NASA TECHNICAL STANDARD	**NASA-STD 8719.24 With Change 3**
National Aeronautics and Space Administration Washington, DC 20546	Approved: 2011-08-26 Superseding: NASA-STD-8719.24 With Change 2

NASA EXPENDABLE LAUNCH VEHICLE PAYLOAD SAFETY REQUIREMENTS

Measurement System Identification:
Metric (English)

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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.

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FOREWORD

This standard is published by the National Aeronautics and Space Administration (NASA) to provide technical safety requirements for unmanned orbital and unmanned deep space payloads that fly onboard Expendable Launch Vehicles (ELVs). The requirements contained in the Annex to this standard were developed jointly by NASA and U.S. Air Force Range Safety representatives (30th and 45th Space Wings) using Air Force Space Command Manual (AFSPCMAN) 91-710, Range Safety User Requirements, and NASA safety standards. These requirements are provided in a matrix format that was developed to facilitate project-specific tailoring of the safety requirements for each NASA ELV payload project (see the Annex).

This standard is approved for use by NASA Headquarters and NASA Centers, including Component Facilities and the Jet Propulsion Laboratory (JPL), and contractors/service providers to the extent specified in their contracts with NASA. This standard supplements the policy and requirements in NPR 8715.7, Expendable Launch Vehicle Payload Safety Program. This standard is compliant with AFSPCMAN 91-710, Range Safety User Requirements, and NASA safety standards.

This standard is a mandatory NASA standard to be applied to NASA ELV payload project contracts or agreements as cited in NPR 8715.7, Expendable Launch Vehicle Payload Safety Program.

Comments and questions concerning the contents of this publication should be referred to the National Aeronautics and Space Administration, Director, Safety and Assurance Requirements Division, Office of Safety and Mission Assurance, Washington, DC 20546 or via "Feedback" in the NASA Technical Standards System at http://standards.nasa.gov.

/s/

Bryan O'Connor
Chief, Safety and Mission Assurance

August 26, 2011

Approval Date

DEPARTMENT OF THE AIR FORCE
45TH SPACE WING (AFSPC)
30TH SPACE WING (AFSPC)

OCT 18 2011

MEMORANDUM FOR NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
ATTENTION: MR. CALVERT A. STAUBUS
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SUBJECT: Approval of the Use of NASA-STD-8719.24, NASA Expendable Launch Vehicle Payload Safety Requirements, for Payloads to be Processed and Launched from the Eastern and Western Ranges

1. Over the past two years, representatives from our organizations have been working with your organization to develop a joint set of tailored AF and NASA Expendable Launch Vehicle (ELV) payload safety requirements. The culmination of this effort is provided in NASA-STD-8719.24. This document provides a single set of payload safety requirements to be applied to all NASA ELV payloads launching from the Eastern and Western Ranges.

2. The 30th and 45th Space Wing Safety Offices approve the use of NASA-STD-8719.24 as the basis from which specific requirements tailoring for NASA ELV payload programs will be completed in lieu of AFSPCMAN 91-710. The authorities, responsibilities, and approvals required by AFSPCMAN 91-710 are not changed and still apply. Additional tailoring of these requirements for specific programs requires the approval of 30 SW/SE or 45 SW/SE, dependent upon launch location.

3. We believe the use of this document represents a significant improvement and adds efficiency over the previous process. The NASA support necessary to accomplish this task is sincerely appreciated.

4. Our points of contact are Mr. Ron Valentine, 30 SW/SEA, (805) 606-2489, Ronald.Valentine@vandenberg.af.mil, and Mr. Jeff Wethern, 45 SW/SEA, (321) 494-3286, .Jeffrey.Wethern@Patrick.af.mil.

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CHAPTER 1. SCOPE

1.1 PURPOSE

This standard establishes the safety requirements for NASA payloads launched on unmanned Expendable Launch Vehicles (ELVs).

1.2 APPLICABILITY

This document is applicable to NASA Headquarters and NASA Centers including component facilities, programs, projects, and technical and service support centers. This document applies to JPL, other contractors, and grant recipients only to the extent specified or referenced in applicable contracts, grants, or agreements. Unless otherwise specified, the term "Center" throughout the rest of this document is meant to include NASA Component Facilities and JPL.

This document is applicable to unmanned orbital and unmanned deep space payloads that fly onboard ELVs (including aircraft-assisted ELVs such as Pegasus) 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 ELV payload and its design, fabrication, testing, vehicle integration, launch processing, launch through payload separation, and planned recovery; payload-provided upper stages flown on ELVs; 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.

This document applies to ELV payloads developed under a NASA grant or cooperative agreement (to the extent specified in the grant or agreement) to ensure compliance with Federal, State, and local requirements relating to safety as specified in NPR 5800.1, Grant and Cooperative Agreement Handbook (14 CFR 1260.37), and to ensure that the payload project properly implements the safety requirements pertaining to use of NASA facilities, NASA contracted facilities, and equipment.

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) 8715.3, NASA General Safety Program Requirements; and NPR 8715.7, Expendable Launch Vehicle Payload Safety Program.

1.4 TAILORING AND WAIVERS/DEVIATIONS

Procedures in NPR 8715.5 and NPR 8715.7 govern tailoring/waiver/deviation/non-applicability for this document and its Annex. This document is not subject to the processes defined in NASA-STD 8709.20, Management of Safety and Mission Assurance (SMA) Technical Authority (TA) Requirements, as stated in section 4.1.2a and Appendix C of NASA-STD-8709.20.

CHAPTER 2. APPLICABLE DOCUMENTS

2.1 GENERAL

The documents listed in this section are referenced within this document. The latest issuances of cited documents shall be used unless otherwise indicated. The references used in this document and its Annex are accessible via the NASA Online Directives Information System (NODIS) at http://nodis3.gsfc.nasa.gov/, or the NASA Technical Standards System at http://standards.nasa.gov, or the ELV Payload Safety Program's website at http://kscsma.ksc.nasa.gov/ELVPayloadSafety, or directly from the Standards Developing Organizations (SDOs) or other document distributors. For documents placed on contracts, the version specified in the contract is normally used unless otherwise stated in the contract.

The documents listed in this section do not include all of the references used in the Annex. These references are found at the end of Volume 7 of the Annex.

2.2 GOVERNMENT DOCUMENTS

AFSPCMAN 91-710	Range Safety User Requirements
NPR 8715.3	NASA General Safety Program Requirements
NPR 8715.5	Range Safety Program
NPR 8715.7	Expendable Launch Vehicle Payload Safety Program
NASA-STD 8709.22	Safety and Mission Assurance Acronyms, Abbreviations, and Definitions

CHAPTER 3. ABBREVIATIONS, ACRONYMS, AND TERM DEFINITIONS

3.1 ABBREVIATIONS AND ACRONYMS

Acronym	Term
AFSPCMAN	Air Force Space Command Manual
ELS	Equivalent Level of Safety
ELV	Expendable Launch Vehicle
JPL	NASA Jet Propulsion Laboratory
NASA	National Aeronautics and Space Administration
NODIS	NASA On-Line Directives Information System (NODIS can be accessed at http://nodis3.gsfc.nasa.gov/)
NPR	NASA Procedural Requirements
PSWG	Payload Safety Working Group

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-STD 8709.22, Safety and Mission Assurance Acronyms, Abbreviations, and Definitions. Volume 7 of the Annex contains term definitions that apply to the Annex.

CHAPTER 4. GENERAL REQUIREMENTS

4.1 OVERVIEW

This standard is an element of the NASA ELV 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 ELVs. This standard delineates the information that is required for safety reviews and contains technical payload safety design and processing requirements.

4.2 OBJECTIVES

a. The Annex to this standard contains the NASA ELV Payload Safety Requirements tailoring matrix. All NASA ELV 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. Air Force Range Safety (30th and 45th Space Wings) to tailor the applicable safety requirements for all NASA ELV payload projects. The requirements in this matrix provide a streamlined starting point for NASA ELV 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 EXPENDABLE LAUNCH VEHICLE PAYLOAD SAFETY REQUIREMENTS

5.1 GENERAL

Each NASA ELV 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 ELV 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, Launch Services Program 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 ELV PAYLOAD SAFETY REQUIREMENTS TAILORING MATRIX

Tailoring is the process of assessing the applicable safety requirements within the NASA ELV 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 ELV 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 Air 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 recommended changes (additions or modifications) not altering a requirement in the ORIGINAL TEXT 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 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 Noncompliant Paragraphs (NC)

a. When a requirement is not going to be met, the STATUS column shall be marked "NC" for noncompliant.

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, Air Force) if they are known.

d. ELS determinations made during the tailoring process do not require a NASA Form NF 1826 NASA ELV 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 the NASA ELV 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 Air Force property or resources shall also be submitted on a Launch Safety Requirements Relief Request if required by Air Force Range Safety. All these forms may be found on the NASA Electronics Forms (NEF) portal (https://nef.nasa.gov/) and on the NASA ELV Payload Safety Program Website (http://kscsma.ksc.nasa.gov/ELVPayloadSafety) under the ELV Payload Safety Forms button on the left side of the homepage.

e. All waivers shall be requested using the NASA Form NF 1827 NASA ELV Payload Safety Waiver Request Form and follow the waiver process found in NPR 8715.7, paragraphs 1.4.7 and 1.4.8.

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 ELV 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 ELV 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.

c. All tailored changes to a requirement shall include a sufficient rationale (see 5.4.3).

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 ELV 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 ELV 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 ELV Payload Safety Program Website at http://kscsma.ksc.nasa.gov/ELVPayloadSafety.