NASA Procedural Requirements

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COMPLIANCE IS MANDATORY FOR NASA EMPLOYEES

# Orbital Debris Mitigation

## Responsible Office: Office of Safety and Mission Assurance

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# Preface

## P.1 Purpose

a. This NASA Procedural Requirements (NPR) directive defines responsibilities and procedural requirements for the planning, implementation, and review of orbital debris mitigation measures for NASA-sponsored spaceflight activities, consistent with the National Space Policy, the United States (U.S.) Government Orbital Debris Mitigation Standard Practices (ODMSP), and NASA's policy to protect the orbital space environment.

b. This revision updates orbital debris mitigation responsibilities for spaceflight activities, including those involving partnerships or spaceflight services, and reviews requirements for activities conducted under NASA's authority. The document no longer addresses processes and standards for conjunction assessment and collision avoidance, which are now addressed in NPR 8079.1, NASA Spacecraft Conjunction Analysis and Collision Avoidance for Space Environment Protection.

## P.2 Applicability

a. This NPR is applicable to NASA Headquarters and NASA Centers, including Component Facilities and Technical and Service Support Centers. This directive is applicable to the Jet Propulsion Laboratory, a Federally Funded Research and Development Center, only to the extent specified in the NASA/Caltech Prime Contract. This directive is applicable to other contractors, recipients of grants or cooperative agreements, or parties to other agreements only to the extent specified in contracts, grants or cooperative agreement, or other agreements.

b. Specifically, this NPR is applicable to organizations that develop, acquire, or operate spaceflight systems or services involving objects that exceed 130km (~70mi) in altitude and achieve or exceed Earth orbital velocity.

c. Supplemental guidance issued on earlier versions of this directive that were intended to except or clarify requirements do not apply to this revision as they have been considered and incorporated as warranted. It is the intent of this directive that all NASA programs and projects involved in spaceflight activities understand orbital debris mitigation responsibilities consistent with the National Space Policy and NASA Policy Directive (NPD) 8700.1, NASA's Policy for Safety and Mission Success. However, this revision continues to limit the applicability of NASA-specific standards and review requirements to spaceflight activities conducted under NASA authority. See section 1.2 for more details.

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

e. In this directive, individuals responsible for the formulation and implementation of spaceflight systems, elements and acquired services are referred to as Project Managers. When such individuals have a different title (e.g., Program Managers or Principal Investigators), the responsibilities and procedural requirements defined for Project Managers apply to them.

f. In this directive, document citations are assumed to be the latest version, unless otherwise noted.

## P.3 Authority

a. The National Aeronautics and Space Act, 51 U.S.C. § 20113.

b. National Space Policy of the United States of America, 2020.

c. U.S. Government Orbital Debris Mitigation Standard Practices, 2019.

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

## P.4 Applicable Documents and Forms

a. NASA-STD-8719.14, Process for Limiting Orbital Debris.

## P.5 Measurement/Verification

Compliance with the requirements contained in this directive is monitored by the SMA Technical Authority with support from the Orbital Debris Program Office and is verified as part of selected life cycle reviews.

## P.6 Cancellation

NPR 8715.6B, NASA Procedural Requirements for Limiting Orbital Debris and Evaluating the Meteoroid and Orbital Debris Environments, dated February 16, 2017.

# Chapter 1. Introduction

## 1.1 Orbital Debris Mitigation

1.1.1 Space Policy Directive-3, National Space Traffic Management Policy, defines orbital debris as any human-made space object orbiting Earth that no longer serves any useful purpose. This definition covers objects ranging from spacecraft to spent launch vehicle stages to components and include materials, fragments, or other objects which are intentionally or inadvertently cast off or generated.

1.1.2 Preservation of the orbital environment requires that the generation of orbital debris is limited. NASA standards for doing so are based on the following objectives:

a. Orbital debris released as part of normal spaceflight operations by spacecraft and launch vehicles is minimized.

b. The potential for orbital debris generated by collisions or accidental explosions during operations and following decommissioning and disposal is limited.

c. The number of expended or decommissioned space objects remaining in orbit, and their durations in orbit, are limited.

1.1.3 NASA standards furthermore seek to limit the potential for human casualty from objects reentering Earth's atmosphere to an acceptable level.

1.1.4 These objectives collectively describe the scope of orbital debris mitigation.

1.1.5 NASA's orbital debris mitigation standard, NASA-STD 8719.14, Process for Limiting Orbital Debris, focuses largely on the protection of the Earth orbital environments. However, NASA recognizes that debris-related concerns may extend to other domains beyond Earth orbit. The NASA standard includes a limited set of requirements applicable to non-Earth orbits.

1.1.6 NASA-HDBK 8719.14 provides relevant background information. NPR 8079.1 provides further requirements and background specific to conjunction analysis and collision avoidance through space object tracking and maneuvering.

## 1.2 Guiding Policies

1.2.1 NPD 8700.1 defines NASA's general policy regarding the protection of the public and orbital environment and forms the basis for responsibilities and requirements in this NPR.

1.2.2 This NPR serves as implementation of part of the U.S. National Space Policy of 2020, which states:

> *"To preserve the space environment for responsible, peaceful, and safe use, and with a focus on minimizing space debris the United States will:*
>
> *• [...] Limit the creation of new debris, consistent with mission requirements and cost effectiveness, during the procurement and operation of spacecraft, launch services, and conduct*

*of tests and experiments in space by following and periodically updating the United States Government Orbital Debris Mitigation Standard Practices;*

*• [...] Require approval of exceptions to the United States Government Orbital Debris Mitigation Standard Practices from the head of the sponsoring agency and notification to the Secretary of State; [...]"*

1.2.3 Accordingly, NASA seeks to ensure that missions in which it is involved adopt responsible debris mitigation standards, the implementation of which is independently reviewed by an appropriate authority.

1.2.4 This NPR distinguishes between cases in which spacecraft or launch vehicle activities are conducted under NASA's authority and cases where they are authorized and supervised by other governmental entities and, as such, subject to orbital debris mitigation requirements imposed by those entities. Examples of the latter are Federal Aviation Administration-licensed launches (per the National Space Transportation Policy of 2013), Federal Communications Commission-licensed satellite operations, and launches provided by the Department of Defense or foreign partner agencies. For a given mission, this authority may be different for the launch vehicle and spacecraft operations.

1.2.5 If a governmental entity other than NASA is the authority for launch vehicle or spacecraft operations, NASA will defer to that organization for review of the relevant portion of orbital debris mitigation measures. Those portions of NASA-sponsored operations that fall outside the regulatory authority of such entities are considered to take place under NASA's authority and will be subject to NASA standards and review processes. The responsibilities and procedural requirements in this NPR are defined accordingly.

# 1.3 Relief from Requirements

1.3.1 As defined in NPR 8715.3, NASA General Safety Program Requirements, requests for the tailoring (e.g., via non-applicability determinations, waivers, or deviations) of requirements in this NPR and NASA-STD-8719.14 (to the extent applicable) are submitted by the Mission Directorate Associate Administrator (MDAA) sponsoring the mission or a designee to the Chief, SMA and adjudicated in coordination with the Office of the Administrator. The Office of the Administrator may delegate individual decisions to the Chief, SMA.

1.3.2 When waivers or deviations result in exceptions to the ODMSP, the National Space Policy requires notification to the Secretary of State. Notifications are performed by the Associate Administrator for International and Interagency Relations (AA/OIIR) in coordination with the Mission Directorate and the Chief, SMA.

1.3.3 Even when NASA-sponsored spaceflight activities are not performed under NASA's authority, programs and projects should inform Mission Directorates and the Chief, SMA of known exceptions to orbital debris mitigation standards imposed by authorizing governmental entities. The Mission Directorate and Chief, SMA will coordinate to inform the Office of the Administrator.

1.3.4 Given the elevation of tailoring decisions for debris mitigation standards, programs and projects considering relief from such standards should promptly consult the sponsoring Mission Directorate. Concerns about the ability to meet orbital debris requirements should be documented as project risks and communicated during key decision points.

1.3.5 Exemptions or tailoring (e.g., via non-applicability determinations, waivers, or deviations) of requirements in this NPR and NASA-STD-8719.14 (to the extent applicable) that are given or have been previously granted via a mission's Assurance Implementation Matrix (AIM) as defined in NPR 8705.4, or other documented approval or agreement with the Office of Safety and Mission Assurance (OSMA) or the NASA Orbital Debris Program Office (ODPO) are considered applicable to a mission for its entire lifetime.

# Chapter 2. Roles and Responsibilities

## 2.1 Chief, Safety and Mission Assurance

2.1.1 The Chief, SMA, as stated in NPD 1000.3, The NASA Organization, is responsible for advising the Administrator and other senior officials on matters related to risk, safety, and mission success. As part of this responsibility, the Chief, SMA:

a. In coordination with the Space Environment Sustainability Advisory Board (SESAB), establishes Agency orbital debris mitigation policy, requirements, and guidelines for NASA programs and projects consistent with national policy and international guidelines.

b. Maintains and advises the Agency on the application of models and tools to characterize the orbital debris environment and assess the risk of orbital debris generation and disposal methods.

c. Reviews, monitors, and periodically reports to the Agency on compliance with orbital debris mitigation requirements by NASA programs and projects.

d. Coordinates the adjudication of requests for relief to requirements in this NPR and NASA-STD-8719.14 with the Office of the Administrator and relevant Mission Directorates.

e. Initiates, in coordination with the relevant offices, notifications of Agency leadership and external agencies concerning uncontrolled reentries of NASA objects.

f. In coordination with OIIR, promotes the determination, adoption, and use of international orbital debris mitigation guidelines through international fora, such as the Inter-Agency Space Debris Coordination Committee (IADC) and the International Organization for Standardization (ISO).

2.1.2 The Chief, SMA maintains the ODPO to support the implementation of these responsibilities. As directed by the Chief, SMA, the ODPO:

a. Collects measurement data to characterize the orbital debris populations and the ever- changing orbital debris environment.

b. Maintains and leads the advancement of orbital debris models, assessment tools, and mitigation standards.

c. Provides technical evaluations of the Orbital Debris Assessment Reports (ODAR) and End of Mission Plans (EOMP).

d. Tracks the compliance with orbital debris mitigation measures by NASA programs and projects.

e. Assists U.S. Government departments and agencies on matters related to the characterization of the orbital debris environment and the application of orbital debris mitigation measures and policies.

f. Contributes to the determination, adoption, and use of international orbital debris mitigation guidelines through international fora such as the United Nations Committee on the Peaceful Uses of Outer Space, the IADC, and ISO.

## 2.2 Center-Level SMA Technical Authority

The Center-Level SMA Technical Authority, as defined in NPR 7120.5, NASA Space Flight Program and Project Management Requirements, will support the Chief, SMA in overseeing the implementation of procedures and technical requirements defined in this NPR and applicable standards by programs and projects at their Center, and ensures MDAAs and OSMA are informed regarding potential concerns about non-compliances with these documents.

## 2.3 Mission Directorate Associate Administrator

2.3.1 The MDAAs sponsoring NASA spaceflight missions and contributions to missions are accountable for the implementation of responsible orbital debris mitigation measures by spacecraft, embedded or attached spacecraft elements, other hardware contributions, and supporting launch services.

2.3.2 Accordingly, MDAAs:

a. Consider the adequacy of orbital debris mitigation measures during decisions regarding the formulation, implementation, extension, and termination of their missions.

b. Ensure missions use launch services that are subject to NASA-STD-8719.14 or a comparable standard accepted by the governmental entity providing authorization for the launch.

c. Initiate, in coordination with the relevant offices, notifications of Agency leadership and external agencies concerning controlled reentries of spacecraft under NASA authority.

d. Request relief from requirements for non-compliance(s) with orbital debris mitigation requirements by spacecraft or launch vehicles to be operated or operating under NASA authority.

## 2.4 Managers Responsible for NASA Spacecraft

2.4.1 NASA Project Managers responsible for spacecraft to be operated or operating under NASA's authority (including secondary payloads):

a. Plan and implement orbital debris mitigation measures for their spacecraft, including embedded or attached hardware elements provided by others, in compliance with NASA-STD- 8719.14.

b. Obtain the review and acceptance by the Chief, SMA or delegated organization of planned and implemented orbital debris mitigation measures for their spacecraft.

c. Continue to consider orbital debris mitigation objectives and requirements as an integral aspect of operational decisions.

## 2.5 Managers Responsible for Acquired Spaceflight Services

2.5.1 NASA Project Managers responsible for the acquisition of spaceflight services (including launch services):

a. Use services that are subject to NASA-STD-8719.14 or a comparable standard accepted by the governmental entity providing authorization for the launch.

b. If services are provided under NASA's authority to conduct spaceflight activities, obtain the review and acceptance by the Chief, SMA or delegated organization of planned and implemented orbital debris mitigation measures.

c. When services are not performed under NASA's authority, inform Agency leadership and relevant offices, via the Mission Directorate sponsoring the mission, of any known exceptions to orbital debris mitigation standards imposed by the authorizing governmental entity.

## 2.6 Managers Responsible for Hardware Contributions to Spaceflight Systems

NASA Program and Project Managers responsible for hardware elements to be embedded in or attached to a spacecraft or launch vehicle will plan and implement measures to support compliance by the spacecraft or launch vehicle with applicable orbital debris mitigation standards and review processes. This applies whether the hosting spacecraft or launch vehicle is managed by NASA or a partner organization.

## 2.7 Office of International and Interagency Relations (OIIR)

2.7.1 The Associate Administrator for OIIR, in coordination with the MDAA and OSMA:

a. Negotiates responsibilities and standards for the implementation of orbital debris mitigation with interagency or foreign partners participating in a joint mission.

b. Notifies the Secretary of State of any non-compliance with the ODMSP, as required by the U.S. National Space Policy.

# Chapter 3. Requirements

## 3.1 Mission Formulation

3.1.1 During formulation, Mission Directorates shall direct and verify that project plans, contracts, and agreements define applicable orbital debris mitigation standards and responsibilities for the implementation and review of orbital debris mitigation measures in accordance with this NPR. Mission Directorates should address orbital debris mitigation as part of Announcements of Opportunity for future missions.

3.1.2 Project Managers shall adopt NASA-STD-8719.14 as the applicable orbital debris mitigation standard for spaceflight systems to be operated under NASA's authority as described in section 1.2 of this NPR.

3.1.3 Agreements for the delivery of hardware by NASA to another U.S. Government agency, a U.S. non-governmental organization, or international partner may cite alternative orbital debris mitigation standards accepted by the governmental entity providing authorization and supervision of the spaceflight activities. NASA organizations involved in the preparation of such agreements should consult with the ODPO to establish whether such alternative standards are consistent with the ODMSP or are otherwise acceptable, e.g., consistent with the IADC Space Debris Mitigation Guidelines.

3.1.4 For projects subject to NPR 8705.4, Risk Classification for NASA Payloads, orbital debris mitigation responsibilities and standards should be included in the Assurance Implementation Matrix defined in that NPR.

3.1.5 For projects not following the life cycle model defined in NPR 7120.5, the project documentation should identify a schedule for the review of orbital debris mitigation measures that meets the intent of the schedule defined in this NPR. This includes, but is not limited to, projects implemented under NPR 7120.8, NASA Research and Technology Program and Project Management Requirements.

## 3.2 Pre-Launch Review of NASA Spacecraft

3.2.1 As defined in Chapter 2 of this NPR, the review of orbital debris mitigation measures implemented by spacecraft and launch vehicles operating under NASA's authority is performed by the ODPO on behalf of the Chief, SMA.

3.2.2 Project Managers responsible for spacecraft to be operated under NASA's authority shall:

a. Prior to the mission Preliminary Design Review (PDR) and Critical Design Review (CDR), prepare and obtain a review by the ODPO of the Orbital Debris Assessment Report. The purpose of these reviews is to confirm that the spacecraft and mission designs meet or are expected to meet NASA-STD 8719.14. Portions of the ODAR pertaining to the launch vehicle may be left incomplete if the information is not available.

b. Prior to the Operational Readiness Review (ORR) or equivalent readiness review, prepare and obtain concurrence on an updated ODAR covering the spacecraft and launch vehicle by or on

behalf of the Chief, SMA via the ODPO. Here, concurrence represents agreement that the spacecraft, launch vehicle and their planned launch, commissioning, operations, decommissioning, and disposal are compliant with NASA-STD 8719.14.

c. If the project does not follow the life cycle model defined in NPR 7120.5, follow the alternate review schedule established in accordance with paragraph 3.1.5.

3.2.3 Projects should keep the Mission Directorate informed regarding ODAR submittals and risks concerning the ability to meet applicable orbital debris mitigation standards.

3.2.4 The contents of ODARs are described in NASA-STD 8719.14. The ODPO normally requires 14 days to conduct its review.

3.2.5 Spacecraft using launch services that do not operate under NASA's authority or that are launching as secondary payloads on a launch vehicle are exempted from submitting the launch vehicle portion of the ODAR. Such projects should include a statement referencing this paragraph and identify the organizations responsible for reviewing orbital debris mitigation measures by the launch vehicle.

3.2.6 The ODPO normally documents and provides projects and Center-level SMA Technical Authority with the results of its reviews via the evaluation form defined in NASA-STD 8719.14. The ODPO will notify the Chief, SMA when ODARs do not demonstrate compliance with NASA-STD 8719.14 to determine the need for further action.

3.2.7 The ODPO may exempt projects from some or all analysis and reporting requirements defined in NASA-STD 8719.14 if the spacecraft's design and operational parameters fall within a standardized class of spacecraft that is approved by the Chief, SMA as being compliant with related technical requirements. In such cases, projects should document the basis for the exemption in the ODAR.

3.2.8 Table 1 summarizes the documentation and review requirements in this and other sections.

| Phase/Milestone<br>Project Deliverable | Formulation | PDR | CDR | ORR | Operations and Sustainment |
|---|---|---|---|---|---|
| **Documentation of responsibilities & applicable standards** | X (3.1.1) | | | | |
| **ODAR** | | X (3.2.2.a) | X (3.2.2.a) | X (3.2.2.b) | |
| **EOMP** | | | | Via ODAR (3.5.1) | X (3.5.3) |

**Table 1: Summary of documentation and review requirements for projects following the life cycle model defined in NPR 7120.5.**

# 3.3 Hardware Contributions

3.3.1 Project Managers responsible for hardware elements to be attached to or embedded in a spacecraft operating under NASA's authority (including spacecraft already on orbit) or launch vehicle should share information relevant to the planning, implementation, and review of orbital debris mitigation measures required by this directive with the program responsible for the spacecraft or launch vehicle. NASA-STD-8719.14 defines the contents of an abbreviated ODAR that may be used for that purpose.

3.3.2 Project Managers responsible for hardware elements to be attached to or embedded in a spacecraft not operating under NASA's authority should provide the operating entity with the information needed to demonstrate compliance with standards agreed to in accordance with paragraph 3.1.3 of this NPR.

3.3.3 If a host spacecraft has not been identified, Project Managers should prepare to share information as described in paragraph 3.3.1.

3.3.4 Once the hardware element is attached or embedded, the element is considered part of the spacecraft or launch vehicle for orbital debris mitigation purposes.

3.3.5 Project Managers responsible for on-orbit spacecraft operating under NASA's authority and embedding or attaching hardware elements not described in a pre-launch ODAR shall negotiate a schedule for the evaluation of orbital debris mitigation measures with OSMA and ODPO.

# 3.4 Launch Services

3.4.1 Orbital debris mitigation measures for launch vehicles to be operated under NASA's authority are normally reviewed as part of ODAR reviews described in section 3.2.

3.4.2 NASA managers providing launch services to non-NASA spacecraft should confirm prior to launch whether debris mitigation measures for those spacecraft were reviewed by the governmental entity providing authorization. Responsibilities for the review of orbital debris mitigation measures should be defined in relevant agreements. If a spacecraft cannot be shown to be compliant with NASA-STD 8719.14, the ODMSP, or an otherwise acceptable standard, e.g., the IADC Space Debris Mitigation Guidelines, the launch service manager should consult with OSMA and OIIR regarding further steps. NASA will not adjudicate requests for relief from orbital debris mitigation requirements for spaceflight systems that do not fall under its authority.

# 3.5 Mission Operations, Extensions, and Termination for NASA Spacecraft

3.5.1 For spacecraft operating in Earth orbit under NASA's authority, the final ODAR serves as the initial EOMP, which describes how the mission limits the generation of debris and protects the public and other spacecraft during decommissioning and disposal of operational spacecraft.

3.5.2 During the operations phase, projects should monitor the ability of the spacecraft to limit the generation of orbital debris and dispose of the spacecraft consistent with the final ODAR or EOMP, whichever is the most recent. Projects should inform the mission directorate and ODPO of events and conditions that significantly impact that ability.

3.5.3 Prior to any decision to extend a mission or otherwise change plans to decommission and dispose of a spacecraft operating in Earth orbit under NASA's authority in a manner that could reasonably be viewed as impacting adherence to the most recent EOMP, Project Managers responsible for such spacecraft shall prepare and obtain a review by the ODPO of an updated EOMP. The applicability of this requirement includes cases in which plans are changed due to the loss of a spacecraft's ability to perform previously planned decommissioning and disposal operations.

3.5.4 The updated EOMP should reflect the best available knowledge of the state of the spacecraft, its consumables, and the environment in which it operates.

3.5.6 The review of the updated EOMP will evaluate changes in the compliance with NASA- STD 8719.14 due to proposed changes. For operational missions already on-orbit, relief from requirements in NASA-STD-8719.14 is not required for existing non-compliances, e.g., those caused solely by design issues that existed prior to launch, changes in the environment models or assessment tools, or spacecraft anomalies or failures. In contrast, relief from the requirements via a waiver is required for non-compliances that would be the result of or worsened by planned operational changes or planned mission life extensions.

3.5.7 When a Mission Directorate intends to terminate a mission and/or decommission or terminate operation of a spacecraft, NPD 8010.3, Notification of Intent to Decommission or Terminate Operating Space Systems and Terminate Missions, requires notification of that intent to NASA Offices, including OSMA. The notification to OSMA should be provided via the

3.5.8 ODPO, and the information should include confirmation that the spacecraft will be passivated and disposed of in a manner that is consistent with the most recent EOMP.

# 3.6 Reentry and On-orbit Fragmentation Notifications

3.6.1 The ODPO, based on information provided by the U.S. Space Force, tracks and provides notifications of upcoming reentries of large NASA-related spaceflight systems to relevant NASA Offices and Mission Directorates.

3.6.2 To augment existing national procedures where the Department of Defense alerts "U.S. Government" agencies to the impending reentry of NASA-related space objects, OIIR may, in consultation with the relevant Mission Directorate, OSMA, Office of Communications, and the Office of the General Counsel, coordinate amplifying information with other U.S. Government agencies.

3.6.3 OIIR may also coordinate any NASA press releases for reentries with the Office of Communications, Office of the General Counsel, OSMA, the National Security Council, and the Office of Science and Technology Policy, United States Space Command (via Department of Defense Public Affairs), and the Department of Homeland Security, as needed.

3.6.4 Project Managers responsible for NASA-related spaceflight systems conducting controlled reentries, in coordination with the Mission Directorate, shall notify OSMA and OIIR via the ODPO

of such reentries to allow for coordination of external notifications and press releases. This notification may be accomplished as part of notifications required by NPR 8010.3.

3.6.5 The ODPO, based on breakup notifications provided by the Department of Defense, assesses risks from new major on-orbit fragmentation events to the International Space Station and to the environment. The ODPO also provides notifications, including results of the assessments, to OSMA and relevant NASA Offices.

# 3.7 Reporting

Not less frequently than every two years, the ODPO shall provide data concerning the compliance with orbital debris mitigation measures by NASA programs and projects to the NASA SESAB.

# Appendix A. Definitions

**Launch vehicle.** A vehicle used to transport a spacecraft beyond Earth's atmosphere, either into orbit around Earth or to a destination in outer space.

**Orbital debris mitigation.** Design and operational measures taken to limit:

- The release of orbital debris as part of normal spaceflight operations by spacecraft and launch vehicles.
- The potential for orbital debris generated by collisions or accidental explosions during operations and following decommissioning and disposal.
- The number of expended or decommissioned space objects remaining in orbit and their duration in orbit.
- The potential for human casualty from objects reentering Earth's atmosphere.

**Spacecraft.** A vehicle that is designed for travel or operation outside the earth's atmosphere. When present, any science or engineering hardware carried as payload are considered part of the spacecraft.

**Spaceflight system.** A spacecraft, launch vehicle, or element thereof.

# Appendix B. Acronyms

| | |
|---|---|
| AA/OIIR | Associate Administrator, Office of International and Interagency Relations |
| CDR | Critical Design Review |
| EOM | End of Mission |
| EOMP | End of Mission Plan |
| IADC | Inter-Agency Space Debris Coordination Committee |
| ISO | International Organization for Standardization |
| MDAA | Mission Directorate Associate Administrator |
| NPD | NASA Policy Directive |
| NPR | NASA Procedural Requirements |
| ODAR | Orbital Debris Assessment Report |
| ODPO | NASA Orbital Debris Program Office |
| ODMSP | Orbital Debris Mitigation Standard Practices |
| OIIR | Office of International and Interagency Relations |
| ORR | Operational Readiness Review |
| OSMA | Office of Safety and Mission Assurance |
| PDR | Preliminary Design Review |
| SESAB | Space Environment Sustainability Advisory Board |
| SMA | Safety and Mission Assurance |
| U.S. | United States |

# Appendix C. References

C.1 Space Policy Directive-3, National Space Traffic Management Policy (2018).

C.2 NPD 1000.3, The NASA Organization.

C.3 NPD 8010.3, Notification of Intent to Decommission or Terminate Operating Space Systems and Terminate Missions.

C.4 NPD 8700.1, NASA's Policy for Safety and Mission Success.

C.5 NPR 7120.5, NASA Space Flight Program and Project Management Requirements.

C.6 NPR 7120.8, NASA Research and Technology Program and Project Management Requirements.

C.7 NPR 8705.4, Risk Classification for NASA Payloads.

C.8 NPR 8079.1, NASA Spacecraft Conjunction Analysis and Collision Avoidance for Space Environment Protection.

C.9 NPR 8715.3, NASA General Safety Program Requirements.

C.10 NASA-HDBK-8719.14, Handbook for Limiting Orbital Debris.