SAFE-OSMA-4003 or SMA-002-14 in the System for Administration, Training, and Educational Resources for NASA (SATERN) NASA Root Cause Analysis within the last five years meet this requirement.

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d. If appointed as a Mishap Investigation Board Chair with no prior NASA mishap training, the appointed chair is to take the MIB Chair course, SATERN course SMA-002-13.

1.5.2.3 CD and Program/Project Managers shall ensure Human Factors members and ex officios complete training in:

a. Human Factors Mishap Investigation Principles and Practices.

Note: The online course SMA-001-07 Introduction to Human Factors in Mishap and Close Call Investigation meets this requirement for all IA members except Human Factors investigator and ex officio. Classroom training SMA-SAFE-OSMA-4004 Human Factors in Mishap Investigation or SMA-002-15 (SATERN) within the last five years meets this requirement. The Mishap Investigation Program Executive or assignee may approve educational study or degree equivalent.

b. Basic knowledge of physical and psychological processes, capabilities, skill levels, and limitations of humans, such as the science and practical application of cognitive psychology, human reliability, anthropometrics, biomechanics, and human factors engineering applications to design.

Note: SMA-SAFE-OSMA-4004 Human Factors in Mishap Investigation (within the last five years) meets this requirement. The Agency Mishap Investigation Program Executive or assignee may approve educational study or degree in Human Factors as equivalent.

1.5.2.4 CD and Program/Project Managers shall ensure:

a. The Safety member has completed training in maintaining the security of the mishap site.

b. All advisors and voting members have technical knowledge and completed training in areas required to support the IA.

Note: Refer to Appendix D for a summary of Mishap Required Training.

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Chapter 2. Mishap Response, Notification, and Classification

2.1 Initial Mishap Response

2.1.1 Center and Program/Project employees shall:

a. Employees who witness or are involved in a workplace injury, illness, or property damage event, notify emergency response (911 or designated emergency contact) of the need for assistance as soon as the safety of personnel permits.

Note: Not all NASA mishaps or close calls require local emergency response notification. Situations involving damages to test articles or other items may need to be secured by means other than what the Program/Project/Center organizations can provide.

b. Complete witness statements on request of emergency response or IRT personnel.

2.1.2 The CD or Program/Project Manager shall:

a. Upon notification of a mishap or close call that triggers the initiation of the MPCP (as defined in the applicable MPCP), initiate the Center MPCP and support the program/project as the Program/Project MPCP is initiated.

b. Deploy the IRT to support the investigation in accordance with the Center or Program/Project MPCP.

c. Assist the IRT with the collection of witness statements.

2.1.3 Upon notification of a mishap, the Program/Project Manager shall initiate the Program/Project MPCP.

2.1.4 The Center Office of Protective Services (OPS) shall support the incident commander, cognizant Safety Office, and IRT in securing the site and impounding data, records, equipment, and facilities.

2.1.5 The Center or Program/Project IRT shall:

a. Preserve potential evidence, document the scene, obtain witness statements, and collect debris.

Note 1: Written witness statements obtained within the first 24 hours of a mishap or close call are privileged and protected if collected by a Federal employee. If needed, Federal employee IRT members can also grant privilege anytime thereafter.

Note 2: Where possible, written witness statements should be collected on a NASA form that includes the statement of privilege (Figure 1).

Note 3: Written and verbal witness statements given after 24 hours of a mishap or close call, as part of a NASA mishap investigation, where witnesses are informed their accounts will not be released, are privileged and protected.

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Note 4: NASA will not grant privilege to witnesses for written or verbal witness statements when an external investigating body is expected to be the sole mishap IA (e.g., catastrophic aerospace vehicle failure or airplane loss).

Note 5: External IAs are not required to comply with NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping (e.g., a congressionally appointed mishap investigation board or the NTSB conducting an investigation involving an airplane or catastrophic vehicle loss). Consequently, NASA cannot guarantee privileged statements will be protected from the IA or other authorities.

b. Refrain from giving witnesses a copy of privileged written statements or transcripts of verbal witness statements. If witness statements or transcripts of witness statements are provided to witnesses, NASA cannot ensure privilege and confidentiality.

c. Conduct evidence preservation actions without affecting essential safety operations.

d. Collect and impound, with cognizant Safety Office, supervisors, and OPS support, appropriate data, records, equipment, witness statements, and facilities that may be involved in the mishap.

2.1.6 The Center or Program/Project IA shall coordinate with the Contracting Officer prior to accessing the site, impounding contractor data, and interviewing contractor personnel as permitted by the contract.

Note: For incidents outside Center property, NASA has the authority to impound NASA property; however, impounding or collecting other data, records, and equipment is determined by local and Federal laws, agency agreements, and contracts.

2.1.7 The CD or AA, MSD shall report, by telephone, to the Administrator and CHMO when it becomes known that there is a work-related fatality or serious injury or illness of a NASA employee, resident non-NASA Federal employee, or resident contractor (a NASA contractor whose primary place of business is on or near a NASA Center or NASA-owned facility).

2.2 Initial Mishap Notifications

2.2.1 The Center or Program/Project supervisors shall notify the Center and Program/Project cognizant Safety Office when a mishap or close call occurs or is suspected.

2.2.2 The Center or Program/Project cognizant Safety Office shall:

a. Notify OSMA. After emergency response has been initiated and within one hour of a Type A or Type B mishap or a high-visibility mishap or close call, notify OSMA by calling 1-216-433-9614, or, if no answer, by calling the NASA Headquarters After Hours Contact Center at 1-202-358-1414.

b. During this notification, provide the following information:

(1) Center name.

(2) Location of incident.

(3) Time of incident.

(4) Number of fatalities, if known.

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(5) Number of hospitalized employees, if known.

(6) Type of injury, if known.

(7) Type and estimate of damage, if known.

(8) Contact person and telephone number.

(9) Brief description of the mishap.

c. For Type A and Type B mishaps and high-visibility mishaps and close calls, send an encrypted electronic notification to OSMA and CHMO containing information found in section 2.2.2.b.

d. Notify CHMO. Within one hour, report to the CHMO an illness or injury that results in a loss of life, permanent disability, hospitalization, extensive first aid, or lost workdays, in accordance with NPR 1800.1, NASA Occupational Health Program Procedures.

e. Report to OSHA in accordance with 29 CFR pt. 1904.

f. After notifying OSHA, inform OSMA that an oral report has been provided to OSHA.

2.2.3 The Center or Program/Project IRT shall:

a. Notify the Center PAO about casualties, damages, and any potential hazards to the public.

b. Support the release of information to the media by PAO and other offices to alert Center personnel and the public of any known hazards and their potential effects.

c. At the earliest opportunity, advise the supervisor of a Federal employee if drug testing should be requested in accordance with NPR 3792.1, NASA's Plan for a Drug-Free Workplace.

> *Note: In accordance with NPR 3792.1, the supervisor will initiate drug testing after a mishap if the mishap results in a fatality or personal injury requiring immediate hospitalization or in damages estimated to be in excess of $20,000 to Government or private property. This applies to Federal employees only.*

d. At the earliest opportunity, notify the Contracting Officer or the Contracting Officer's Representative if drug testing for contract personnel is to be implemented according to the contract or applicable agreements.

e. If the impacted individuals have signs or symptoms consistent with a medical malady that may have been contributory or as a result of the mishap itself, contact the flight surgeon, or medical professional, on-call for appropriate referral, testing, or disposition.

2.2.4 International Mishaps.

2.2.4.1 The Official-in-Charge shall:

a. Notify, by the most expeditious means, the Chief, SMA; the appropriate MDAA; the CHMO, if injury or illness related; and the cognizant Safety Office that a mishap has occurred on foreign territory or in international waters.

b. When a Type A or Type B mishap occurs outside the United States (for example, at a tracking station or during an aircraft, rocket, or balloon launch operation involving NASA personnel), in

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coordination with the AA/OCOM and the AA/OIIR, release factual details, limited to the same details outlined in this NPR, through the U.S. Embassy or Consular Office in the locale of the mishap, in accordance with policies and procedures established by those offices.

2.2.4.2 The MDAA shall notify, by the most expeditious means, the Associate Administrator (AA) that a mishap has occurred on foreign territory or in international waters.

2.2.4.3 The AA shall notify, by the most expeditious means, the Administrator; the Deputy Administrator; AA/OCOM; AA/OIIR; the Office of the General Counsel; and other appropriate staff that an international mishap has occurred.

2.2.5 Mishap (after mishap scene is secured) public release of information.

2.2.5.1 The NASA HQ OCOM shall approve the release of all information related to NASA Type A and Type B mishaps and high-visibility mishaps and close calls prior to release to media or public, this includes relevant external government organizations (e.g., White House, Department of State, etc.).

2.2.5.2 The AA/OCOM, or designee, shall:

a. Within one hour of the incident, release information to the media and alert Center personnel and the public of any known hazards and their potential effects and provide instructions to mitigate the risk and harm.

b. As warranted and with the assistance of the cognizant Safety Office, IRT, and CD or AA, MSD, release interim public affairs status reports about the investigation to the media through the Center PAO.

2.2.5.3 The Center PAO shall:

a. Prior to the appointment of an IA and in coordination with AA/OCOM, as warranted, identify and disseminate any preliminary information, video, and imagery related to the mishap that is suitable for public release.

b. When a fatality or injury (permanent disability) has occurred to a NASA employee involved in a Center work-related activity, coordinate with AA/OCOM and then promptly announce the incident to the public.

2.2.5.4 The CD or AA, MSD shall ensure that:

a. In the case of Federal fatalities, release of victim names will be made through the Center PAO at the earliest possible time after CD or AA, MSD and AA/OCOM concurrence that the next of kin notification has been accomplished with CD or AA, MSD protocols.

Note: For NASA aircraft incidents, refer to section 8.1.1.

b. Initial announcements include what is known at the time, the injuries or fatalities that have occurred, and when additional information is expected to be available.

c. For Centers located on a military installation, release of victim names will be made according to procedures previously agreed upon by the installation commander and CD or AA, MSD.

2.2.5.5 Resident contractor and grantee employee casualties. NASA does not assume responsibility

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for the release of information concerning mishaps involving resident contractor or grantee employees except when a Type A injury or illness mishap occurs onsite at a Center or at HQ or involves a NASA-managed program administered by that Center. In this instance, the CD or AA, MSD, in coordination with the Center PAO and HQ OCOM, shall announce within one hour that a mishap has likely occurred and, at the earliest possible time, the specific facts regarding the injury or illness.

Note 1: Neither the CD nor the AA, MSD will announce the identity of non-NASA personnel involved.

Note 2: For NASA aircraft incidents, refer to section 8.2.1.

2.3 Post-Mishap Notifications

2.3.1 The CD, the AA, MSD, and the MDAA shall report, by telephone or e-mail, to the Administrator and CHMO within 24 hours of learning the instance of a NASA Type A or Type B mishap or high-visibility mishap or close call.

2.3.2 The NASA Office of Inspector General (OIG) and the Center's Office of the Chief Counsel or the NASA Office of the General Counsel shall be notified of information potentially related to criminal activity in connection with a mishap.

Note: All personnel governed by this NPR can make this notification.

2.3.3 Recording the mishap or close call.

2.3.3.1 The Center or Program/Project cognizant Safety Office shall, within 24 hours of notification, ensure all NASA mishaps and close calls are initially recorded in the NMIS and are updated throughout the investigation.

2.3.3.2 The Center or Program/Project occupational health representative or other medical person shall provide the appropriate medical information regarding the persons injured and the nature of the injuries as a result of a mishap or close call to the cognizant Safety Office for inclusion in the investigation report and NMIS.

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Chapter 3. Investigating Authority and Investigation Support Selection

3.1 Appointing Official Determination

3.1.1 The Administrator shall:

a. Serve as the AO for Type A mishaps or delegate authority to the AA, MDAA, CD, CHMO, or other designee.

b. Serve as the AO for NASA joint participation on an investigation with the Department of Defense and other agencies unless otherwise specified in existing agreements.

3.1.2 The MDAA shall:

a. Serve as the AO for Type A mishaps, if delegated by Administrator, Type B mishaps, high-visibility mishaps, and high-visibility close calls involving Mission Directorate-managed programs, projects, and activities occurring during space flight or occurring outside Center property at MDAA program and project sites (excluding offsite Center support contractor locations).

b. Serve as the AO (or designate the responsibility in the Program/Project MPCP) for Type C and Type D mishaps, and close calls involving Mission Directorate-managed programs, projects, and activities occurring during space flight, aircraft operations, or outside Center gates at MDAA program or project sites (excluding offsite Center support contractor locations).

3.1.3 The Chief, SMA or designee shall:

a. Contact the Administrator within one hour of the initial notification of a Type A mishap to ascertain if the Administrator wishes to exercise appointment authority.

b. Concur with the mishap classification level and the IA membership and serve as an endorsing official for Type A and Type B mishaps and high-visibility mishaps and close calls reports.

3.1.4 The CD and AA, MSD shall:

a. Serve as the AO (if designated by the Administrator) for Type A and Type B mishaps and high-visibility mishaps and close calls that occur onsite at a Center, at offsite Center support contractor locations, or at Center-managed offsite contractor locations that are not part of an MDAA program or project activity.

> *Note: A program-independent flight operations office manages aircraft operations; therefore, the CD serves as the AO for mishaps and close calls involving aircraft managed by the Center.*

b. Serve as the AO (or otherwise authorized in the Center MPCP) for Type C and Type D mishaps and close calls that occur onsite at a Center, at offsite Center support contractor locations, or at Center-managed offsite contractor locations that are not part of an MDAA program or project activity.

c. Consign formal authority to approve IA travel, resource acquisitions, or responsible organization

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corrective actions, when delegating AO responsibilities for Type C and D mishaps and close calls.

d. When identifying a position to act with AO authority, formally designate that position within the Center MPCP and confer full AO authority upon that position.

3.1.5 The Chief Health and Medical Officer (CHMO) shall:

a. Serve as the AO for a Type A mishaps, if delegated by the Administrator, Type B mishaps, high-visibility mishaps, and high-visibility close calls involving a human research subject.

b. Serve as the AO, via the Institutional Review Board (IRB) process, for Type C and Type D mishaps, and close calls involving a human research subject. (reference 14 CFR pt. 1230, Protection of Human Research Subjects and 7100.1, Protection of Human Subjects).

3.1.6 The OSMA Mishap Investigation Program Executive on NASA's behalf shall:

a. Support investigations of NASA mishaps by other Federal agencies authorized to investigate NASA mishaps.

b. Support other Federal agencies, foreign participants, and private industry mishap investigations in accordance with agreements.

Note 1: Applicable when a Presidential Commission is appointed pursuant to the NASA Authorization Act of 2005, Pub. L. 109-155, sec. 821 to investigate the loss.

1. The International Space Station or its operational viability.

2. Any other United States space vehicle carrying humans and is owned by the Federal Government or being used pursuant to a contract with the Federal Government.

3. Crewmember or passenger of any space vehicle described in this subsection.

Note 2: NASA interaction with external investigating authorities under Public Law is illustrated in Appendix G.

3.2 Investigating Authority Member Selection

3.2.1 The AO shall, for Type A and Type B mishaps and high-visibility mishaps and close calls:

Note: For Type C and Type D mishaps and close calls, IA appointment is documented in the MPCP.

a. Within 48 hours of the mishap, request from the OSMA Mishap Investigation Program Executive a provisional list of IA appointees for concurrence.

Note: IA members include chairperson, voting members, and ex officios. Support personnel such as advisors and consultants are not members of the IA.

b. Within seven workdays of the mishap, appoint the members of the IA in accordance with Table B and section 3.5 of this NPR with concurrence from the NASA Chief, SMA, Office of the Chief Engineer (OCE), the CHMO, and the Aircraft Management Division (AMD) when warranted by the

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undesired outcome.

c. The CHMO concurrence is required for mishaps when at least one of the following is true:

(1) The undesired outcome was an injury, including fatality, or illness.

(2) An injury or illness was causal to the undesired outcome.

(3) Amelioration impacted the severity of the undesired outcome where injury or illness is involved.

d. Designate the IA chairperson.

e. Determine if NASA will accept the investigation and subsequent mishap investigation report of another competent authority having jurisdiction.

Note: When the NASA AO accepts an independent investigation conducted by other authorities or contractors citing factual events and conditions for findings from which proximate causes, root causes, and contributing factors may be deduced, the AO is not required to conduct a separate NASA investigation.

Table B. Classification Level With Corresponding Appointing Official and Investigating Authority

Appointing Official and Investigating Authority Assignment Matrix		**High-Visibility Mishap or Close Call**	**Type A**	**Type B**	**Type C**	**Type D**	**Close Call**
Investigating Authority		MIB	MIB (at least five members)	MIB or MIT (at least three members)	MIT or MI	MIT or MI	MIT or MI
Appointing Official1	Offsite, In-flight or Program Contractor Site	MDAA	Administrator, AA or MDAA	MDAA	MDAA Designee (Program MPCP)		
	Center Onsite or Offsite Center Support Contractor or Grantee	CD or AA, MSD	Administrator, AA, CD or AA, MSD	CD or AA, MSD	CD or AA, MSD Designee (Center/Program MPCP)		

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	Human Research Subjects	CHMO or CD or AA, MSD	Administrator, AA, CHMO or MDAA	CHMO or CD or AA, MSD	CHMO (IRB)
Concurrence on IA Membership	All Damage, Injury, or Mission Failures	OSMA and OCE			Center/Program MPCP
	Injury or Illness as defined in 3.2.1(b)	CHMO			IRB
	NASA Aircraft Involved	AMD			N/A

[1] For Centers, AO responsibility may be delegated to the SMA Director but no lower.

Note 1: For mishaps involving human research subjects, the OICs will discuss the case before determining who the AO will be.

Note 2: If the NTSB performs an investigation where a NASA event exists (i.e., employee work-related injury, property damage, or mission failure), OSMA requests that a NASA representative be party to the investigation.

Note 3: An ex officio is not required for investigations by a single mishap investigator where one person becomes injured or ill from a fall down stairs; slip or trip on floor or ground; musculoskeletal disorder (cumulative or acute) while performing routine office duties; insect bite; or aggravated pre-existing medical condition.

f. Compose the IA following these requirements:

Note: Refer to Table C for breakdown of IA functions by mishap classification.

(1) IA members and the executive secretary are to be Federal personnel.

(2) The majority of IA members are to be independent from or have no responsibility for the operation or activity associated with the mishap or close call.

(3) IA members, the executive secretary, advisors, and consultants are to have the requisite security clearances as identified in the Center or Program/Project MPCPs.

Table C. Investigating Authority Functions by Incident Classification

Investigating Authority Federal Employee Functions	High-Visibility Mishap or	Type A	Type B MIB or	Type C MIT or MI	Type D MIT or MI	Close Call MIT or

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Functions (1)		Close Call	MIB	MIT (2)	MI (2)	MI (2)	MI (2)
Voting members (3)	Chairperson	Required except for MIs					
	Human Factors Investigator	Required			Center/ Program MPCP	Center/ Program MPCP	Center/ Program MPCP
	Safety Officer	Required					
	Medical Doctor	Required, as appropriate for injury or illness (4)					
	Technical Subject Matter Expert	(5)					
Non-voting members	Ex Officio	Required					
	Executive Secretary	(6)					
Advisors	Legal	Required					
	Public Affairs	Required					
	NASA Safety Center (NSC)	Required					

(1) Functions are combined when appropriate. The AO obtains concurrence from Chief, SMA, OCE, and CHMO on IA membership for Type A and Type B mishaps and high-visibility mishaps and close calls.

(2) An ex officio is not required for investigations by a single mishap investigator where one person becomes injured or ill.

(3) The IA consists of an odd number of voting members including the chairperson.

(4) For Types A and B and high-visibility mishaps and close calls, the AO requests concurrence from the CHMO to include a medical doctor member. For C/D mishaps and close calls, the AO consults the Center occupational health authority or OCHMO for medical representation and consultation. The IA chairperson may request a medical doctor as an advisor or consultant if one is not an IA member.

(5) The AO determines the need for a subject matter expert based on exceptionally large board membership and investigative scope.

(6) The AO determines the need for an executive secretary and other advisors such as procurement, import/export control, or others.

3.2.2 The Center or Program/Project IA shall have the following authority and responsibilities:

a. Have primacy over other Agency collateral investigations with the exception of the OIG criminal

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investigations.

b. Recommend membership changes to the AO regarding:

(1) Voting members.

(2) Ex Officio.

(3) Advisors.

c. Not participate in more than one type of investigation (NASA, collateral, contractor) for the same investigation or at the same time.

3.2.3 The Center or Program/Project IA composition shall:

a. Consist of an odd number of voting members including the chairperson, members at a minimum.

b. Have at least five members for Type A mishaps and at least three members for mishaps and high-visibility incidents.

Note: An ex officio is not required for investigations by a single mishap investigator for Type B, Type C, and Type D mishaps and close calls where one person becomes injured or ill from a fall down stairs; slip or trip on floor or ground; musculoskeletal disorder (cumulative or acute) while performing routine office duties; insect bite; or aggravated preexisting medical condition.

c. Have a member knowledgeable in aircraft operations and maintenance or a member knowledgeable in aviation safety for all Type A and Type B mishaps and high-visibility mishaps and close calls involving aircraft.

d. For Type A and Type B mishaps and high-visibility mishaps and close calls, include safety, medical, and human factors professionals as members.

Note 1: For aviation Type A, Type B, or high-visibility events, a NASA Human Factors Analysis and Classification System (HFACS) will be performed by the Human Factors member.

Note 2: If the area of investigation expertise cannot be obtained within NASA, the IA's members may be appointed from another Agency.

3.2.4 The Center or Program/Project ex officio shall:

a. Be a non-voting participant in all investigation deliberations.

b. Participate in all investigation proceedings as he or she deems appropriate.

c. Ensure the investigation conforms to NASA policy and this NPR, and the investigation process is impartial, independent, and non-punitive.

Note: An OSMA mishap investigation specialist is the preferred choice as ex officio for Type A and Type B mishaps and high-visibility mishaps and close calls investigations.

3.2.5 The Center or Program/Project IA Chairperson shall:

a. Manage and coordinate all aspects of the mishap investigation including, but not limited to, the following tasks: assign group leaders; coordinate document and information gathering activities;

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interview witnesses; reconstruct the mishap or close call; identify facts; identify causal (proximate, intermediate, and root) and contributing factors; generate recommendations; and complete the mishap investigation report.

b. Have the authority to impound data, records, equipment, and facilities and collect or salvage data and debris.

c. Work with the procurement and legal advisors to obtain and impound data for mishaps at contractor or subcontractor sites.

Note: NASA has the authority to impound NASA property for mishaps outside Center property; however, authorization to impound or collect other data, records, and equipment is dictated by local and Federal laws, Agency agreements, and contracts.

d. Release impounded data, records, equipment, facilities, and mishap site when no longer necessary.

Note: If repairs or modifications are determined through the IA investigation to be required before returning equipment or facilities to use, the release of impounded items should include a letter stating what is required.

e. Define the roles and areas of investigative responsibility for each group or subgroup on the IA.

f. Coordinate with the IA legal advisor, HQ, or cognizant public affairs advisor, and other advisors throughout the investigation.

g. Report only to the AO or designee during the investigation.

Note: The intent of this requirement is to provide the IA chairperson with only one supervisor during the investigation, thereby preventing numerous NASA requests for data and status. The report to the AO may include information such as status, facts, preliminary findings, and recommendations for immediate implementation.

h. With the IA legal advisor assistance, refer allegations and evidence of criminal activity identified in the course of an investigation to the OIG and General/Chief Counsel. Privileged witness statements will be protected to the extent provided by law, and all OIG requests for privileged information should be processed through NASA HQ.

3.3 Investigating Authority Advisor Selection

3.3.1 For Type A and Type B mishaps and high-visibility mishaps and close calls, the Center or Program/Project IA shall have a legal advisor and a public affairs advisor.

Note 1: The AO may appoint other advisors to provide specialized expertise or liaison.

Note 2: The AO will designate advisors for Type C, D, and close calls in accordance with the MPCP.

3.3.2 For Type A and Type B mishaps and high-visibility mishaps and close calls, the IA will have access to an OSMA (NASA Safety Center (NSC)) mishap investigation specialist to support the

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investigation:

a. If requested by the IA, OSMA will provide a mishap investigation specialist to support Type A and Type B mishaps and high-visibility mishaps and close calls.

b. The mishap investigation specialist can provide the following investigation support activities if requested by the IA:

(1) Consultation, preparation, and reporting assistance provided to IA chairperson and ex officio (when not named as ex officio).

(2) Identifying pertinent Agency-level audit results from other NASA installations and coordination with associated Center representatives responding to audit findings.

(3) Researching similar mishap findings and associated recommendations, corrective actions, and lessons learned.

(4) Investigation tool provision and coordination with tool specialists or necessary training.

(5) Assessment of the root cause analysis and associated IA recommendations for clarity, verifiability, achievability, and traceability.

(6) Assistance with IA investigation endorsement.

3.3.3 The Center or Program/Project IA Advisors shall:

a. Be NASA Federal employees.

Note: When possible, the advisors should have completed the NASA Root Cause Analysis classroom training within the last five years, supported an IA, and taken the online mishap training series within the last two years.

b. Attend meetings as necessary, travel with the IA as requested, and have access to all investigative material. Only the legal and medical advisors may be afforded access to privileged witness statements and interview records.

3.3.4 The Center or Program/Project Legal Advisor shall:

a. Develop nondisclosure agreements (NDAs) for IA contractor administrative support personnel and consultants.

b. Develop NDAs when the IA uses a contractor to analyze interview data or participate in interviews.

c. Provide legal advice and counsel as requested by the chairperson.

d. Attend interviews if a lawyer accompanies the interviewee during the interview process.

3.3.5 The chairperson may exclude advisors, with the exception of the legal advisor, from participating in deliberations that discuss privileged witness statements.

Note: The legal advisor may review witness statements to provide legal guidance to the IA. The medical advisor may be present at an interview of a victim or review a victim's statement.

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3.4 Investigating Authority Consultant Selection

3.4.1 Non-Federal employees may serve as consultants to the IA.

3.4.2 Consultants' academic and technical experience should match or exceed the technical and management complexity of systems related to the mishap.

3.4.3 IA consultants may be contracted or hired to:

a. Provide technical expertise to the IA.

b. Perform analysis.

c. Assist in formulating findings, as requested.

3.4.4 Center or Program/Project consultants shall not:

a. Participate in deliberations or vote on findings.

b. Read, listen, or participate in witness interviews unless they are tasked to record or analyze interviews.

Note: The IA may procure the services of contractors specializing in witness interview techniques or having other technical expertise if the following are true:

1. The contractor is not affiliated with the mishap, the contractors, or responsible organizations involved in the mishap.

2. The contractor is specifically tasked by contract to support the interview process or analyze interviews.

3. The contractor has signed the NDA prior to participation or support.

4. NASA does not have Federal employees readily available to perform the task.

3.4.5 Center or Program/Project Non-Federal employee administrative support shall sign an NDA before given access to mishap data or International Traffic in Arms Regulations (ITAR), Export Administration Regulations (EAR), proprietary, or privileged information.

3.5 Appointment Letter Content

3.5.1 For Type A and Type B mishaps and high-visibility mishaps and close calls, the Center or Program/Project AO shall document the following in the IA appointment letter:

a. IA member identification (chairperson, ex officio, and advisors).

b. Scope of the investigation including undesired outcome.

c. Projected completion date in accordance with this NPR. Within 75 workdays of the mishap or close call or as specified in the appointment letter or MPCP, the IA submits the completed and signed mishap report to the AO.

Note: The designated person with authority to classify an event as a NASA mishap may not

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become aware of the event or exposure until long after its occurrence. For example, exposure to asbestos, noise, or toxins may not be known to reach potentially disabling levels for months. In such cases, the AO should note the start of the investigation from the signature date of the appointing letter instead of the date of occurrence.

d. IA relief from collateral duties statement for the appointment period.

e. Expected cooperation of Center and program personnel regarding IA requests for information relevant to the investigation.

f. Point of contact for matters relating to the appointment and investigation including administrative, logistical, and information technology support functions at a minimum.

Note: For Type C and Type D mishaps and close calls, the IA appointment document will be in accordance with Center policy or Program/Project MPCP, whichever takes precedence.

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Chapter 4. Mishap Investigation Process

4.1 Mishap Investigation Analysis

4.1.1 The Center or Program/Project IA shall:

a. Determine what happened, when it happened, and why it happened with the goal of preventing incident recurrence and similar incident occurrence.

b. Use a structured analysis (such as Fault Tree Analysis or Human Factors Analysis) technique to establish elements in 4.1.1.a.

Note: For aviation Type A, Type B, or high-visibility events, NASA HFACS will be performed by the Human Factors member.

4.2 Site Safety and Evidence Preservation and Impoundment

4.2.1 After arriving at the mishap site, the Center or Program/Project IA shall:

a. Verify the mishap site is safe and secured.

b. Confirm evidence has been preserved and impounded, which includes the following:

(1) Relevant perishable evidence has been collected, photographed, and documented or impounded or both.

(2) All necessary data, records, and equipment have been impounded and stored in a secure site.

c. Take custody of all evidence gathered at the scene and all data pertaining to the investigation including impounded records; determine the status of impounded records and equipment; and develop a record of the actions taken by the IRT, the cognizant Safety Office, emergency response, and protective services personnel.

4.3 Evidence and Fact Gathering

4.3.1 The Center or Program/Project IA shall:

a. Collect, to the extent needed, and evaluate all available data and records relevant to the mishap. These data and records are not limited to those generated concurrently or as a result of the mishap, but also include relevant information such as historical, environmental, operational, and other information.

b. When conducting privileged witness interviews, permit only Federal employees to be present at an interview with the exception of the interviewee and contractors hired specifically to support interviews.

c. Interview witnesses with two basic objectives in mind:

(1) Determine witness observations or actions.

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(2) Elicit witness opinions of possible causes of the mishap.

Note 1: The IA reviews available information and evidence and considers other factors associated with the mishap to identify potential witnesses.

Note 2: Interviewees may include personnel at other locations or performing other work that may have influenced decisions, processes, materials, or systems involved in developing mishap conditions.

d. Before an interview begins, inform the interviewee if the information to be gathered during the interview is privileged.

Note: If the same person is interviewed multiple times, this should occur each time the person is interviewed.

4.3.2 In the event the IA decides to conduct an interview in which the discussion is kept privileged, the Center or Program/Project interviewer shall read the statement in Figure 1 of this NPR and inform the interviewee of the following provisions:

a. The witness oral or written statement will be retained as part of the investigation report background files but will not be released as part of the mishap investigation report.

b. NASA makes every effort to keep the witness statements privileged to the greatest extent permitted by law.

The purpose of this safety investigation is to determine the proximate causes and root causes of the mishap that occurred on _____and to develop recommendations toward the prevention of similar mishaps. It is not our purpose to place blame or to determine legal liability. Your statement is entirely voluntary, but we hope that you will assist the investigating authority to the maximum extent of your knowledge in this matter.

Your statement will be documented and retained as part of the mishap record background file but will not be released with your name as part of the mishap investigation report.

The investigating authority will make every effort to keep your statement confidential and privileged to the greatest extent permitted by law.

Figure 1. Required Formal Interview Initial Statement

4.3.3 The Center or Program/Project interviewee shall not receive a copy of the privileged statement

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given in the course of a NASA mishap investigation.

Note: NASA cannot ensure privilege and confidentiality if interviewee statements or transcripts of the statement are provided to an interviewee.

4.4 Findings Determination

4.4.1 The Center or Program/Project IA shall:

a. For Type A and Type B mishaps and high-visibility mishaps and close calls, determine the sequence of events and conditions and document them in a timeline.

b. Determine relationships, supported by facts, of events and conditions to the undesired outcome.

4.4.2 NASA Advisories.

4.4.2.1 The Center or Program/Project IA shall:

a. Create a NASA Advisory (using the NASA Advisory Reporting System (NARS https://nars.nasa.gov/, per NPR 8735.1, Exchange of Problem Data Using NASA Advisories and the Government-Industry Data Exchange Program (GIDEP)) at any time during the investigation when the IA identifies a safety finding requiring immediate action and could impact one or more Centers or when NASA-wide implications are present.

b. Obtain approval from the IA legal and public affairs advisors or by local policy via NARS.

4.4.2.2 OSMA will distribute the NASA Advisory electronically to Agency SMA personnel.

4.4.2.3 OSMA maintains the distribution lists for status reports (section 4.6) and mishap related NASA Advisories and makes them available on the NASA Mishap Investigation Web site.

4.5 Recommendations Generation.

4.5.1 The Center or Program/Project IA shall:

a. Develop recommendations to prevent incident reoccurrence and similar or like incident occurrence.

b. Confirm the recommendations are clear, verifiable, achievable, measurable, and traceable to at least one significant finding.

4.5.2 The Center or Program/Project AO shall:

a. Assess recommendations according to their effectiveness in reducing likelihood and consequence of causal factor reoccurrence.

b. Communicate recommendations outside his or her authority to the responsible NASA organization or external body for implementation of corrective action.

4.6 Status Reports

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4.6.1 The Center or Program/Project IA shall:

a. Develop a publicly releasable investigation status report for NASA Type A and Type B mishaps and high-visibility mishaps and close calls every 30 workdays from the time the appointment letter is signed until the mishap investigation report is signed. The template obtained from the NSC mishap support specialist will be used.

Note: The AO may require status information at other intervals from the IA.

b. Distribute the approved status report to the AO, responsible CD or Program Manager, Cognizant Safety Office, OSMA, OCHMO, and Agency SMA personnel through an approved distribution list.

c. Post 30-day status report to the mishap record in NMIS.

4.6.2 The Center or Program/Project IA shall document facts on the investigation status to date in the status report.

Note: A status report is a publicly releasable document approved by the public affairs and legal advisors assigned to the IA. The status report described in this section is not approved or issued by OCOM and is not to be confused with a public affairs status report, which is prepared by the HQ public affairs advisor and issued by OCOM to the news and information media.

4.7 Other Investigation Types

4.7.1 If it is reasonably suspected a mishap resulted from criminal or hostile activity, the Center or Program/Project IA shall halt the investigation; immediately notify the OIG, the AO, and the Office of the General Counsel or the Office of the Chief Counsel.

4.7.2 The Center or Program/Project IA chairperson shall only release privileged witness statements and related material to the OIG upon receipt of a written request signed by the Inspector General or Deputy Inspector General, addressed to the NASA Administrator or Deputy Administrator, and forwarded to the IA chairperson from the Administrator's office.

Note: The OIG respects and, as a general rule, will defer to the disclosure restrictions of NASA mishap investigations. Upon receipt of such information, the OIG will consider it confidential and treat it as such to the full extent required by the Inspector General Act of 1978, 5 U.S.C. app. 3.

4.8 Mishap Site Release

4.8.1 Only the IA chairperson is authorized to release the mishap site and impounded data, records, equipment, or facilities with concurrence of legal advisor.

4.8.2 The Center or Program/Project IA shall not release original data and records.

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Chapter 5. Mishap Investigation Report

5.1 Mishap Investigation Report Development

5.1.1 The Center or Program/Project IA shall:

a. Complete a mishap investigation report that contains the information as specified in Table D.

Note 1: Witness statements, witness names, and names of those involved in the mishap or related activities are not to be included in the mishap investigation report.

Note 2: For Type C and Type D mishaps and Close Calls, the investigation report may be accomplished according to the Center or Program/Project MPCP.

b. Include the mishap classification level (i.e., Type A and Type B mishaps and high-visibility mishaps and close calls) and NMIS event number, the incident date, and the report date on the mishap investigation report title page and in the report executive summary.

c. Describe in the mishap investigation report the type of property damage or mission failure and the severity of injuries or illnesses.

d. Describe in the mishap investigation report the actual direct cost of the mishap or an estimate if the actual direct cost is not available.

e. Sign the completed mishap investigation report.

f. Submit the completed and signed mishap investigation report to the AO within the specified time frame.

Note: For Type A and Type B mishaps and high-visibility mishaps and close calls, the mishap investigation report is not considered available for response to a Freedom of Information Act (FOIA) request until signed and officially endorsed. Distribution of the report will be in accordance with Sensitive But Unclassified (SBU) requirements and with the AO's concurrence.

g. Submit a request for additional time to complete the investigation or the mishap investigation report and include the rationale for the extension. The IA chairperson should make the request to the AO or designee.

5.1.2 Type A and Type B mishaps and high-visibility mishaps and close calls investigation reports, the Center or Program/Project IA shall include the products shown in Table D in the following order:

a. Section 1: Signature pages, list of consultants, executive summary, and OSHA Form 301, Injury and Illness Incident Report questions 14 through 17 information (for reportable occupational injury or illness).

b. The executive summary should include a public-releasable description of the activity leading to the mishap and the findings and recommendations in the report.

c. Section 2: Narrative description and facts (what, when, where, how).

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d. Section 3: Type of data gathered and data analysis.

e. Section 4: Findings.

f. Section 5: Recommendations.

g. Section 6: Minority Report.

Note: For Type C and Type D mishaps and close calls, Table D products are included according to Center or Program/Project policy.

Table D. Required Investigation Products

Investigation Products Required for Each Classification Level/Type of Investigation	High-Visibility Mishap or Close Call	Type A	Type B	Type C	Type D	Close Call
a. Signatures of Investigating Authority	X	X	X	X	X	X
b. Signature of Ex Officio	X	X	X			
c. Signatures of all advisors	X	X	X	As applicable		
d. List of all consultants, if any	X	X	X	X		
e. Executive summary (no privileged, proprietary, Privacy Act, ITAR, or EAR information)	X	X	X	X		
f. OSHA 301 or equivalent form for injuries only	X	X	X	X	X	
g. Narrative description of facts (who, what, when, where)	X	X	X	X	X	X
h. Description of type of data gathered during the investigation	X	X	X			
i. Timeline	X	X	X			
j. Description of all structured analysis techniques used and how they contributed to determine the findings	X	X	X			

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k. Event and Causal Factor Tree or similar graphical representation of the mishap	X	X	X			
l. Description explaining why the mishap or close call occurred including all findings such as proximate causes, root causes, contributing factors, failed barriers, observations, and the evidence upon which the findings are based	X	X	X	X	X	X
m. Findings and recommendations	X	X	X	X	X	X
n. Minority report, if existing	X	X	X	X	X	X

5.1.3 The Center or Program/Project ex officio shall:

a. Serve as the authorized representative of the Chief, SMA.

b. Sign the completed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls attesting to the following:

Note: Ex officio requirements for Type C and Type D mishaps and close calls will comply with Center or Program policy.

(1) The investigation was conducted in conformance with NASA policy and this NPR.

(2) The investigation process was impartial, independent, and non-punitive.

(3) The mishap investigation report contains all the required elements.

(4) The mishap investigation report accurately identifies the proximate causes, root causes, and contributing factors. He or she should verify that the process was followed, and the causes were identified and labeled correctly.

(5) Adequate facts have been gathered and analyzed to substantiate the findings.

(6) Recommendations reasonably address the causes and findings.

(7) Each recommendation is associated with or traceable to at least one significant finding.

c. If the conditions in section 5.1.3 b. have not been met, describe the mishap investigation report's deficiencies in writing and sign, and attach this description to the mishap investigation report in lieu of signing the report.

5.1.4 Center or Program/Project NASA advisors shall sign the mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls stating that each has reviewed the report, and it meets NASA policies and procedures in the advisor's functional area. The following also applies to advisor signatures:

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a. The export control advisor's signature indicates that any ITAR and EAR information has been identified and marked as non-releasable to the public.

b. The legal and public affairs advisors' signatures indicate that any privileged or proprietary information, or material subject to the Privacy Act has been identified and marked as non-releasable to the public (e.g., NASA SBU); and releasable volumes and appendices are marked publicly releasable. The public affairs advisor is not responsible for identifying such information because this knowledge is outside the scope of the public affairs advisor's functional area; however, the public affairs advisor is responsible for verifying the appropriate reviews have been conducted by the appropriate experts before signing the report.

Note 1: Public release of reports for Type A, Type B, and high-visibility mishaps and close calls is accomplished through the FOIA process. For mishaps of certain public interest, reports may be released by the AO after review and concurrence from the supporting legal and public affairs organizations. For mishaps of certain public interest whose reports are not suitable for public release because the information they contain is proprietary or subject to ITAR or EAR, the IA public affairs advisor and the IA will produce a separate, publicly releasable summary of the findings and recommendations in the report. The AA/OCOM or designee may disseminate this summary. For Type C and Type D mishaps and close calls, the AO and public affairs advisor will determine the process for public release of the resulting mishap investigation report.

Note 2: Although the report may be marked as publicly releasable, the public release of the information is still dependent on completion of endorsements, PAO authorizations, and NASA receipt of an FOIA request.

5.1.5 The names of consultants may be listed in the mishap investigation report; however, Center or Program/Project consultants shall not sign the mishap investigation report.

Note: The IA will determine if any consultant information should be withheld in the report and acknowledge consultant participation.

5.1.6 Upon completion of the investigation, Center or Program/Project cognizant Safety Offices shall upload the report to NMIS (Appendix H).

5.2 Investigating Authority Release

Upon receiving the completed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls, the Center or Program/Project AO shall first verify it fulfills the appointment letter and then inform the IA that its responsibilities have been fulfilled.

5.3 Mishap Investigation Report Review, Endorsement, and Approval

5.3.1 Upon receipt of the signed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls, the Center or Program/Project AO shall:

a. Schedule an Endorsement Review with appropriate officials to review and endorse the mishap

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investigation report.

Note: Refer to Table E for breakdown of Endorsing Officials by mishap classification.

Table E. Endorsing Officials by Mishap Classification

Endorsing Official by Mishap Classification	Type A	Type B	High-Visibility Mishap or Close Call
AA	All mishaps for which he or she is the AO		
Chief, SMA	X	X	X
CHMO (when involving injury or illness)	X	X	X
OSI/AMD* (when involving aircraft)	X	X	X
NASA Chief Engineer	X	X	X

*Office of Strategic Infrastructure, Aircraft Management Division

b. Deliver a copy of the mishap investigation report a minimum of five workdays prior to conducting the Endorsement Review.

Note: During the five-day period, the endorsing official's technical experts will review the report for compliance with requirements stated in sections 5.3.2 and 5.3.3. Lower level mishaps and close calls are reviewed and endorsed according to Center or Program policy.

5.3.2 The Center or Program/Project AO shall include Appendix I in the Endorsement Review:

Note: The Endorsement Review, or Mishap Out Brief, is intended to be the culmination of the mishap investigation process, whereby the Appointing and Endorsing Officials have reviewed the mishap investigation report and are prepared to concur or not concur with the report content including findings and recommendations. The Endorsement Review may be waived at the AO's discretion and in coordination with the cognizant Safety Office and OSMA Mishap Investigation Program Executive. The IA is released from duty at the review's conclusion.

a. IA's presentation of the mishap investigation report and its associated findings and recommendations.

b. Discussion and resolution of endorsing official comments and concerns.

c. Determination of report release option.

d. Identification of actions accepted by the AO.

5.3.3 On Endorsement Review, the Center or Program/Project endorsing officials shall:

a. Verify the mishap investigation report content is technically correct and complete in addressing facts and circumstances associated with the mishap.

b. Concur that the mishap investigation report describes causal and contributing factors.

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c. Concur that the recommendations are practical, feasible, achievable, and will, in the opinion of the reviewer, prevent the occurrence of similar mishaps or close calls.

d. Concur that proprietary, ITAR, or EAR information; material subject to the Privacy Act; or privileged information has been properly identified and protected.

5.3.4 Upon conclusion of the Endorsement Review, Center or Program/Project endorsing officials shall sign the Endorsement Review Record, signifying mishap investigation report concurrence or nonconcurrence and provide comments related to concurrence or disagreement with elements of the report.

5.3.5 The Center or Program/Project AO shall attach the Endorsement Review Record and comments to the mishap investigation report and maintain as part of the permanent record.

5.3.6 The Center or Program/Project AO, with assistance from the cognizant Safety Office, shall prepare for release of the Endorsement Review Record, which includes the following:

a. List of Endorsement Review attendees.

b. Appointing and endorsing officials' comments attached to the IA report.

c. Document release authorization priority and any special distribution are according to Note 1, section 5.1.4.b.

d. Actions accepted by the AO to be incorporated into the mishap Corrective Action Plan (CAP).

e. Endorsing officials' signatures signifying mishap investigation report concurrence or nonconcurrence.

5.3.7 The Center or Program/Project AO shall:

a. Serve as final authority for acceptance or rejection of mishap and close call investigation reports in which he or she holds the AO's position.

b. Ensure the mishap investigation process is complete.

c. Verify the mishap investigation report is reviewed and endorsed.

d. Assess the recommendations.

> *Note 1: Recommendations should be assessed in relationship to their effectiveness at reducing the likelihood and consequence of reoccurrence. The AO determines the method most appropriate to perform this assessment. The highest rated recommendations should be considered for endorsement and corrective action, while those rated lower may be deferred or eliminated by the AO.*
>
> *Note 2: The IA may recommend to the AO, at any time during the investigation, that immediate corrective action be taken to ensure the safety of personnel associated with ongoing operations, internal or external to NASA.*

e. If the AO rejects the mishap investigation report, provide a written description of the deficiencies warranting the rejection and direction going forward. Options include assigning the same IA to redo part or all of the investigation; or dismissing the original IA and appointing a new IA with instructions in section 3.5; or releasing the IA in favor of a collateral investigation.

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5.4 Mishap Investigation Report Distribution

5.4.1 Upon notification from the Center or Mission Directorate representatives that the mishap investigation report is authorized for public release, the designated Center or Program/Project FOIA officer shall send the approved mishap investigation report with authorization comments to the AO, OSMA, and the cognizant Safety Office (dependent on level of investigation).

5.4.2 OSMA will complete a Mishap Summary public release review and distribute the Mishap Summary as necessary for the purpose of mishap prevention awareness and other action deemed appropriate by NASA Centers and field installations.

5.4.3 Upon release of the Mishap Summary, the MDAA or the Center cognizant Safety Office shall distribute the Mishap Summary to the appropriate NASA programs and organizations including, but not limited to, the responsible organization or program, all cognizant Safety Offices, the CHMO when injury or fatality is involved, and AMD when the mishap involves an aircraft.

Note: At any time following initial mishap investigation report endorsement, the cognizant Safety Office may distribute actions and factual information associated with the mishap investigation, with the exception of that deemed subject to Privacy Act or the Health Insurance Portability and Accountability Act (HIPAA) or security related, for the purposes of corrective action planning or general workforce awareness of hazards with the potential to cause similar mishap reoccurrence.

5.4.4 The AA/OCOM shall determine whether a mishap investigation report, whatever its origin, will be issued from HQ or the Center.

Note: For NASA aircraft incidents, refer to section 8.5.1.

5.4.5 If a FOIA request is made, and FOIA rules require mishap investigation report redaction, the Center or Program/Project Manager shall not distribute the redacted report to the public except through the FOIA process.

5.4.6 The Center or Program/Project cognizant Safety Office shall ensure the information recorded in the NMIS is updated.

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Chapter 6. Post-Investigation Activities

6.1 Corrective Action Plan Development

6.1.1 The Center or Program/Project AO shall, after the mishap investigation report has been endorsed and at the earliest opportunity, direct the responsible organization or program/project to develop a CAP for those recommendations approved by the AO.

Note: At any time during the investigation, the IA may recommend to the AO that immediate corrective actions be taken to ensure safety during ongoing operations internal or external to NASA.

6.1.2 The Center or Program/Project Manager shall, within 15 workdays from being tasked, submit the CAP to the AO for approval and then implementation.

Note: The AO may extend the CAP deadline upon written request from the responsible organization or program/project.

6.2 Corrective Action Plan Contents

6.2.1 The Center or Program/Project Manager shall include the following in the CAP:

a. Corrective actions description and the estimated completion dates for each corrective action.

b. The lowest-level NASA organization responsible for completing the corrective actions.

c. A matrix or other means of matching corrective actions to all findings and recommendations.

6.3 Corrective Action Plan Review and Approval

6.3.1 The AO may provide the CAP to cognizant Safety Office and other offices as deemed appropriate for review.

6.3.2 The Center or Program/Project AO shall:

a. Accept or reject the CAP.

b. Return a rejected CAP with comments to the responsible organization or program/project for revision and resubmission.

6.4 Corrective Action Plan Implementation

6.4.1 The Center or Program/Project Manager shall:

a. Implement the corrective actions.

b. Track the corrective action performance and completion in NMIS and provide the AO with a

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status at intervals determined by the AO.

6.4.2 The Center or Program/Project cognizant Safety Office shall:

a. Assist the responsible organization to enter updates into NMIS as described in the Center MPCP.

b. Enter into NMIS the actual direct cost of the mishap or the estimated direct cost, if the actual direct cost is not available.

6.5 Corrective Action Plan Monitoring and Close Out

6.5.1 The Center or Program/Project Manager shall:

a. Update the cognizant Safety Office on the status of corrective action activities at least every 30 workdays until the CAP is closed.

b. Submit changes to the CAP after it has been approved (i.e., actions considered unwise or not feasible) to the cognizant Safety Office or Program for review. After this review, the requested changes will be sent to the AO for approval.

Note: Center or program policy may provide supplementary instruction regarding completing, submitting, and monitoring CAPs.

6.5.2 The Center or Program/Project AO shall:

a. Assess and approve any changes to the CAP.

b. Send approved changes to the responsible organization and the cognizant Safety Office.

c. Once corrective actions for Type A and Type B mishaps and high-visibility mishaps and close calls are fulfilled, provide a Corrective Action Plan Closure Statement to the supporting cognizant Safety Office and responsible organization advising the CAP has been closed.

6.5.3 The Center or Program/Project cognizant Safety Office shall:

a. Track corrective action activities to verify they are carried out according to plan and report non-compliance to the AO.

b. Verify corrective actions activities were implemented, completed, and closed.

c. Notify the AO that actions have been implemented, completed, and closed.

d. Verify that the mishap investigation report, endorsements, approved CAP and Corrective Action Plan Closure Statement, and mishap activities completion statements are complete and correctly recorded in NMIS.

6.6 Lessons Learned Development, Disposition, Submittal, and Approval

Note: Section applies to Types A and B mishaps and high-visibility mishaps and close calls investigations. Center Mission Directorates or Programs may develop disposition instructions for lower level (i.e., Types C and D mishaps and close calls investigations). The AO will

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determine criteria for including mishap data in the Lessons Learned Information System (LLIS).

6.6.1 The Center or Program/Project AO shall ensure:

a. Resources are provided to submit the Mishap Summary to the LLIS for entry for Type A and Type B mishaps and high-visibility mishaps and close calls.

b. Lessons learned are developed and submitted as described in the MPCP for Type C and D mishaps and close calls.

6.6.2 The Center or Program/Project tasked to develop lessons learned shall:

a. Generate lessons learned comprising, at a minimum, the mishap investigation report's executive summary, findings, and recommendations authorized for public release.

b. Within ten workdays of being tasked, submit prepared lessons learned to the AO.

6.7 Investigation Activities Conclusion

6.7.1 The Center or Program/Project AO shall:

a. Submit the mishap investigation activities completion statement to the responsible organization, OSMA (for Type A and Type B mishaps and high-visibility mishaps and close calls), the cognizant Safety Office, and other appropriate organizations indicating the investigation was performed; the CAP was implemented, completed, and closed; and the lessons learned were entered into the NASA LLIS (as determined appropriate by Center or mission authorities).

b. The AO's mishap investigation obligations are fulfilled with the delivery of the mishap activities completion statement, and the mishap file is closed (i.e., all activities associated with the mishap have been completed).

6.8 Evidence Recording and Retention

6.8.1 The Center or Program/Project IA shall not release original data and records unless copies are made as needed and retained with mishap investigation records.

6.8.2 The Center or Program/Project cognizant Safety Office shall:

a. Keep, retained, physical mishap evidence for two years from the date of the mishap.

b. Before disposition of physical evidence, seek concurrence from the Office of the General Counsel to confirm there is no active litigation affecting dispositional decisions.

c. File the final CAP and approved lessons learned with the official approved mishap investigation report in a location specified in the Center MPCP.

Note: NASA medical reports and witness statements are excluded from a mishap investigation report, but should be retained, marked confidential and privileged, and filed with the official approved mishap investigation report.

6.8.3 Manage and suitably dispose of the CAP, lessons learned, witness statements, and other

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records documenting the investigation in accordance with NPR 1441.1, NASA Records Management Program Requirements and NRRS 1441.1, NASA Records Retention Schedules.

Note: Such records, regardless of format, include, but are not limited to, mishap investigation reports and associated records; IRT and IA relevant notes and e-mail messages; meeting agendas, minutes, and other documentation of the investigation process; and copies of data and records used to evaluate and analyze the mishap.

6.8.4 The Chief, SMA or designee shall:

a. Archive HQ-approved NASA mishap investigation reports and related documents in accordance with NRRS 1441.1.

b. Handle and protect NASA information according to the requirements of NPR 1600.1, NASA Security Program Procedural Requirements; NPR 2190.1, NASA Export Control Program; and NPR 2810.1, Security of Information Technology.

Note: NASA policy protects NASA information commensurate with the national security classification level, sensitivity, value, and criticality as stated in NPR 1600.1, NPR 2190.1, and NPR 2810.1. The Federal Information Security Management Act (FISMA) of 2002, 44 U.S.C. ch. 35, subch. III and other Federal laws and directives (e.g., ITAR) require the NASA Administrator to administer information security controls in accordance with these and other Federal laws and directives, which are applicable for all who provide, use, or have access to NASA information.

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Chapter 7. Requirements for Commercial Launch Mishap and Close Call Investigations

7.1 Introduction

This chapter provides specific requirements on mishaps and close calls that occur during commercial International Space Station resupply programs or commercial crew programs where NASA obtains support under a Space Act Agreement (SAA) or Cooperative Research and Development Agreements (Appendix J, reference J.3). Emphasis in this chapter is given to MPCPs that support such SAA per memorandums of agreement (MOA) where the various parties to the agreements define responsivities including responsibilities for notifying, investigating, and reporting on mishaps and close calls.

7.2 Applicable NASA Policy Directives (NPDs) and NASA Advisory Implementing Instructions (NAIIs) That Address Commercial Launch

7.2.1 NPD 1050.1, Authority to Enter into Space Act Agreement.

7.2.2 NAII 1050.1, Space Act Agreement Guide.

7.2.3 NAII 1050.2, Authority to Enter into Cooperative Research and Development Agreements.

7.2.4 NAII 1050.3, NASA Partnerships Guide.

7.2.5 Mishap Preparedness and Contingency Plan (MPCP) for International Space Station (ISS) SSP 50190, Commercial Resupply Services (CRS) SSP 50190 Annex A and Commercial Crew Program (CCP) CCT-PLN-1010.

7.3 What to Expect When Supporting a Commercial Program/Project Mishap or Close Call

7.3.1 Per the reference provided in 7.2.1, support for all parties supporting an SAA mishap or close call will depend greatly on which party, defined by the MOA, has operational control of the operation. This determination of operational control should be made with support of NASA legal counsel and documented in the Project/Program MOA.

7.3.2 NASA Program/Project Managers entering into an SAA with commercial partners shall define all phases of the project (e.g., ground transport, pre-launch, launch, orbit, cruise, de-orbit, recovery, and so on).

7.3.3 For any phase of a commercial Program/Project that NASA legal advises as a NASA operational responsibility, the CD or Program/Project Manager shall accomplish the mishap investigation in accordance with this NPR.

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7.3.4 The level of NASA involvement on an SAA mishap or close call investigation will vary but should always be documented in the Program/Project SAA MOA. NASA may stand up an independent review team. As per the reference provided in 7.2.2, it is recommended to use the "Standard Clause" in NAII 1050.1 in the section for "Investigations of Close Calls, Mishaps, and Mission Failures (Sample Clause)."

7.3.5 For NASA to protect its own personnel and resources, the following standard clause should be added into all SAA and Statement of Work (SOW) documents:

> *"NASA may investigate any NASA mishaps or close calls that involve NASA personnel, equipment, or property that occur in the performance of this contract. The contractor or partner shall provide personnel support and data, as necessary, to support a NASA investigation."*

7.4 MPCP Guidance

7.4.1 MPCPs for commercial launch should address coordination and cooperation actions to be taken by all parties to the SAA in an MOA. Such actions should include:

a. Responsibility for mishap or close call notification for various phases and locations of the Program/Project based on NASA legal determination of operational responsibility.

b. IRT personnel and responsivity.

c. IA and investigation support selection.

7.5 Background and Purpose

Commonality of launch vehicles, launch vehicle systems, components, and launch range safety systems exists for launches conducted under launch licenses issued by the Federal Aviation Administration (FAA) and launches conducted by and for both the United States Air Force (USAF) and the National Aeronautics and Space Administration (NASA). The FAA, USAF, and NASA, therefore, require timely knowledge of the facts and circumstances of space launch accidents. In accordance with the Quad Agency Working Group Charter between the NTSB and the FAA Associate Administrator for Commercial Space Transportation (AST), the NTSB may lead investigations of certain commercial space launch accidents. This Quad Agency Working Group Charter and the NTSB-AST agreement establish the relationship between the NTSB, USAF, NASA, and FAA (the parties) during space launch accidents and guide the parties' exchange of accident information and participation in an accident investigation.

7.6 Investigations

7.6.1 The parties agree that either the FAA Office of Commercial Space Transportation or NTSB will lead investigations of FAA-licensed commercial space launch accidents, pursuant to terms of the NTSB-AST agreement, and that the USAF will lead investigations of accidents involving USAF certified launches, and NASA will lead investigations of accidents involving NASA-certified launches through the Launch Services Program.

7.6.2 In the event the NTSB leads an investigation of a commercial space accident in accordance

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with the NTSB-AST agreement, the NTSB will permit upon request of the USAF and/or NASA, appropriate USAF and/or NASA personnel to participate as "Official Observers" to the NTSB investigation. USAF and/or NASA may also be offered "Party Status" to a NTSB investigation, in accordance with the provisions of Investigation Procedures, 49 CFR pt. 831 in appropriate circumstances.

7.6.3 Personnel observing or participating in an investigation will be under the control and direction of the lead agency's chief investigator (e.g., NTSB "Investigator-In-Charge," FAA "Investigator-In-Charge," or USAF "Safety Investigation Board President," or NASA "Mishap Investigation Board Chair"). All such personnel will follow the lead agency's rules regarding the handling or release of information or other evidence collected during an investigation.

7.7 Confidential Nature of NTSB Accident Investigations

The USAF or Center or Program/Project personnel shall treat all NTSB investigation data, information, documents or other material obtained in the course of an accident investigation, led by the NTSB, as confidential (not in the classified sense, but rather, in the sense that it is subject to claim of governmental and/or other privilege) and not disclosed in any manner without the written consent of the NTSB Investigator-in-Charge. This restriction also applies to all accident investigation work performed by the USAF and/or NASA personnel in support of an investigation led by the NTSB, and any such information or documents will be considered the confidential work product of the NTSB. In addition, any FOIA request, subpoena, or other request for such information that is directed to the USAF or NASA will be referred to the NTSB for resolution.

7.8 Confidential Nature of USAF Safety Investigations

In a USAF led investigation of space launch accidents or mishaps, the NTSB (if they participate), NASA, and the FAA agree to use their own rules similar to the rules in DoD and USAF instructions on safeguarding safety information protected by the military safety privilege; DoDI 6055.7, Accident Investigation, Reporting, and Record Keeping and AFI 91-204, Safety Investigation and Reports. Information collected by or for a USAF safety investigation may only be released to the NTSB, NASA or FAA during the investigation by the safety board president with the consent of the convening authority chief of safety. If USAF safety investigators discover a critical safety concern applicable to commercial launches, that information will be provided to the FAA, NTSB and NASA in accordance with AFI 91-204. Any FOIA request, subpoena, or other request for safety information protected by the military safety privilege that is directed to FAA, NASA or NTSB personnel will be referred to the USAF for resolution.

7.9 Confidential Nature of NASA Safety Investigations

In a NASA led investigation of space launch mishaps, the NTSB (if they participate), USAF and the FAA agree to abide by the rules in this NPR. Information collected by or for a NASA Safety investigation may only be released to the NTSB, USAF or FAA during the investigation by the Mishap Investigation Board (MIB) Chair, with the consent of the Chief, SMA. If NASA safety investigators discover a critical safety concern applicable to commercial launches, that information will be provided to the FAA, NTSB and USAF in accordance with this NPR. Any FOIA request, subpoena, or other request for safety information protected by NASA safety privilege that is directed

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to the FAA, NTSB or USAF personnel will be referred to NASA for resolution.

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Chapter 8. NASA Aircraft Mishap and Close Call Investigations

8.1 Readiness to Conduct Investigations

8.1.1 Centers shall describe, in MPCPs, the NASA response to incidents for all flights within the local flying area and cross county flights that occur for three or fewer days' absence from the home Center, for NASA aircraft owned by NASA Centers, in addition to the elements listed in section 1.3.1.

Note: Project MPCPs for aircraft operations need not address flight operations of three days or fewer for cross-country flights or short campaigns.

8.1.2 In addition to the Mishap Preparedness Contingency Plan (MPCP) elements specified in paragraph 1.3.1, Centers and Project Managers conducting aircraft operations shall include the following additional elements in MPCPs:

a. Designate the position responsible to receive and act upon Emergency Locator Transmitter (ELT) transmissions received by FAA or other Air Traffic Control agencies.

Note: Ensure ELTs are registered appropriately with a 24-hour contact number that has authority to initiate a NASA mishap response. Ensure the 24-hour ELT point of contact has an up-to-date emergency response checklist that also notifies the Center safety office and flight operations personnel.

b. Specify the organization responsible for IRT and MIB resourcing (staffing and logistics) in the event of an incident involving a NASA aircraft loaned to another Center or a NASA pilot flying as a guest from another Center.

c. Specify next-of-kin contact procedures and supporting resources.

d. Specify drug and alcohol testing procedures for civil service and contract aircrew and maintenance personnel both at the assigned Center and off-site during mission campaigns.

e. Require inclusion of a table that lists for each Center aircraft all hazards, locations, and emergency procedures that emergency response personnel are aware of (including mission-specific hazards).

f. Specific NASA Aircraft Management Information System (NAMIS) data capture procedures in the event of a mishap or close call including during global flight operations (to include contacting JSC NAMIS Administrator to lock down NAMIS data entry for the incident aircraft).

8.2 Mishap Response, Notification, and Classification

8.2.1 Center and Program/Project employees shall immediately, and by the most expeditious means available, report an aircraft mishap or close call, including an NTSB-defined accident (defined in Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and

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Preservation of Aircraft Wreckage, Mail, Cargo, and Records, 49 CFR pt. 830), to the cognizant Safety Office and the Center Chief of Flight Operations and Center Chief Medical Officer/Medical Director and provide the information required under 49 CFR pt. 830.

8.2.2 Center and Program/Project employees shall report unexpected aircraft departure from controlled flight for all aircraft except when departure from controlled flight has been pre-briefed (e.g., upset recovery training, high angle of attack (AOA) envelope testing, aerobatics, or Out of Controlled Flight (OCF) for training) or mitigated through the flight test process inherent at each Center.

8.2.3 The Center's Chief of Flight Operations or his or her designee shall immediately notify the NTSB (per 49 CFR pt. 830) of the NTSB-defined accident that could also be categorized as a NASA A or B mishap, and then advise OSMA Mishap Investigation Program Executive and the Aircraft Management Division (AMD) that NTSB has been informed.

Note: NTSB notification definitions are found in 49 CFR pt. 830.

8.2.4 The Center or Program/Project cognizant Safety Office shall enter all information for aircraft mishaps and close calls listed in 49 CFR pt. 830, with the exception of the aircrew members' names, into NMIS.

8.2.5 The Center or Program/Project Manager shall report the following events in NMIS as a "Non-NPR 8621 event":

a. UAS events, where the UAS damage cost is below $20,000, to document the potential hazards of UAS operations. This includes any engineering analysis, findings, and corrective actions from the event.

b. Non-damaging bird or wildlife strikes. Damage to aircraft or hazardous conditions encountered in flight as a result of weather conditions, as well as a bird or animal strike will be treated as a mishap or close call. All bird strikes, regardless of damage, also have to be reported to the FAA or DoD for inclusion in the national bird strike database.

8.2.6 Within ten days of an aircraft mishap or close call that meets the reporting requirements in 49 CFR pt. 830, the Center Chief of Flight Operations shall submit an NTSB Form 6120, Pilot/Operator Aircraft Accident/Incident Report, to the NTSB regional office closest to the location of the mishap or close call.

8.2.7 Under Commercial Aircraft Service (CAS) operations, the organization having operational control of the aircraft, helicopter, or UAS is the one responsible for making all NTSB notifications as required in 49 CFR pt. 830.

8.3 Investigating Authority and Investigation Support Selection

8.3.1 In the event the NTSB exercises its authority to investigate a NASA aircraft mishap, NASA may conduct a separate investigation, if determined necessary by OSMA.

Note: A program-independent flight operations office manages aircraft operations; therefore, the CD serves as the AO for mishaps and close calls involving aircraft managed by the Center.

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8.3.2 The Center or Program/Project AO shall obtain concurrence from AMD, OSMA, OCE, and CHMO for IA selection for Type A, Type B, and high-visibility mishaps and involving aircraft.

8.3.3 For Types A and B and agency high-visibility mishaps and close calls involving aircraft, the AO consults with the Director, AMD, OSMA, and CHMO to appoint an aircraft operations voting member (a NASA civil servant qualified as Pilot in Command in any NASA aircraft per reference NPR 7900.3, NASA Aircraft Operations Management) and an aircraft maintenance voting member (a NASA civil servant qualified as a NASA Maintenance or Quality Assurance Officer per reference J.13) and a NASA civil servant flight surgeon or other Federal medical professional.

Note: AOs should consider assigning advisors qualified per reference 1 as an airworthiness engineer, aircraft life support systems (ALSS) expert, and human factors subject matter expert beyond a Human Factors Investigation qualification.

8.4 Mishap Investigation Process

See Chapter 4 for the mishap investigation process.

8.5 Mishap Investigation Report

For aircraft mishap investigations delegated to NASA by the NTSB, OSMA shall submit the approved NASA mishap investigation report to the NTSB, ensuring it meets the NTSB's required information. The NTSB may reformat and streamline the investigation report as necessary to meet its requirements without changing the report's causal and contributing factors, recommendations, and findings.

8.6 Post-Investigation Activities

See Chapter 6 for the post-investigation process.

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Chapter 9. Guidance for NASA Spacecraft Mishap and Close Call Investigations (Reserved)

Reserved

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Appendix A. Terms and Definitions

Advisor. For a mishap investigation, an advisor is a Federal employee appointed to or engaged by the investigating authority in a non-voting role for domain knowledge and advice.

Aircraft Flight Mishap.

a. A mishap occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers a fatality or serious injury, or in which the aircraft receives substantial damage.

b. A mishap occurrence associated with the operation of public or civil unmanned aircraft system that takes place between the time the system is activated with the purpose of flight and the time the system is deactivated at the conclusion of its mission, and in which any person suffers a fatality or serious injury, or in which the aircraft receives substantial damage.

Aircraft Ground Mishap. A mishap involving an aircraft or unmanned aircraft system that does not meet the threshold of an Aircraft Flight Mishap, and in which any person suffers a fatality or serious injury, or in which the aircraft receives substantial damage.

Agency-Level Directive. A NASA directive with Agency-wide applicability; that is, NASA Policy Directives (NPDs), NASA Procedural Requirements (NPRs), and NASA Interim Directives (NIDs).

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

Approved Mishap Investigation Report. The final mishap investigation report authorized for public release.

Barrier. A physical device intervention (e.g., a guardrail) or an administrative intervention that can provide procedural separation in time and space (e.g., lock-out/tag-out procedure) used to reduce risk of the undesired outcome.

Cause. An event or condition resulting in an effect. Anything that shapes or influences the outcome. A cause must precede and be necessary and sufficient on its own to bring about the undesired outcome of a mishap.

Center High Visibility. An event where the Center chooses to apply NASA High Visibility severity criteria (Type A or Type B mishap potential) for a locally assigned Type C, Type D, or close call investigation, using greater scope and depth than typically conducted according to the Center MPCP. Out brief and endorsements may be conducted entirely at the Center level.

Center Safety Office. The Center safety organization responsible for reporting and recording mishaps.

Chairperson. The individual in charge of a mishap investigation board or mishap investigation team.

Close Call. An event requiring first aid treatment or less, or property damage/mission failure direct cost of less than $20,000, but has NASA mishap potential considering and documenting either most

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likely or worst case estimates by the responsible organization.

Cognizant Safety Office. The responsible Safety Office within the host Center Safety and Mission Assurance Directorate that hosts the project or has been assigned safety and mission assurance accountability for the program.

Condition. A single as-found state.

Consultant. For a NASA mishap investigation, a consultant is a non-Government subject matter expert engaged by the investigating authority for domain knowledge and analysis or opinion.

Contingency. For planning, an emergency or urgent need that is regarded as unlikely but requiring some extent of pre-determined action if it occurred.

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

Control. An active mechanism used to detect the initiating event or the hazard or both, and enable an active device (hardware, software, environmental, or human) to prevent or reduce the likelihood of the hazard affecting a target. Controls minimize effects of the initiating event by detecting and correcting them before bringing about an undesired outcome.

Corrective Action. Any change that results in preventing, minimizing, or limiting the potential for occurrence of an incident (e.g., design processes, work instructions, workmanship practices, training, inspections, tests, procedures, specifications, drawings, tools, equipment, facilities, resources, material, and so on).

Corrective Action Plan Closure Statement. A final statement made by the appointing official documenting all corrective actions have been completed and the Corrective Action Plan is closed.

Damage. Either material or mission objective loss that is calculable as a Direct Cost (see Direct Cost of Mishap or Close Call).

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

Endorsing Official. An official who reviews the signed mishap investigation report and provides a signed written endorsement, comments, and when not the appointing official, a recommendation for the report approval or rejection by the appointing official.

Event. A real-time occurrence describing one discrete action, typically an error, failure, or malfunction (e.g., pipe broke, power lost, lightning struck, and person opened valve).

Event and Causal Factor Tree. A graphic representation of the mishap or close call that shows the event (accident) at the top of the tree; depicts the logical sequence of events; illustrates all causal factors (including conditions and failed barriers) necessary and sufficient for the mishap or close call occurrence; and depicts the root causes at the bottom of the tree.

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Evidence. Everything used to support or refute a hypothesis or finding. For a safety investigation, the types of evidence are physical (e.g., hardware), demonstrable (24 hours in one day), witness interview, and documentary (witness statement, logbooks, and electronic data).

Ex Officio. An individual tasked to ensure the investigation conducted conforms to NASA policy and this NPR.

Executive Summary. A top-level summary, which is part of the mishap investigation report, describing the circumstances of a mishap including who, what, when, where, and why, and a description of the proximate and root causes. The executive summary should be worded where possible to meet NASA's Office of Communications criteria for public release.

Fault Tree Analysis. An analytical technique whereby an undesired system state is specified, and the system is then analyzed in the context of its environment and operation to find all credible ways in which the undesired event can occur.

Federal employee. (Per 5 U.S.C. pt. 2101)

a. Civil service consists of all appointive positions in the executive, judicial, and legislative branches of the Government of the United States, except positions in the uniformed services.

b. Armed forces means the Army, Navy, Air Force, Marine Corps, and Coast Guard.

c. Uniformed services means the armed forces, the commissioned corps of the Public Health Service, and the commissioned corps of the National Oceanic and Atmospheric Administration.

Finding. A conclusion, positive or negative, based on facts established by the investigating authority during the investigation (i.e., cause, contributing factor, and observation).

First Aid. Refer to OSHA definition in 29 CFR pt. 1904.

Final Mishap Investigation Report. The signed mishap investigation report with endorsements and comments attached.

Flight Hardware. Any hardware that is flown on or part of an aircraft, experimental flight vehicle, satellite, lighter than air vehicles, unoccupied aerial vehicle, or space transportation system.

Flight Software. Any software that is flown on or part of an aircraft, experimental flight vehicle, satellite, lighter than air vehicles, unoccupied aerial vehicle, or space transportation system.

Hazard. A state or a set of conditions, internal or external to a system, having the potential to cause harm.

High-Visibility Mishap or Close Call. A mishap or close call, regardless of the amount of property damage or personnel injury, that the Administrator; Chief, Safety and Mission Assurance, Office of Safety and Mission Assurance; Center Director, Associate Administrator, Mission Support Directorate (AA, MSD); Aircraft Management Division Director; or Center Safety and Mission Assurance Director judges to possess a high degree of safety risk, programmatic impact or public, media, or political interest including, but not limited to, mishaps and close calls affecting flight hardware or software, or completion of critical mission milestones.

Hull Loss. An aircraft damaged to the extent that repair is not economically feasible. This includes destroyed and missing aircraft (exception: unmanned aircraft).

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Human Error. Either an action that is not intended or desired by the human or a failure on the part of the human to perform a prescribed action within specified limits of accuracy, sequence, or time that fails to produce the expected result and has led or has the potential to lead to an unwanted consequence.

Human Factors.

a. A body of scientific facts about human characteristics, capabilities, and behavior. The term 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.

b. A body of information about human abilities, human limitations, and other human characteristics from a physical and psychological perspective relevant to the design, operations, and maintenance of complex systems.

Human Factors Analysis. The study of how people interact with their environment. Physiological, psychological, and organizational behaviors are evaluated. Human factors analysis is an important component of mishap investigation. Determining why, how, and where human behaviors contributed to mishaps and close calls is key to preventing future mishaps.

Human Factors Investigator. An investigator with expertise in human factors engineering and mishap causation who has primary responsibility to assist in data collection and analysis; determine the manner in which human factors caused or contributed to the mishap or close call; evaluate relevant human error and determine its root causes; and generate recommendations to eliminate or reduce error occurrence or minimize the error's negative effects to prevent the occurrence of a similar mishap.

Incident. An occurrence of a mishap or close call.

Incident Commander. The person responsible for directing or controlling resources by means of explicit legal, Agency, or delegated authority. The incident commander is responsible for all aspects of incident response including developing objectives, managing operations, setting priorities, and defining the Incident Command System organization for the particular response.

Initiating Event. An active energy transfer event from a hazard with the potential to affect a valued target and lead to an undesired outcome.

Interim Response Team. A team called to the mishap scene immediately after an incident to secure the scene; document the scene using photography, video, sketches, and debris mapping; identify witnesses; collect written witness statements and contact information; preserve evidence; impound evidence at the scene and other NASA locations as needed; collect debris; implement the chain-of-custody process for the personal effects of the injured and deceased; notify the Public Affairs Office about casualties, damages, and potential hazards to the public and NASA personnel; advise the supervisor if drug testing should be initiated; and provide all information and evidence to the investigating authority. The team is considered interim because it operates as a short-term response team and concludes its mishap response activities when the official NASA-appointed investigating authority takes control.

Intermediate Cause. An event or condition that existed before the proximate cause, directly resulted in its occurrence, and if eliminated or modified, would have prevented the proximate cause from occurring.

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Investigating Authority. The individual mishap investigator, mishap investigation team, or mishap investigation board authorized to conduct an investigation for NASA. This includes the mishap investigation board chairperson, voting members, and ex officio, but does not include the advisors and consultants.

Launch. To place a vehicle and any payload from Earth in a suborbital trajectory, in Earth orbit, or in outer space.

Lessons Learned. The written description of knowledge or understanding gained by experience, whether positive such as a successful test or mission, or negative such as a mishap or failure.

Life-Threatening Injury. An injury involving a substantial risk of death; loss or substantial functional impairment of a bodily member, organ, or mental faculty likely to be permanent; or an obvious disfigurement likely to be permanent.

Lost Time Injury or Illness. A nonfatal traumatic injury resulting in any loss of time from work beyond the day or shift it occurred; or a nonfatal, non-traumatic illness or disease-causing disability at any time.

Mishap Investigation Board. A NASA-sponsored board tasked to investigate the mishap or close call and to generate the mishap investigation report in accordance with the requirements specified in this NPR.

Mishap Investigation Report. The mishap investigation report documents the facts associated with an incident as determined by the investigating authority. In the report, the investigating authority identifies primary, or root, causes, and contributing and possible causes and recommends corrective actions to prevent the occurrence of similar mishaps.

Mishap Investigation/Mishap Support Specialist. A NASA Safety Center Federal employee trained and experienced in all facets of NASA mishap investigation. Specialists assist and advise Centers, programs, projects, and investigating authorities on behalf of the Office of Safety and Mission Assurance Mishap Investigation Program Executive on implementation of policy and best-practice techniques to conduct and endorse NASA mishap and close call investigations.

Mishap Investigation Team. A NASA-sponsored team tasked to investigate a mishap or close call and generate the mishap investigation report in accordance with the requirements specified in this NPR.

Mishap Investigator. A Federal employee who serves as sole investigator for a mishap or close call and generates the mishap investigation report in accordance with the requirements specified in this NPR.

Mishap Preparedness and Contingency Plans. Pre-approved documents outlining timely organizational activities and responsibilities that must be accomplished in response to emergency, catastrophic, or potential (but not likely) events encompassing injuries, loss of life, property damage, or mission failure.

Mishap Summary. A formatted presentation prepared by the NASA Safety Center as a public-releasable document to capture the event sequence, findings, and recommendations contained in a NASA Type A, Type B, or high-visibility mishap or close call investigation report.

Mission Failure. A mishap of whatever intrinsic severity prevents the achievement of the mission's minimum success criteria or minimum mission objectives as described in the mission operations

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report or equivalent document.

Note: A mission failure applies only to a NASA program's mission, and not to a test or ongoing institutional operation. A program that accomplishes all minimum success criteria, but not full mission objectives, is not a mission failure, although in some cases, it may appropriately be classified and investigated as a close call.

NASA Aircraft. Aircraft that are bought, borrowed, chartered, rented, or otherwise procured or acquired—including aircraft produced with the aid of NASA funding—regardless of cost, from any source for the purpose of conducting NASA science, research, or other missions, and which are NASA-operated or NASA-managed. Unmanned aircraft are defined as "aircraft" by the Federal Aviation Administration and are included in the definition of NASA aircraft unless specified otherwise.

NASA Contractor or Grantee Mishap or Close Call. A mishap or close call requiring a NASA contractor or grantee to report or investigate it according to provisions in the contactor or grantee's contract.

NASA Employees. Federal civil servants employed and paid by NASA, or on detail from other Federal agencies, and NASA Support Service Contractors.

NASA Mishap. A NASA mishap is an unplanned event resulting in at least one of the following:

a. Occupational injury or occupational illness to non-NASA personnel caused by NASA operations.

b. Occupational injury or occupational illness to NASA personnel caused by NASA operations.

c. Destruction of or damage to NASA property, public or private property, including foreign property, caused by NASA operations or NASA-funded research and development projects.

d. NASA mission failure before the scheduled completion of the planned primary mission.

NASA Mishap Information System. A custom-developed system for capturing mishaps, close calls, and hazards, as required in this NPR.

NASA Operation. An activity or process under direct NASA physical, administrative, or contractual control or where significant NASA resources are dedicated to accomplishing an objective common to NASA and other independent organizations. This does not include non-NASA contracted or funded activities conducted at a common location or environment with NASA resources.

Serious Injury. Per the NTSB, any injury resulting from an aircraft mishap in which one or more of the following apply:

a. Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received.

b. Results in a fracture of any bone except for simple fractures of fingers, toes, or nose.

c. Causes severe hemorrhages or nerve, muscle, or tendon damage.

d. Involves any internal organ.

e. Involves second- or third-degree burns or any burns affecting more than five percent of the body surface.

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Observation. A factor, event, or circumstance identified during an investigation that did not contribute to the mishap or close call, but if left uncorrected, has the potential to cause a mishap or increase the severity of a mishap; or a positive factor, event, or circumstance that should be noted.

Occupational Injury or Illness. Work-related per 29 CFR pt. 1904.

Occupational Safety and Health Administration Final Mishap Summary. A report (OSHA 301 Form: Injury and Illness Incident Report, or an equivalent form) provided in accordance with 29 CFR pt. 1960 by NASA to the Office of Federal Agency Programs for each mishap involving an OSHA-recordable incident.

Organizational Factor. Any operational or management structural entity that exerts control over the system at any stage in its life cycle including, but not limited to, the system's concept development, design, fabrication, test, maintenance, operation, and disposal—for example, resource management (budget, staff, training); policy (content, implementation, verification); and management decisions.

Permanent Total Disability. A nonfatal injury or occupational illness that, in the opinion of competent medical authority, permanently and totally incapacitates a person to the degree where he or she cannot follow any gainful occupation and results in a medical discharge or civilian equivalent.

Permanent Partial Disability. An injury or occupational illness that does not result in a fatality or permanent total disability, but in the opinion of competent medical authority, results in permanent impairment through loss of use of any body part with the following exceptions: loss of teeth, fingernails, or toenails; loss of tip of fingers or toes without bone involvement; inguinal hernia (if it is repaired); disfigurements; or sprains or strains that do not cause permanent limitation of motion.

Privilege. A level of confidentiality that a NASA (Federal employee) investigating authority or interim response team member may grant to a witness to an incident. Confidentiality means a witness is assured verbally and in writing that information provided during interviews or in a written statement will be protected by NASA to the extent provided by law.

Procedure. A documented description of the sequential actions in performing a given task.

Process. A set of activities used to convert inputs into desired outputs to generate expected outcomes and satisfy a purpose.

Property Damage. Damage to any type of Government or civilian property including, but not limited to, flight hardware and software, facilities, ground support equipment, and test equipment.

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

Range. A permanent or temporary area or volume of land, sea, or airspace within or over which orbital, suborbital, or atmospheric vehicles are tested or flown. This includes the operation of launch vehicles from a launch site to orbital insertion or final landing or impact of suborbital vehicle components. This also includes the entry of space vehicles from the point that the commit to deorbit is initiated to the point of intact vehicle impact or landing or the impact of all associated debris. This includes range operations with aeronautical vehicles from takeoff to landing.

Recommendation. An action developed by the investigating authority to correct the cause or a

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finding identified during the investigation.

Responsible Organization. The organization responsible for the activity, people, operation, or program, where a mishap occurs, or the lowest level of organization where corrective action will be implemented.

Risk. In the context of mission execution, risk is operationally defined as a set of triplets:

a. The scenarios leading to degraded performance with respect to one or more performance measures (e.g., scenarios leading to [1] injury, fatality, destruction of key assets; [2] exceedance of mass limits; [3] cost overruns; or [4] schedule slippage).

b. The likelihoods (qualitative or quantitative) of those scenarios.

c. The consequences (qualitative or quantitative severity of performance degradation) that would result if those scenarios were to occur.

Note: Uncertainties are included in the evaluation of likelihoods and consequences.

Root Cause. An event or condition, primarily associated with organizational factors, which existed before the intermediate cause and directly resulted in its occurrence (indirectly caused or contributed to the proximate cause and subsequent undesired outcome) and, if eliminated or modified, would have prevented the intermediate cause from occurring and the undesired outcome. Typically, multiple causes contribute to an undesired outcome. In the absence of a prevalent organizational factor, the root cause may be identified as undetermined.

Root Cause Analysis. A structured evaluation method used to identify the root causes of an undesired outcome and the actions adequate to prevent occurrence. Root cause analysis should continue until organizational factors have been identified or until data are exhausted.

Serious Workplace Hazard. A condition, practice, method, operation, or process having substantial probability of death or serious physical harm.

Spacecraft. A habitable vehicle or device including, but not limited to, orbiters, capsules, modules, landers, transfer vehicles, rovers, Extravehicular activity suits, and habitats, designed for travel or operation outside Earth's atmosphere.

Substantial Damage. Damage or failure adversely affecting structural strength, performance, or flight characteristics of an aircraft, which would normally require major repair or component replacement. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered substantial damage (49 CFR pt. 830).

Test. A procedure for critical evaluation; a means of determining the presence, quality, or truth of something; a trial. In engineering, a method of determining performance by exercising or operating a system or item using instrumentation or special test equipment that is not an integral part of the item being tested.

Timeline. Events and conditions preceding and following a mishap supported by facts and arranged in chronological order.

Type A Mishap. A mishap resulting in one or more of the following:

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a. Occupational injury or illness resulting in a fatality or a permanent total disability.

b. Total direct cost of mission failure and property damage of $2,000,000 or more.

c. Crewed aircraft hull loss.

d. Unexpected aircraft departure from controlled flight for all aircraft except when departure from controlled flight has been pre-briefed (e.g., upset recovery training, high AOA envelope testing, aerobatics, or Out of Controlled Flight for training) or mitigated through the flight test process inherent at each Center.

Type B Mishap. A mishap causing an occupational injury or illness resulting in permanent partial disability; hospitalization for inpatient care of three or more people within 30 workdays of the mishap; or a total direct cost of mission failure and property damage of at least $500,000, but less than $2,000,000.

Note: Hospitalization does not include any hospital stay intended only for medical testing, diagnosis, or observation to determine nature or extent of injury or illness.

Type C Mishap. A mishap resulting in a nonfatal OSHA-recordable occupational injury or illness causing days away from work, restricted duty, or transfer to another job beyond the day or shift on which the mishap occurred; 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 $50,000 but less than $500,000.

Type D Mishap. A mishap resulting in a nonfatal OSHA-recordable occupational injury 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 $20,000, but less than $50,000.

Unmanned Aircraft System. An unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.

Undesired Outcome. An event or result that is unwanted and different from the desired and expected outcome. For mishap investigation, an undesired outcome should describe the loss that determined the mishap classification (i.e., property damage, mission failure, fatality, permanent disability, lost-time case, or first-aid case).

Witness. A person who has information, evidence, or proof about a mishap and provides his or her knowledge of the facts to the investigating authority.

Witness Statement. A verbal or written statement from a witness of his or her account including a description of the sequence of events, facts, conditions, and causes of the mishap.

Worst Case Estimate. For a reportable incident involving system or a process, a worst-case estimate is the responsible organization's forecast of most severe possible work-related injury, illness, damage to NASA or public property, or loss of critical mission objectives.

Note: Likelihood of a worst-case outcome may be small, but if the loss potential is unacceptable (Type A or B outcome if not for intervention of one single barrier or control), then investigation scope and depth may need to match such potential loss."

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Appendix B. Acronyms

AA	Associate Administrator
AA, MSD	Associate Administrator, Mission Support Directorate
AA/OCOM	Associate Administrator, Office of Communications
AA/OIIR	Associate Administrator, Office of International and Interagency Relations
AMD	Aircraft Management Division
AO	Appointing Official
AOA	Angle of Attack
CAP	Corrective Action Plan
CD	Center Director
CCP	Commercial Crew Program
Chief, SMA	Chief, Safety and Mission Assurance
CHMO	Chief Health and Medical Officer
DoD	Department of Defense
EAR	Export Administration Regulations
ELT	Emergency Locator Transmitter
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation
FEMA	Federal Emergency Management Agency
FISMA	Federal Information Security Management Act
FOIA	Freedom of Information Act
HFACS	Human Factors Analysis and Classification System HIPAA Health Insurance Portability and Accountability Act
HQ	NASA Headquarters
IA	Investigating Authority
IRB	Institutional Review Board
IRT	Interim Response Team
ITAR	International Traffic in Arms Regulations
LLIS	Lessons Learned Information System
LSP	Launch Services Program

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MDAA	Mission Directorate Associate Administrator
MI	Mishap Investigator
MIB	Mishap Investigation Board
MIT	Mishap Investigation Team
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPCP	Mishap Preparedness and Contingency Plan
NAMIS	NASA Aircraft Management Information System
NASA	National Aeronautics and Space Administration
NDA	Nondisclosure Agreement
NFS	NASA FAR Supplement
NMIS	NASA Mishap Information System
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NRRS	NASA Record Retention Schedules
NSC	NASA Safety Center
NTSB	National Transportation Safety Board
OCE	Office of the Chief Engineer
OCF	Out of Controlled Flight
OCHMO	Office of the Chief Health and Medical Officer
OCOM	Headquarters Office of Communications
OIG	Office of Inspector General
OIIR	Office of International and Interagency Relations
OPS	Office of Protective Services
OSHA	Occupational Safety and Health Administration
OSI/AMD	Office of Strategic Infrastructure, Aircraft Management Division
OSMA	Office of Safety and Mission Assurance
PAO	Public Affairs Office
SAA	Space Act Agreement
SATERN	System for Administration, Training, and Educational Resources for NASA
SBU	Sensitive But Unclassified
SMA	Safety and Mission Assurance

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sUAS	Small Unmanned Aircraft System
USAF	United States Air Force
UAS	Unmanned Aircraft System

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Appendix C. Test-Induced Damages

C.1 NASA conducts tests to better understand and mitigate complex design, manufacturing, or operational issues. The objective of testing is to provide NASA with confidence that the system meets its technical and programmatic requirements and can successfully and safely perform its mission in the operational environment. Some tests are designed and intended to result in hardware damage (e.g., a structural test-to-failure). Other tests are aggressive in nature, and test-incurred damage often occurs; the knowledge gained is used to improve designs. These instances of test damage would be reportable NASA mishaps if the failure or damage was associated with procedural errors or with a non-compliance to design or construction requirements, or if test-incurred damage caused harm to personnel or to uninvolved equipment, facilities, or property.

C.2 For the purposes of mishap determination, development tests are not missions nor are development test objectives mission objectives, nor commercial off-the-shelf acceptance tests conducted by contractor on equipment not accepted by the government, unless specifically defined as such in the program, project, or mission pre-mishap plan.

C.3 Where public, Government, or private property is located within a military test range, and the risk to such property is formally approved and accepted by the range authority as part of the test approval process, NASA may support and accept the mishap classification, reporting, and investigation completed by the outside authority (the Federal agency authorized to investigate the military range) as described in section 3.1.7.

C.4 The signed document describing the risk of potential test-induced damage outcomes includes the test team's best understanding of the uncertainties in environments, test limits, or system performance.

C.5 Examples of test-induced damage incidents that may be accepted prior to testing in a test plan or related document include the following:

a. Structural damage resulting from planned structural tests-to-yield when performance between yield and ultimate failure is uncertain.

b. Unplanned but acceptable limited erosion of a flame trench during launch or engine firing.

c. Thermal damage to brakes and tires during a maximum braking test.

d. Thermal, blast, or erosion damage to cables and other normally exposed equipment on a launch pad or in an explosive chamber.

e. Excessive splashdown structural damage to a recoverable booster when new parachute performance is uncertain.

f. Loss of test hardware as a result of known, accepted deficiencies in the test or test support system (e.g., planned use of off-the-shelf, low-reliability sounding rockets for low-cost suborbital tests).

g. Crash damage to an small Unmanned Aircraft System (sUAS) airplane as a result of known and accepted controller handling quality limitations.

h. Damage sustained to unmanned aircraft when used for risk reduction flights to test systems of manned aircraft.

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i. Damage resulting from one or more of the following:

(1) Acknowledged limitations in pre-test analysis or models or uncertainties in analysis, model, or environmental predictions.

(2) Planned test operations in known and approved hazardous environmental conditions. Purposefully testing in an organizational environment where NASA, by formal choice, does not control hazards (i.e., Space Act or international agreements where NASA cedes design, operational risk management, or both to the partner).

C.6 Examples of test-related damage normally not "accepted risks," and, therefore, would be candidates for mishap categorization include these:

a. Damage as a result of human error in test setup or conduct when relevant human performance is not part of the test objectives.

b. Damage as a result of standard test planning or test design not done in accordance with Agency, Center, or Program requirements.

c. Damage to the test article resulting from test facility malfunction during a test.

d. Damage as a result of test facility software malfunction when relevant software performance is not part of the test objectives.

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Appendix D. Mishap Required Training (Available Through SATERN)

Required NASA Mishap Training for at least one board member and ex officio;

D.1 NASA IA Web-Based Training (Web-Based Training)

D.1.1 Overview of Mishap Investigations (SMA-002-07)

D.1.2 Mishap Investigation Roles and Responsibilities (SMA-002-08)

D.1.3 Completing the Investigation and Mishap Report (SMA-002-09)

D.1.4 Root Cause Analysis (SMA-002-14)

D.1.5 Introduction to Human Factors in Mishap and Close Call Investigation (SMA-001-07)

D.1.6 NASA Interim Response Team Training (SMA-002-11)

D.1.7 Mishap Board Chair (SMA-002-13) required for MIB Chair appointment

D.1.8 Human Factors in Mishap Investigation (SMA-002-15)

D.2 NASA IA Classroom Instruction

D.2.1 NASA Root Cause Analysis (SMA-SAFE-OSMA-4003)

D.2.2 Human Factors in Mishap Investigation (SMA-SAFE-OSMA-4004)

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Appendix E. Procedural Sequence for Mishap Notification and Investigation

E.1 Procedural Sequence for Mishap Notification and Investigation

Procedural Sequence for Mishap Notification and Investigation		
Timeframe		
Responsible party	**Action**	**NPR8621.1D**
Immediately		
Employees	If the situation warrants, notify emergency response (911 or designated emergency contact).	2.1.1 a.
Supervisors	Notify cognizant Safety Office of occurrence or suspected occurrence of a mishap or close call.	2.2.1
Employees	Report an aircraft mishap or close call, including a National Transportation Safety Board (NTSB) defined mishap, to the cognizant Safety Office and the Center Chief of Flight Operations.	1.2.1
Cognizant Chief of Flight Operations or Designee	Notify the NTSB of NTSB-defined mishap, and then advise Office of Safety and Mission Assurance (OSMA) Mishap Investigation Program Executive and the Aircraft Management Division (AMD) that NTSB has been informed.	1.2.2
Cognizant Safety Office	Upon notification of a mishap or close call that triggers the initiation of the Mishap Preparedness and Contingency Plan (MPCP), initiate the Center MPCP and support the program/project as the Program/Project MPCP is initiated.	2.1.2 a.
	Deploy the Interim Response Team (IRT) to support the investigation in accordance with the Center or Program/Project MPCP.	2.1.2 b.
Program/Project Manager	Upon notification, initiate Program/Project MPCP.	2.1.3
After Emergency Response Initiated and Within 1 Hour of Mishap		

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Cognizant Safety Office	For Type A or Type B mishap or a high-visibility mishap or close call, notify OSMA by calling 1–216–433–9614, or if no answer, by calling the NASA Headquarters (HQ) After Hours Contact Center at 1–202-358-1414 (and provide required information).	2.2.2 a. and b.
	Report to the CHMO an illness or injury that results in a loss of life, permanent disability, hospitalization, extensive first aid, or lost workdays in accordance with NPR 1800.	2.2.2 d.
Center Director or AA, MSD	Report, by telephone, to the Administrator and CHMO a work-related fatality or serious injury or illness	2.1.7
Associate Administrator/ Office of Communications	Release information to the media and alert Center personnel and the public of any known hazards and their potential effects and provide instructions to mitigate the risk and harm.	2.2.5.2 a.
	With assistance from the cognizant Safety Office, IRT, and Center Director (CD) or AA, MSD, release interim public affairs status reports about the investigation to the media through the Center Public Affairs Office (PAO)	2.2.5.2 b.
Center Director or AA, MSD	In coordination with Center PAO and HQ Office of Communications (OCOM), for resident contractor and grantee employee casualties, release information regarding the occurrence of and facts about injury or illness mishap only for a Type A injury or illness mishap occurring onsite at a Center or at HQ or involves a NASA-managed program administered by that Center.	2.2.5.5
After Emergency Response Initiated		
Cognizant Safety Office	For Type A or Type B mishaps or high-visibility mishaps or close calls, send encrypted electronic communication to OSMA. (See section 2.2.2 b.)	2.2.2 c.
	Report to the Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR 1904.	2.2.2 e.

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	Inform OSMA that an oral report has been provided to OSHA.	2.2.2 f.
As Quickly as Possible (Notifications)		
Official-In-Charge	For NASA mishaps occurring on foreign territory or in international waters, notify Chief, SMA, appropriate Mission Directorate Associate Administrator (MDAA), the CHMO if injury or illness related, and cognizant Safety Office.	2.2.4.1
	When a Type A or Type B mishap occurs outside the United States, in coordination with the Associate Administrator, Office of Communications (AA/OCOM) and the Associate Administrator, Office of International and Interagency Relations (AA/OIIR), release factual, limited details through the U.S. Embassy or Consular Office in the locale of the mishap, in accordance with policies of that office	2.2.4.2
Mission Directorate Associate Administrator	For NASA mishaps occurring on foreign territory or in international waters, notify the Associate Administrator (AA).	2.2.4.3
Associate Administrator	Notify the Administrator, Deputy Administrator, the AA/OCOM, the Office of the General Counsel, and other appropriate staff that an international mishap has occurred.	2.2.4.4
Headquarters Office of Communications	Approve the release of all related information for Type A and Type B mishaps and high-visibility mishaps and close calls prior to release to media or public.	2.2.5.1
Center Public Affairs Office	Before an Investigating Authority (IA) is appointed and in coordination with AA/OCOM, identify and disseminate any preliminary information, video, and imagery related to the mishap that is suitable for public release.	2.2.5.3 a.
	When a fatality or injury (permanent disability) has occurred to a NASA employee involved in a Center work-related activity, coordinate with AA/OCOM and, then, promptly announce the incident to the public.	2.2.5.3 b.

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At Mishap Scene		
Interim Response Team	Preserve potential evidence, document the scene, obtain witness statements, and collect debris.	2.1.5 a.
	Copies of privileged written or transcripts of verbal statements are not to be given to witnesses as privilege and confidentiality cannot be ensured.	2.1.5 b.
	Conduct evidence preservation actions without affecting essential safety operations.	2.1.5 c.
	With support from the cognizant Safety Office, supervisors, Center Chief Medical Officer or Medical Director, and the Center Office of Protective Services (OPS), collect and impound appropriate data, records, equipment, witness statements, and facilities that may be involved in the mishap.	2.1.5 d.
	If the impacted individuals have signs or symptoms consistent with a medical malady that may have been contributory or as a result of the mishap itself, contact the flight surgeon, or medical professional, on-call for appropriate referral, testing, or disposition.	2.2.3 e.
Interim Response Team and Investigating Authority	Coordinate with the Contracting Officer before accessing site, impounding contractor data, and interviewing contractor personnel.	2.1.6
Employees	Complete witness statements at the request of emergency response or IRT personnel.	2.1.1 b.
Cognizant Safety Office	Assist with witness statement collection.	2.1.2 c.
Center Office of Protective Services	Support the incident commander, cognizant Safety Office, and IRT to secure mishap site and impound data, records, equipment, and facilities.	2.1.4
After Scene Is Secured		
	Notify Center PAO about casualties, damages, and any potential hazards to the public.	2.2.3 a.

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Interim Response Team	Support PAO with release of information to the media to alert Center personnel and the public of any known hazards and their potential effects.	2.2.3 b.
At Earliest Opportunity		
Interim Response Team	Advise Federal employee's supervisor if drug testing should be requested according to NPR 3792.1.	2.2.3 c.
	Notify the Contracting Officer or Contracting Officer’s Representative if drug testing for contract personnel is to be implemented according to the contract or applicable agreements.	2.2.3 d.
Center Director or AA, MSD	[All personnel governed by this NPR] Notify NASA Office of Inspector General (OIG) and the Center's Office of the Chief Counsel or the NASA Office of the General Counsel of facts potentially related to criminal activity in connection with a mishap.	2.5.2
	For Centers located on a military installation, release victim names according to procedures previously agreed upon by the installation commander and CD or AA, MSD.	2.2.5.4 c.
Cognizant Public Affairs Office	In cases of Federal fatalities, release victim names after CD or AA, MSD and AA/COM concurrence that next of kin notification has been accomplished with CD or AA, MSD protocols.	2.2.5.4 a.
Within 24 Hours		
Mission Directorate Associate Administrator, CHMO, Center Director, and AA, MSD or Designees	Determine the mishap classification level for all mishaps within their jurisdiction and obtain concurrence on this classification level from the Chief, SMA for Type A and Type B mishaps and high-visibility mishaps and close calls.	2.3.2
Center Director, AA, MSD, and Mission Directorate Associate Administrator	Report by telephone or e-mail to the Administrator and CHMO the instance of a NASA Type A or Type B mishap or high-visibility mishap or close call.	2.4.1

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Cognizant Safety Office	Ensure all NASA mishaps and close calls are initially recorded in the NASA Mishap Information System and are updated throughout the mishap investigation.	2.3.3.1 and Appendix H
	Enter all information for aircraft mishaps and close calls listed in 49 CFR pt. 830, with the exception of the pilot's name, into NMIS.	2.4.3.1.
Occupational Health Representative (or Other Medical Person)	Provide the appropriate medical information regarding the persons injured and the nature of the injuries as a result of a mishap or close call to the cognizant Safety Office for inclusion in the investigation report and NMIS.	2.4.3.2
Responsible Organization	Calculate the direct cost of a mishap or close call with review and concurrence of the cognizant Safety Office.	2.3.3
Responsible Program Manager or Responsible Organization	Calculate the cost of a mission failure in coordination with the cognizant Chief Financial Officer or designee.	2.3.4
Within 48 Hours		
Appointing Official	For Types A and B, and high-visibility mishaps and close calls, provide a provisional list of IA appointees to the OSMA Mishap Investigation Program Executive for concurrence.	3.2.1 a.
Within 7 Workdays		
Appointing Official	Appoint the members of the IA with concurrence from NASA Chief, SMA, the Office of the Chief Engineer (OCE), and the Chief Health and Medical Officer (CHMO).	3.2.1 b., Table B, and sec. 3.5
	Designate the IA chairperson.	3.2.1 c.
	Obtain concurrence from the AMD for Type A and Type B mishaps and high-visibility mishaps and close calls involving aircraft.	3.2.1 d.
	Compose the IA. Ensure requirements are met.	3.2.1 f. and Table C
Investigating Authority	Recommend membership changes to the AO regarding voting members, ex officio, and advisors.	3.2.2 c.
Within 10 Workdays of an Aircraft Mishap		

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Cognizant Chief of Flight Operations	When an aircraft mishap or close call meets reporting requirements in 49 CFR pt. 830, submit an NTSB Form 6120 to the NTSB regional office nearest to the location of the mishap or close call.	2.3.3
During Investigation		
Investigating Authority Chairperson	Manage and coordinate all aspects of the mishap investigation.	3.2.5 a.
	Authorize impoundment of data, records, equipment, and facilities and collection or salvage of data and debris.	3.2.5 b.
	Work with procurement and legal advisors to obtain and impound data for mishaps at contractor or subcontractor sites.	3.2.5 c.
	Release impounded data, records, equipment, facilities, and mishap site when no longer necessary.	3.2.5 d.
	Define the roles and areas of investigative responsibility for each group or subgroup on the IA.	3.2.5 e.
	Coordinate with the IA legal advisor, HQ, or cognizant public affairs advisor, and other advisors throughout the investigation.	3.2.5 f.
	Report only to the AO or designee during the investigation.	3.2.5 g.
	With IA legal advisor assistance, refer allegations and evidence of criminal activity identified in the course of an investigation to the OIG and General/Chief Counsel. Privileged witness statements will be protected to the extent provided by law and all OIG requests for privileged information will be processed through HQ.	3.2.5 h.
	For Type A and Type B mishaps and high-visibility mishaps and close calls, the IA will have a legal advisor and a public affairs advisor	3.3.1

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Investigating Authority	Have access to a NASA Safety Center (NSC) mishap investigation specialist to assist with investigation for Type A and Type B mishaps and high-visibility mishaps and close calls.	3.3.2
	Verify the mishap site is safe and secured. Confirm evidence has been preserved and impounded. Take custody of evidence gathered at the scene.	4.2.1 a. through c.
	Collect and evaluate all available data and records relevant to the mishap.	4.3.1 a.
	Permit only Federal employees to be present at privileged witness interviews. (Exception: the interviewee and contractors hired to support interviews. Contractors will have signed a nondisclosure agreement (NDA).	4.3.1 b.
	Interview witnesses.	4.3.1 c. (1) and (2)
	Inform interviewee if the information gathered during the interview is confidential and privileged.	4.3.1 d.
	When the discussion is kept privileged, read the witness statement to the interviewee.	4.3.2 and Figure 1
	Use a structured analysis technique to determine what happened, when it happened, and why it happened with the goal of preventing incident occurrence.	4.1.1 a. and b.
	Provide a mishap related NASA Advisory at any time during the investigation for a safety finding requiring immediate action and could impact one or more Centers or when NASA-wide implications are present.	4.4.2.1 a.
	Obtain mishap related NASA Advisory approval from the IA legal and public affairs advisors or by local policy.	4.4.2.1 b.
Investigating Advisors (Federal employees)	Attend meetings as needed, travel with the IA as requested, and have access to all investigative material. Only the legal and medical advisors may access privileged witness statements and interview records.	3.3.3 b.

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Investigating Authority Legal Advisor	Develop NDAs for IA contractor administrative support personnel and consultants.	3.3.4 a.
	Develop NDAs when the IA uses a contractor to analyze interview data or participate in interviews.	3.3.4 b.
	Provide legal advice and counsel as requested by the chairperson.	3.3.4 c.
	Attend interviews if the interviewee is accompanied by a lawyer during the interview process.	3.3.4 d.
Investigating Authority Consultants	Have academic and technical experience matching or exceeding the technical and management complexity of systems related to the mishap.	3.4.2
	Contracted or hired to provide technical expertise to the IA; perform analysis; assist in formulating findings.	3.4.3 a. through c.
	Non-Federal employee administrative support: sign an NDA before given access to mishap data or International Traffic Arms Regulations (ITAR), or Export Administration Regulations (EAR) information or proprietary, or privileged information.	3.4.5
Ex Officio	Participate in all investigation deliberations as a non-voting member and participate in all investigation proceedings.	3.2.4 a. and b.
	Ensure the investigation conforms to NASA policy and this NPR and the investigation process is fair, independent, and non-punitive.	3.2.4 c.
	Ensure timely availability to support Type A and Type B mishaps and high-visibility mishaps and close calls.	3.3.2 a.
	Provide consultation, preparation, and reporting assistance to the IA chairperson.	3.3.2 b. (1)
	Identify pertinent Agency-level audit results from other NASA installations and coordinate with associated Center representatives responding to audit findings.	3.3.2 b. (2)

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NASA Safety Center	Researching similar mishap findings and associated recommendations, corrective actions, and lessons learned.	3.3.2 b. (3)
	Provide investigation tools and training.	3.3.2 b. (4)
	Assess the root cause analysis and associated IA recommendations for clarity, verifiability, achievability, and traceability.	3.3.2 b. (5)
	Assist with IA investigation endorsement.	3.3.2 b. (6)
	Maintain the distribution lists for status reports (section 4.6) and mishap related NASA Advisories, and place mishap related NASA Advisories on the NASA Mishap Investigation Web site and the NSC Web site. Mishap related NASA Advisories and status reports will be co-located.	4.4.2.3
NASA Safety Center Director	Distribute mishap related NASA Advisories electronically to Agency Safety and Mission Assurance (SMA) personnel through an approved distribution list.	4.4.2.2
Appointing Official	Assess recommendations according to their effectiveness in reducing likelihood and consequence of causal factor reoccurrence.	4.5.2 a.
	Communicate recommendations outside his or her authority to the responsible NASA organization or external body for implementation of corrective action.	4.5.2 b.
Every 30 Workdays During Investigation		
Investigating Authority	Develop a publicly releasable investigation status report for NASA Type A and Type B mishaps and high-visibility mishaps and close calls, every 30 workdays from the time the appointment letter is signed until the mishap investigation report is signed.	4.6.1 a.
	Distribute the approved status report to the AO, responsible Center or Program Safety Office, NSC mishap support specialist, and Agency SMA personnel through an approved distribution list and attach the report to the case file in NMIS.	4.6.1 b. and c.

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Within Specified Timeframe		
Investigating Authority	Complete a mishap investigation report that contains the specified information.	5.1.1 a. through f. and 5.1.2 a through g. and Table D.
Investigating Authority Chairperson	If additional time is needed to complete the investigation and/or the mishap investigation report, submit a request to the AO including the rationale for the extension.	5.1.1 g.
Ex Officio	As the Chief, SMA authorized representative, sign the completed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls and attest to items (1) through (7).	5.1.3 a. and b. (1) through (7)
	If requirements described in 5.1.3 b. have not been met, describe the mishap investigation report's deficiencies in writing and sign and attach this description to the mishap investigation report in lieu of signing the report.	5.1.3 c.
Investigating Authority Advisors (Federal Employees)	Sign the mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls stating that the report meets NASA policies and procedures in the advisor's functional area.	5.1.4
Cognizant Safety Office	Upload the report to NMIS.	5.1.6 and Appendix H.
Appointing Official	Verify completed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls fulfills the appointment letter's and this NPR's requirements, and release the IA from duty.	5.2
	Schedule an Endorsement Review with appropriate officials to review and endorse the mishap investigation report and deliver a copy of the mishap investigation report a minimum of five workdays prior to conducting the Endorsement Review.	5.3.1 a. and b. and Table E.
At Endorsement Review and Out Brief		

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Investigating Authority Chairperson	Present the mishap investigation report and its associated findings and recommendations at out brief.	5.3.2 a. through d.
Endorsing Officials	Verify the mishap investigation report content is technically correct and complete.	5.3.3 a.
	Concur/nonconcur the mishap investigation report describes causal and contributing factors.	5.3.3 b.
	Concur/nonconcur that the recommendations as practical, feasible, achievable, and in the opinion of the reviewer, will prevent the occurrence of similar mishaps or close calls.	5.3.3 c.
	Concur/nonconcur that proprietary, ITAR, or EAR information; material subject to the Privacy Act; or privileged information has been properly identified and protected.	5.3.3 d.
	Sign the Endorsement Review Record, signifying mishap investigation report concurrence or nonconcurrence and provide comments related to decision.	5.3.4
	Attach the Endorsement Review Record and comments to the mishap investigation report as part of the permanent record.	5.3.5
After Endorsement Review and Out Brief		
Appointing Official	With assistance from the cognizant Safety Office, prepare for release of the Endorsement Review Record.	5.3.6 a. through e.
	Serve as final authority for acceptance or rejection of mishap and close call investigation reports in which he or she holds the AO's position.	5.3.7 a.
	Ensure the mishap investigation process is complete; verify the mishap investigation report is reviewed and endorsed.	5.3.7 b. and c.
	Assess the report recommendations.	5.3.7 d.
	If rejecting the report, provide a written description of deficiencies and direction going forward.	5.3.7 e.

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Cognizant or Mission Directorate Representatives	Notify the designated Freedom of Information Act (FOIA) officer that the mishap investigation report is authorized for release.	5.4.1
Freedom of information Act Officer	When notified by the Center or mission directorate representatives that the mishap investigation report is authorized for public release, send approved mishap investigation report with authorization comments to the AO, OSMA, and the Center Safety Office (dependent on level of investigation).	5.4.1
NASA Safety Center	Complete public release review and distribute the Mishap Summary for prevention awareness and other appropriate action by NASA Centers and field installations.	5.4.2
Mission Directorate Associate Administrator or Cognizant Safety Office	Distribute Mishap Summary to the appropriate NASA programs and organizations.	5.4.3
Associate Administrator, Office of Communications	Determine whether a mishap investigation report, whatever its origin, will be issued from HQ or the Center.	5.4.4
	Distribute the redacted mishap investigation report to the public only through FOIA request.	5.4.5
Office of Strategic Infrastructure	For aircraft mishap investigations delegated to NASA by NTSB, submit the approved NASA mishap investigation report to the NTSB ensuring it meets the NTSB's required information.	5.4.6
Cognizant Safety Office	Ensure the information recorded in NMIS is updated.	5.4.7
After Report Endorsement and at the Earliest Opportunity		
Appointing Official	Direct the responsible organization or program/project to develop a Corrective Action Plan (CAP).	6.1.1
Within 15 Workdays of Tasking CAP to Close Out		
Responsible Organization or Program/Project Manager	Submit the CAP to the AO for approval and then implementation.	6.1.2

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Appointing Official	Review and accept or reject the CAP.	6.3.2 a.
	Return a rejected CAP with comments to the responsible organization or program/project for revision and resubmission.	6.3.2 b.
Responsible Organization	Implement CAP and track performance.	6.4.1 a. and b.
	Update the cognizant Safety Office on the status of corrective action activities at least every 30 workdays until the CAP is closed.	6.5.1 a.
	Submit changes to the CAP after it has been approved to the cognizant Safety Office or Program for review. After this review, send the requested changes to the AO for approval.	6.5.1 b.
Appointing Official	Assess and approve any changes to the CAP.	6.5.2 a.
	Send approved changes to the responsible organization and the cognizant Safety Office.	6.5.2 b.
	Once corrective actions for Type A and Type B mishaps and high-visibility mishaps and close calls are fulfilled, provide a Corrective Action Plan Closure Statement to the Center Safety Office and responsible organization advising the CAP has been closed.	6.5.2 c.
Cognizant Safety Office	Assist the responsible organization, if needed, to enter updates into NMIS as described in the Center MPCP.	6.4.2 a.
	Enter into NMIS the actual direct cost of the mishap or the estimated direct cost, if the actual direct cost is not available.	6.4.2 b.
	Verify corrective actions activities were implemented, completed, and closed.	6.5.3 b.
	Report noncompliance to or notify AO that actions have been implemented, completed, and closed.	6.5.3 a. and 6.5.3 c.
	Verify the mishap investigation report, endorsements, approved CAP and Corrective Action Plan Closure Statement, and mishap activities completion statements are complete and correctly recorded in NMIS.	6.5.3 d.

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Appointing Official	Ensure resources are provided to submit the Mishap Summary to the Lessons Learned Information System (LLIS) for entry for Type A and Type B mishaps and high-visibility mishaps and close calls. Lessons learned for Types C and D mishaps and close calls are developed according to the MPCP.	6.6.1 a. and b.
Within 10 Workdays of Tasking (Lessons Learned)		
Responsible Organization Designees	Generate lessons learned.	6.6.2 a.
	Submit lessons learned to AO.	6.6.2 b.
Upon Completion of Investigation		
Appointing Official	Submit the investigation activities completion statement to the responsible organization, OSMA (for Type A and Type B mishaps and high-visibility mishaps and close calls), the cognizant Safety Office, and other appropriate organizations indicating the investigation was performed; the CAP was implemented, completed, and closed; and the lessons learned were entered into the NASA LLIS.	6.7.1 a.
Cognizant Safety Office	Retain records and evidence for two years from the date of mishap and before disposition of physical evidence, seek concurrence from the Office of the General Counsel to confirm there is no active litigation affecting dispositional decisions.	6.8.2 and 6.8.3
	Manage and dispose CAP, lessons learned, witness statements, and other documentation in accordance with NPR 1441.1.	6.8.5
Chief, Safety and Mission Assurance or Designee	Archive HQ-approved NASA mishap investigation reports and related documents in accordance with NRRS 1441.1.	6.8.6 a.
	Handle and protect NASA information according to the requirements of NPR 1600.1, NPR 2190.1, and NPR 2810.1.	6.8.6 b.

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APPENDIX F. Positional Sequence for Mishap Notification and Investigation

F.1 Positional Sequence for Mishap Notification and Investigation

Positional Sequence for Mishap Notification and Investigation		
Responsible Party	**Action**	**NPR 8621.1D**
Administrator		
Appointing Official Determination		
	Serve as AO for Type A mishaps or delegate authority to the Associate Administrator (AA), Mission Directorate Associate Administrator (MDAA), Center Director (CD), CHMO, or other designee.	3.1.1 a.
	Serve as AO for NASA joint participation on a Mishap Investigation Board (MIB) with the Department of Defense and other agencies unless otherwise specified.	3.1.1 b.
Appointing Official (AO)		
Appointing Official Determination		
	When delegating responsibilities for Types C and D mishaps and close calls, consign formal authority to approve Investigating Authority (IA) travel, resource acquisitions, or responsible organization corrective actions.	3.1.4 d.
Investigating Authority Member Selection		
	Within 48 hours for Type A and Type B mishaps and high-visibility mishaps and close calls, provide a provisional list of IA appointees to the Office of Safety and Mission Assurance (OSMA) Mishap Investigation Program Executive.	3.2.1 a.
	Within seven workdays, appoint IA members with concurrence from NASA Chief, SMA, the Office of the Chief Engineer (OCE), and the Office of the Chief Medical Officer (CHMO).	3.2.1 b., Table B, and sec. 3.5
	Designate the IA chairperson.	3.2.1 c.
	Obtain concurrence from the Aircraft Management Division (AMD) for Type A and Type B mishaps and high-visibility mishaps and close calls involving aircraft.	3.2.1 d.

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	Determine if NASA will accept the investigation and subsequent mishap investigation report of another competent authority having jurisdiction.	3.2.1 e.
	Compose the IA following requirements given in 3.2.1 f. (1) through (3).	3.2.1 f. and Table C
Recommendations Generation		
	Assess recommendations according to their effectiveness in reducing likelihood and consequence of causal factor reoccurrence.	4.5.2 a.
	Communicate recommendations outside his or her authority to the responsible NASA organization or external body for implementation of corrective action.	4.5.2 b.
Investigating Authority Release		
	Verify completed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls fulfills the appointment letter's and this NPR's requirements and release the IA from duty.	5.2
Mishap Investigation Report Review, Endorsement, and Approval Section		
	Schedule an Endorsement Review with appropriate officials to review and endorse the mishap investigation report.	5.3.1 a.
	Deliver copy of mishap investigation report **a minimum of five workdays prior to conducting the Endorsement Review.**	5.3.1 b.
	Prepare for release of the Endorsement Review Record (with ex officio assistance), which includes the elements in 5.3.5 a. through e.	5.3.6 a. through e.
	Serve as final endorser and authority for acceptance or rejection of mishap and close call reports in which he or she holds the AO's position.	5.3.7
	Ensure the mishap investigation process is complete. Verify mishap investigation report is reviewed and endorsed.	5.3.7 b. and c.
	Assess the recommendations.	5.3.7 d.
	If mishap investigation report rejected, provide a written description of the deficiencies and direction going forward.	5.3.7 e.
Corrective Action Plan Development		

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	After the mishap investigation report has been endorsed, direct the responsible organization or program/project to develop a Corrective Action Plan (CAP).	6.1.1
Corrective Action Plan Review and Approval		
	Review and accept or reject the CAP.	6.3.2 a.
	Return a rejected CAP with comments to the responsible organization or program/project for revision.	6.3.2 b.
Corrective Action Plan Monitoring and Close Out		
	Assess and approve any changes to the CAP.	6.5.2 a.
	Send approved changes to the responsible organization and the Center Safety Office.	6.5.2 b.
	Once corrective actions for Type A and Type B mishaps and high-visibility mishaps and close calls are fulfilled, provide a Corrective Action Plan Closure Statement to the Center Safety Office and responsible organization advising the CAP has been closed.	6.5.2 c.
Lessons Learned Development, Disposition, Submittal, and Approval		
	Ensure resources are provided to submit the Mishap Summary to the LLIS for entry for Type A and Type B mishaps and high-visibility mishaps and close calls. Lessons learned for Types c and D mishaps and close calls are developed according to the Mishap Preparedness and Contingency Plan (MPCP).	6.6.1 a. and b.
Mishap Activities Conclusion		
	Submit the mishap activities completion statement to the responsible organization, OSMA (for Type A and Type B mishaps and high-visibility mishaps and close calls), the cognizant Safety Office, and other appropriate organizations indicating the investigation was performed; the CAP was implemented, completed, and closed; and the lessons learned entered into the NASA LLIS.	6.7.1 a.
	The AO's mishap investigation obligations are fulfilled with the delivery of the mishap activities completion statement, and the mishap file is closed.	6.7.1 b.
Associate Administrator, Office of Communications (AA/OCOM)		
Mishap Public Release of Information		

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	Within one hour of the incident, release information to the media and alert Center personnel and the public of any known hazards and their potential effects, and provide instructions to mitigate the risk and harm, and provide instructions.	2.2.5.2 a.
	With the assistance of the cognizant Safety Office, Interim Response Team (IRT), and Center Director (CD) or AA, MSD, release interim public affairs status reports about the investigation to the media through the Center Public Affairs Office (PAO).	2.2.5.2 b.
Mishap Investigation Report Distribution		
	Determine whether a mishap investigation report, whatever its origin, is issued from Headquarters (HQ) or the Center.	5.4.4
	Distribute the redacted mishap investigation report to the public only through FOIA request.	5.4.5
Associate Administrator (AA)		
Initial Mishap Notifications		
	Notify the Administrator, Deputy Administrator, the Associate Administrator, Office of Communications (AA/OCOM), the Office of the General Counsel, and other appropriate staff that an international mishap has occurred.	2.2.4.4
Mishap Investigation Report Review, Endorsement, and Approval Section		
	Serve as endorsing official for all mishaps in which he or she is the AO.	Table E.
Center Chief of Flight Operations		
Aircraft Mishaps and Close Calls		
	Immediately notify the National Transportation Safety Board (NTSB) of the NTSB-defined mishap, and, then, advise OSMA and Aircraft Management Division (AMD) that the NTSB has been informed.	1.2.2
	Within ten workdays of an aircraft mishap or close call that meets the reporting requirements in 49 CFR pt. 830, submit an NTSB Form 6120 to the NTSB regional office closest to the location of the mishap or close call.	1.2.3
Center Director (CD)/Associate Administrator, Mission Support Directorate (AA, MSD)		
Roles and Responsibilities		

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	Implement and fund the Center MPCP, including the mishap reporting, investigating, and recordkeeping requirements that fall under CD and AA, MSD responsibility. Be the approval authority or delegate appropriately for Center MPCPs.	1.3.1
	Develop the Center MPCP and include the content specified in section 1.3. The CD and AA, MSD are responsible for funding and supporting Center MPCPs in conformance with this NPR. This includes requirements to notify, report, investigate, and record mishaps and close calls that fall within CD and AA, MSD jurisdiction.	1.4.1.1
Initial Mishap Response		
	Report by telephone or e-mail to the Administrator and CHMO of a work-related fatality or serious injury or illness of a Federal employee or contractor employee working on a NASA operation.	2.1.7
	For Centers located on a military installation, release victim names according to procedures previously agreed upon by the installation commander and CD or AA, MSD.	2.2.5.4 c.
Mishap or Close Call Classification		
	Within 24 hours, determine mishap classification level for all mishaps within the MDAA's jurisdiction and for which the Center has reporting responsibility and obtain concurrence on classification level from the Chief, SMA for Type A and Type B mishaps and high-visibility mishaps and close calls.	1.2.2
Mishap Public Release of Information		
	In initial announcements, include what is known at the time, the injuries or fatalities that have occurred, and when additional information is expected to be available.	2.2.5.4 b.
	For resident contractor and grantee employee casualties, release information (within one hour) regarding the occurrence of and facts about a Type A injury or illness mishap occurring on a Center or at HQ or involving a NASA-managed program administered by the Center.	2.2.5.5
Mishap Notifications		
	Within 24 hours of leaning of a Type A or Type B mishap, report, by telephone or e-mail, to the Administrator.	2.3.1

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	[All personnel governed by this NPR] Notify the OIG and the Center's Office of the Chief Counsel or the HQ Office of the General Counsel of facts potentially related to criminal activity.	2.3.2
Appointing Official Determination		
	Serve as the AO (if designated by the Administrator) for Type A and Type B mishaps and high-visibility mishaps and close calls that occur onsite at a Center, at offsite Center support contractor locations, or at Center-managed offsite contractor locations that are not part of an MDAA program or project activity.	3.1.4 a.
	Serve as the AO (or otherwise authorize in the Center MPCP for Type C and Type D mishaps, and close calls that occur onsite at a Center, at offsite Center support contractor locations, or at Center-managed offsite contractor locations that are not part of an MDAA program or project activity.	3.1.4 b.
	When delegating AO responsibilities for Type C and D mishaps and close calls, consign formal authority to approve IA travel, resource acquisitions, or responsible organization corrective actions.	3.1.4 c.
	When identifying a position to act with AO authority, formally designate that position within the Center MPCP and confer full AO authority upon that position.	3.1.4 d.
Center Office of Protective Services (OPS)		
Initial Mishap Response		
	Support the incident commander, cognizant Safety Office, and IRT to secure the mishap site and impound data, records, equipment, and facilities.	2.1.4
Center Office of the Chief Counsel		
Mishap Notifications		
	[All personnel governed by this NPR] Notify the NASA Office of the General Counsel of facts potentially related to criminal activity in connection with a mishap.	2.3.2
Center Procurement Office		
Readiness to Conduct Investigations		

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	Involve the Center Safety Office in the acquisition strategy planning activities for proposed contracts as detailed in 48 CFR , NFS pt. 1807.	1.4.5.2
	Incorporate applicable mishap and close call reporting and investigating procedures and corrective action requirements detailed in the NFS 1852.223-70 (Safety and Health) into contracts, agreements, and grants covering NASA programs and operations.	1.4.5.1
Center Public Affairs Office (PAO)		
Mishap Public Release of Information		
	Before an IA is appointed and in concurrence with AA/OCOM, identify and disseminate factual, mishap-related, and suitable preliminary information to the public. Announce to the public that a fatality or injury (permanent disability) has occurred to a NASA employee involved in a Center work-related activity.	2.2.5.3 a. and b.
	In the case of Federal fatalities, release victim names at the earliest possible time after CD or AA, MSD, and AA/OCOM concurrence that next of kin notification has been accomplished with CD or AA, MSD protocols.	2.2.5.4 a.
Center Responsible Organization (or Program/Project Manager)		
Initial Mishap Notifications		
	Calculate the direct cost of a mishap or close call with review and concurrence of the Center Safety Office.	1.2.4
Corrective Action Plan Development		
	Within 15 workdays of tasking CAP to close out, develop and submit CAP to the AO for approval and then implementation. (See section 6.2 for CAP contents.)	6.1.2
Corrective Action Plan Implementation		
	Implement the corrective actions.	6.4.1 a.
	Track the corrective action performance and completion in the NASA Mishap Information System (NMIS) and provide the AO with a status at intervals determined by him or her.	6.4.1 b.
Corrective Action Plan Monitoring and Close Out		
	Update the cognizant Safety Office on the status of corrective action activities at least every 30 workdays until the CAP is closed.	6.5.1 a.

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	Submit changes to the CAP after it has been approved to the cognizant Safety Office or Program for review. After this review, send the requested changes to the AO for approval.	6.5.1 b.
Lessons Learned Development, Disposition, Submittal, and Approval		
	[Individual or team tasked to develop lessons learned] Generate lessons learned comprising, at a minimum, the mishap investigation report's executive summary, findings, and recommendations authorized for public release.	6.6.2 a.
	Within ten workdays of being tasked, submit prepared lessons learned to the AO.	6.6.2 b.
Center Safety Office and Mission Assurance Directorate		
Readiness to Conduct Investigations		
	Support the development of the Center MPCP, Program/Project MPCPs, contract clauses, and mishap investigation training.	1.4.3.1
	Ensure Center employees are familiar with the roles and responsibilities as documented in the Center MPCP and this NPR.	1.4.3.2
	Review and provide concurrence that all program/project plans include any required program-/project-specific information and procedures not covered in the Center's MPCP (e.g., special procedures for safing, handling, or containing hazardous chemicals present in program or project hardware)	1.4.3.3
	Maintain an updated list of all Center personnel who have training and experience in mishap investigation including information such as relevant training courses, dates of training, and recent participation in a mishap investigation.	1.4.3.4
	Forward copies of Center and Program/Project MPCPs to the OSMA Mishap Investigation Program Executive as soon as the plans are approved.	1.4.3.5
Chief Engineer		
Mishap Investigation Report Review, Endorsement, and Approval		
	Serve as an endorsing official for Type A and Type B mishaps and high-visibility mishaps and close calls.	Table E.
Cognizant Safety Office		
Initial Mishap Response		

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	Upon notification of a mishap or close call that triggers the initiation of the MPCP, initiate the Center MPCP and support the program/project as the Program/Project MPCP is initiated.	2.1.2 a.
	Deploy the IRT to support the investigation in accordance with the Center or Program/Project MPCPs.	2.1.2 b.
	Assist the IRT with the collection of witness statements (Federal employees only).	2.1.2 c.
Initial Mishap Notifications		
	After emergency response has been initiated and within one hour of a Type A or Type B mishap or a high-visibility mishap or close call, notify OSMA by calling 1–216–433–9614, or if no answer, by calling HQ After Hours Contact Center at 1–202-358-1414 (and provide required information).	2.2.2 a. and b.
	For Type A and Type B mishaps and high-visibility mishaps and close calls, send an electronic notification to OSMA containing information found in section 2.2.2 b.	2.2.2 c.
	Within one hour report to the CHMO an illness or injury that results in a loss of life, permanent disability, hospitalization, extensive first aid, or lost workdays in accordance with NPR 1800.1.	2.2.2 d.
	Report to the Occupational Safety and Health Administration (OSHA) in accordance with 29 CFR pt. 1904.	2.2.2 e.
	After notifying OSHA, inform OSMA that an oral report has been provided to OSHA.	2.2.2 f.
Mishap Notifications		
	Within 24 hours of notification, ensure all NASA mishaps and close calls are initially recorded in NMIS and are updated throughout the mishap investigation.	2.3.3.1 and Appendix H
	Enter all information for aircraft mishaps and close calls listed in 49 CFR pt. 830, with the exception of the pilot's name, into NMIS.	2.3.3.1
Mishap Investigation Report Development		
	Upload the report to the NMIS.	5.1.6 and Appendix H
Mishap Investigation Report Distribution		

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	After release by the NSC, distribute the Mishap Summary to the appropriate NASA programs and organizations.	5.4.3
	Ensure the information recorded in NMIS is updated.	5.4.7
Correction Action Plan Implementation		
	Assist the responsible organization, if needed, to enter updates into NMIS as described in the Center MPCP.	6.4.2 a.
	Enter into NMIS the actual direct cost of the mishap or the estimated direct cost, if actual direct cost is not available.	6.4.2 b.
Corrective Action Plan Monitoring and Close Out		
	Track corrective action activities to verify they are carried out according to plan and report non-compliance to the AO.	6.5.3 a.
	Verify corrective actions activities were implemented, completed, and closed.	6.5.3 b.
	Notify the AO that actions have been implemented, completed, and closed.	6.5.3 c.
	Verify the mishap investigation report, endorsements, approved CAP and Corrective Action Plan Closure Statement, and mishap activities completion statements are complete and correctly recorded in NMIS.	6.5.3 d.
Evidence Recording and Retention		
	Retain physical mishap evidence for two years from the date of the mishap and before disposition of physical evidence, seek concurrence from the Office of the General Counsel to confirm there is no active litigation affecting dispositional decisions.	6.8.2 and 6.8.3
	Manage and suitably dispose CAP, lessons learned, and witness statements, and other documentation in accordance with NPR 1441.1.	6.8.5
Employees		
Initial Mishap Response		
	If the situation warrants, notify emergency response (911 or designated emergency contact).	2.1.1 a.
	Complete witness statements upon request of emergency response or IRT personnel.	2.1.1 b.
Initial Mishap Notifications		

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	Report an aircraft mishap or close call, including an NTSB-defined mishap, to the cognizant Safety Office and the Center Chief of Flight Operations.	1.2.1
Endorsing Officials		
Mishap Investigation Report Review, Endorsement, and Approval		
	Verify the mishap investigation report content is technically correct and complete.	5.3.3 a.
	Concur/nonconcur the mishap investigation report describes causal and contributing factors.	5.3.3 b.
	Concur/nonconcur that the recommendations are practical, feasible, achievable, and in the opinion of the reviewer, will prevent the occurrence of similar mishaps or close calls.	5.3.3 c.
	Concur/nonconcur that proprietary, International Traffic Arms Regulations (ITAR), or Export Administration Regulations (EAR) information; material subject to the Privacy Act; or privileged information has been properly identified and protected.	5.3.3 d.
	Sign the Endorsement Review Record, signifying mishap investigation report concurrence or nonconcurrence, and provide comments related to decision.	5.3.4
Ex Officio		
Investigating Authority Member Selection		
	Participate in all investigation proceedings.	3.2.4 a. and b.
	Assure the investigation conforms to NASA policy and this NPR and the investigation process is fair, independent, and non-punitive.	3.2.4 c.
Mishap Investigation Report Development		
	Serve as the authorized representative of the Chief, SMA.	5.1.3 a.
	Sign the completed mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls attesting to the elements 5.1.3 b (1) through (7) of NPR.	5.1.3 b. (1) through (7)
	If the previous conditions have not been met, describe the mishap investigation report's deficiencies in writing and sign and attach this description to the mishap investigation report in lieu of signing the report.	5.1.3 c.
Freedom of Information Act (FOIA) Officer		

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Mishap Investigation Report Distribution		
	When notified by the Center or mission directorate representatives that the mishap investigation report is authorized for public release, send approved mishap Investigation report with authorization comments to the AO, OSMA, and the Center Safety Office (dependent on level of investigation).	5.4.1
	Distribute the full mishap investigation report to the public only by way of FOIA.	5.4.5
Interim Response Team (IRT)		
Initial Mishap Response		
	Preserve potential evidence, document the scene, obtain witness statements, and collect debris.	2.1.5 a.
	Copies of privileged written or transcripts of verbal statements should not be given to witnesses as privilege and confidentiality cannot be ensured.	
	2.1.5 b.	
	Conduct evidence preservation actions without affecting essential safety operations.	2.1.5 c.
	With cognizant Safety Office, supervisors, and OPS support, collect and impound appropriate data, records, equipment, witness statements, and facilities that may be involved in the mishap.	2.1.5 d.
Initial Mishap Notifications		
	Notify the Center PAO about casualties, damages, and any potential hazards to the public.	2.2.3 a.
	Support the PAO with release of information to the media to alert Center personnel and the public of any known hazards and their potential effects.	2.2.3 b.
	At the earliest opportunity, advise a Federal employee's supervisor if drug testing should be requested according to NPR 3792.1.	2.2.3 c.
	At the earliest opportunity, notify the Contracting Officer or Contracting Officer's Representative if drug testing for contract personnel is to be implemented according to the contract or applicable agreements.	2.2.3 d.
Investigating Authority (IA)		

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Investigating Authority Member Selection		
	Have primacy over other Agency collateral investigations with the exception of the OIG criminal investigations.	3.2.2 a.
	Consist of an odd number of voting members including the chairperson.	3.2.2 b.
	Recommend membership changes to the AO regarding voting members, ex officio, and advisors.	3.2.2 c.
	Does not participate in more than one type of investigation (NASA, collateral, contractor) for the same investigation or at the same time.	3.2.2 d.
	Composed of a chairperson, members, and, when required, an ex officio, at a minimum.	3.2.3 a.
	Have at least five members for Type A mishaps and at least three members for Type B mishaps and high-visibility incidents.	3.2.3 b.
	Include a member knowledgeable in aircraft operations and maintenance or a member knowledgeable in aviation safety for all Type A and Type B mishaps and high-visibility mishaps and close calls involving aircraft.	3.2.3 c.
	For Type A and Type B mishaps and high-visibility mishaps and close calls, include safety, medical, and human factors professionals as members.	3.2.3 d.
Investigating Authority Advisor Selection		
	For Type A and Type B mishaps and high-visibility mishaps and close calls, have a legal advisor and a public affairs advisor.	3.3.1
	Have access to a NASA Safety Center (NSC) mishap investigation specialist to assist with investigation for Type A and Type B mishaps and high-visibility mishaps and close calls.	3.3.2
Mishap Investigation Process Overview		
	Use a structured analysis technique to determine what happened, when it happened, and why it happened with the goal of preventing incident reoccurrence and similar incident occurrence.	4.1.1 a. and b.
Incident Site Safety Evidence Preservation and Impoundment		
	Verify the mishap site is safe and secured.	4.2.1 a.

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	Confirm evidence has been preserved and impounded.	4.2.1 b.
	Relevant perishable evidence has been collected, photographed, and documented or impounded or both.	4.2.1 b. (1)
	All necessary data, records, and equipment have been impounded and stored in a secure site.	4.2.1.b. (2)
	Take custody of evidence gathered at the scene; determine status of impounded records and equipment; and develop a record of IRT, the cognizant Safety Office, emergency response, and protective services personnel actions.	4.2.1 c.
Evidence and Fact Gathering		
	Collect and evaluate all available data and records relevant to the mishap.	4.3.1 a.
	Permit only Federal employees to be present at privileged witness interviews. (Exception: the interviewee and contractors hired to support interviews. Contractors will have signed a Nondisclosure Agreement (NDA).	4.3.1 b.
	Interview mishap witnesses to determine witness observations or actions and to elicit witness opinions of possible causes of the mishap.	4.3.1 c. (1) and (2)
	Inform interviewee if the information gathered during the interview is confidential and privileged.	4.3.1 d.
	When the discussion is kept privileged, read the witness statement to the interviewee.	4.3.2 and Figure 1.
	Do not give a copy of the privileged statement to the interviewee.	4.3.3
Findings Determination Section		
	For Type A and Type B mishaps and high-visibility mishaps and close calls, determine the sequence of events and conditions and document them in a timeline.	4.4.1 a.
	Determine relationships, supported by facts, of events and conditions to the undesired outcome.	4.4.1 b.
	Provide a mishap related NASA Advisory at any time during the investigation when the IA identifies a safety finding requiring immediate action and could impact one or more Centers or when NASA-wide implications are present.	4.4.2.1 a.

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	Obtain mishap related NASA Advisories approval from the IA legal and public affairs advisors or by local policy via NARS.	4.4.2.1 b.
Recommendations Generation		
	Develop recommendations to prevent incident reoccurrence and similar or like incident occurrence.	4.5.1 a.
	Confirm the recommendations are clear, verifiable, achievable, and traceable to at least one significant finding.	4.5.1 b.
Status Reports		
	Develop a publicly releasable investigation status report for NASA Type A and Type B mishaps and high-visibility mishaps and close calls, every 30 workdays from the time the appointment letter is signed until the mishap investigation report is signed.	4.6.1 a.
	Distribute the approved status report to the AO, responsible Center or Program Safety Office, NSC mishap support specialist, and Agency Safety and Mission Assurance (SMA) personnel through an approved distribution list.	4.6.1 b.
	Post 30-day status report to the mishap record in NMIS.	4.6.1. c.
Other Investigation Types		
	If it is reasonably suspected a mishap resulted from criminal activity, the IA will halt the investigation; immediately notify the OIG, the AO; and the Office of the General Counsel or the Office of the Chief Counsel.	4.7.1
Mishap Investigation Report Development		
	Complete a mishap investigation report that contains the information as specified in Table D of this NPR in the correct order as specified.	5.1.1 a. through g. and 5.1.2 a. through g. and Table D
IA Advisors (Federal Employees)		
Investigating Authority Advisor Selection		
	Attend meetings as needed, travel with the IA as requested, and have access to all investigative material except for privileged witness statements and interview records.	3.3.3 b.
Mishap Investigation Report Development		

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	Sign the mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls stating that the report meets NASA policies and procedures in the advisor's functional area.	5.1.4
IA Chairperson		
Investigating Authority Member Selection		
	Manage and coordinate all aspects of the mishap investigation.	3.2.5 a.
	Authorize the impoundment of data, records, equipment, and facilities and collection or salvage data and debris.	3.2.5 b.
	Work through the Contracting Officer with guidance from the legal advisor to obtain and impound data for mishaps at contractor or subcontractor sites.	3.2.5 c.
	Release impounded data, records, equipment, facilities, and mishap site when no longer necessary.	3.2.5 d.
	Define the roles and areas of investigative responsibility for each group or subgroup on the IA.	3.2.5 e.
	Coordinate with the IA legal advisor, HQ, or Center public affairs advisor, and import/export control advisor throughout the investigation.	3.2.5 f.
	Report only to the AO or designee during the investigation.	3.2.5 g.
	Refer allegations and evidence of criminal activity identified in the course of an investigation to the OIG and General/Chief Counsel.	3.2.5 h.
Investigating Authority Advisor Selection		
	Include the legal advisor in deliberations that discuss privileged witness statements.	3.3.5
Mishap Investigation Report Development		
	Submit a request, originating with the IA chairperson, to the AO if the IA needs additional time to complete the investigation or the mishap investigation report and include the reasons for extension.	5.1.1 g.
Mishap Investigation Report Review, Endorsement, and Approval		
	Present the mishap investigation report and its associated findings and recommendations.	5.3.2 a.
IA Consultant		

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Investigating Authority Consultant Selection		
	Have academic and technical experience matching or exceeding the technical and management complexity of systems related to the mishap.	3.4.2
	Contracted or hired to provide technical expertise to the IA; perform analysis; assist in formulating findings.	3.4.3 a. through c.
	Non-Federal employee administrative support: sign an NDA before given access to mishap data or ITAR, EAR, proprietary, or privileged information.	3.4.5
IA Legal Advisor		
Investigating Authority Advisor Selection		
	Develop NDAs for IA contractor administrative support personnel.	3.3.4 a.
	Develop NDAs when the IA uses a contractor to analyze interview data or participate in interviews.	3.3.4 b.
	Provide legal advice and counsel as requested by the chairperson.	3.3.4 c.
	Attend interviews if a lawyer accompanies the interviewee during the interview process.	3.3.4 d.
Mission Directorate Associate Administrator (MDAA)		
Readiness to Conduct Investigations		
	Ensure program/project managers develop, fund, and support Program/Project MPCPs in conformance with this NPR. This includes procedures to notify, report, investigate, and record mishaps and close calls that fall under MDAA responsibility.	1.4.2.1
	Ensure international partner joint program agreements and other Federal agency agreements incorporate the mishap and reporting elements of this NPR.	1.4.2.2
Initial Mishap Notifications		
	Notify the AA that a mishap has occurred on foreign territory or in international waters.	2.2.4.3
	Within 24 hours, determine mishap classification level for all mishaps within the MDAA's jurisdiction and for which the Center has reporting responsibility and obtain concurrence on classification level from the Chief, SMA for Type A and Type B mishaps and high-visibility mishaps and close calls.	1.2.2

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	Within 24 hours of learning of a Type A or Type B mishap, report, by telephone or e-mail, to the Administrator and CHMO.	2.3.1
Appointing Official Determination		
	Serve as the AO for Type A mishaps, if delegated by Administrator, Type B mishaps, high-visibility mishaps, and high-visibility close calls involving Mission Directorate-managed programs, projects, and activities occurring during space flight or occurring outside Center property at MDAA program and project sites) (excluding offsite Center support contractor locations).	3.1.2 a.
	Serve as the AO (or designate the responsibility in the Program/Project MPCP for Type C and Type D mishaps, and close calls involving Mission Directorate-managed programs, projects, and activities occurring during space flight or outside Center gates at MDAA program or project sites) (excluding offsite Center support contractor locations).	3.1.2 b.
Mishap Investigation Report Distribution		
	After NSC releases Mishap Summary, distribute it to the appropriate NASA programs and organizations.	5.4.3
NASA Safety Center (NSC), Director		
Findings Determination		
	Distribute the mishap related NASA Advisories electronically to Agency SMA personnel through an approved distribution list.	4.4.2.2
NASA Safety Center (NSC)		
Investigating Authority Advisor Selection		
	Support investigation activities if IA requests.	3.3.2 b.
	Assist the IA chairperson and ex officio (when not named as ex officio) in consultation, preparation, and reporting.	3.3.2 b. (1)
	Identify pertinent Agency-level audit results from other NASA installations and coordinate with associated Center representatives responding to audit findings.	3.3.2 b. (2)
	Research similar mishap findings and associated recommendations, corrective actions, and lessons learned.	3.3.2 b. (3)
	Provide investigation tools and coordinate with tool specialists or necessary training.	3.3.2 b. (4)

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	Assess root cause analysis and associated IA recommendations for clarity, verifiability, achievability, and traceability.	3.3.2 b. (5)
	Assist with IA investigation endorsement.	3.3.2 b. (6)
Mishap Investigation Report Distribution		
	Maintain the distribution lists for status reports (section 4.6) and mishap related NASA Advisories, and place mishap related NASA Advisories on the NASA Mishap Investigation Web site and the NSC Web site. Mishap related NASA Advisories and status reports will be co-located.	4.4.2.3
	Complete public release review and distribute the Mishap Summary for prevention awareness and other appropriate action by NASA Centers and field installations.	5.4.2
Occupational Health Representative or Other Medical Person		
Mishap Notifications		
	Provide medical information regarding injured persons and the nature of the injuries as a result of a mishap or close call to the Center Safety Office for inclusion in the investigation report and NMIS.	2.3.3.2
Office of Communications (OCOM)		
Mishap Public Release of Information		
	Approve the release of all information related to NASA Type A and Type B mishaps and high-visibility mishaps and close calls prior to release to media or public.	2.2.5.1
Lessons Learned Development, Disposition, Submittal, and Approval (Export and Import)		
Office of Inspector General (OIG)		
Mishap Notifications		
	[All personnel governed by this NPR] Notify the NASA Office of the General Counsel of facts potentially related to criminal activity in connection with a mishap.	2.3.2
Office of Protective Services (OPS)		
Initial Mishap Response		
	Support the incident commander, cognizant Safety Office, and IRT in securing the site and impounding data, records, equipment, and facilities	2.1.4

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Chief, Safety and Mission Assurance		
Appointing Official Determination		
	Contact the Administrator within one hour of the initial notification of a Type A mishap to determine if the Administrator wishes to exercise appointment authority.	3.1.3 a.
	Concur with the mishap classification level and the IA membership and serve as an endorsing official for the mishap investigation report for Type A and Type B mishaps and high-visibility mishaps and close calls.	3.1.3 b.
	If the NTSB exercises its authority to investigate a NASA aircraft mishap, [may] conduct a separate investigation.	3.1.6
Mishap Investigation Report Review, Endorsement, and Approval Section		
	Serve as an endorsing official for Type A and Type B mishaps and high-visibility mishaps and close calls.	Table E.
Evidence Recording and Retention		
	Archive HQ-approved NASA mishap investigation reports and related documents in accordance with NRRS 1441.1.	6.8.6 a.
	Handle and protect NASA information according to the requirements of NPR 1600.1, NPR 2190.1, and NPR 2810.1.	6.8.6 b.
Office of Safety and Mission Assurance (OSMA)/Mishap Investigation Program Executive		
Appointing Official Determination (on NASA's behalf)		
	Support investigations of NASA mishaps by other Federal agencies authorized to investigate NASA mishaps.	3.1.7 a.
	Support other Federal agencies, foreign participants, and private industry mishap investigations in accordance with agreements.	3.1.7 b.
Office of Strategic Infrastructure (OSI)		
Mishap Investigation Report Distribution		
	For aircraft mishap investigations delegated to NASA by NTSB, submit the approved NASA mishap investigation report to the NTSB ensuring it meets the NTSB's required information.	5.4.6
Office of Strategic Infrastructure, Aircraft Management Division (OSI/AMD)		
Mishap Investigation Report Review, Endorsement, and Approval		

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	Serve as an endorsing official for Type A and Type B mishaps and high-visibility mishaps and close calls involving aircraft.	Table E.
Office of the Chief Health and Medical Officer (CHMO)		
Appointing Official Determination		
	Serve as the AO for a Type A mishaps, Type B mishaps, high-visibility mishaps, high-visibility close calls involving a human research subject.	3.1.5 a.
	Serve as the AO via the IRB process for Type C and Type D mishaps, and close calls involving a human research subject.	3.1.5 b.
Mishap Investigation Report Review, Endorsement, and Approval Section		
	Serve as an endorsing official for Type A and Type B mishaps and high-visibility mishaps and close calls involving injury or fatality.	Table E.
Office of the General Counsel		
Mishap Notifications		
	[All personnel governed by this NPR] Notify the NASA Office of the General Counsel of facts potentially related to criminal activity in connection with a mishap.	2.3.2
Official-In-Charge		
Initial Mishap Notifications		
	For NASA mishaps occurring on foreign territory or in international waters, notify the Chief, SMA; the appropriate MDAA; and the cognizant Safety Office.	2.2.4.1
	When a Type A or Type B mishap occurs outside the United States involving NASA personnel, the Official in Charge, in coordination with AA/OCOM and Associate Administrator, Office of International and Interagency Relations (AA/OIIR), releases factual details outlined in NPR through the U.S. Embassy or Consular Office in the locale of the mishap, in accordance with policies and procedures established by those offices.	2.2.4.2
Program/Project Manager		
Readiness to Conduct Investigations		

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	Coordinate Program/Project MPCPs with applicable Centers' MPCPs and with the appropriate NASA HQ Offices, which include, at a minimum, MDAA, General Counsel, OSMA, OCOM, and OIIR, before its final approval.	1.4.4.1
	Develop the Program/Project MPCP and include the content specified in section 1.2. This includes requirements to notify, report, investigate, and record mishaps and close calls that fall within Program/Project jurisdiction.	1.4.4.2
Initial Mishap Response		
	Upon notification of a mishap, initiate the Program/Project MPCP.	2.1.3
Responsible Program Manager or Organization		
	In coordination with the Chief Financial Officer or designee, calculate the cost of a mission failure.	1.2.4
Corrective Action Plan Development		
	Within 15 workdays from being tasked, submit the CAP to the AO for approval and then implementation.	6.1.2
Supervisors		
Initial Mishap Notifications		
	Notify the Center Safety Office when a mishap or close call occurs or is suspected.	2.2.1

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APPENDIX G. NASA Mishap Investigation Interface With External Mishap Investigation

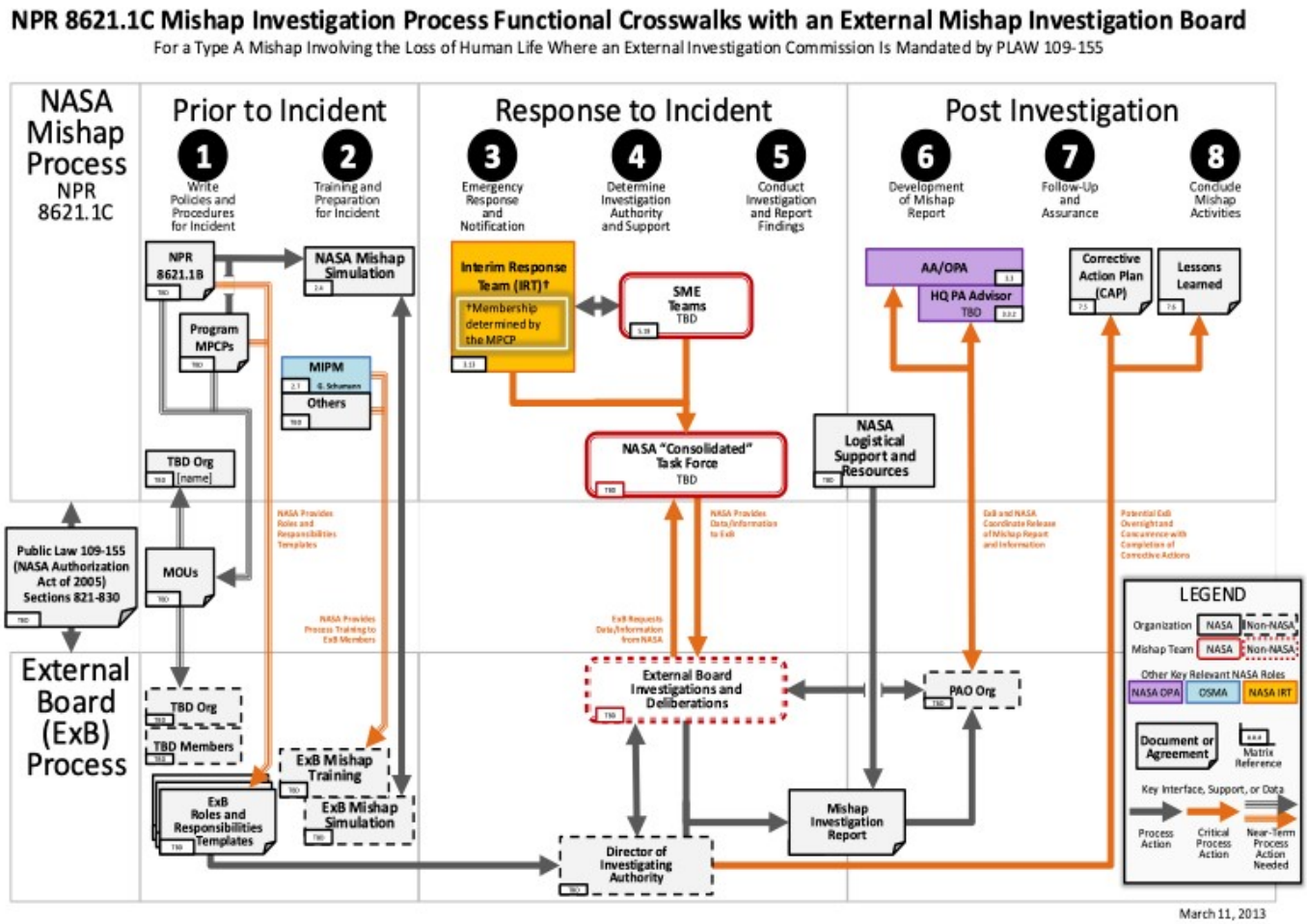

Figure G.1 NASA Mishap Investigation Interface With External Mishap Investigation

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Appendix H. Data Entry Elements and Recording Requirements

Table H.1 Data Entry Elements and Recording Requirements

Common Data Elements for NASA Incident Reporting and Investigation			
Concept	Element	Comment	Recording Requirement
Who	a. Center submitting the report, author of incident report, phone number, and mail code	Format: First name, last name, organization code, phone number, mail code. If NASA contractor, include company name and contract number. Otherwise state "Non-NASA."	Data entry by 24 hours of incident
	b. Responsible organization, organization's point of contact, phone number, and mail code	Format: First name, last name, organization code, phone number, mail code. If NASA contractor, include company name and contract number. Otherwise state "Non-NASA."	
	c. Injury/Illness employee name	Format: First name, last name, organization code, company name, contract number, or other status (visitor, volunteer, grantee).	Only if OSHA-recordable Privacy Act applies
	a. Brief description of mishap or close call	Include incident source, mechanism, and outcome. For example, "Employee tripped over exposed pipe; injured in fall. Lost workday case" provides sufficient information. Multiple undesired outcomes may be listed but indicate the most severe used to determine classification. Do not include personal identifiable information (body part or injury description, medical diagnosis, or treatment) here or anywhere in the Safety Incident. With a completed mishap investigation report, update undesired outcome known at time of	Data entry by 24 hours of incident

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		undesired outcome known at time of report signature (e.g., building structure and contents were destroyed).	
	b. Mission affected	Mission name and number.	
	c. Program impact, if known	Estimate incident's cost/schedule/technical impact. Update impacts as of mishap investigation report completion date. Impact to program/project life-cycle cost estimate may differ from estimated direct cost of damage since it includes costs to the program/project not required for estimating direct cost of damage.	
	d. Number and type of injuries or fatalities, if known	Specify extent of treatment (first aid, medical treatment, inpatient hospitalization—other than for observation or human test). If mishap investigation report completed, update as of mishap investigation report completion date (e.g., employee incurred permanent disability).	
	e. Type of damage to equipment, flight hardware, or flight software, or facilities	Specify type of property (spacecraft, forklift), system (propulsion, chassis) nomenclature, and data used to calculate direct cost per section 1.2.3. Update final direct cost on mishap investigation report completion.	
What	f. Estimate of direct cost of damage	Available information is used within 24 hours of incident. After 24 hours and before mishap investigation report signature, estimate should be updated if new information changes mishap classification criteria (e.g., previous estimate of $15,000 becomes $22,000, raising the incident to a Type D mishap).	

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	g. Appropriate medical information regarding the persons injured and the nature of injuries	Include nature of injury or illness (laceration, bruise, hearing loss), body part or system affected, and work-related determination. Include all OSHA-recordable information.	Per 29 CFR pt. 1904. HIPAA, Privacy Act apply
	h. Incident classification	Options are Type A/B/C/D/Close Call/Non-NPR 8621.1.	Data entry by 24 hours of incident
	i. Calculated direct cost of mishap on date of report signature		Data entry by two workdays following mishap investigation report completion
	j. The OSHA Final Mishap Summary (OSHA 301 Form: Injury and Illness Incident Report, or an equivalent form), if the mishap is an OSHA-recordable incident		NASA A-C report attachment < 75 workdays or per AO
	k. Signed mishap investigation report	Use PDF only	NASA A-D/CC attachment by two workdays of report signature
	l. Mishap investigation report endorsements	Use PDF only	NASA A-D/CC by two workdays of endorsement signature
	m. CAP description of corrective actions		Attachment by two workdays of AO approval
	n. AO Corrective Action Plan Closure Statement	Use PDF only	For all NASA mishaps and close calls
	a. Incident date	Format: dd/mm/yyyy	Data entry by 24 hours of incident
	b. Incident time	Format: 24-hr clock, local time	

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When	c. Time report submitted	Format: 24-hr clock, local time	
	d. Date report submitted	Format: dd/mm/yyyy	
	e. CAP completion date for each corrective action	Format: dd/mm/yyyy	Attached CAP update and/or Action Request for all NASA mishaps and close calls
Where	a. Center submitting report		Data entry by 24 hours of incident
	b. Incident general location	Onsite: Select closest geographic area where incident occurred from standard list of Center, component facility, or other NASA properties, structures, areas, and roads. If no choice is accurate, use the Detail Description field to explain, Otherwise state "Offsite."	
	c. Incident exact location, if known	Enter amplifying information for the General Location, such as room number or mile marker or nearest geographic reference. Offsite and other examples: "1234 Avenue A, Los Angeles, CA 98765" or "38 deg, 54 min 7 sec North." For inflight aircraft lacking GPS position data, "110R, 65 DME from ABC VORTAC, FL250." For inflight spacecraft, include altitude and planet latitude/ longitude directly beneath.	
Why	Findings supported by facts and associated recommendations	See NASA Root Cause Analysis course for specifics in developing findings and recommendations from facts. At minimum, a finding is a complete sentence in which the subject indicates some effect concluded from facts. Example of fact: "The coefficient of friction was 0.3." Example of finding: "The floor was too slippery for the employee to	Data entry within two workdays of Report signature

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		was too slippery for the employee to walk upon safely." Example of recommendation: "For Center facilities, ensure hallways are blocked and posted as hazardous after floor washing/waxing until surface is dry."	

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Appendix I. Endorsement Review Process Flow

I.1 Part 1

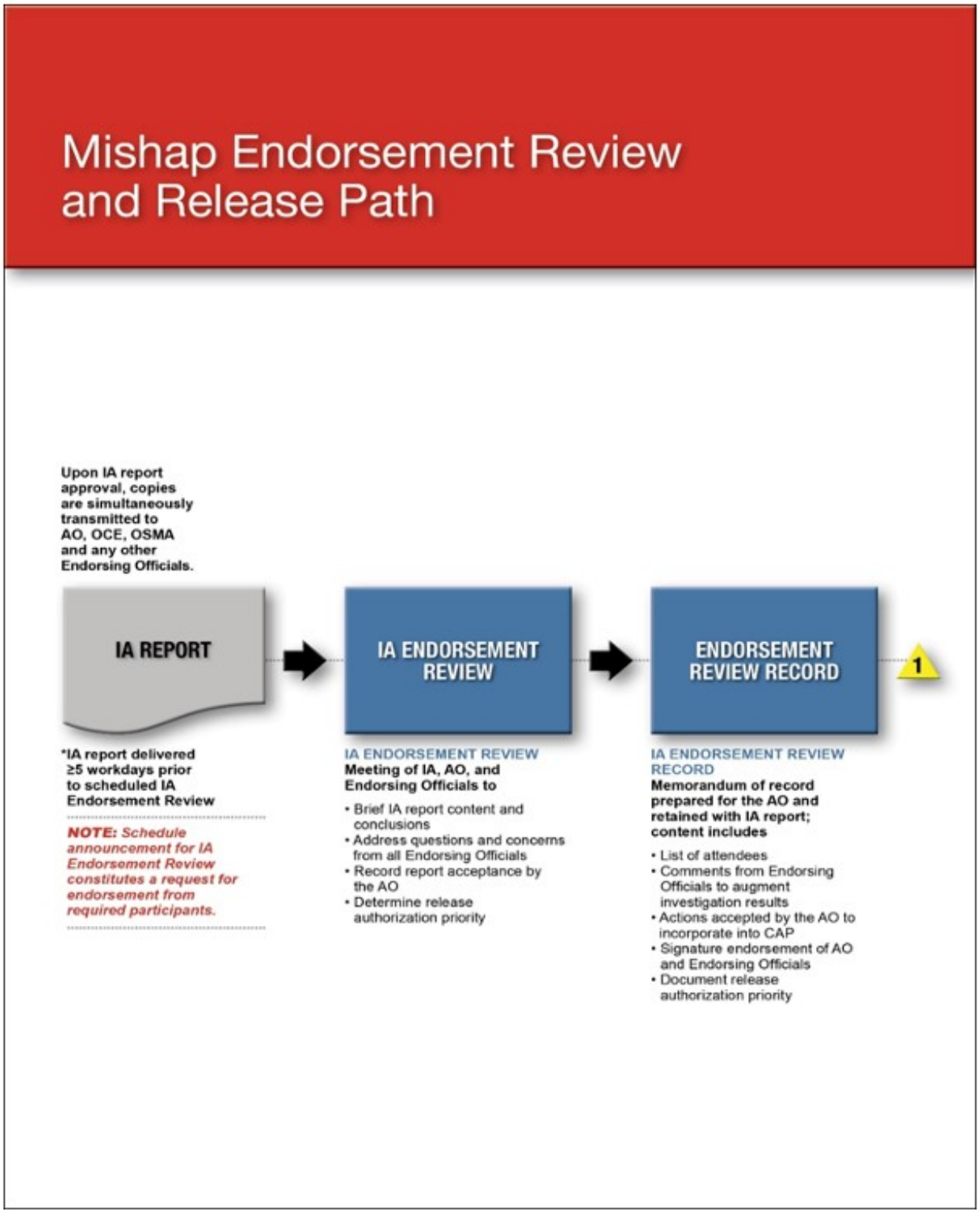

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Figure I.1 Part 1: Endorsement Review Process Flow

I.2 Part 2

Figure I.2 Part 2: Endorsement Review Process Flow

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Appendix J. References

J.1 The Freedom of Information Act, 5 U.S.C. § 552, As Amended by Public Law No. 104-231, 110 Stat. 3048.

J.2 Occupational Safety and Health Act of 1970, § 19, as amended, 29 U.S.C. § 668.

J.3 The National Aeronautics and Space Act, 51 U.S.C. § 20113(a), as amended.

J.4 Human Space Flight Independent Investigation Commission, 51 U.S.C. § 70701.

J.5 NASA Authorization Act of 2005, Human Space Flight Independent Investigation Commission, Pub. L. 109-155, sec. 8, subtitle B.

J.6 Aeronautics and Space, 14 CFR pt. 1200-1310.

J.7 Protection of Human Subjects, 14 CFR pt. 1230.

J.8 Safety and Health Measures and Mishap Reporting, NFS pt. 1852.223-70.

J.9 NPD 1000.3, The NASA Organization.

J.10 NPD 9800.1, NASA Office of Inspector General Programs.

J.11 NPR 1400.1, NASA Directives and Charters Procedural Requirements.

J.12 NPR 1850.1 Quality Assurance of the NASA Medical Care.

J.13 NPR 7120.5, NASA Space Flight Program and Project Management Requirements.

J.14 NPR 7900.3, NASA Aircraft Operations Management.

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