

MWI 8715.10

REVISION I

EFFECTIVE DATE: September 22, 2020

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MARSHALL WORK INSTRUCTION

QD01

EXPLOSIVES, PROPELLANT, AND PYROTECHNICS PROGRAM

COMPLIANCE IS MANDATORY

DIRECTIVE IS UNCONTROLLED WHEN PRINTED

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Change/ Revalidation/ Canceled)	Document Revision/ Change	Effective Date	Description
Baseline		12/27/99	
Revision	A	6/25/01	Renumbered document to be consistent with other 8715 series documents. Alphabetized paragraphs 3 & 4. Added paragraph 5.2 CERTRAK definition. Made editorial changes to paragraphs 6.1.1, 6.1.1.1.b, 6.1.1.1.f, 6.1.1.3, 6.1.1.3.b, 6.1.2.1, 6.1.2.3, 6.1.4.1, 6.1.4.2, 6.1.5.4b, 6.1.5.6a, 6.1.5.6.b, 6.1.6.1, 6.1.6.3a, 6.1.6.3b, and 6.1.6.3.b. Spelled out APRS, provided directions for forwarding requisitions to S&MA, and provided marking instructions in Paragraph 6.1.2.1. Added instructions for S&MA notification in Paragraph 6.1.2.5. Corrected paragraph 6.1.5.1 to provide the correct process. Deleted S&MA notification in paragraph 6.1.5.4a. Added paragraph 6.1.8, "Emergency Notifications". Added paragraphs 9.5 & 9.6, records requirements. Added paragraph 10.2, recommended training. Updated paragraph 12 to reflect the proper cancellations.
Revision	B	10/29/2004	Revised to bring document in compliance with the HQ Rules Review Action (CAITS: 04-DA01-0387). Changes were also made to reflect S&MA organizational name changes (i.e., QS to QD). Format changes. Added Applicable Documents, Deleted Reference documents. Update procurement system and Logistics contractor definitions. Corrected the explosives management process in paragraph 6.1. Made editorial changes throughout document. Added requirements in paragraphs 6.1.4.3, 6.1.9.1, and 6.4.10. updated maintenance of records in paragraphs 9.4, 9.5, and 9.6
Revision	C	4/9/2007	Updated organization names and codes throughout. Updated Applicable Documents section to correct documents listed and added NPR 1441.1. Updated Records section to reflect NASA records management requirements. Minor administrative changes to provide added clarity have been included throughout. Added paragraph 5.9, definition for pressurant. Added legal statement to paragraph 6.1. Reworded Paragraph 6.1.1.1.f. Reworded Paragraph 6.1.1.3.a. Deleted "Requests for issuance shall be routed to LSC and S&MA through e-mail." from paragraph 6.1.5.3. Added paragraph 6.3.3. Changed paragraph 6.4.3. [On 7/30/2007, an administrative deletion was made at 6.1.3, 6.1.3.2, and 6.1.4.1 a., b., and c. by the MSFC Directives Manager upon the recommendation of the Protective Services Office and agreement by the OPRD.]
Revision	D	9/18/2008	Revised 2. Applicability statement to address the applicability of this directive to the Michoud Assembly Facility. Added 6.5 to address MAF. Made one "shall" per paragraph. Revised sections 9 and 10. Renumber some paragraphs. Reflects minor editorial changes. Added table of contents.
Revision	E	1/14/2011	Revised to reflect changes in how explosives are purchased and how the Redstone ESDB will support MSFC. Added Explosive Licenses and Explosive Site Plans.
Change	I	11/18/2011	On 11/18/11, administrative change made in Appendix C to correct numbering from B.1 to C.1
Revision	F	12/18/2012	Total rewrite. Revised per 2011 management review. Rearranged some sections and deleted others so that the flow is easier to follow and the requirements are clearer. Definitions in Appendix A, Acronyms in Appendix B, Records in Appendix D, Training in Chapter 1.

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Revision	G	8/7/2014	Revised paragraph 5.5.5 added "provided to the MSFC ESO annually" Added requirement in paragraph 5.5.6 and record retention in D.2.
Revision	H	7/20/2015	Revised throughout to address organizational and operational changes for Redstone Arsenal support. Added note to 5.1.10 to address employee certification. Added section 5.6 to address disposal. Added section 5.7.5 to address RF and ESD. Made editorial changes throughout document.
Change	1	3/21/2016	On 3/21/16, at the request of the OPRD, an administrative change was made to remove Support Agreement W6WQAA-14220-004 as an applicable document and its citation at 5.3.3, and update document title at 4.22.
Change	2	3/1/2017	On 3/1/17, at the request of the OPRD, an administrative change was made to change MSFC Form 4551 to NASA Form 1791 at 4.15.
Revision	I	9/22/2020	Updated organizational acronyms, removed abbreviations and editorial corrections to be in compliance with NPR 1400.1. Removed 5.2.4.4 Note, changed 5.2.5 address, added form requirement to 5.3.1, clarified 5.3.4 Note, updated 5.3.5 language, and updated language in 5.6.2.

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1. PURPOSE

To provide general instructions for all employees working with explosives, propellants, and pyrotechnics in accordance with NASA Procedural Requirement (NPR) 8715.3.

2. APPLICABILITY

2.1 This Marshall Work Instruction (MWI) applies to Center personnel, programs, projects, and activities, including contractors and resident agencies to the extent specified in their respective contracts or agreements. (“Contractors,” for purposes of this paragraph, include contractors, grantees, Cooperative Agreement recipients, Space Act Agreement partners, or other agreement parties.)

2.2 This MWI applies to the Michoud Assembly Facility (MAF).

2.3 This MWI applies the following: 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.

2.4 This MWI applies the following: all document citations are assumed to be the latest version unless otherwise noted.

3. AUTHORITY

NPR 8715.3, NASA General Safety Program Requirements

4. APPLICABLE DOCUMENTS AND FORMS

4.1 29 CFR Part 1910, Labor

4.2 49 CFR Part 172.800, Hazardous Materials Table, Special Provisions, Hazardous Materials Communication, Emergency Response Information, Training Requirements, and Security Plans

4.3 49 U.S.C., Transportation

4.4 MPR 3410.1, Training

4.5 MPR 4500.1, Management of Propellants and Pressurants

4.6 MWI 3410.1, Personnel Certification Program

4.7 MWI 5100.1, Initiating Procurement Requisitions

4.8 MWI 8715.15, Ground Operations Safety Assessment Program

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- 4.9 NRRS 1441.1, NASA Records Retention Schedules
- 4.10 NASA-STD-8719.12, NASA Safety Standard for Explosives, Propellants, and Pyrotechnics
- 4.11 MSFC-SPEC-164, Cleanliness of Components for Use in Oxygen, Fuel, and Pneumatic Systems
- 4.12 MSFC-STD-1800, Electrostatic Discharge (ESD) Control for Propellant and Explosive Devices
- 4.13 ANSI/AIAA G-095-2004, Guide to Safety of Hydrogen and Hydrogen Systems
- 4.14 ASTM MNL36, Safe Use of Oxygen Systems: Handbook for Design, Operation, and Maintenance
- 4.15 NASA Form 1791, Explosive Facility License
- 4.16 DA Form 581, Request for Issue and Turn-In of Ammunition
- 4.17 DA Form 1687, Notice of Delegation of Authority - Receipt for Supplies
- 4.18 DD Form 250, Material Inspection and Receiving Report
- 4.19 DD Form 626, Motor Vehicle Inspection (Transporting Hazardous Materials)
- 4.20 DD Form 1149, Requisition and Invoice/Shipping Document
- 4.21 Supply and Service Division, Support Services Standard Operating Procedure

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5. INSTRUCTIONS

5.1 General

5.1.1 Explosive operations shall be performed in accordance with the applicable requirements of NASA- Standard (STD)-8719.12 and Marshall Space Flight Center (MSFC)/MAF operational and safety standards.

5.1.2 An MSFC Explosive Safety Officer (ESO) shall be appointed by the MSFC Center Director in accordance with NPR 8715.3.

5.1.3 All explosive operations at MSFC/MAF shall be coordinated with the MSFC ESO for review and approval.

5.1.4 All explosive operations at MAF shall be coordinated with the Safety and Mission Assurance (SMA) Manager/MAF.

5.1.5 Only the minimum quantities of explosives shall be on hand in support of approved projects or activities.

5.1.6 Accountability of explosives shall be maintained until they are expended in use, turned in as excess, or disposed of.

NOTE: Maintain all documentation to include procurement documentation and records of expended materials.

5.1.7 Explosive site plans/licenses shall be developed/obtained and approved by the ESO.

5.1.7.1 Guidance for the development of explosive site plans can be obtained from the ESO and NASA-STD-8719.12.

5.1.7.2 Explosive Licenses shall be requested and obtained from the ESO through MSFC Form 4551.

5.1.8 Explosives which are excess to the needs of MSFC/MAF or are determined to be of no further use due to deterioration, obsolescence, or are otherwise considered unsafe for use shall be disposed of in a timely manner.

5.1.9 At MSFC, a Department of the Army (DA) Form 1687 “Notice of Delegation of Authority Receipt for Supplies” shall be completed at least annually or as changes occur, and filed with the Logistics Readiness Center (LRC) Ammunition Supply Point (ASP), by each office with personnel authorized to withdraw or turn-in explosives.

NOTE: Approval signature is Office Manager level. The DA Form 1687 along with the Managers appointment letter is provided to ASP to provide them with a list of National

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Aeronautics and Space Administration (NASA) personnel who are authorized to request, receive, and turn-in explosives.

5.1.10 Only qualified personnel certified in accordance with MWI 3410.1 perform explosive operations.

NOTE: Under special circumstances, the ESO can issue a limited certification for personnel who have not fulfilled all the requirements of MWI 3410.1. If a limited certification is issued, the personnel are only allowed to perform the task(s) allowed in the limited certification.

5.1.11 Offices storing materials at ASP shall assist ASP in the conduct of inventories or inspections, as requested.

5.1.12 Programs storing materials at MAF shall assist SMA in conduct of those inventories or inspections, as requested.

5.1.13 For explosives stored at ASP, all requests for issue or turn-in shall be in accordance with Redstone Arsenal Supply and Services Division, Consolidated External Standard Operating Procedure (ESOP). This ESOP is available from the Ammo Division Supervisor (see 5.2.5 of this MWI for contact information) or the MSFC ESO.

NOTE: Issue and turn-in of explosives at on-site MSFC/MAF storage facilities are controlled by procedure for each storage location.

5.1.14 For shipment of explosives from MSFC to another location, contact ASP for packaging requirements.

5.1.15 A transportation security plan shall be developed in accordance with 49 Code of Federal Regulations (CFR) 172.800 when transporting explosives.

5.2 Procurement Procedures

5.2.1 Explosives shall be procured through the Office of Procurement in accordance with MWI 5100.1. After receiving ESO and SMA approval, explosives will be procured by the requiring program.

5.2.2 Purchase requisitions for explosives shall include a statement requesting the supplier to include in the purchasing documentation the explosive markings and shipping address specified in paragraph 5.2.4 and 5.2.5, as well as the following documentation:

5.2.2.1 Department of Transportation (DOT) "Letter of Competent Authority"

NOTE: A Department of Defense (DoD) Interim Hazard Classification (IHC) may be required for explosive that will be stored on Redstone property. The DOT letter assigns a

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hazard classification for transportation and the DoD IHC is for storage. Consult with ASP to determine if an IHC is required for explosives stored on Redstone property. AMCOM provides DoD Interim Hazard Classification support for Redstone Arsenal. If AMCOM provides support in determination of hazard classification, various fees may be charged for the service.

5.2.2.2 Company or government “Shipper” forms

5.2.2.3 DD250/DD1149 or other property forms

5.2.2.4 Safety Data Sheet (SDS)

NOTE: If SDS does not contain information concerning Radio Frequency (RF) and ESD sensitivity, additional information may be needed from the supplier.

5.2.3 The MSFC ESO shall concur with all procurement requests for explosives including items procured by contractors and external customers.

5.2.4 Shipping or storage containers for explosives to be stored at Redstone ASP shall be clearly marked with contents, to include:

5.2.4.1 Part number

5.2.4.2 Serial number if applicable

5.2.4.3 DOT nomenclature/hazard classification

5.2.4.4 National Stock Number (NSN)

5.2.4.5 Gross weight and net explosive weight

5.2.4.6 Marked as NASA or MSFC property

5.2.4.7 A MSFC point of contact (POC)/phone number

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5.2.5 All explosives are required to be marked and shipped to the “Ammunition Supply Point.” All shipments are processed through the ASP and U. S. Army Quality Assurance Specialist Ammunition Surveillance (QASAS) Office prior to storage or transfer to or pickup by NASA. All shipments are to be addressed as follows:

Ammunition Supply Point
 Building 8763, Pershing Road
 ATTN: ASP Branch Chief/Accountable Officer 256-876-1332
 ATTN: NASA, ET10 Dennis Strickland 256-544-4165 or Steve Rodgers, 256-544-2973
 Redstone Arsenal, Alabama 35898-5330

5.2.5.1 Explosives received at other addresses are re-directed to Building 8763.

5.2.5.2 All explosive shipments for MAF use will be received through Gate 12.

5.3 Receiving Procedures

5.3.1 All MSFC explosive shipments should be coordinated with the ASP prior to delivery at ASP. NASA personnel or designated contractor personnel are required to notify the Army ASP in advance of the shipment and provide an MSFC point-of-contact. All MAF explosives shipments will be coordinated with SMA and Protective Services prior to delivery at MAF. Refer to MSFC Form 4694 for process handling of explosive shipments.

NOTE: The MSFC point-of-contact is required to have a current DA Form 1687 on file with ASP to withdraw/turn-in explosives at ASP.

5.3.2 All MSFC explosive shipments shall be processed through the Redstone ASP. All explosive shipments for MAF use will be received through Gate 12. Under no circumstances will explosives be received at the Shipping and Receiving Department at Building 103.

5.3.3 In agreement between MSFC and ASP, ASP has agreed to perform the following functions:

5.3.3.1 Receive, inspect, store, transport, provide hazardous materials (HAZMAT) shipping certification, issue, and inventory of explosive material(s) for MSFC users.

5.3.3.2 For explosives stored at ASP provide actual issue and delivery direct to the MSFC customer’s use point.

5.3.3.3 Maintain the master inventory system records for all MSFC-controlled explosives under their control.

5.3.3.4 Provide reports of inventory on an as-needed basis to the appropriate owning organizations within the Center.

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5.3.4 Explosive shipments shall be arranged in advance by the POC for the explosives, and are either stored at the ASP, directed to an MSFC approved storage or use area by the POC for the explosives or picked-up by the POC for the explosives for delivery to an MSFC-approved storage or use area.

NOTE: Inspections can be requested at Building 8762.

5.3.4.1 Items entering the ASP system require a DA 581.

NOTE: Items directed to NASA or for NASA pickup without entering the ASP system do not require a DA 581.

5.3.4.2 The vehicle used to pick up explosives from ASP shall have current inspection (DD Form 626).

5.3.4.3 Contractor employees who pick up explosives shall be certified and have a Commercial Driver's License (CDL) with HAZMAT endorsement per 49 United States Code (U.S.C.) and the driver accompanied by a second individual who is certified.

5.3.4.4 MSFC employees who pick up explosives shall be certified and have met the training requirements of AR655-30.

5.3.5 MSFC doesn't designate explosive traffic routes. However, all explosive shipments shall be coordinated with MSFC ESO or their designated representative prior to utilize any route other than standard traffic flow.

5.3.6 Items received in cardboard containers that will be stored at ASP are required to be maintained in the original cardboard box to ensure traceability, placed in a wooden or metal container, and all markings transferred to the wooden or metal container.

5.3.7 The responsible MSFC POC for the explosive shipment shall ensure the shipping paperwork is delivered to MSFC Central Receiving (Building 4631) within 24 hours for processing.

5.3.8 The responsible organization shall maintain a copy of all paperwork for traceability. Paperwork and traceability will be required if the item is ever disposed of, shipped off Redstone, or put into ASP storage.

5.4 Issuance/Turn in Procedures for Explosives Stored at ASP

5.4.1 For issuance or turn in of explosives, submit a DA Form 581 "Request for Issue and Turn-in of Ammunition" in advance of the requested issue date. The request can be submitted no later than 5 days and not sooner than 20 days prior to the needed date of issue. Appointment for ammunition pickup from the ASP must be made 48 hours in advance.

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5.5 Storage Procedures for MSFC/MAF

5.5.1 Storage of MSFC-controlled explosives, solid propellants, and pyrotechnics shall be in MSFC ESO-approved storage facilities/sites to ensure compliance with safety and security regulations.

5.5.2 Materials within specific storage locations shall be stored in such a manner as to ensure compatibility, as defined in NASA-STD-8719.12.

5.5.3 Questions concerning storage location and compatibility requirements shall be addressed to the MSFC ESO for MSFC/MAF locations.

5.5.4 User organizations shall develop and maintain an inventory list of all explosive material to include expenditures.

5.5.5 A copy of the explosive, propellant, and pyrotechnics inventory of material stored on MSFC/MAF shall be provided to the MSFC ESO annually and on an as-needed basis.

5.5.6 All inert or expended explosives shall be marked, labeled, stenciled or tagged as to their status which is traceable to verification paperwork.

5.5.7 If explosives are to be stored by ASP, a designated NASA or contractor personnel will submit a DA Form 581 "Request for Issue and Turn-in of Ammunition" to ASP.

5.5.8 User organization shall perform and document a quarterly condition of material assessment.

5.5.8.1 Any material that is determined to be unsuitable for use shall be properly disposed of and removed from the active inventory in accordance with section 5.6.

5.6 Transfer of Explosives for Disposal

5.6.1 All explosives or expended items still containing hazardous materials shall be disposed of through Redstone Open Burn Open Detonation (OBOD).

AMRDEC, Open Burn Open Detonation
 Building 7310, Blueberry Road
 Redstone Arsenal, Alabama 35898-5330
 OBOD Planner 256-876-1341
 OBOD Operations Manager 256-876-0799

5.6.2 A DA Form 581 "Request for Issue and Turn-in of Ammunition," SDS and Explosive Waste Profile Sheet for each item on the form (this form is obtained from OBOD) will be required to transfer explosives and expended items to OBOD for disposal. Coordinate with OBOD for all documentation prior to transferring any materials.

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NOTE: Obtain a copy of the completed forms from OBOD for traceability and inventory.

5.6.3 Coordinate with OBOD to verify funding and schedule disposal.

5.6.4 Coordinate with OBOD to arrange for OBOD to pick up items or for NASA to deliver items to building 7310.

NOTE: If NASA vehicles are used to transport explosives and expended items, all the requirements for vehicle inspection and drivers still apply.

5.7 Safety Requirements for Explosives, Propellants, and Pyrotechnics

5.7.1 Detailed procedures, plans, drawings, and other documentation to safely control explosive operations shall be developed in accordance with NASA-STD-8719.12 and MWI 8715.15.

5.7.2 User organizations shall provide explosive operations documentation to the MSFC ESO for review and approval prior to operations involving explosives.

NOTE: The MSFC ESO resides in the Industrial Safety Branch (ISB); therefore, the MSFC ESO approval constitutes ISB approval meeting the approval requirements of MWI 8715.15.

5.7.3 Personnel involved in transporting, storing, handling, using and inspecting explosives, propellants, and pyrotechnics shall be certified in accordance with MWI 3410.1.

5.7.4 Control of Electrostatic Discharge (ESD) for explosive, propellant, and pyrotechnics operations shall be in accordance with MSFC-STD-1800 and NASA-STD-8719.12.

5.7.5 No radio frequencies RF (cell phone, two-way radio, etc.) are allowed within 25 feet of Electro Explosive Device (EED) sensitive explosives, propellants, and pyrotechnics. This distance can be lessened if an RF analysis, per NASA-STD-8719.12 is performed to reduce this requirement.

5.7.6 Hazard assessments required by MWI 8715.15 shall be performed in accordance with MWI 8715.15 for explosive, propellant, and pyrotechnics operations. Consult with the MSFC ESO for required hazard assessments for specific operations.

5.7.7 Quantity distance requirements in accordance with NASA-STD-8719.12 shall be determined and approved by the MSFC ESO for all explosive, propellant, and pyrotechnics operations and storage facilities.

5.7.8 Explosive operations in process during electrical storms shall be in accordance with NASA-STD-8719.12.

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NOTE: NASA-STD-8719.12 requires evacuation when an approaching electrical storm is within 5 miles but MSFC requires a more stringent 10 mile evacuation.

5.7.9 Immediate evacuation of an area shall occur in any situation where it is deemed that the explosives, propellants or pyrotechnics in the area have become unstable or pose an immediate explosive hazard.

5.7.10 In an emergency where personnel are injured or in case of a fire, call 911. If using a non-MSFC network phone, tell the operator you are located on MSFC. To assist the emergency responders, be specific in identifying your location by providing a building number or street name. At MAF, call 911. If using a non-MAF network phone, call 504-257-2333 and tell the operator where you are located at MAF. To assist the emergency responders, be specific in identifying your location by providing the building floor, and column number or street name.

5.8 Liquid/Gaseous Propellants and Pressurants

5.8.1 Procurement of propellants and pressurants shall be per Marshall Procedural Requirements (MPR) 4500.1.

5.8.2 Flammable liquid and gaseous systems and components shall be purged with an inert media prior to introduction of the flammable media to preclude the development of a flammable mixture.

5.8.3 Cryogenic systems shall be purged with an inert or nonreactive material prior to the introduction of the cryogen to remove moisture/residual cleaning solvents from the system.

5.8.4 Propellant systems and components shall be cleaned to the requirements of MSFC-Specification (SPEC)-164.

5.9 Pyrophoric/Hypergolic Fuels

5.9.1 Systems and operations using pyrophoric/hypergolic fuels shall conform to the manufacturer's recommendations.

5.9.2 Full face shields, impervious clothing, including appropriate chemically-compatible gloves shall be worn when handling pyrophoric fuels.

5.9.3 Full face shield, self-contained breathing apparatus and Class 1 full body suit shall be worn when handling the following:

5.9.3.1 Earth storable hypergolic fuels (i.e., hydrazine, alkyl substituted hydrazines, monomethylhydrazine (MMH), 1,1-dimethylhydrazine (UDMH), alkylamines, mixtures thereof, strained ring hydrocarbons, or unsaturated hydrocarbons).

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5.9.3.2 Oxidizer compounds (including inhibited red fuming nitric acid (IRFNA), white fuming nitric acid (WFNA), nitrogen tetroxide (N₂O₄, NTO), chlorine trifluoride (ClF₃, CTF), nitrogen oxide mixtures using nitrogen monoxide (NO) and nitrogen tetroxide (N₂O₄) often referred to as Mixed Oxides of Nitrogen (MON)25, MON20, MON3)

5.9.3.3 Hydrogen peroxide of 30 percent by weight and greater.

5.9.4 Pyrophoric/hypergolic fuels systems shall be designed for minimum capacity and purging of all residual fuels.

5.9.5 Pyrophoric/hypergolic fuels shall be stored in properly labeled and serviceable holding containers, cabinets, and drums.

5.9.6 Pyrophoric/hypergolic fuels shall not be stored with any kind of explosive or propellant.

5.9.7 Hydrazine systems and operations shall conform to the recommended guidance provided by SMA.

5.10 Hydrogen

5.10.1 Hydrogen systems and operations shall conform to the requirements of 29 CFR Part 1910 subpart H, "Hazardous Materials" and American National Standards Institute (ANSI)/American Institute of Aeronautics and Astronautics (AIAA) G-095-2004.

5.10.2 Areas around hydrogen burn stacks shall be maintained clear of vegetation and other combustibles for a radius of 100 feet.

5.11 Rocket Propellant-1 (RP-1)

5.11.1 RP-1 propellant systems and operations shall conform to the requirements of NASA-STD 8719.12.

5.12 Oxygen

5.12.1 Oxygen systems and operations shall conform to the requirements of 29 CFR Part 1910 subpart H, "Hazardous Materials" and American Society for Testing and Materials (ASTM) Manual (MNL)36.

5.12.2 Oxygen enrichment detection systems shall be provided in areas where release of oxygen could increase the oxygen level above 23 percent by volume.

5.13 Nitrogen and Helium

5.13.1 Nitrogen and helium systems and operations shall conform to the recommended guidance provided by SMA.

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5.13.2 Oxygen deficiency detection systems shall be provided in areas where nitrogen release could reduce the oxygen level below 19.5 percent by volume.

5.14 Other Propellants and Pressurants

All other propellants and pressurant systems and operations shall be in accordance with manufacturer, SDS, and SMA recommendations.

6. CANCELLATION

MWI 8715.10H, Explosives, Propellant, and Pyrotechnics Program, dated July 20, 2015.

Electronically approved by

Jody Singer
Director

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APPENDIX A DEFINITIONS

NOTE: See NASA-STD-8719.12 and MSFC-STD-1800 for a comprehensive list of definitions associated with the explosives, propellants and pyrotechnics program.

CERTRAK (Certification Tracking). The Safety and Mission Assurance (SMA) Directorate software data base system used for employee certification records.

Compatibility. Chemical property of materials to coexist without adverse reaction for an acceptable period of time. Compatibility in storage exists when storing materials together does not increase the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident. Storage compatibility groups are assigned to provide for segregated storage.

Explosive License. License for locations within NASA's control where explosives are used, staged or stored for use (used for armories, ejection systems, gun clubs, and similar applications).

Explosive Safety Officer (ESO). A trained and experienced person is designated as the ESO at each NASA Center to manage the Center's Explosives, Propellants, and Pyrotechnics Safety Program as specified in NPR 8715.3, paragraphs 3.11.3 and 3.11.4.

Explosives. Any chemical compound or mixture of compounds that, when subjected to heat, impact, friction, detonation or other suitable initiation, undergoes a very rapid chemical change with the evolution of large amounts of heat energy generating superheated gases which travel supersonically causing rapid pressure changes in the surrounding medium.

Hypergolic. An inherent property of certain fuel rich compound(s) to spontaneously ignite and sustain combustion upon physical contact with certain oxidizing compounds which are oxygen and/or fluorine rich, without an external initiation event (i.e., spark, current, or pressure shock).

Pressurant. Media utilized to pressurize a liquid propellant system in order to force the propellant to flow through the system.

Propellant. Any substance or combination of substances, gaseous, liquid, or solid that, when ignited, propels or provides thrust through a deflagration reaction. A propellant is an explosive that is suitable for effecting the controlled propulsion of a solid body.

Pyrophoric. Chemicals which ignite spontaneously in air; usually used as an ignition source for liquid engines and hybrid rocket motors. A commonly used pyrophoric at MSFC is triethylaluminum/triethylborane (TEA/TEB).

Pyrotechnics. Any item or device manufactured from explosive or chemical ingredients (including powdered metals) that is capable of deflagration or detonation. Pyrotechnics devices are generally designed to produce large quantities of heat and/or light instead of large volumes of high-pressure gases.

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APPENDIX B ACRONYMS

AIAA	American Institute of Aeronautics and Astronautics
AMCOM	Aviation and Missile Command
ANSI	American National Standards Institute
ASP	Ammunition Supply Point
ASTM	American Society for Testing and Materials
CDL	Commercial Driver's License
CERTRAK	Certification Tracking System
CFR	Code of Federal Regulations
CIF3	Chlorine Trifluoride
CTF	Chlorine Trifluoride
DA	Department of the Army
DD Form	Department of Defense Form
DoD	Department of Defense
DOT	Department of Transportation
EED	Electro Explosive Device
ESD	Electrostatic Discharge
ESO	Explosive Safety Officer
ESOP	External Standard Operating Procedure
HAZMAT	Hazardous Materials
IHC	Interim Hazard Classification
IRFNA	Inhibited Red Fuming Nitric Acid

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ISB	Industrial Safety Branch
LRC	Logistics Readiness Center
MAF	Michoud Assembly Facility
MMH	Monomethylhydrazine
MNL	Manual
MON	Mixed Oxides of Nitrogen
MPR	Marshall Procedural Requirement
MSFC	Marshall Space Flight Center
MWI	Marshall Work Instruction
N2O4	Nitrogen Tetroxide
NASA	National Aeronautics and Space Administration
NO	Nitrogen Monoxide
NPR	NASA Procedural Requirement
NRRS	NASA Record Retention Schedule
NSN	National Stock Number
NTO	Nitrogen Tetroxide
OBOD	Open Burn Open Detonation
OP	Operating Procedure
POC	Point of Contact
QASAS	Quality Assurance Specialist Ammunition Surveillance
RF	Radio Frequency
RP-1	Rocket Propellant-1
SMA	Safety and Mission Assurance

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SDS	Safety Data Sheet
SPEC	Specification
STD	Standard
TEA	Triethylaluminum
TEB	Triethylborane
UDMH	Dimethylhydrazine
U.S.C.	United States Code
WFNA	White Fuming Nitric Acid

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**APPENDIX C
VERIFICATION MATRIX**

Section	Brief Description	Verification			Comments
		Inspect	Document	Test	
5.1	General		x		
5.2	Procurement Procedures		x		
5.3	Receiving Procedures		x		
5.4	Issuance/Turn-in Procedures for Explosives Stored at ASP		x		
5.5	Storage Procedures for MSFC/MAF		x		
5.6	Transfer of Explosives for Disposal		x		
5.7	Safety Requirements for Explosives, Propellants and Pyrotechnics		x		
5.8	Liquid/Gaseous Propellants and Pressurants		x		
5.9	Pyrophoric/Hypergolic Fuels		x		
5.10	Hydrogen		x		
5.11	Rocket Propellant (RP-1)		x		
5.12	Oxygen		x		
5.13	Nitrogen and Helium	x			
5.14	Other Propellants and Pressurants		x		

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APPENDIX D RECORDS

D.1 Explosive usage/disposal and inventory records are maintained by the user organizations for 2 years, and then destroyed in accordance with NASA Records Retention Schedules (NRRS) 1441.1, schedule 4/12/B/2.

D.2 Explosive quarterly condition of material assessments are maintained by the user organizations for 2 years, and then destroyed in accordance with NRRS 1441.1, schedule 4/2/B.

D.3 Operating procedures (OP) are maintained by the organization performing the activity in accordance with NRRS 1441.1, schedule 1/72/B/2/(b) for the length of time the OP is applicable, then destroyed when no longer needed or as required by the organization's procedures.

D.4 Explosive Site Plans are maintained by the ESO in accordance with the NRRS 1441.1, schedule 1/123, destroy on expiration or when superseded.

D.5 Explosive licenses (MSFC Form 4551) are maintained by the ESO in accordance with the NRRS 1441.1, schedule 1/123, destroy on expiration or when superseded.

D.6 Training records for personnel involved in transporting, storing, handling, using, and inspecting explosives, propellants, and pyrotechnics are documented and maintained in accordance with MPR 3410.1.

D.6.1 Civil service employees training records are maintained in accordance with MPR 3410.1.

D.6.2 Contractor employee training records are maintained by the contractor in accordance with MPR 3410.1.

D.7 Personnel certification records are maintained by SMA in the CERTRAK database in accordance with MWI 3410.1.