



**VIRGINIA
SPACEPORT
AUTHORITY**

DIR-SQE-0001

Revision: 2

Site Safety and Health Plan

PUBLIC RELEASE

DISTRIBUTION

Overview:

The Virginia Commercial Space Flight Authority (“Virginia Spaceport Authority” or “VCSFA” or “VSA”) Site Safety and Health Plan encompasses VSA employees, property, contractors, operations and general business.

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1.0 Summary

The Site Safety and Health Plan states the overall safety philosophy implemented by VSA that meets or exceeds the regulatory requirements of the Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Federal Aviation Administration (FAA), National Aeronautics and Space Administration (NASA), and any other federal, state or local safety policy applicable to VSA operations.

1.1 Definitions

8-hour Time Weighted Average (TWA) - a method of calculating a worker's daily exposure to a hazardous substance or agent. It is the average workplace exposure to any hazardous contaminant or agent using the baseline of an 8-hour per day or 40 hours per week work schedule.

Burst Pressure - pressure at which pressure system components undergoing pressurize-to-burst testing rupture or exhibit an unstable fracture

Danger Area - area defined by ground and/or flight safety analysis (including impact areas, abort areas, storage areas, or hazard areas) where normal operations or a system malfunction will create impacting objects, debris, blast, toxic release, or other hazards and where access must be restricted or otherwise controlled in order to satisfy established risk criteria

Design Burst Pressure - pressure is a calculated test pressure that pressurized components shall withstand without rupture to demonstrate its design adequacy in a qualification test. It is equal to the product of MAWP and a burst factor

Electro-explosive Device - electric initiator or other component in which electrical energy is used to cause initiation of explosives contained therein

Essential Personnel - individuals whose activities contribute directly to the performance of a potentially hazardous operation which is under way, and whose presence is mandatory for completion of the operation

First Aid - one-time treatment of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care and any follow-up visit(s) for the purpose of observation. Such one-time treatment, and follow-up visit(s) for the purpose of observation, is considered first aid even if provided by a physician or registered professional.

Ground Safety - safety considerations, procedures, and resultant restrictions associated with hazardous systems during storage, handling, pre-launch, launch, and recovery/abort operations, whereby operations can be performed in a reasonable and prudent manner without undue risk to people or property or the environment

Hazardous Material - substance or material in a quantity and form which may pose an unreasonable risk to health and safety or property

Hazardous Procedure - designation for a particular type of procedure

Imminent Danger - operations or practices that, if allowed to continue, could result in death or physical harm

Launch Vehicle - rocket, rocket system, or balloon that is used to launch a suborbital or orbital payload, probe, satellite, or other experiment

Maximum Allowable Working Pressure (MAWP) - maximum pressure at which a component or system can continuously operate based on allowable stress values and functional capabilities. This maximum pressure value is most often cited in requirements and standards that address ground-based



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pressure systems, such as the ASME boiler and pressure vessel code and the NASA standard on ground-based pressure vessels.

Maximum Design Pressure - system pressure rating based on structural and functional reliability - reference also operating pressure

Maximum Expected Operating Pressure (MEOP) - term used in requirements and standards that address aerospace pressure vessels, such as AIAA/ANSI S-080, AIAA/ANSI S-081, or MIL-STD-1522. It is the highest pressure that a pressure vessel, pressurized structure, or pressure component is expected to experience during its service life and retain its functionality, in association with its applicable operating environments, synonymous with maximum operating pressure or maximum design pressure includes the effect of temperature, pressure transients and oscillations, vehicle quasi-steady, and dynamic accelerations and relief valve operating variability.

Operating Pressure - pressure a system shall be subjected to during static and dynamic conditions - maximum temperature, maximum relief pressures, maximum regulator pressure, and where applicable, transient pressure excursions

Public - for the purposes of range safety risk management, all people who are not mission-essential personnel. Public includes visitors and personnel inside and outside NASA-controlled property who are not critical operations personnel and who may be on land, on waterborne vessels, or in aircraft.

Range Safety - application of safety policies, principles, and techniques to protect the public, workforce, and property from hazards associated with range operations.

Safety Infraction - any failure to comply with safety protocols, whether intentional or unintentional, that risks the safety of the employee, coworkers, or workplace

Safety Protocol - established procedures, guidelines, or rules designed to prevent accidents, injuries, or hazardous conditions in the workplace, e.g., wearing personal protective equipment (PPE), following lockout/tagout (LOTO) procedures, or adhering to equipment operation guidelines

Trinitro-toluene (TNT) Equivalency - explosive energy per unit mass of the energetic material in question, propellants in VSA's case, divided by the energy per unit mass of TNT. This number can be expressed as a percentage or a fraction.

1.2 Abbreviations/Acronyms

AED - Automated External Defibrillator

AHJ - Authorities Having Jurisdiction

AIAA - American Institute of Aeronautics and Astronautics

ALARA - As Low as Reasonably Achievable

ANSI - American National Standards Institute

ASME - American Society of Mechanical Engineers

BMP - Best Management Practice

CEO - Chief Executive Officer

CFR - Code of Federal Regulations

CMG - Configuration Management Group

DOD - Department of Defense

DOT - Department of Transportation



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EAP - Emergency Action Plan
FCS - Fluid Control System
GPR - Goddard Procedural Requirements
GSE - Ground Support Equipment
GSFC - Goddard Space Flight Center
GSG - Ground Safety Group
GSP - Ground Safety Plan
HR - Human Resources
IAW - In Accordance With
ILV - Integrated Launch Vehicle
IR - InfraRed
LEL - Lower Explosive Limit
LEV - Launch Equipment Vault
LN2 - Liquid Nitrogen
LSP - Launch Service Provider
MARS - Mid-Atlantic Regional Spaceport
MEC - Munitions and Explosives of Concern
MIL - Military
NFPA - National Fire Protection Association
NPR - NASA Procedural Requirements
OJT - On-the-Job Training
OSS - Operations Safety Specialist
PG - Procedural Guidelines
PIP - Performance Improvement Plan
POC - Point of Contact
PPF - Payload Processing Facility
PV/S - Pressure Vessels and Pressurized Systems
RF - Radio Frequency
RP - Rocket Propellant
RSM - Range Safety Manual
RSO - Range Safety Officer
S/A - Safe Arm
SDS - Safety Data Sheet
SGM - Spaceport General Manager
SME - Subject Matter Expert
SQE - Safety, Quality, Environmental
SSHHP - Site Safety and Health Plan



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STD - Standard

TC - Test Conductor

TEL – Transporter-Erector-Launcher

UAS - Unmanned Ariel Systems

US - United States

UTV - Utility-Terrain Vehicle

UV - Ultraviolet

UXO - Unexploded Ordnance

VDEQ - Virginia Department of Environmental Quality

VOSHA - Virginia Occupational Safety and Health Administration

VPDES - Virginia Pollutant Discharge Elimination System

WFF - Wallops Flight Facility

1.3 References

[29 CFR 1910](#) - Occupational Safety and Health Standards

[29 CFR 1910.97](#) - Nonionizing Radiation

[29 CFR 1910.119](#) - Process Safety Management of Highly Hazardous Chemicals

[29 CFR 1910.132](#) - Personal Protective Equipment

[29 CFR 1910.146](#) - Permit-Required Confined Spaces

[29 CFR 1910.147](#) - The Control of Hazardous Energy (LOTO)

[29 CFR 1926](#) - Safety and Health Regulations for Construction

[316-91](#) - Laser Range Safety

FRM-SFTY-0014 - Hazardous Commodity Detection Checklist

FRM-SFTY-0015 - Work Hour Waiver

FRM-SFTY-0016 - Safety Variance Request

[GD-ENV-0004](#) - Hazardous Waste Program

[GD-LOG-0008](#) - Part Tagging

[GD-SEC-0004](#) - Facilities Access Plan

[GD-SFTY-0001](#) - Control of Hazardous Energy

[GD-SFTY-0002](#) - Electrical Safety Program

[GD-SFTY-0003](#) - Contractor Safety Verification Program

[GD-SFTY-0004](#) - Personal Protective Equipment Program

[GD-SFTY-0005](#) - Incident and Near Miss Investigation Program

[GD-SFTY-0006](#) - Confined Space Program

[GD-SFTY-0007](#) - Fire Protection and Prevention Program

[GD-SFTY-0008](#) - Mishap Plan

[GD-SFTY-0009](#) - Lifting Devices and Equipment Program

[GD-SFTY-0013](#) - Hazard Communication Program



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[GD-SFTY-0015](#) - Fall Protection Program

[GD-SFTY-0016](#) - Emergency Action Plan

[GD-SFTY-0017](#) - Facility Inspection Program

[GD-SFTY-0021](#) - PPF Ground Safety Plan

[GD-VCSFA-0009](#) - Hazardous Materials Transportation Program

[GD-VCSFA-0016](#) - Foreign Object Debris (FOD) Program

GPR 1400.1 - Waiver Processing

GPR 1700.2 - Chemical Hygiene Program

GPR 1700.5 - Control of Hazardous Energy (Lockout/Tagout)

GPR 1840.2 - Industrial Hygiene Program

GPR 1860.1 - Ionizing Radiation Protection

GPR 1860.2 - Laser Radiation Protection

[GPR 1860.3](#) - Radio Frequency Radiation Protection

GPR 1860.4 - Ultraviolet and High Intensity Light Radiation Protection

GPR 8700.11 - Safety Program for Non-NASA Operations on Wallops Flight Facility (WFF)

GPR 8710.3 - Certification and Recertification of Ground-Based Pressure Vessels and Pressurized Systems

GPR 8715.5 - Fire Protection

GPR 8715.8 - Fall Protection Requirements for GSFC

GPR 8834.1 - Lifting Operations Requirements

[GSFC-STD-8009](#) - Goddard Space Flight Center (GSFC) Wallops Flight Facility (WFF) Range Safety Manual (RSM)

[GSFC-STD-8715.1](#) - Measurement System Identification: Metric/SI (English)

[MARS 0037](#) - Waiver Process

NASA-STD-8719 - Safety Standard for Fire Protection

[NASA-STD-8719.9](#) - Lifting Standard

NASA-STD-8719.11 - Safety Standard for Fire Protection

[NASA-STD-8719.12](#) - Safety Standard for Explosives, Propellants, and Pyrotechnics

NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals

NFPA 70E - Standard for Electrical Safety in the Workplace

NFPA 497 - Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas

NPR 1800.1 - NASA Occupational Safety and Health Program Procedures

NPR 8710.5 - Safety Policy for Pressure Vessels and Pressurized Systems

NPR 8715.1 - NASA Occupational Safety and Health Program

NPR 8715.5 - NASA Range Flight Safety and Health Program

NPR 8719.9 - Lifting Standard

NPR 8719.11 - Safety Standard for Fire Protection and Life Safety



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NPR 8719.12 - Safety Standard for Explosives, Propellants, and Pyrotechnics

[POLICY-SQE-0001](#) - Safety Policy

[SOP-OPS-0001](#) - Level 4 Document Authoring and Execution

[SOP-OPS-0003](#) - Work Order Module User's Guide

1.4 Responsibilities

Responsibility for complying with the requirements of the Site Safety and Health Plan ultimately rests with each individual employee. However, VSA designates the following specific responsibilities to key positions to achieve VSA's goal of identifying and eliminating hazardous conditions in the workplace:

CEO

The CEO is responsible for ensuring the safety and occupational health of all VSA employees. The CEO designates the Chief SQE Officer to implement and manage the Site Safety and Health Plan. The CEO recognizes their commitment is fundamental to a successful safety and health program.

SGM

The SGM or delegate has site responsibility and authority for the safety and occupational health of all VSA employees. The SGM has the responsibility to operate VSA in a compliant, responsible manner that protects the safety and health of employees, visitors, contractors, customers, and the surrounding community. The SGM will ensure that safety and health is integrated into all VSA projects.

Specific Responsibilities:

- Allocate funds to meet the requirements of the Site Safety and Health Plan, if warranted
- Enforce compliance with the VSA Site Safety and Health Plan
- Inform NASA WFF of planned activities at VSA-operated facilities within WFF in accordance with applicable documents or agreements

Chief SQE Officer

The Chief SQE Officer or designee is responsible for the implementation and oversight of the VSA Site Safety and Health Plan.

Specific responsibilities:

- Partner with Safety Program Manager and SQE Operations lead to ensure compliance and effectiveness of all safety programs through inspections/audits
- Advise management of all regulatory requirements that affect the safety and health of VSA employees
- Remain informed of newly promulgated OSHA standards and regulations and determine potential impact on operations
- Ensure all launch and operational lessons learned pertaining to safety are communicated to WFF Safety Office
- In coordination with SQE Operations lead, maintain surveillance of pad operations in order to detect and correct unsafe practices and conditions
- Review and approve all incident mitigation plans
- Report all incidents, close calls, and mishaps to senior leadership and NASA as required by GPR 8700.11.
- Attend monthly NASA Executive Safety Committee meeting



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Safety Program Manager

The Safety Program Manager is responsible for implementation of VSA safety program and training.

Specific responsibilities:

- Assist VSA employees and their contractors in performing hazard assessments and safety reviews prior to performing hazardous activities
- Verify contractor organizations train and certify their employees in accordance with the Contractor Safety Verification program
- Ensure all employees are aware of regulatory changes and provide training as needed
- Conduct routine inspections of VSA worksites and operations to ensure compliance with OSHA and other safety standards and regulations. Ensure that all findings are corrected on the spot or tracked and fixed through approved SQE tracking platform.
- Manage Incident Reporting System and assist with investigations
- Coordinate and schedule facility emergency response training and drills
- Oversee the VSA Safety and Health Council meeting
- Represent VSA on the monthly WFF Contractor Safety Committee

SQE Operations Supervisor

SQE Operations Supervisor is responsible for the coordination of all operational safety functions and Supervises the safety oversight of the engineered systems and their operations at VSA.

Specific responsibilities:

- In conjunction with the Safety Program Manager, provide input and assist in development of:
 - training for confined space, lifting safety, LOTO, and fall protection
 - safety contingency plans - fires, spills, etc.
 - reports findings from incident investigations
 - reports of exposure to job and chemical hazards
 - mishap response training and drills - reference GD-SFTY-0008
 - job hazard analysis and PPE assessment
- Review operations documentation to ensure hazard mitigation
- Coordinate with VSA management to resolve operational safety-related concerns and support continuous improvement
- Conduct field audits, inspect facilities, machinery, and safety equipment in order to identify and correct potential hazards

Environmental Program Manager

The Environmental Program Manager is responsible for program oversight and collaboration with local, state, federal regulatory agencies.

Specific responsibilities:

- Manage regulated materials - hazardous and nonhazardous
- Ensure compliance with air permit
- Ensure compliance with VPDES permit
- Coordinate with NASA on natural resource compliance
- Ensure maintenance of all sites BMPs for stormwater pond management
- Report any accidental release into air, waterways, and land to all regulatory agencies



HR Department

HR must maintain safety records, provide training, investigate infractions, and ensure consistent application of the safety infraction protocol.

Managers/Supervisors

Managers/Supervisors are responsible to the CEO, Chief SQE Officer and SGM for the safe conduct of their operations. Managers/Supervisors shall establish safe operations, be cognizant of the safety and health regulations affecting their operations, allocate adequate resources to implement the Site Safety and Health Plan, use safety as a performance evaluation criterion, and correct deficiencies within their operations in a timely fashion.

Specific responsibilities:

- Provide required PPE specific to the workplace exposures and hazards
- Ensure their operations are in compliance with the Site Safety Health Plan
- Conduct periodic safety inspections in their area of responsibility under the direction of the Environmental Program Manager and Safety Program Manager
- Ensure employees stay in compliance with established safety regulations
- Review operations documentation to ensure hazard mitigation
- Ensure employees are aware of major hazards associated with their work areas
- Communicate with SQE department to evaluate new equipment, materials, and processes for hazards before introducing them to the workplace
- Work with SQE to mitigate hazards
- Ensure employees receive prompt medical treatment for all injuries and report incident to Chief SQE Officer or designee
- Report all incidents and close calls to SQE department promptly
- Enforce good housekeeping practices within their areas
- Report any spills or releases to the environment to the Environmental Program Manager
- Enforce safety protocols, monitor compliance, investigate reported infractions, and implement corrective actions as outlined in the safety infraction protocol

Employees

All employees are responsible for performing their job duties in a safe manner for themselves and other employees. Everyone is responsible for acknowledging and following applicable safety work rules, including the use of PPE as appropriate, requesting information needed to understand and evaluate job-related hazards, promptly reporting all incidents and near misses to their supervisors, and correcting or reporting observed hazardous conditions

Specific responsibilities:

- Read and comply with the Site Safety and Health Plan and all applicable safety and health programs, procedures and requirements specific to their assigned work
- Complete required training for the safe conduct of their job
- Report all injuries, exposures, and any symptoms of possible exposure to their supervisor as soon as possible
- Inspect and maintain PPE in good working order prior to and after each use
- Consult with physician if they have any medical conditions to ensure they are fit for duty
- Participate in worksite inspections



- Must comply with all safety protocols, attend mandatory safety training, use required PPE, and report safety concerns or infractions immediately

1.4.1 Customers

VSA shall ensure that any customer prior to entering a VSA-owned site shall have reviewed and will maintain an understanding of the VSA Access Briefing and recognize hazards and risks associated with being onsite. Therefore, agreements with customers utilizing spaces owned by VSA, such as Launch Complex 0, PPF, UAS Airfield and any associated facilities shall require that the customer comply with VSA rules and guidelines established by this Site Safety and Health Plan. In addition, VSA shall ensure that customers comply with the established NASA GSFC/WFF and any federal requirements within the operational/range safety and health requirements during operations.

1.4.2 Contractors

VSA will ensure that safe work practices are used by contractor personnel to provide for the control of hazards during operations via GD-SFTY-0003. When selecting a contractor for any work on VSA leased, occupied, or owned property, VSA will obtain and evaluate information regarding the contract employer's safety performance, programs, and training to ensure that occupational safety and health policies have been established and are being followed.

2.0 Commitment to Safety and Health as WFF Sponsor

The requirements of this document are applicable to VSA activities conducted at NASA GSFC/WFF. Only the Chief SQE Officer and SGM may grant a variance from the requirements of this document. A variance request, FRM-SFTY-0016, must be submitted and approved prior to deviating. Any variance must provide a justification for extenuating circumstances or a degree of worker protection at least equivalent to the procedure or requirement it replaces and must be documented. Once request is signed, it must be submitted to CMG to file. All variances needing NASA approval will be communicated by the Chief of SQE.

The philosophy and concepts described in this document are applicable to all work performed by VSA and its affiliated contractors and sub-tier contractors to ensure safety and health receives full review and consideration. VSA serves as the sponsor organization in this relationship and is responsible for ensuring the partner organization/customer(s) adhere to WFF safety policies and procedures.

2.1 Policy and Objectives

It is VSA policy, POLICY-SQE-0001, to:

- protect employees, customers, the public, and the environment from unsafe conditions and harm
- ensure all VSA officers, managers, employees, and contractors are held accountable for safety
- ensure all management and employees are empowered to raise safety concerns and have the authority to stop any perceived unsafe operation
- reward employees for actively engaging in creating a safe work environment
- thoroughly investigate all mishaps, close calls, and unsafe conditions to identify root causes
- maintain a formal system for identification of unsafe conditions, implementation of mitigation or corrective actions, track safety concerns through resolution, and maintain records and trending data related to unsafe conditions
- ensure all management, employees, and contractors are adequately trained and maintain the skills to safely perform assigned tasks
- develop plans and exercise responses to potential emergency situations



- apply disciplinary actions as required to address safety violations

VSA has established the following objectives to meet the safety policy:

- Ensure all personnel are trained and possess the knowledge and skill to fulfill their responsibilities
- Ensure all VSA employees, customers, and contractors understand they have a responsibility to mitigate any risk of incidents/mishaps to themselves, others, and property damage
- Ensure adherence to established safety and health requirements with an understanding that compliance is a condition of employment
- Empower each VSA employee with the responsibility to work safe and when to use stop work authority
- Promote a visible leadership team that provides the motivating force for an effective safety and health program
- Instill a VSA team commitment to safety and health by management, worker and contractor participation in all aspects of the program, including joint work area inspections, incident reviews and established clear lines of authority and responsibility for safety and health at all organizational levels
- Allocate necessary resources to effectively address safety and health concerns/findings

2.2 Safety Infraction Protocol

VSA is committed to providing a safe workplace in compliance with all applicable local, state, and federal regulations, including OSHA standards. All employees are required to follow safety protocols, participate in safety training, and report unsafe conditions or behaviors. Failure to adhere to safety protocols constitutes a safety infraction and will result in disciplinary action, up to and including termination.

When an employee commits an unsafe act or causes property damage, that employee's immediate supervisor will counsel the employee and instruct him or her in the proper method of accomplishing the task. This is also considered coaching and is highly encouraged. Other disciplinary action will be dependent on the level of concern and/or potential of injury/property damage during the unsafe act, damage, etc.

Disciplinary action, if necessary, will be taken as outlined below:

Minor/Unintentional

First Infraction:

- Verbal warning issued by the supervisor
- Employees must complete a refresher safety training session within five business days
- Incident documented in the employee's personnel file

Second Infraction:

- Written warning issued by the supervisor or HR
- Employees may be required to undergo additional safety training or shadowing
- Incident documented, and a PIP may be initiated

Third Infraction:

- Final written warning or suspension without pay - one to five days, depending on severity
- Mandatory retraining and a formal safety compliance review
- Incident documented with a clear warning that further infractions may lead to termination



Subsequent Infractions:

- Termination of employment, subject to review by HR and the CSQE Officer

Serious or Intentional Offense:

- A serious or intentional offense will result in termination of employment

The disciplinary action will be determined by the employee's supervisor, with final review by HR and approval from the executive team

2.3 Emergency Evacuation Requirements

VSA has emergency procedures for Launch Complex 0 and other VSA sites. All partner organizations are required to plan for emergency evacuation events. Planning shall include communication with NASA and VSA personnel, securing of equipment and data, lockdown of facilities, recall notification procedures, evaluation of damage, and restart of work and operations. Planning shall include coordination through VSA with the WFF Safety Office Emergency Management personnel, WFF fire department, and WFF senior management. For specific requirements and policies, reference GD-SFTY-0016.

2.4 Documentation and Configuration Management Processes

VSA follows documentation control and configuration management principles for all systems and assets, which are, or have the ability to be, deemed hazardous, or are required to be maintained per federal, state, or local statutes, or industry standard practices. VSA is required to retain and make available information concerning program operations per GPR 8700.11. This document defines what procedures require review and approval. VSA will submit, upon request and in compliance with, all applicable agreements to GSFC's WFF comprehensive handling, assembly, and/or checkout procedures for all hazardous systems for review and approval.

3.0 Institutional Safety Requirements

3.1 Training

Training is essential to reducing injuries and illnesses. VSA recognizes the need for an ongoing training and orientation program as a preventive method of controlling work-related injuries and illnesses. VSA will adhere to 29 CFR, Sections 1910 and 1926 as well as GPR-8700.11, Section 12. VSA employees, contractors, and customers shall train their employees to ensure their understanding of safe work practices, hazard recognition, and appropriate responses to emergencies.

3.1.1 Certification Program Requirements

Personnel who perform or control hazardous operations shall demonstrate they possess the necessary knowledge, skill, judgment, and physical ability to do the job in a safe, healthful, and qualified manner. Contractor organizations shall self-certify personnel are competent to perform the job function assigned and provide documentation upon request.

3.2 Drills

VSA performs drills annually on a rotating basis to maintain active workforce engagement. Drills will be performed at all VSA sites and can be in coordination with NASA or solely VSA events. The WFF fire department and security force will be alerted prior to a drill if activation of an emergency alarm is deemed necessary. VSA participates with NASA and the Commonwealth of Virginia in their annual spring tornado drill. Additional fire drills and other types of drills shall be performed as required to address any noted lack of understanding by employees at the various VSA locations.



3.3 Office Safety

The leading types of disabling accidents that occur within the office are the result of falls, strains and overexertion, falling objects, striking against objects, and being caught in or between objects. Office safety training shall be provided to employees as mandated by federal, state, and local regulations and NASA requirements. Specific office safety training shall be provided to employees whose primary role is administrative. Office safety training shall consist of, but not be limited to:

- slips, trips and falls
- ergonomics
- recycling
- incident reporting - GD-SFTY-0005
- workstation ergonomics
- air quality
- emergency response plans - SafetySkills

3.4 Drug-Free Workplace

VSA is committed to providing a safe, quality-oriented and productive work environment consistent with the standards of the community in which VSA operates. For specific guidelines pertaining to drug and alcohol use by employees, reference the VSA Employee Handbook.

3.5 Maximum Work Policy

VSA maximum work hour policy follows the directions given under NASA NPR 1800.1. This applies to VSA employees, customers, and contractors involved with mission/launch operations - safety critical activities. Exceptions to the maximum work hour policy are covered by FRM-SFTY-0015. Minor exceptions (up to a few hours) are based on urgent circumstances that are based on logical reasoning and do not result in fatigue concerns. These exceptions can be made by the senior onsite official without a waiver. All waivers are to be submitted by Directors or Chiefs to the SGM. After each mission that requires waivers, the hours will be reviewed by executive leadership. Specific work hour requirements are contained within Appendix A.

3.6 Motor Vehicle Safety

When operating a motor vehicle on company business, all VSA employees shall obey all traffic laws on and off NASA WFF property. All VSA employees, contractors, and customers shall obey NASA WFF traffic laws while operating on NASA property to include giving the right of way to vehicles transporting explosives. Use of handheld cellular phones, radios, and other communications devices is prohibited while driving. Seatbelts shall be worn when vehicle is in motion by driver and passengers. No persons are allowed to ride in the bed of trucks or in cargo storage areas of vans or UTVs.

When operating non-conventional vehicles (forklifts, mobile lifts, tugs, etc.) on the WFF roadways, caution shall be used by the operator to ensure that the vehicle is operated in a safe manner, caution lights/blinkers (if equipped) are on, and visibility is maintained to the highest degree possible. All traffic rules apply to non-conventional vehicles on the WFF roadways. Drivers operating on WFF roadways will give right of way to vehicles transporting explosives or hazardous material.

3.6.1 Vehicle Inspection

VSA's vehicles are driven on public and private roadways. They are inspected annually and by VSA employees prior to each use. Vehicle operators shall report any discrepancies (lights out, turn signals not



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working, maintenance required lights, etc.) to the Fleet Manager so that repair activities can be performed.

3.7 PPE

VSA shall provide all employees with PPE at no expense to the worker in those situations where engineering controls, management controls, or other corrective actions do not reduce the hazard to an acceptable level where use of engineering controls, management controls, or other techniques are not feasible. A workplace hazard assessment will be conducted by the Safety Program Manager with managers/supervisors to determine the presence of hazards which require use of PPE.

The only exception for minimum PPE at Launch Complex 0 and UAS Airfield shall be during escorted tours of pad facilities. Escorted tours shall be scheduled with and approved by the following: External Relations, Security, Facility Management, and senior leadership. The Facility Manager will ensure that work is not being conducted in the area of the tour and that any hazardous operations occurring does not pose a risk to visitors on the tour. If hazards present a risk to tours, the tour can be withheld access to the facility, or PPE issued for the area of access.

3.7.1 PPE Issuance

PPE shall be issued to all employees exposed to known hazards. Employees will be responsible and accountable for issued PPE. Transients or visitors may be furnished PPE on a temporary basis if they are on site for VSA-related business purposes or at VSA's invitation. The host, guide, or area supervisor shall be responsible for obtaining, issuing, and recovering the PPE. Contractors and other non-VSA personnel must procure their own PPE to provide an equivalent level of safety as required by NASA, GSFC, VSA and federal safety standards - reference GD-SFTY-0004.

3.7.2 PPE Storage, Maintenance and Employee Training

PPE shall be provided, used, stored, and maintained, and employees trained in its use, in accordance with 29 CFR 1910.132 through 1910.137. At a minimum retraining shall be provided when:

- changes in the workplace make previous training out of date
- an employee's work habits, or knowledge indicates a lack of the necessary understanding, motivation, and skills required to use the PPE
- new equipment is installed
- changes in the types of PPE to be used make previous training out of date

3.7.3 Fall Protection in Industrial and Construction Activities

VSA employees, contractors, and customers shall comply with the fall protection safety requirements contained in GPR 8715.8 and OSHA Sections 1910 and 1926. If an operation creates a temporary fall hazard (open decking, removing railings, removing trench coverings etc.), actions will be taken to protect, barricade and properly demarcate the area. For specific requirements, reference GD-SFTY-0015.

3.8 Procedures - Buddy System

The buddy system shall be used for all hazardous operations with the buddy in the immediate vicinity of the task being performed. The "buddies" are to monitor each other, to stay close enough to be able to help in an emergency and to follow prescribed safety procedures as applicable.

Non-hazardous operations do not require a buddy to be in the immediate vicinity but will require other forms of communication to ensure assistance is available in the event of an emergency. This can be achieved through advising others of one's location with check-in times, radio communications, cell phone communications, and direct contact with others in the area.



Non-hazardous tasks performed outside normal work hours will require communication with the location POC or designee.

3.9 WFF Access

WFF is a federal NASA base with shared Navy access. All personnel badging requests are subject to background checks. WFF island access must be granted to any VSA employee, contractor, customer, or visitor to access the VSA Launch Complex 0, PPF, and UAS prior to their arrival. Personnel are not permitted on the seawall, wetlands, on towers or roofs, inside confined spaces or any area designated hazardous or past a roadblock or fence without explicit authorization. For further requirements regarding VSA access, reference GD-SEC-0004.

3.10 First Aid and Emergency Medical Treatment

VSA employees will provide first aid on a voluntary basis. Ambulance service and emergency medical treatment service is available to all employees, contractors, and VSA customers. At WFF, this service is supplied by the WFF fire department, 24 hours a day on the main base and on the island. The WFF fire department responds to a call with certified emergency medical responders (on base landline phone - 911/cell phone - 757-824-1333). At other locations, this service shall be provided by appropriate medical treatment centers and local 911 emergency medical services. If there are any questions as to the seriousness of the injury, employees shall be referred to a professional medical facility. In the event, timely medical services are not available, VSA has trained volunteer employees to assist with first aid medical treatment until medical services arrive. These employees are certified in first aid, CPR, and the use of AEDs.

3.10.1 AED

AEDs are available in most VSA locations in accessible areas and are inspected monthly to ensure they are in working condition should the need for use arise. VSA's volunteer employees shall be certified in first aid, CPR and AED.

3.11 SDS

VSA shall follow the requirements in GPR 8700.11, Sections 4.0 and 4.1. VSA will supply copies of the SDS to the Wallops Safety Office upon request. VSA will provide WFF fire department with SDS for hazardous materials above reporting limits. VSA shall maintain an SDS database that is accessible to all employees.

3.11.1 Hazardous Material

VSA shall comply with GSFC Policy GPR 1700.2 and GPR 1840.2.

Transportation of hazardous material shall be in accordance with GD-VCSFA-0009. Storage, use, and disposal of hazardous materials shall comply with federal, GSFC and state regulations and address the requirements for release prevention, control, countermeasures, contingency planning, and a listing of restricted/prohibited materials for purchasing and use at WFF. Conditions of materials in storage shall be assessed at least monthly, and those determined to be unsuitable for use removed from active inventory - for specific requirements and standards on hazard communication reference GD-SFTY-0013 and GD-ENV-0004.

3.12 Smoking

Smoking is not permitted within VSA occupied buildings, VSA vehicles, or the confines of VSA operations areas. This prohibition includes the use of electronic cigarettes. Smoking is permitted



outdoors in designated smoking areas and at least 25' away from building entrances. Cleanliness of designated smoking areas is the responsibility of those utilizing that area.

3.13 Communication System

VSA complies with all applicable WFF communications protocols and RF survey requirements. All RFs will be assigned and approved per the NASA WFF RF request process as determined by GPR 1860.3.

3.14 Adverse Weather

It is the policy of VSA to remain open during most periods of inclement weather; however, where extraordinary circumstances warrant, due to weather or other unforeseen business interruption, VSA reserves the right to close the facility. Should this occur, employees are encouraged to call VSA's Operational Status Hotline, 757-999-9920, and monitor emails from VSA Emergency Management.

If the Wallops Island area is going to be under the threat of a hurricane or nor'easter, VSA will follow the guidance of the NASA Hurricane/Nor'easter Plan for the WFF. VSA will participate in planning sessions and follow NASA updates.

NASA will issue advisories and warnings based on the WFF detection system. Advisories and warnings for severe weather, such as thunderstorm warnings, high winds, or lightning notifications, are transmitted over the WFF handheld radios and the emergency warning system. If a broadcast is missed, employees may call 757-824-1300 for clarification. Personnel assigned to provide oversight for construction activities shall notify contractors performing outdoor construction activities of any advisories and warnings. All workers must comply with these advisories and warnings and stand down or evacuate the launch pads if necessary.

The VSA waiver process for requesting permission to return to the pads during a lightning warning:

- The requester is to contact the Chief SQE Officer to make the request. The requester shall be prepared to explain and defend the need to return to the pad during a lightning warning.

3.15 LOTO

VSA employees, contractors, and customers shall meet or exceed OSHA minimum performance requirements for the control of hazardous energy as outlined in 29 CFR 1910.147.

Affected personnel and qualified persons performing electrical work shall be trained on GD-SFTY-0001. Any individual undergoing OJT shall be under the direct supervision of a qualified person. The individual undergoing OJT is required to complete safety training on the hazards involved prior to performing the work. For lockout/tagout procedures, refer to GD-SFTY-0001 and GPR 1700.5.

3.16 Electrical Safety

VSA electrical systems shall be designed in accordance with the National Electric Code. Electrical systems shall be operated and maintained to adequately control hazards likely to cause death or serious physical harm or severe system damage. VSA utilizes GD-SFTY-0002 to assist in the development of electrical safety procedures, guidelines and trainings that delineate safe work methods, and assigns responsibilities for complying with OSHA, National Electrical Code, and other associated national consensus standards for all electrical operations on circuits above 50 volts.

3.17 Confined Space

An assessment of all confined spaces has been performed, and the Safety Program Manager and area SMEs have identified all confined spaces under the control of VSA. All confined spaces are treated as permit-required confined spaces unless declassified; that list may be found GD-SFTY-0006. Entry into confined spaces requires written procedures and authorizations regardless of permit-required status. No



entry into confined spaces shall be made until an additional real-time assessment of the space prior to entry has been conducted. A permit-required confined space shall have the permit posted at the entrance or kept under the control of the confined space supervisor. VSA Confined Space Program complies with 29 CFR 1910.146.

3.18 General Safety Requirements in Welding/Cutting Operations

Welding, soldering and/or cutting activities, as well as ancillary grinding operations, shall not be performed without an approved hot work permit. Hot work permits can be obtained by contacting the Wallops fire department at 757-824-1300 and require completing NASA Form - WI-502 that can be obtained from the fire department. Personnel performing work after hours require approval for hot work 24-hours in advance. Original hot work permits are to be signed and returned to the fire department. Extended duration hot work permits must be signed by hot work operators and fire watch daily prior to hot work verifying compliance. If hot work is to be performed in an area with flammable/combustible piping and tank systems, their integrity must be verified to have no leaks prior to performing work - reference GD-SFTY-0007.

3.18.1 Pressure Monitoring and Relief

Venting of pressure systems during hot work activities shall be coordinated prior to venting operations. Pipe/Tank systems shall be monitored by a qualified operator to ensure the system(s) remain(s) at ambient pressure. No pressure system shall be worked on while the system is fully pressurized. In the event emergency venting is needed, all work activities will be discontinued until the system is returned to a static mode configuration and the work area is rechecked for presence of flammable/combustible/toxic/hazardous materials.

3.18.2 UV/IR Sensor Fire Detection Systems

Shields, preferably at the point of welding/cutting operations, shall be used to preclude the inadvertent activation of UV and IR sensors-based fire detection systems.

3.18.3 Notifications of Hot Work Operations

Prior to performing welding and cutting operations inside/near buildings/facilities equipped with fire detection/alarms, specifically smoke and fire detectors, the WFF fire department will be notified if the detection devices are disabled for the duration of work. If fire alarms/detection devices are disabled, the onsite "fire watch" work crew will maintain communications with the WFF fire department, and alternate alarm/evacuation notification procedures will be established for the building/facility occupants.

3.19 Work in Hazardous Classification Areas

VSA shall follow NFPA 497 and NFPA 70E (Class 1, Div. 2). Procedures for working in hazardous classification areas shall be developed to permit intrinsically safe, non-intrinsically safe, and hot work operations in hazardous classification areas under specific conditions and controls. The required conditions and controls shall be specifically designed to preclude the inadvertent ignition, e.g., flames, sparks etc. of potential leaks from combustibles and flammable sources.

3.20 Alarms

VSA facilities have site-specific alarms in order to alert personnel of emergency situations through warning lights and audio announcers. Light indications and actions required:

- For each VSA facility:
 - a flashing amber light (yellow) indicates that potential hazards exist and is the nominal situation



- A flashing red light indicates hazardous operations are taking place
- Red flashing lights near O2 area presents immediate danger and area should be cleared and pad manager notified
- White flashing lights indicate fire alarm activation and area should be evacuated immediately and pad manager informed
- For additional information reference the Launch Complex 0 PPF UAS Site Safety Access Briefing
- VSA acknowledges that any further alarm systems will be determined in consultation with the WFF Safety Office

3.21 Fire Safety

Fire safety is coordinated and implemented by the WFF Safety Office and the WFF fire department. VSA shall not tamper with fire protection systems or fire detection systems. As the sponsor organization, VSA shall meet NASA-STD-8719.11. VSA shall also comply with the specific requirements and procedures found in NASA-STD-8719 and GPR 8715.5. The standard generally provides for the following.

3.21.1 Potential Fire Hazards

Supervisors and managers shall ensure materials that are potential fire hazards are properly identified. They will ensure there is adequate storage for the type and amounts of materials to be used/stored. They will ensure the storage and handling is in accordance with NFPA, OSHA, NASA GSFC/WFF safety procedures.

3.21.2 Safety Inspections

Periodic safety inspections to include fire prevention, with particular attention to hazardous materials, electrical systems, housekeeping, smoking, exits, fire protection equipment, etc. will be conducted by facilities managers and Safety. Some additional information can be found in GD-SFTY-0017.

3.21.3 Extinguishing Systems

Extinguishing systems, including sprinklers, portable extinguishers, hose lines, etc., will vary with local needs. Supervisors and employees shall be trained in the use of portable fire extinguishers. At a minimum all Wallops-based VSA personnel should complete Fire Extinguisher Training in SafetySkills.

3.21.4 Fire Protection and Detection Systems

VSA/MARS shall not tamper with fire protection systems or fire detection systems.

3.21.5 Maintenance

Supervisors and managers shall use scheduled preventive maintenance of systems to ensure equipment and systems are properly maintained to ensure nominal operation and system integrity. This ensures no accidental ignition of combustible materials. They also ensure system metals and chemicals are compatible. All work areas shall be kept clean and orderly with strong emphasis on housekeeping.

3.21.6 Emergency Action Plans

Supervisors and managers shall ensure employees in NASA-owned buildings follow NASA/WFF Emergency Response Plan.

Each VSA building will have a specific EAP, which consists of written procedures and a floor plan. All building occupants shall observe the respective building evacuation plan. Each new employee shall become familiar with his/her responsibilities in fire prevention - reference GD-SFTY-0016.



3.21.7 Fire Lanes

Fire lanes shall be maintained to permit fire department access to buildings or equipment.

3.21.8 Chemical Storage

All flammable and combustible liquids shall be stored and used in accordance with NFPA 45. Flammable storage cabinets must be authorized by Fire Protection Services.

3.21.9 Housekeeping

Work areas shall be maintained in an organized manner such that egress routes are not impeded, and combustible materials are not concentrated in an area that would increase the severity of a fire in the event that a fire occurs. Housekeeping shall be maintained per GD-VCSFA-0016.

3.21.10 Waste

Approved containers with lids shall be provided for flammable or combustible liquid-soaked cloths, rags, or waste. Trash and rag containers shall be emptied daily.

3.22 Working at Heights

VSA shall implement the requirements of 29 CFR 1910, Subpart D via GD-SFTY-0015, for employees that are working from unprotected elevated work surfaces that are four feet above the next lower surface.

When working on a mobile aerial platform, all employees shall follow the requirements for safe operations that are outlined in GD-SFTY-0009.

Scaffold safety applies to all VSA employees, contractors, and customers working with scaffolds. These requirements apply to VSA construction activities and all industrial and non-industrial operations and maintenance at VSA facilities. For specific requirements for scaffolding safety, reference GD-SFTY-0015.

When using ladders to perform operations, all employees shall follow the guidelines in GD-SFTY-0015, to include the daily inspection of ladders, proper use and proper setup of extension ladders.

3.23 Lifting Safety

VSA employees, contractors, and customers shall use the standards and guidelines in NASA-STD-8719.9 and GPR 8834.1 for protecting persons and property during lifting operations. The NASA-STD-8719.9 document establishes minimum safety requirements for the design, testing, inspection, personnel certification, maintenance, and use of overhead and gantry cranes, mobile cranes, hoists, special hoist-supported personnel lifting devices, hydra sets, hooks, and slings for VSA owned and contractor-supplied equipment used in support of VSA operations. Active operations involving lifting devices and rigging shall be tagged with the certified/rated load capabilities - reference GD-SFTY-0009.

3.24 Pressure and Vacuum Systems Safety

VSA employees, contractors, and customers shall comply with GSFC's program for ensuring the structural integrity of PV/S as outlined in GPR 8710.3. GPR 8710.3 and the Safety Office Letter of Acceptance for Tailored Safety Requirements assigns responsibilities for the various aspects of the program; references the required codes, standards, guides, and federal regulations; and establishes unique NASA requirements in areas such as certification/ recertification, documentation, configuration management, and operator training/certification.



3.25 Hearing Conservation Program

VSA will monitor noise via sound-level measurements or dosimetry to determine employee exposure to noise. Noise monitoring will be conducted and repeated whenever there is a change in work environment, such as changes in production, process, equipment and/or controls. VSA will administer the audiometric testing program, provide annual training for employees, and notify employees of noise monitoring and audiometric testing results. The Hearing Conservation Program will be reviewed for the effectiveness of the program and making sure that it satisfies the requirements of all applicable federal, state, or local hearing conservation requirements.

3.26 Authority to Stop Work

VSA is committed to promoting a safe work environment and empowers each employee to stop work. Stop work provides the general safety requirements for stopping operations or practices that if allowed to continue could result in death or physical harm. These situations are referred to as “imminent danger”. All employees have the authority to stop work anytime they feel the work is unsafe. Work may resume after the person is made to feel comfortable with the operation and the unsafe condition has been mitigated. If there is no resolution to the concern or immediate danger to personnel persist, the operation stoppage will continue. A supervisor and the Safety office will be immediately notified so that a plan of action can be put in place. The operation will not proceed without concurrence from the Safety office that the hazard has been eliminated.

3.27 Defective Equipment Tagging

Supervisors shall ensure any equipment/tools identified as defective and being involved in an “imminent danger” situation are taken out of service immediately and tagged per GD-LOG-0008. Defective equipment shall be appropriately tagged and secured to ensure it cannot be brought back into service prior to repair or disposal.

3.28 Explosive Propellant and Pyrotechnic Safety

VSA contractors and customers shall use the latest revisions of NASA-STD-8719.12 and GSFC-STD-8715.1 for protecting persons and property from hazards of explosives and explosive materials, including all types of explosives, propellants (liquid and solid), oxidizers, and pyrotechnics. Explosive, propellant, and pyrotechnic operations shall be conducted in a manner that exposes the minimum number of people to the smallest quantity of explosives for the shortest period consistent with the operation being conducted. VSA will work closely with the GSFC Explosives Safety Officer who has jurisdiction for explosives, propellant, and pyrotechnic operations on any issues dealing with explosives, propellants, and pyrotechnic safety.

Special caution should be used by employees while on the Wallops Island Recreational Beach and northern parts of the island. This area has been used historically as a bombing practice range by the US Navy. There may occasionally be UXO or MEC that may become exposed due to erosion or digging activities. Do not touch the item(s) or cause it to move. Move to a distance of at least 1250' away. Immediately report the location to NASA Security by either calling 911 or (757) 824-1300.

3.29 Non-Ionizing Electromagnetic Radiation

Various state regulations, national consensus standards, and federal standards, including 29 CFR 1910.97 address microwave and radar protection regulatory requirements. This plan provides directives for protecting persons and property during laser use in VSA operations. The primary laser hazard to humans is eye and/or skin damage from direct exposure to the beam or specular reflection, and in some cases, viewing the diffuse reflection. Laser operations during any open-air laser scenario conducted on



DOD controlled ranges or test facilities or by DOD personnel shall use document 316-91 for guidance. For specific GSFC requirements and policies reference GPR 1860.2, GPR 1860.3 and GPR 1860.4.

3.30 Ionizing Radiation

VSA, contractors, and customers shall comply with the policies and guidance for handling, use, and storage of radioactive material under GPR 1860.1. To maintain and preserve the health of the workforce and to minimize necessary exposures to ionizing (radioactive sources and X-ray producing machines) radiation, personnel exposures shall be kept ALARA through the use of strict management controls, safe operating procedures, appropriate equipment, adequate shielding, and limiting personnel exposure times.

3.31 Safe Handling of Cryogenics and Propellants

VSA, contractors, and customers shall comply with the VSA requirements for the safe handling of cryogenics and propellants and the safe operation of cryogenic systems at WFF. More detailed procedures shall be prepared for the specific processes, to include specific PPE, steps, cautions and warnings for the safe operation.

4.0 Operational Safety Requirements

VSA maintains compliance with the safety policies and criteria defined in NPR 8715.5 and the current revision of GSFC-STD-8009 for WFF.

4.1 Operational Safety Goal

VSA's operational safety goal is to prevent mishaps and to minimize the hazards and risks to personnel, property and the environment while operating at any VSA facility.

The following recognized methods shall be used to minimize risks while conducting hazardous operations:

- Identify all known hazards
- Implement safety as soon as design process, following OSHA 29 CFR 1910.119
- Minimize exposure of personnel to hazardous system/operations
- Establish safe operating procedures
- Establish safe distances via ropes and barriers when necessary
- Plan and prepare for contingencies

4.1.1 Exposure Limits

VSA shall follow the cardinal safety principle for hazardous locations and operations - limit the operation to a minimum number of people, for the minimum time, and to a minimum number of potential hazards. Placards denoting exposure hazards will be posted at each site.

4.1.2 Personnel Limits

Only essential personnel are permitted in operational areas during hazardous operations, e.g., explosives handling, hazardous chemicals, rocket motors, high pressure systems, etc. At a minimum, all hazardous operations shall employ the buddy system - no less than two personnel, including Safety.

NOTE - Safety shall not be denied access to any area where hazardous operations are conducted, IAW approved procedures

4.1.3 Visitors

VSA employees, contractors, and customers shall comply with GSFC-STD-8009 for GSFC WFF and GD-SEC-0004 regarding official visitors, guests and tours.



4.1.4 Marshalling Areas

VSA shall designate marshalling areas for all personnel in cases of emergency. Marshalling areas may differ based on the situation, wind and weather. In case of an emergency, personnel will evacuate and proceed immediately to a marshalling area. Personnel shall use windsocks to evacuate upwind to avoid any windblown hazard. For specific requirements and policies, reference GD-SEC-0004.

4.1.5 Badge Control/Access

VSA will control access and maintain accountabilities for all personnel entering onto VSA-maintained launch pads or areas of restriction such as the airfield and PPF. For specific requirements and policies, reference GD-SEC-0004.

4.2 Hazard Categories

WFF establishes hazard categories for launch campaigns assigned to launch or operate at VSA-controlled facilities to differentiate between hazardous and non-hazardous systems. All hazardous systems including but not limited to electrical, chemical, pressure, etc. shall be categorized within the GSP. For specific requirements and policies, reference GSFC-STD-8009.

4.3 Danger Area

Hazardous operations clear, also known as zones, shall be designated by the associated GSP or agreed upon between VSA, customers, and NASA ground safety for launch campaigns or any work deemed hazardous that extends out of the VSA-controlled fence line. Hazardous operations clears or zones for any work not deemed mission related or outside of the VSA fence line shall be determined by safety and engineering respectively as per SOP-OPS-0001.

4.3.1 Danger Area Access

Access into operational danger areas at VSA is controlled by the operation task leader and safety. Admittance into a hazardous operation clear requires the approval of the task leader and VSA Safety. When the danger area is controlled by NASA OSS, the admittance requires the concurrence of NASA OSS.

4.3.2 Danger Area Warning System

The danger area warning system for Launch Complex 0, PPF, and the UAS involves lights, sirens, signs, and/or ropes, barriers, or roadblocks to alert personnel of the potential hazards and/or to prevent personnel from entering hazard/clear areas. Under no circumstances shall personnel pass through a danger area warning without first obtaining permission from the responsible safety organization. For specific requirements and policies, reference GD-SEC-0004.

VSA Launch Complex 0 is predominantly in amber status, meaning hazards are always present. However, they do not elevate into a danger status until hazardous operations are ongoing, in which case, the red lights at each entrance are illuminated by a member of the SQE team.

4.4 Hazardous Procedures

Hazardous classification includes any operation, process, or procedure involving materials, equipment, or tasks that have a potential to result in loss of life or serious injury to personnel. For specific procedures, reference SOP-OPS-0001 and SOP-OPS-0003.



4.4.1 Content of Hazardous Procedures

VSA engineering shall determine the need for hazardous procedure(s) during operations controlled by VSA personnel to ensure safety of personnel, protection of equipment, protection of property, and protection of the environment per the guidelines set in SOP-OPS-0001 and SOP-OPS-0003.

4.4.2 Hazardous Markings, Warnings, Cautions and Notes

The title page of all hazardous operating procedures shall be prominently marked in red "THIS PROCEDURE CONTAINS HAZARDOUS OPERATIONS".

Procedures shall use warnings, cautions and notes to precede specific steps in which a malfunction or error could produce a reaction that causes system degradation, use of hazardous chemicals or tools, or anomaly, personnel injury, or death. For specific requirements and policies reference SOP-OPS-0001.

4.4.3 Approvals/Changes and Deviations

All hazardous procedures require approval by the SQE Supervisor or their designee and the responsible/cognizant engineer. All variances to approved hazardous procedures shall be processed using SOP-OPS-0001 and MARS 0037. NASA Safety Office will approve hazardous operations and deviations if it is under the control of the NASA ground and/or range safety office per GPR 1400.1.

- Variances to safety methods shall be processed in accordance with MARS 0037

4.4.4 Hazardous Procedures Deviations

Deviations within hazardous procedures to include out-of-sequence work steps require the approval of the SQE Supervisor or their designee. Deviations from the hazardous procedures require the approval of the NASA ground safety group when the operation is under the control of the NASA OSS.

4.5 Emergency Evacuation

In the event of an emergency evacuation, VSA will follow the Emergency Action Plan laid out in GD-SFTY-0016.

4.6 Launch Vehicle and Payload Description Data

The following data requirements are necessary for VSA and WFF to perform an operational safety analysis. The actual requirements shall be mission-specific.

4.6.1 Hazardous Electrical Circuits

Customers shall provide VSA and the WFF Range Safety Office with necessary schematic and drawings to confirm compliance with hazard system standards in RSM 8009. VSA and the WFF Range Safety Office shall be promptly notified of any changes to hazardous electrical circuits.

4.6.2 Safety Critical Software

All safety critical software developed by VSA and launch service provider will conform to the RSM requirements.

4.6.3 Mechanical Systems

Customers shall provide a description, including technical details and precautions, for all hazardous mechanical systems. Scale drawings shall be supplied showing the location of these and all other hazardous systems (ordnance, pressure, etc.).

4.6.4 Ordnance Devices

For each electro-explosive device, data sheets shall be provided to the WFF Range Safety Office listing the minimum of all fire current, maximum no-fire current, recommended firing current, normal



resistance, pin-to-case resistance, and, if available, the RF sensitivity characteristics. A technical description of all safe/arm type devices (out-of-line S/A, S/A connectors, mechanical restraints, etc.) employed shall be provided. For ordnance devices such as: rocket motors, shape charges, detonating cord, etc., data sheets shall also be provided which identify the DOT explosive classification, normal output characteristics, composition, or any other relevant information needed to perform safety analyses.

4.6.5 Chemical Systems and Chemicals

Customers and all contractors shall be required to provide a description and schematic diagram of any chemical system on the vehicle or payload to the WFF Range Safety Office. All hardware "plumbing" components (tanks, fittings, valves) and system safety features shall be defined. VSA customers will also provide an inventory and an SDS for all chemicals used on their program.

4.6.6 Pressure Systems

Customers shall provide a description of all pressure systems used on the program to include, but are not limited to, the technical characteristics such as, design burst pressure, MAWP pressures, internal volume, and materials of construction.

4.6.7 Radiation - Non-Ionizing (RF) Sources

Customers shall provide data on all non-ionizing emitters including frequency, type of emission, type of radiating antenna, and radiated power (both peak and average). Standard practice will be to prohibit personnel from being in the vicinity of RF transmitters while active; however, VSA customers can provide procedures with safe distance parameters for necessary operations around active RF emitters.

4.6.8 Radiation - Ionizing Sources

Customers shall provide data on all ionizing sources as required by GPR 1860.1 - Ionizing Radiation Protection.

4.6.9 Optical Sources

Customers shall provide data on all hazardous optical emitters, e.g., lasers including wavelength, pulse width, pulse repetition frequency, divergence angle, and power output.

4.6.10 Ground Support Equipment

Customers shall provide schematics, drawings, operational description, technical details, and documentation of certification for all GSE used to support hazardous systems or operations. This includes, but is not limited to, pyrotechnic checkout meters, breakout boxes, calibration sources, pressure systems, chemical service modules, and lifting and handling devices.

4.7 Launch Vehicle Operating Procedures

All procedures for the handling, assembly, and checkout of hazardous systems shall be approved by the NASA Safety Office prior to use at WFF. Approvals shall be obtained prior to performing any potentially hazardous operation.

4.7.1 Hazardous Systems Operating Procedures

Detailed procedures for handling, assembly, and checkout for all hazardous systems (ordnance, mechanical, pressure, chemical, etc.) shall be provided to VSA and WFF prior to beginning operations.

4.7.2 Recovery Operations Procedures

Customers shall provide a recovery operations procedure that meets the data requirements of GSFC-STD-8009 for GSFC WFF. The procedure will list items to be recovered, reason for recovery, potential



hazards involved, and recovery aids with their characteristics. Recovery operation procedures shall provide hazard mitigation plan and system safing verification methods.

4.7.3 Hazardous Commodity Fueling/Monitoring

Customers shall provide SDSs of all hazardous commodities prior to occupying any VSA facilities. Continuous or personal monitoring is required any time that a propellant source has the capability of personnel exposure. Specific mission safety documentation as written by the AHJ shall be followed for hazardous fueling procedures.

Propellant loading shall be accomplished by qualified personnel. During propellant flow operations, only essential personnel shall be permitted within the danger area.

Once a hazardous substance or fuel enters the PPF or enclosed space, continuous monitoring shall go uninterrupted for the duration of customer occupancy. Sniff checks shall be performed and documented on FRM-SFTY-0014 prior to entry into the PPF or enclosed space daily by trained personnel as applicable. The person(s) performing sniff checks shall slowly walk to each door and sniff prior to opening each door they come to and until they arrive at the source. If at any time during sniff checks the meter alarms, immediately leave the area, seek fresh air and contact emergency services. GD-SFTY-0021 will be provided prior to PPF occupancy.

4.7.4 Contingency Operations Procedures

Customers shall provide their contingency operation procedures prior to beginning launch operations. The contingency operation procedures to include detailed actions and procedures to be taken in the event of launch postponement (with interim launch vehicle and VSA launch pad safing procedures during postponement and the criteria for "hold" or "abort" conditions), launch cancellation (including de-staging operations), ignition failure of the solid and/or liquid booster rocket(s), and emergency response, chemical spill cleanup, or any other contingency that may endanger personnel, property and/or the environment.

In the event of a launch mishap, the contingency plan calls for VSA to work with the lead investigative agency. Details of this working relationship are laid out in program-specific plans.



**VIRGINIA
SPACEPORT
AUTHORITY**

DIR-SQE-0001
Revision: 2
Site Safety and Health Plan

APPENDIX A: Work Hour Policy Safety Critical Positions

Safety Critical Positions	
Maximum Work Period Hours	• 12 hours
Maximum Hours in a 7-day period	• 60 hours
Maximum Consecutive Days Worked	• 7 consecutive
Minimum Time Off Between Work Periods (Hours)	• 8 hours • 10 hours when work period exceeds 10 hours • 12 hours when working 2 consecutive shifts, greater than or equal to, 12-hour work periods • 24 hours after working maximum consecutive days
Waiver Authority	• SGM