NASA TECHNICAL STANDARD	**NASA-STD 8719.24 Revision A**
National Aeronautics and Space Administration Washington, DC 20546	Approved: 2022-03-30 Superseding: NASA-STD-8719.24 With Change 3

NASA PAYLOAD SAFETY REQUIREMENTS

Measurement System Identification:
Metric (English)

DOCUMENT HISTORY LOG

Status	Document Revision	Approval Date	Description
Baseline		2011-08-26	Initial Release *(JWL4)*
Change	1	2011-10-28	Addition of USAF/30SW & 45SW concurrence with NASA-STD 8719.24 *(JWL4)*
Change	2	2015-09-30	Revised information required on payload project's mission-specific tailored requirements title page. Added NASA electronic forms NF 1826 NASA ELV Payload Safety Post-Tailoring Equivalent Level of Safety Request and NF 1827 NASA ELV Payload Safety Waiver Request. *(SH)*
Change	3	2018-06-13	Updated the hyperlink (http://kscsma.ksc.nasa.gov/ELVPayloadSafety) for the NASA Expendable Launch Vehicle (ELV) Payloads website throughout the document and corrected the document approval date to match when the document baseline was approved.
Revision	A	2022-03-30	General update to remove reference to Expendable Launch Vehicle (ELV) and maintain consistency with NASA Procedural Requirement NPR 8715.7, NASA Payload Safety Program and NPR 8715.1, NASA Safety and Health Programs. Update USAF to USSF.

FOREWORD

This NASA technical standard provides uniform engineering and technical requirements for processes, procedures, practices, and methods that have been endorsed as standard for NASA programs and projects, including requirements for selection, application, and design criteria of an item.

This standard establishes technical safety requirements for unmanned orbital and unmanned deep space payloads that fly onboard launch vehicles. The requirements contained in this Standard and the Annex to NASA-STD 8719.24 were developed jointly by NASA and U.S. Space Force Range Safety representatives (SLD 30 and SLD 45) using Space Force Space Command Manual (SPFCMAN) 91-710, Range Safety User Requirements, and NASA safety standards.

This standard was developed by the NASA Office of Safety and Mission Assurance (OSMA). Requests for information, corrections, or additions to this standard should be submitted to the OSMA by email to Agency-SMA-Policy-Feedback@mail.nasa.gov or via the "Email Feedback" link at https://standards.nasa.gov.

/s/

WILLIAM RUSS DELOACH
CHIEF, SAFETY AND MISSION ASSURANCE

APPROVAL DATE

DEPARTMENT OF THE AIR FORCE
UNITED STATES SPACE FORCE
SPACE LAUNCH DELTA 45
SPACE LAUNCH DELTA 30

MEMORANDUM FOR NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
ATTENTION: MR. THOMAS FRATTIN

FROM: SLD 45/SE
1201 Edward H. White II Street
Patrick SFB FL 32925-3238

SLD 30/SE
806 13th Street Suite 3C
Vandenberg SFB CA 93437

SUBJECT: Approval of the use of NASA-STD-8719.24, *NASA Payload Safety Requirements*, for Payloads to be Processed and Launched from the Eastern and Western Ranges

1. The SLD 45 and SLD 30 Safety Offices approve the use of NASA-STD-8719.24, as the basis for which specific requirements tailoring for NASA payload programs can be completed in lieu of Air Force Space Command Manual (AFSPCMAN) 91-710, Volumes 1 and 3 and United States Space Force Command Manual (SPFCMAN) 91-710, Volumes 6 and 7. The authorities, responsibilities, and approvals required by the aforementioned requirements still apply. Additional tailoring of these requirements for specific programs requires the approval of SLD 45/SE or SLD 30/SE, dependent upon launch location.

2. The delta points of contact for this approval are Mr. Henry "Greg" Peebles, SLD 45/SEA, at e-mail henry.peebles@spaceforce.mil and Mr. Jeff Holmes, SLD 30/SEA, at e-mail jeffrey.holmes@spaceforce.mil.

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Date: 2022.01.31 11:34:15 -05'00'

PATRICK G. YOUNGSON, Colonel, USSF
Chief, Space Launch Delta 45 Safety

Digitally signed by GOTFRAIND.MARK.A.1230080042
Date: 2022.01.27 15:54:18 -08'00'

MARK A. GOTFRAIND, GS-15, DAF
Chief Engineer, Space Launch Delta 30 Safety

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CHAPTER 1. SCOPE

1.1 PURPOSE

This standard establishes the safety requirements for NASA payloads launched on unmanned launch vehicles.

1.2 APPLICABILITY

This standard is applicable to NASA Headquarters and NASA Centers, including Component Facilities and Technical and Service Support Centers. This document 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.

This document is applicable to unmanned orbital and unmanned deep space payloads that fly onboard launch vehicles (including aircraft-assisted launch vehicles such as Pegasus XL) and are managed by NASA, whether developed by NASA or any contractor or independent agency in a joint venture with NASA.

This document contains requirements that apply to each payload and its design, fabrication, testing, vehicle integration, launch processing, launch through payload separation, and planned recovery; payload-provided upper stages flown; interface hardware that is flown as part of a payload; and ground support equipment used to support payload-related operations. This document does not address in-flight spacecraft operational safety. The mission success and any scientific objectives of the payload are the responsibility of the Payload Project Office and are beyond the scope of this document.

In this standard, 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.

1.3 PRECEDENCE

The requirements contained in this standard are in full compliance with AFSPCMAN 91-710, Range Safety User Requirements; NASA Procedural Requirements (NPR) 8715.1, NASA Safety and Health Programs; NPR 8715.3, NASA General safety Program Requirements; and NPR 8715.7, NASA Payload Safety Program.

1.4 TAILORING AND WAIVERS/DEVIATIONS

Procedures in NPR 8715.7 govern tailoring/waiver/deviation/non-applicability for this document and its Annex.

CHAPTER 2. APPLICABLE AND REFERENCE DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The documents listed in this section contain provisions that constitute requirements of this standard as cited in the text. Use of more recent issues of cited documents may be authorized by the responsible Center Institutional Safety Discipline Leads and Project's Safety and Mission Assurance (SMA) Technical Authority. The applicable documents are accessible via the NASA Technical Standards System at https://standards.nasa.gov or may be obtained directly from the Standards Developing Organizations or other document distributors.

2.2 REFERENCE DOCUMENTS

SPFCMAN 91-710	Range Safety User Requirements
NPR 8715.1	NASA Safety and Health Programs
NPR 8715.3	NASA General Safety Program Requirements
NPR 8715.7	NASA Payload Safety Program
Annex to NASA-STD 8719.24	Annex to NASA Payload Safety Requirements
NASA-HDBK 8709.22	Safety and Mission Assurance Acronyms, Abbreviations, and Definitions
NF 1826	NASA Payload Safety Post-Tailoring Request
NF 1827	NASA Payload Safety Waiver Request

CHAPTER 3. ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

3.1 ABBREVIATIONS AND ACRONYMS

AFSPCMAN	Air Force Space Command Manual
ELS	Equivalent Level of Safety
JPL	NASA Jet Propulsion Laboratory
NASA	National Aeronautics and Space Administration
NC	Noncompliance
NEF	NASA Electronics Forms
NF	NASA Form
NODIS	NASA On-Line Directives Information System (NODIS can be accessed at http://nodis3.gsfc.nasa.gov/)
NPR	NASA Procedural Requirements
N/A	Not Applicable
PSWG	Payload Safety Working Group
SLD	Space Launch Delta
SMA	Safety and Mission Assurance
SPFCMAN	Space Force Command Manual
STD	Standard

3.2 DEFINITIONS

The terms used in the main body of this document are consistent with the terms defined in NPR 8715.7 and NASA-HDBK 8709.22, Safety and Mission Assurance Acronyms, Abbreviations, and Definitions. Volume 7 of the Annex contains definitions that apply to the Annex.

CHAPTER 4. GENERAL REQUIREMENTS

4.1 OVERVIEW

This standard is an element of the NASA Payload Safety Program defined by NPR 8715.7. NPR 8715.7 contains NASA's policy, roles and responsibilities, and safety review process requirements for safeguarding people and resources from hazards associated with payloads that will fly on unmanned launch vehicles. This standard delineates the information that is required for safety reviews and contains technical payload safety design and processing requirements.

4.2 REQUIREMENTS

a. NASA-STD-8719.24 Annex contains the NASA Payload Safety Requirements tailoring matrix. All NASA payload projects shall use this matrix in lieu of AFSPCMAN 91-710. This matrix is the product of a significant cooperative effort between NASA and U.S. Space Force Range Safety (SLD 30 and SLD 45) to tailor the applicable safety requirements for all NASA payload projects. The requirements in this matrix provide a streamlined starting point for NASA payload projects.

b. The requirements are provided in a matrix format to facilitate further tailoring of the requirements for each payload project to meet project-specific needs. Each payload project shall work with the project Payload Safety Working Group (PSWG) to implement the safety requirements tailoring process and the review and approval process in accordance with NPR 8715.7. Chapter 5 of this standard provides instructions for tailoring the Annex for a specific payload project.

c. The specific payload project tailored edition of the requirements matrix shall be placed on the project's contract, grant, or other agreement.

CHAPTER 5. INSTRUCTIONS FOR PROJECT-SPECIFIC TAILORING OF NASA PAYLOAD SAFETY REQUIREMENTS

5.1 GENERAL

Each NASA payload project shall follow these instructions to develop a project-specific tailored edition of the requirements matrix contained in the Annex to this standard.

> *NOTE: See NPR 8715.7 for the tailoring process and Volume 1, Attachment 1 of the Annex for tailoring instructions.*

5.2 TITLE PAGE

a. The Title Page shall be the first page of the NASA Payload-Specific Project Safety Requirements Document.

b. The Title Page, at a minimum, shall contain:

(1) Project Name

(2) Completion date of the latest version

(3) Contract number

(4) NASA Center acquiring the payload

(5) Name of the preparing organization/company, address, and phone number

(6) Signature, Name, Title, Organization, and Signature Date of the Preparer, Project Manager, Project's SMA Technical Authority, Range Safety Representative, and Payload Safety Working Group Chairperson

(7) Proprietary and necessary export control statements

5.3 FOREWORD TO THE ANNEX

The Foreword (provided in the Annex) is not to be tailored and shall remain as part of the final project-specific safety requirements document.

5.4 PAYLOAD SAFETY REQUIREMENTS TAILORING MATRIX

Tailoring is the process of assessing the applicable safety requirements within the NASA Payload Safety Requirements tailoring matrix for applicability to a specific payload project and evaluating the project's potential implementation in order to generate a set of specific safety requirements for the project.

The project-specific tailored matrix shall be submitted in the matrix format with the first column containing the ORIGINAL TEXT, the second column containing the STATUS, the third column containing TAILORED TEXT (if any), and the last column containing RATIONALE/COMMENTS.

NOTE 1: The requirements paragraphs found under the ORIGINAL TEXT column follow the numbering used in AFSPCMAN 91-710 for applicable payload requirements.

NOTE 2: AFSPCMAN 91-710 requirements that are not applicable to NASA payloads were eliminated. This results in an irregular numbering of paragraphs (certain paragraph(s) may appear to be skipped or missing because they were not applicable).

NOTE 3: Additionally, in some cases entire inapplicable volumes or chapters may be missing and are not included in the Annex. The absence of these requirements does not alter the Space Force or other applicable Range Safety authority. The project may add back any AFSPCMAN 91-710 requirements that are pertinent to their project upon agreement by the project's PSWG and Range Safety representatives.

5.4.1 STATUS

The STATUS column is used to indicate the applicability of a requirement to the project and if applicable, whether the requirement will be implemented as originally written or is tailored for the project. One of the following notes shall be used to indicate the status:

5.4.1.1 Compliant Paragraphs (C)

Paragraphs without any changes to the requirements or titles shall maintain the ORIGINAL TEXT and a "C" shall be placed in the STATUS column.

5.4.1.2 Not Applicable Paragraphs (N/A)

Paragraphs that are not applicable to the payload project shall be marked "N/A" under the STATUS column and a rationale or justification provided under the RATIONALE/COMMENTS column stating why the paragraph requirement is not applicable.

5.4.1.3 Tailored Paragraphs (T)

a. Paragraphs with any recommended changes (additions or modifications) shall be annotated with a "T" in the STATUS column, with the tailored paragraph requirement provided in its entirety under the TAILORED TEXT column.

b. New requirement paragraph(s) may also be added by placing a "T" in the STATUS column, of a new row, and placing the new requirement paragraph with a new paragraph number under the TAILORED TEXT column.

c. A clearly written rationale or justification shall be provided for every altered original or new paragraph in the RATIONALE/COMMENTS column.

5.4.1.4 Noncompliance (NC)

a. When a requirement cannot be met, the STATUS column shall be marked "NC" for noncompliance.

b. Paragraph changes (additions, modifications, or partial deletions) or any new requirement paragraph related to the noncompliance (NC) shall be fully written under the TAILORED TEXT

column with sufficient rationale and justification provided under the RATIONALE/ COMMENTS column explaining the reason for noncompliance and any alternative approach.

c. The PSWG and Range Safety representatives shall determine whether the NC provides an equivalent level of safety (ELS) or requires a waiver. Indicate "ELS" or "Waiver" as appropriate in the RATIONALE column and provide the waiver numbers (NASA and, if applicable, Space Force) if they are known.

d. ELS determinations made during the tailoring process do not require a NASA Form NF 1826, NASA Payload Safety Post-Tailoring Equivalent Level of Safety (ELS) Request Form. ELS requests made after the tailoring of the payload project-specific requirements have been completed and signed shall require approval via submittal of NF 1826, NASA Payload Safety Post-Tailoring Equivalent Level of Safety (ELS) Request Form or an equivalent form that contains all information required on NF 1826. ELS requests that impact Space Force property or resources shall also be submitted on a Launch Safety Requirements Relief Request if required by Space Force Range Safety. All these forms may be found on the NASA Electronics Forms (NEF) portal (https://nef.nasa.gov/) and on the NASA Payload Safety Program Website (http://kscsma.ksc.nasa.gov/PayloadSafety) under the Payload Safety Forms button on the left side of the homepage.

e. All waivers shall be requested using the NASA Form NF 1827, NASA Payload Safety Waiver Request Form and follow the waiver process found in NPR 8715.7.

5.4.1.5 Information/Title Paragraphs (I)

a. Paragraphs annotated with an "I" in the STATUS column are considered informational only.

b. These informational or title paragraphs shall remain in the final payload-specific requirements.

5.4.2 TAILORED TEXT

a. Changes to a requirement shall be documented in the TAILORED TEXT column adjacent to the original requirement in the NASA Payload Safety Requirements tailoring matrix, with the revised or new requirement stated in its entirety. This allows for easy comparison of the old requirement and the revised or new requirements. Changes to a requirement include additions, partial or whole deletions, and rewording modifications.

b. When a totally new requirement is proposed in addition to the requirements in the NASA Payload Safety Requirements tailoring matrix, a new paragraph number shall be entered in TAILORED TEXT column using the next paragraph number in the matrix's numbering scheme for the new requirement paragraph.

5.4.3 RATIONALE/COMMENTS

a. A thorough and informative rationale for all revisions shall be documented in the RATIONALE/COMMENTS column for any requirements in the NASA Payload Safety Requirements tailoring matrix that are not applicable (N/A) or are revised, modified, or added in the TAILORED TEXT column.

b. The rationale and/or comments shall be complete enough to succinctly justify the change to the NASA Payload Safety Requirements tailoring matrix.

NOTE 1: When the rationale or comments are lengthy, an attachment may be provided.

NOTE 2: The RATIONALE/COMMENTS column may also be used to reference other documents, waivers, or lengthy rationales or comments that are provided as an attachment.

NOTE 3: If the tailoring of a requirement results in an increased safety risk, NPR 8715.7 paragraph 1.4.6 requires the Payload Project Office to prepare and process a waiver request. This is in addition to entering the information into the tailoring matrix.

NOTE 4: A copy of this standard is available on the NASA Payload Safety Program Website at http://kscsma.ksc.nasa.gov/PayloadSafety.