

Kennedy NASA Procedural Requirements

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Responsible Office: Safety and Mission Assurance

KSC Construction Contractor Safety and Health Practices Procedural Requirements

National Aeronautics and
Space Administration

John F. Kennedy Space Center

CHANGE LOG

Date	Revision	Description
11/24/2009	Basic	The primary purpose of this document is to make available to NASA/KSC construction contractors' requirements regarding Safety, Health, and Fire Prevention, including project Safety and Health Plans, workplace safety compliance to 29 CFR 1926 (Safety and Health Regulations for the Construction Industry) and 29 CFR 1910 (Safety and Health Regulations for General Industry), National Consensus Standards, and NASA/KSC Safety Program and Policies. Some of the requirements presented herein are repeated in this KNPR for convenience and appear in other requirements documents. Revisions of this KNPR will reflect changes to these requirements in other documents.
8/12/2010	A	The primary goals for Revision A are to: a. Address comments requesting additional clarification on some of the requirements from the Basic revision of the document (changed throughout the document). b. Ensure the information contained in this document, KNPR 8715.3, and KSC-UG-2814 (KSC Construction Contractor Safety and Health Practices User Guide) correspond with each other (changed throughout the document). c. Make grammatical changes/corrections, update the formatting and numbering of some sections and forms, and correct/insert hyperlinks throughout. Where content was not changed, this process was not noted in this Revision History (changed throughout the document). Section P.1 Purpose: Clarified purpose by removing summary of safety information and provided for reference purposes only. Performed re-write of paragraph "b" and clarified paragraph "c." Section P.4 Applicable Documents: Added: l. KNPR 8500.1, KSC Environmental Requirements; m. KNPR 8715.2, Comprehensive Emergency Management Plan (CEMP); updated r. IEEE C2 National Electrical Safety Code Section 1.3 Responsibilities: Added paragraphs "b" and "c" identifying the expectations of KSC contractor employees to comply with KSC safety and health policies/requirements/procedures, and to perform work safely and healthfully. Section 2.1.e. NOTE: Changed supervisor to contractor's authorized representative.

		Section 2.2 Contractor Employee Training: Clarified information to allow updates without having to go through the full plan update approval process. Section 2.3 Accident / Incident (Mishap / Close Call) Reporting: added new paragraph “b” about having means to initiate emergency notification; updated paragraph “e” to change property damage amount to \$500,000; added two notes after paragraph “j” clarifying investigation authority for mishaps; added new paragraph “k” identifying contractor responsibility to cooperate with any Government mishap / close call investigation. Section 2.4.2 Wind Policy: Established method for an Alternate Wind Advisory Plan. Section 2.6 Construction Site Safety: Updated paragraphs “i” and “j” clarifying the use of cell phones and texting devices on work sites. Section 2.8 Drinking Water: Clarified requirements. Section 2.10 First Aid and Medical: Removed requirement to comply with physician direction. Not an enforceable item per contract. Section 2.11 Hazard Communications: Modified paragraph “a” to remove redundant information with paragraph “b.” Section 2.16 Job Hazard Analysis (JHA): Added NOTE covering the review and updating process for JHAs. Section 3.1 Confined Space Entry: Modified paragraph “b” to add information on electrical power systems in enclosed spaces. Section 3.2 Cranes and Lifting Operations: Paragraph “a” added 29 CFR 1926 (OSHA) requirements; paragraph “w” added Reference to UG-2814 and KSC Form 50-101 for lift planning; paragraph “x” added refer to 29 CFR 1926.550(g) for requirements; added NOTE to reference OSHA regulations and requirements for the hoisting of personnel by crane; paragraph “y(2)” added reference to FAA Advisory Circular AC 70/7460-1K. Section 3.3.6 Additional Demolition Requirements: Added paragraph “d” requirement for Florida Department of Environmental Protection (FDEP) a “Notice of Asbestos Renovation and Demolition Form” [DEP Form 62-257.900(1)]. Section 3.5 Electrical Safety: Reorganized sections to better clarify requirements; added new 3.5.1 “Electrical JHAs”; added a new note after paragraph “c(3)” “systems de-energized by personnel other than from the contractor”; updated 3.5.1.d. Elements (of
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		JHA) to add as applicable to paragraphs “(9)” and “(10)””; updated 3.5.4b to include employees crossing the NFPA 70E prohibited approach boundary; updated paragraph “d” to clarify exceptions for energized work; 3.5.5.1a added in close proximity to the work. Section 3.11.1 Asbestos Containing Material (ACM): Added NOTE after 3.11.1e.(2) to clarify that the information provided are estimated values and provided for operations and maintenance (O&M) planning purposes only; added NOTE after 3.11.2a. to clarify the requirement for a toxic metals plan; Section 3.12: Changed section title to Hearing Loss Prevention and Hazardous Noise. Section 3.14 Industrial Hygiene: Removed paragraph for written procedures. Actions needed are covered in JHAs. Section 3.20.2 Respirator Selection and Exposure Monitoring: updated section title; updated paragraph “a” and added “b” to clarify exposure pre-assessment and monitoring. Section 3.22 Scaffolding: Added new paragraph “a” to reference requirements of Subpart L of 29 CFR 1926. Section 3.24.1 General Requirements for Elevating Work Platforms (EWP): Updated paragraph “g” and added “h” to correspond with the fall protection requirements of KNPR 8715.3. Section 3.24.3 Work Practices: Clarified section on requirements for fall protection when moving from or to an aerial work platform. Appendix A Definitions: Added numbering; clarified definitions for Hazardous Chemical or Material and Hazardous Operation/Work Activity. Appendix B Acronyms: Added PAWS (Pager and Area Warning System) and TAWS (Tornado Area Warning System).
12/7/2011	A-1	An Interim Change Policy was signed by the Safety and Mission Assurance Director on December 7, 2011. The Interim Policy provides a change to Section 2.16, which required that all Job Hazard Analyses (JHAs) be provided to the project contracting officer for review and acceptance as appendices to the Site-Specific Safety and Health Plan. This change rescinds this requirement and instead places the JHA development, content review, and approval responsibility on the employer and jobsite controlling authority.
7/28/2015	A-2	This document has been administratively changed to extend the expiration date pending review and rewrite. A Change Log was added to capture all changes.
10/6/2015	A-3	An additional extension to allow for centerwide review and finalization of the document.

12/17/2015	A-4	An extension was processed due to extensive rewrite, internal S&MA reorganization, and key personnel shifts. Revised KNPR will need coordination with Engineering and Spaceport Integration and Services.
4/14/2016	A-5	Due to a SA realignment and a change in management, there has been a refocus to rewrite this KNPR. This document is going through a major overhaul and requirements scrub. Also, to reduce our document footprint, we intend to incorporate KSC-UG-2814, KSC Construction Contractor Safety and Health Practices User Guide into the KNPR 8715.7 rewrite. Once a draft is completed, there are several review/comment cycles before finalizing.
08/29/2016	B	Kennedy NASA Procedural Requirements (KNPR) 8715.7 went through a major rewrite. Improvements include: KSC-UG-2814 was incorporated into the rewrite, and KSC forms and permits have been updated. KSC-UG-2814 will be retired. Construction contractors must comply with the Occupational Safety and Health Administration (OSHA) 29 CFR 1926, therefore specific OSHA 1926 requirements have been removed. The Lifting section has been aligned with the NASA Lifting Standard.
9/14/2020	C	Kennedy NASA Procedural Requirements (KNPR) 8715.7 went through a major rewrite. Improvements include adding clarifying language, revisions, and requirements to several sections within the KNPR, and KSC Forms and Permits have been updated. Hyperlinks have also been updated. The requirements set forth by the NASA Lifting Standard were identified as too restrictive on construction contractors and several requirements were removed or altered.
04/08/2025	D	KNPR 8715.7 went through a major rewrite to streamline and remove redundant information contained in other mandatory requirements documents (e.g., OSHA, NFPA). Improvements include: updating hyperlinks throughout the document, adding clarifying language, removal of repetitive language, re-formatting document to streamline information, removal of non-repeating acronyms, and updating requirements. KSC Forms and Permits have also been updated.

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Preface

P.1 Purpose

- a. This directive establishes safety and health procedural requirements that serve as a framework to define the parameters for safely performing construction work at Kennedy Space Center (KSC).
- b. This directive is a compilation of safety information, KSC requirements, and Federal regulations (e.g., Occupational Safety and Health Administration (OSHA)) applicable to contractors conducting construction work on National Aeronautics and Space Administration (NASA) property at the KSC and Cape Canaveral Space Force Station (CCSFS). The information and requirements found within are not intended to cover all the safety requirements of OSHA and other regulations and consensus standards. The references to OSHA are provided for convenience and do not constitute a complete list of all applicable OSHA regulations. This Kennedy NASA Procedural Requirements (KNPR) document does not relieve contractors of their obligations under OSHA regulations or any other applicable local, State, or Federal laws and regulations.

P.2 Applicability

- a. This directive applies to all NASA construction contractors performing work on NASA property at KSC and CCSFS, whether as a Prime construction contractor for NASA or a subcontractor to a services contract performing construction work (i.e., Spaceport Operations contract or program support contracts), as specified in the contract.
- b. In this directive, all mandatory actions (i.e., requirements) are denoted by statements containing the term “shall.” The terms “may” denotes a discretionary privilege or permission, “can” denotes statements of possibility or capability, “should” denotes a good practice and is recommended, but not required, “will” denotes expected outcome, and “are/is” denotes descriptive material.
- c. In this directive, all document citations are assumed to be the latest version unless otherwise noted.
- d. In this directive, all references to “contractor” or “subcontractor” refer to any contractor performing construction activities on KSC and CCSFS unless otherwise noted.
- e. In the event of a conflict between the requirements set forth in this document and:
 - (1) Program or Agency requirements, the more stringent requirements take precedence.
 - (2) Existing contract provisions, the contract provisions take precedence.
 - (3) Sub-tier documents, the provisions of this document take precedence.
 - (4) Other documents at an equivalent level (e.g., other KNPR documents), the respective document offices of primary responsibility will resolve the conflict on a case-by-case basis and provide appropriate guidance.

Note: If disagreement exists over which of the aforementioned documents takes precedence, the NASA KSC Director, Safety and Mission Assurance (SMA) will make the final determination.

P.3 Authority

- a. [29 CFR Part 1926, Occupational Safety and Health Standards for Construction Industry](#)
- b. [KNPD 8700.1, Safety and Mission Assurance Policy](#)

P.4 Applicable Documents and Forms

- a. [KNPR 1840.19, KSC Industrial Hygiene Program](#)
- b. [KNPR 1860.1, KSC Ionizing Radiation Protection Program](#)
- c. [KNPR 1860.2, KSC Non-Ionizing Radiation Protection Program](#)
- d. [NASA-STD-8719.9, Lifting Standard](#)
- e. [NASA-STD-8719.17 Standard for Ground-Based Pressure Vessels and Pressurized Systems \(PVS\)](#)
- f. [KDP-F-3645, NASA Construction Contractor Mishap Report](#)
- g. [KDP-KSC-P-3006, KSC Tropical Storm and Hurricane Operations](#)
- h. [KSC-PLN-1904, Trailer/Equipment Tiedown Plan for the John F. Kennedy Space Center](#)
- i. [KSC Form 8-313, Chemical Inventory for Construction Projects at KSC](#)
- j. [KSC Form 20-165, TAG, DANGER – DO NOT USE OR OPERATE](#)
- k. [KSC Form 20-195, Lockout/Tagout Tag](#)
- l. [KSC Form 20-195A, Lockout/Tagout Tag Identifier](#)
- m. [KSC Form 28-914, Danger Tag Use Control Log](#)
- n. [KSC Form 28-915, Lockout Lock and Lockout Tag Inventory Record](#)
- o. [KSC Form 50-101, Lift Plan for Construction Contractors](#)
- p. [KSC Form NF1921, Energized Electrical Work Permit \(EEWP\)](#)
- q. [KSC Form 50-473, Project-Specific Safety and Health Plan](#)
- r. NFPA 70, National Electric Code
- s. NFPA 70E, Standard for Electrical Safety in the Workplace

P.5 Measurement/Verification

Compliance with the requirements contained in this directive will be verified through normal surveillance, audit, and assessment activities.

P.6 Cancellation

This document cancels KNPR 8715.7, Rev. C, KSC Construction Contractors Safety and Health Practices Procedural Requirements.

/ original signed by 09/25/2024 /

P.R. Rodriguez
Director, Safety and Mission Assurance

Distribution: TechDoc Library

CHAPTER 1: General information

1.1 Goals

The goal of this directive is to provide Center safety requirements that ensure construction activities and operations are performed in a manner that minimizes risk to personnel and property.

1.2 Objective

1.3.3 The objective of this KNPR is to document Center construction safety requirements, to establish procedural requirements unique to KSC, and to convey construction safety requirements effectively and efficiently to the contractor that protects employees and property.

1.2.2 Chapter 2 outlines the general requirements that apply to all construction contractors on KSC and CCSFS, regardless of the scope or complexity of the project. These requirements are outlined in Chapter 1 of the Project-Specific Safety and Health Plan (PSHP) template.

1.2.3 Chapter 3 outlines specific regulatory compliance elements that may apply, depending on the scope of work, project complexity, and duration. The details of how a contractor will comply with these requirements will be outlined in Chapter 2 of the PSHP template.

1.3 Responsibilities

1.3.1 The interpretation of the requirements in this KNPR is the responsibility of the SMA Institutional Division with the appropriate SMA organizations that support the program/project and directorates. The NASA KSC Director of SMA is the final authority for the interpretation of these requirements.

1.3.2 All Prime contractors (reference section [P.2.a](#)) ensure the safety and health requirements found in this directive and their PSHP, or equivalent service contractor required plan, are followed by all employees, including subcontractor employees, on the jobsite.

1.3.3 When unsafe or unhealthful conditions or acts pose a danger to personnel or property, all employees have the right and obligation to stop work or refuse to perform work they feel is unsafe or unhealthful. Supervisors work with their employees to decide how the work can be performed safely and healthfully.

1.3.4 Contractors maintain open, nonretaliatory internal communication regarding safety and health. This is essential to improving and maintaining KSC's safety and health program and retaliation or disciplinary action against an employee who reports a safety concern will not be tolerated.

1.3.5 NASA contractors ensure subcontractor contract deliverables are submitted to their NASA Contracting Officer (CO)/Contracting Officer's Representative (COR) or their representative for review by the respective authority (e.g., NASA Safety, Environmental Health, Industrial Hygiene (IH), Authority Having Jurisdiction).

1.3.6 Subcontractors performing construction activities for a service contractor follow the equivalent contract deliverables submittal and review requirements as identified in their contract.

1.3.7 Violations of the requirements established by this directive could lead to disqualification from performing any further construction work at NASA KSC.

CHAPTER 2: General Safety and Health Requirements

2.1 General Requirements

2.1.1 NASA construction contractors shall complete the PSHP template and address the policies, procedures, and techniques that will be used to ensure the safety and occupational health of the workforce on the awarded contract. Service contractors implement their equivalent program requirements for construction subcontractors per their requirements and the requirements of this KNPR.

Note: Corporate safety and health plans can be used in the development of the PSHP or equivalent service contractor required plan, but they will not fulfill the requirements of a project safety plan as standalone documents. For NASA construction contracts, additional information not fully captured in the PSHP template can be provided as an appendix or under a separate cover.

2.1.2 NASA construction contractors shall submit their PSHP to the government-appointed COR for review and approval before the commencement of any site work. Subcontractors performing construction work for a services contract follow the service contractor's safety and health plan submittal, review, and approval requirements. The COR, or services contract equivalent representative, will review the PSHP or equivalent service contractor required plan in consultation with the safety organization with oversight responsibilities (i.e., NASA, services contractor safety), Environmental, IH, and KSC Fire Services.

Note: The government requires a minimum of 10 business days to complete the review of PSHPs. Documents sent back for rewrite or rework will be completed and returned to the government for additional review.

2.1.3 After the approval of the PSHP or equivalent service contractor plan, the contractor/subcontractor shall request a safety nuts and bolts briefing, conducted by the safety organization with oversight responsibilities for the project, within one week of project kick-off.

Note: The intent of the timing of the nuts-and-bolts meeting is important to ensure the information is provided and discussed as close to the project kick-off as possible.

2.1.4 The contractor's site supervisor shall ensure employees follow all applicable regulatory and NASA/KSC safety and health requirements found in the accepted PSHP or equivalent service contractor required plan, KNPR 8715.7, and best practices as defined by national consensus standards.

2.1.5 Contractors shall identify and mitigate hazards that pose a risk to personnel or property before work starts.

2.1.6 The contractor's authorized representative shall inform and request approval from the COR for any proposed updates or changes to the contractor's approved PSHP or equivalent service contractor-required plan.

2.1.7 The responsible safety organization (i.e., NASA or service contractor) will monitor and evaluate the safety of the contractor's operations and inform the project CO and COR of any issues.

2.1.8 Any recommendations provided by NASA KSC Safety to the contractor should be considered advisory only and do not relieve the contractor from any safety, liability, or contract compliance obligations.

2.1.9 The contractor shall permit jobsite access to the responsible safety organization (i.e., NASA or service contractor) at any time (except when hazardous operations or active clear areas prevent access) and allow for inspections to verify compliance with safety and health requirements.

2.1.10 The CO may issue a stop work order when a contractor does not follow safety procedures, creates, or allows imminent dangerous situations to occur, or accumulates multiple safety non-compliances.

Note: All employees on KSC have stop work authority which can be invoked by any employee on KSC when an activity poses a danger to personnel or property. This differs from a "stop-work order" initiated by the CO or COR at the project level. See the definitions in [Appendix A](#) for added clarification.

2.2 Contractor Employee Safety and Health Training

2.2.1 All contractors and subcontractors shall review the KSC Construction Contractor General Hazards Familiarization safety presentation ([KSC-QF111KSC](#)) and provide a transcript of completion – along with other required training documentation – before work starts.

2.2.2 The contractor will name those employees in special roles (e.g., site supervisor, competent person, qualified person) and keep this information current throughout the project lifecycle in their PSHP, or equivalent service contractor-required plan.

2.2.3 The contractor shall ensure, before starting work, that all employee safety and health training required by the PSHP or equivalent service contractor plan, NASA, and OSHA standards has been completed, is current, and proper documentation has been provided.

2.2.4 Contractor and subcontractor employee training records shall include the employee's name, date of training, type of training received, expiration dates, and signature of a company official (manager). These records will be included as an appendix in the PSHP or equivalent service contractor-required plan.

2.3 Reporting Mishaps/Close Calls

2.3.1 In case of a mishap, the contractor shall take immediate action to prevent further injury to personnel and damage to any property.

2.3.2 The contractor shall immediately (within one hour) notify the assigned NASA KSC Safety Specialist and the COR (or the assigned NASA Project Manager) after a mishap, regardless of severity.

2.3.3 The first notification/report for mishaps and close calls shall include, at a minimum, all available information relating to the time of the incident, the location, a description of the event, and the organization(s) involved in the event.

2.3.4 The contractor shall have the capability to contact emergency services from each job location.

Note 1: Hand-held radios may only be used when approved by the COR. The use of a runner for emergency notification from a job location does not meet this requirement.

Note 2: In case of a serious accident/incident, immediately call 911, (321) 867-7911 (cell phone on KSC), or (321) 853-0911 (cell phone on CCSFS). Ambulances are on call 24 hours/day; 7 days/week on KSC and CCSFS.

2.3.5 After starting emergency notifications, the Contractor Site Supervisor shall act (or give support to NASA response personnel) to secure the site, limit unnecessary access, and preserve evidence until the site is released by the Incident Commander, KSC Security, NASA Safety, or the mishap board chairperson.

2.3.6 The contractor shall ensure all potential incident witnesses and equipment involved remain at the worksite until released by the NASA Safety Investigator.

2.3.7 The contractor shall submit an initial [KDP-F-3645, NASA Construction Contractor Mishap Report](#) by e-mail to NASA Safety within four hours of any mishap or close call.

2.3.8 A completed investigation and final report shall be submitted within 10 working days of the incident unless an extension through NASA KSC Safety has been granted.

2.3.9 The contractor shall cooperate with any NASA mishap/close call investigations.

2.4 First Aid and Medical

2.4.1 The contractor shall describe in the PSHP, or an equivalent service contractor required plan, their approach to providing prompt medical response in case of employee injury.

2.4.2 Personnel should report a medical emergency by dialing 911, (321) 867-7911 (cell phone on KSC) or (321) 853-0911 (cell phone on CCSFS).

2.4.3 For non-emergency, walk-in medical care, personnel can report to the KSC Occupational Health Facility found at the corner of 2nd Street SE and C Avenue SE during normal office hours. After hours or on weekends, call (321) 867-7911 (the KSC 911 Number). Emergency Medical Services personnel will evaluate for first aid or transport to the nearest medical facility.

2.5 Hazard Communications

2.5.1 The contractor will describe in the PSHP, or an equivalent service contractor required plan, their approach to training workers on the details of the hazard communication program, the labeling system used at the worksite, and the location of and access to Safety Data Sheets.

2.5.2 All inventory reporting shall be completed on the Chemical Inventory for Construction Projects at KSC, [KSC Form 8-313](#).

2.6 Job Hazard Analysis

2.6.1 The Contractor Site Supervisor shall verify a job hazard analysis is complete for each task before work starts and that it effectively identifies, eliminates, or otherwise mitigates, known or potential job hazards.

Note: The terms “Job Hazard Analysis (JHA),” “Job Safety Analysis,” and Activity Hazard Analysis,” are synonymous.

2.6.2 A copy of all JHAs for the work being performed shall be available at the jobsite for employee and NASA Safety review.

2.6.3 Contractor employees shall review all JHAs associated with their work and sign a signature page to acknowledge they have read and intend to adhere to the hazard mitigations contained therein.

Note: JHAs are living documents and should be reviewed, updated, and discussed with employees when changes occur in work tasks, alternate equipment is being used, or when alternate methods of performing the task are being considered (e.g., using aerial lifts in place of scaffolding).

2.6.4 The JHA shall include, at a minimum, the following elements:

- (1) **Task (Activity) Description:** Specify the work to be performed, such as operating machinery, equipment, and powered hand tools.
- (2) **Hazard Description:** Using the listed tasks, identify the hazards resulting from the work to be performed (e.g., flying debris, dust, wood chips, or metal shaving getting into the eyes).
- (3) **Hazard Controls:** The preventative measures taken to eliminate or mitigate the hazard to an acceptable risk level (e.g., know and use the manufacturer’s operating, maintenance, and safety procedures, and personal protective equipment (PPE) when required).

Note: Reference Section 3.6, Electrical Safety for energized electrical work assessment requirements.

2.7 Weather Policy

2.7.1 General

2.7.1.1 Weather warnings are announced over the KSC Centerwide Paging and Area Warning System. For tornado sightings, KSC will activate the Centerwide Tornado Area Warning System and make announcements over the public address system.

2.7.1.2 Contractors performing work outdoors shall have a means of receiving the KSC weather alerts.

Note: The following website may be used to register for KSC weather alerts from the 45th Space Wing. <https://nasaksc.onthealert.com>. Contractors can receive these alerts by email or text message.

2.7.2 Wind Policy

2.7.2.1 The contractor shall follow wind advisories and warnings issued by the 45th Space Wing Weather Office.

2.7.2.2 Contractors performing outdoor work shall adhere to the wind restrictions shown in **Table 2** or equipment-specific manufacturer requirements, whichever are more restrictive.

TABLE 2: WIND LIMITATIONS

Steady State	Gusts	Limitations
18 knots (20.7 miles per hour (mph)) and/or follow manufacturer instructions	22 knots (25 mph) and/or follow manufacturer instructions	No erection of or work on floats, spiders, or scaffolding.
30 knots (34.5 mph)	35 knots (40.3 mph)	No work on facility roofs, structure tops, unprotected areas, or outside handrails (materials on roofs are secured or removed).
35 knots (40.3 mph)	40 knots (46 mph)	Contractors will immediately conduct a walk-down of their area for unsecured items.
40 knots (46 mph) and above	45 knots (51.7 mph) and above	Immediate actions will be taken to secure at ground level all loose or unanchored items, equipment, supplies, and materials.

Note: The 45th Space Wing Weather Office issues advisories for winds less than 35 knots, warnings for winds equal to or greater than 35 knots, and watches and warnings for winds equal to or greater than 50 knots.

2.7.2.3 Upon notification of a KSC-announced adverse weather condition, or if wind conditions on the jobsite do not appear to exceed safe working conditions, the contractor may continue to work if:

- (1) Local wind conditions are measured with a calibrated anemometer.
- (2) Winds are monitored continuously during advisories and readings are recorded every 20 minutes.

2.7.3 Lightning Restrictions

2.7.3.1 A Phase I Lightning Watch means that conditions are favorable for lightning to occur within 4 nautical miles of a Lightning Hazard Notification Area (LHNA) boundary with a desired lead time of 30 minutes. A Phase I Lightning Watch is intended to give personnel sufficient lead time to secure their operations before the forecasted lightning begins.

2.7.3.2 A Phase II Lightning Warning means that lightning was seen or is forecasted to occur within four nautical miles from the specific LHNA boundary.

Note: KSC has five LHNAs ([Appendix C](#)): Mid-Course Radar (MCR), Shuttle Landing Facility (SLF), Launch Complex 39 (LC39), Vehicle Assembly Building (VAB) / Booster Fabrication Facility Complex (BFF), and Industrial Area. Outside of these areas, lightning announcements may not be received in time to take proper action. In this case, the PSHP or equivalent service contract required lightning safety plan should include more detailed information about the detection and communication of the lightning hazard.

2.7.3.3 The PSHP or equivalent service contractor required plan shall address the following lightning safety provisions, at a minimum:

- (1) A determination that the construction site is within an LHNA.
- (2) Lightning safety plans for operations that occur outside of the LHNA.
- (3) Lightning safety plans for operations that require more lead time than Phase II Lightning Warning provides.

Note: These are operations in which personnel may require more time to secure equipment or to seek shelter before the lightning hazard is present. In these cases, consideration should be given to seeking shelter upon notification of a Phase I Lightning Watch if the site is located within one of the five LHNAs.

2.7.3.4 Upon notification of a Phase I Lightning Watch, contractors shall prepare to safely halt any operations that may be affected if a Phase II Lightning Warning is announced (i.e., be prepared to safely halt operations that expose personnel to lightning hazards or that must be halted if a Phase II Lightning Warning is announced).

2.7.3.5 It is permissible for outdoor and all electrical system work to continue during a Phase I Lightning Watch only if the operations can be stopped at once upon notification of Phase II Lightning Warning.

2.7.3.6 Upon notification of a Phase II Lightning Warning, personnel shall:

- (1) Safely halt and secure operations that could expose equipment or personnel to the lightning hazard.
- (2) Seek shelter to protect themselves from the dangers of lightning.

Note: Proper lightning shelters include buildings that are protected against lightning and fully enclosed metal vehicles. Trees, open structures such as picnic pavilions, or small buildings/structures are not proper shelters.

- (3) Not remain on or access roofs or open-top levels of structures.
- (4) Cease electrical systems work and maintenance which could pose a risk to personnel due to the lightning hazard.

2.7.4 Hurricane Condition Policy

2.7.4.1 During the Atlantic Hurricane Season (June 1 through November 30), Florida is subject to extreme destruction associated with hurricanes. During the Atlantic Hurricane Season, contractors shall:

- a. Tie down trailers and equipment with an anchorage that complies with [KSC-PLN-1904](#), Trailer/Equipment Tiedown Plan for the John F. Kennedy Space Center.
- b. Follow [KDP-KSC-P-3006](#), KSC Tropical Storm and Hurricane Operations.

2.8 Construction Site Safety

2.8.1 The contractor shall ensure a site supervisor or alternate site supervisor is at the work site during active construction or on Center and able to reach the worksite within 15 minutes.

2.8.2 Contractors shall not use electronic devices (e.g., cell phones) while operating equipment or driving vehicles (hands-free only in vehicles).

2.8.3 The contractor shall ensure all employees know how to submit suggestions or report issues about jobsite and facility safety and health to the project-assigned NASA safety specialist or by calling the Center Safety Office at (321) 867-SAFE (7233). Safety suggestions, violations, or issues can be reported anonymously to their employer or the Center Safety Office without fear of retaliation or retribution.

2.9 Temporary Structures, Trailers, and Work Areas

Contractors shall Implement [KSC-PLN-1904](#) when hurricane or severe weather watches/warnings are issued (per [KDP-KSC-P-3006](#)).

2.10 Controlled/Restricted Access Areas

Contractors shall coordinate with, and obtain approval from, the project COR before accessing any controlled or restricted access areas at KSC or CCSFS.

2.11 Safety Systems – (Permanently Installed)

Contractors shall develop alternate means of protection before altering or invalidating the integrity of any installed safety systems or personnel safety devices (e.g., firefighting equipment and sensing devices, fire alarm centers, fire water supply, guardrails, safety chains, warning lights, and safety signs) and obtain approval from the COR to implement the plan.

2.12 Pre-task Meetings

2.12.1 Contractors shall conduct pre-task meetings to communicate all job-related safety issues to the employees before the start of each workday, hazardous operations, or when a task changes during hazardous operations.

2.12.2 At a minimum, the following topics shall be covered in the pre-task meeting:

- (1) Work tasks planned for the day including sequence and hazard management.
- (2) Weather issues that do or could affect work.
- (3) PPE requirements.
- (4) Safety hazard awareness (from JHA).

2.13 Worksite Inspections

2.13.1 Contractor

Contractors shall perform and document weekly worksite safety inspections, findings, and mitigations.

2.13.2 NASA KSC Safety

2.13.2.1 NASA KSC Safety personnel may conduct site safety inspections at any time.

2.13.2.2 The contractor site supervisor shall work with the assigned NASA KSC Construction Safety Specialist, the COR, and CO (depending on severity) or a designated representative to address any findings and implement corrective action(s).

2.13.2.3 A Notice of Safety Violation (NOSV) may be issued by NASA KSC Safety for repeat or serious safety violations.

2.14 Clothing

Contractor employees conducting work on NASA contracts shall wear proper clothing suitable for the task and hazard level of work, including, at a minimum, long pants, a shirt with sleeves (no tank tops), and shoes proper for the type of work to be performed. Overly loose-fitting, torn, or ragged clothing is not acceptable.

CHAPTER 3: Project-Specific Safety and Health Requirements

The PSHP, [KSC FORM 50-473](#), or an equivalent service contractor-required plan, should only have the sections in Chapter 3 necessary to perform the awarded construction project. For NASA contracts, ensure the proper items in the PSHP Requirements Checklist are checked to reflect these section requirements.

3.1 Cranes and Lifting Operations

3.1.1 A lift plan ([KSC Form 50-101](#)) or equivalent shall be developed and kept on the work site for all crane/lifting operations and will be readily available for review by the assigned NASA Construction Safety Specialist upon request.

3.1.2 Lift plans involving lifting of personnel, lifts exceeding 75 percent of the rated capacity of the crane, and lifts involving more than one crane shall be submitted to the CO for review and concurrence in consultation with the KSC Lifting Devices Equipment Manager (LDEM).

3.1.3 Lifts of any type (crane, jack, forklift, etc.) determined to meet the definition of “Critical Lift – NASA” (as defined in [Appendix A](#) of this document) by the responsible program, CO, or KSC LDEM shall meet the requirements of the NASA Lifting Standard, [NASA-STD-8719.9](#), and must have documented KSC LDEM concurrence that the requirements therein have been met before proceeding with the operation.

3.2 Mobile Elevated Work Platforms

3.2.1 General Requirements

3.2.1.1 Use of Mobile Elevated Work Platforms (MEWPs) shall be per equipment manufacturer instructions, the requirements of this document or, when applicable, American National Standards Institute (ANSI)/SAIA A92-2, A92.3, A92.5, A92.6, and A92.9: Aerial Work Platform Standards.

3.2.1.2 Use of an approved self-retracting device (SRD) connected to an approved anchor point in the basket and full body harness is the best practice on Group B (as defined by ANSI) MEWPs. When an SRD is not used, a length-adjustable lanyard and full body harness shall be connected to an approved anchor point in the basket and adjusted in length in such a manner that it reduces the possibility of the worker falling over the guardrails yet permits the work to be accomplished. Adjustments should be made to the length of the lanyard at different points during the operation to maintain the highest level of safety.

3.2.2 Training Requirements

The contractor shall submit training documentation to the COR, or service contractor equivalent, for review and approval by the safety organization with project oversight responsibilities before work begins.

3.3 Contractor Owned/Leased/Rented Equipment

The contractor shall include in their PSHP, or equivalent service contractor required plan, a list of all contractor-owned, leased, or rented specialty or heavy equipment (e.g., forklifts, lulls,

cranes, earth-moving equipment, and other powered industrial trucks) proposed for use on the contract.

3.4 Demolition

3.4.1 Before any demolition work begins, the construction contractor shall submit project-specific demolition plans to the COR, or service contractor equivalent, for review by the safety organization with project oversight responsibilities.

3.4.2 Demolition plans shall include the specific requirements of National Fire Protection Association (NFPA) 241, if applicable.

3.5 Excavation

3.5.1 Dig Permits

3.5.1.1 The contractor shall request dig permits through the project COR, or a service contractor equivalent process, and keep permits on-site for review.

Note: The soil on KSC is classified as type C.

3.5.1.2 If digging is performed for any reason to any depth, the contractor shall request through the COR, or service contractor equivalent, completion of a Utility Locate/Excavation Permit Request (submitted on the [Excavation Permit Requests: \(nasa.gov\) site](#)).

3.5.1.3 The contractor shall coordinate any deviations from the approved excavation with the COR or service contractor equivalent.

3.5.2 Special Requirements to Hand-Dig Excavations in Specific Situations

3.5.2.1 The contractor shall hand dig all excavations within 24 inches and in all directions of a marked located utility line.

3.5.2.2 The contractor shall hand dig a pilot trench, when called for on the Dig Permit, for all underground utility work along the centerline of new trenches and down to the bottom elevation of the new utility.

3.5.3 Protection of Personnel during Excavations

For all excavations of four feet or greater in-depth, the contractor's competent person shall complete a record of daily inspections and keep the record at the jobsite.

3.6 Electrical Safety

Contractors performing work on or near any electrical system shall provide a written program for such work and identify designated qualified electrical persons in the PSHP, or equivalent service contractor required plan, before the start of the respective work activities.

3.6.1 Electrical Risk Assessments

3.6.1.1 The contractor's written electrical safety program shall include risk assessments covering all expected or known work to be performed in hazardous locations or on or near energized parts including "routine" tasks not requiring an energized work permit by NFPA 70E.

3.6.1.2 Each electrical risk assessment shall be completed by a qualified person and have the following elements:

- a. Date of the analysis.
- b. Description of the activity.
- c. General work steps (in sequence).
- d. Potential hazards for each step.
- e. Controls for each hazard (such as PPE, lockout/tag-out, administrative, and access restrictions).
- f. A detailed list of all PPE, special tools, and safety equipment required including required calibrations, certifications, and inspections.
- g. A separate list of all qualified personnel shall also be provided.
- h. Lighting survey to ensure adequate lighting (in addition to flashlights) is available for the task, particularly for spaces not normally illuminated such as vaults and manholes.
- i. Approach boundaries as determined by the shock risk assessment/hazard analysis (as applicable).
- j. Arc-flash boundaries as determined by the arc-flash risk assessment/hazard analysis (as applicable).

3.6.2 Shock Risk Assessment

3.6.2.1 A qualified electrical person shall perform a shock risk assessment to determine voltage exposure, boundary requirements, and the PPE necessary to minimize the possibility of electric shock.

Note: The Government will supply available information on applied system voltage, and system configuration as required to support the shock risk assessment.

3.6.2.2 The contractor will provide the results of the shock risk assessment to the COR, or service contractor equivalent, and the responsible safety organization (i.e., NASA, service contractor) for review and feedback.

3.6.3 Arc Flash Risk Assessment

3.6.3.1 A qualified electrical person shall complete an arc flash risk assessment to identify arc flash hazards, determine boundary requirements, and identify additional protective measures including PPE to protect personnel from arc flash injury.

Note: The Government or service contractor will supply available information on applied system voltage, upstream circuit protective device settings, cabling distances and sizes, and available fault current as required to support the arc flash risk assessment.

3.6.3.2 The contractor will provide the results of the arc flash risk assessment to the COR, or service contractor equivalent, and the responsible safety organization (i.e., NASA, service contractor) for review.

3.6.4 Electrical System Outage Work Permits

3.6.4.1 The contractor shall ensure all necessary outages that affect utility systems such as electrical, water, fire detection, protection systems, and air handling systems are performed under an approved electrical system outage work permit.

3.6.4.2 The contractor shall schedule such work to minimize outages.

3.6.4.3 The contractor shall request utility outage permits in writing from the COR, or service contractor equivalent, at least 14 working days in advance of the time required.

3.6.4.4 The request shall indicate the system involved, the area involved, the approximate time of the outage, and the nature of the work.

Note: Submittal of a contractor's outage request does not constitute automatic approval. Due to the nature of the operations at KSC, the contractor may not know until the day before the requested date if the outage will take place as scheduled. All outages will normally take place outside normal work hours.

3.6.4.5 When high and medium voltage circuits or equipment are required to be de-energized, the contractor shall obtain an outage permit from the current KSC base operations contractor by submitting [KSC Form 26-311, Request for Utility Outage](#) to the project COR or the service contractor equivalent.

3.6.4.6 The contractor shall lockout/tag-out (LOTO) the required circuits and attach [KSC Form 20-165](#) to the lock (see [LOTO](#)).

3.6.4.7 Where systems are de-energized by personnel other than those employed by the contractor, the contractor shall apply individual lockout/tag-out and verify the absence of voltage while wearing the proper PPE and using the proper instruments.

3.6.4.8 After lockout/tag-out is applied, the contractor shall verify the absence of voltage using suitable test equipment and proper PPE before grounding or performing any work on circuits or equipment.

3.6.4.9 When working in manholes or vaults having energized medium voltage cables, the contractor shall request through the project COR, or service contractor equivalent, that protective relays supplying all such cables be set to the maintenance mode and if available neutral ground resistors (NGRs) at the primary transformers in the corresponding substation are switched in.

3.6.4.10 The contractor shall obtain a work permit ([KSC Form 26-400](#)) from the current KSC base operations contractor through the project COR, or service contractor equivalent, showing that all such relays are set to maintenance mode and if available that NGRs are switched in before entering or working in any manhole or vault with energized medium voltage cables.

3.6.4.11 When working in manholes or vaults, the contractor shall request, through the COR or service contractor equivalent, safety, and industrial hygiene support to perform a pre-entry safety and health assessment to identify any hazards and mitigations associated with the work.

3.6.5 Exposure to Energized Parts

3.6.5.1 The contractor shall place energized parts to which an employee might be exposed in an electrically safe work condition before any employee works on or approaches them unless the contractor can show that de-energizing introduces added or increased hazards or is infeasible due to equipment design or operational limitations.

3.6.5.2 If energized parts are not placed in an electrically safe work condition (e.g., due to increased risk, added hazards, or infeasibility), or if a task involves an employee crossing the NFPA 70E restricted approach boundary, the contractor shall consider the work to be energized electrical work and will perform the work under a written Energized Electrical Work Permit ([KSC Form NF1921](#)) unless:

- a. The capacity of the source and any overcurrent protection between the energy source and the worker will not increase exposure to electrical burns or explosions due to electrical arcs, and the energized parts operate at less than 50 volts to ground without de-energizing the parts.
- b. The work being performed on or near live parts only involves testing, troubleshooting, or voltage measuring, is done by qualified electrical persons, and incorporates proper safe work practices and PPE.

Note: The repairing, replacing, or removing of any energized exposed components during these tasks is considered energized work, not troubleshooting or testing.

3.6.5.3 Contractors shall employ a two-person buddy system when performing work on or near exposed energized parts.

3.6.5.4 The site supervisor shall conduct and document a pre-work briefing for energized work using [KSC Form NF1921](#) before starting work.

3.6.5.5 The contractor shall submit [KSC Form NF1921](#) to the COR, or service contractor equivalent, for review and acceptance in consultation with the responsible organization's Electrical Subject Matter Expert and Safety.

3.7 Lockout/Tagout and Control of Hazardous Energy

3.7.1 Lockout/Tagout

3.7.1.1 The contractor shall follow established and documented procedures applicable to the scope of work when KSC-owned and operated equipment requires servicing and maintenance.

3.7.1.2 The contractor shall use [KSC Form 20-195](#) as the LOTO Tag when the process involves the servicing and maintenance of equipment.

3.7.1.3 The contractor shall attach [KSC Form 20-195A, Lockout/Tagout Tag Identifier](#) to the lockout lock when used during servicing and maintenance.

Note: Contact the COR, PM, or the assigned safety representative to obtain these forms.

3.7.2 Danger Tags

The contractor shall use [KSC Form 20-165, DANGER: DO NOT USE OR OPERATE TAG](#) as the tag to identify any hazard, condition or configuration that presents a threat of death or serious injury to personnel or destruction of flight hardware or equipment. This will include the control of hazardous energy not covered under Lockout/Tagout requirements.

Note: Contact the assigned safety representative to obtain this form.

3.7.3 Recordkeeping

Contractors shall keep an inventory of all locks and LOTO tags issued to them including the location and equipment identifier where they are applied using [KSC Form 28-915, Lockout Lock and Lockout Tag Inventory Record](#).

Note: Contact the assigned safety representative to obtain these forms.

3.8 Fall Protection

3.8.1 Fall Height Exposure

All 29 Code of Federal Regulations (CFR) 1910 and 1926 Fall Protection Regulations are applicable to persons involved in activities on any walking/working surface at KSC. Additionally, work taking place on KSC (including work on scaffolds, maritime, and steel erection) shall not exceed a 6-foot maximum exposure height, even where permitted by OSHA.

Note: Fall hazard exposure levels are regulated by OSHA. OSHA General Industry regulations set a 4-foot maximum fall hazard exposure; OSHA Construction regulations set a 6-foot maximum fall hazard exposure.

3.8.2 Wind

The wind restrictions in section 2.7.2, [Table 2: WIND LIMITATIONS](#) apply to all work at height.

3.8.3 Fall Protection Equipment and Systems

3.8.3.1 Non-Commercial Off-the-Shelf (custom designed) systems being installed for workers will be approved and documented by a Fall Protection Qualified Person in accordance with applicable ANSI/ASSP and OSHA requirements. A procedure should be provided to their employer's Fall Protection Program Administrator to ensure that the Fall Protection Competent Person and Authorized Persons (Users) can determine that the system is approved for use, understand how to use the system, and are aware of any specific requirements or limitations that the system may have.

3.8.3.2 The contractor shall obtain documented approval by a Fall Protection Qualified Person before using equipment that is not designed specifically for fall protection as fall protection equipment, and the approved equipment will be labeled "For Fall Protection Use Only."

3.8.3.3 Fall Arrest Systems that require freefall distance exceeding 6 feet, or maximum arresting force exceeding 900 pounds, shall be designed, and documented by a Fall Protection Qualified Person. Free fall distance exceeding 6 feet is allowable only when it can be proven that it is infeasible to provide a lesser freefall distance.

Note: Being more difficult, time consuming, or costly than a non-compliant alternative does not constitute infeasibility

3.8.3.4 Fall protection equipment used in proximity of flight hardware or other sensitive equipment should utilize features to reduce the likelihood of damage to said hardware/equipment.

3.8.3.5 All equipment shall be marked with a manufacturer's serial number (e.g., tag, webbing) or be serialized with documentation to maintain traceability using a method not destructive to the equipment.

Note: Do not mark on load carrying webbing or other sensitive parts of fall protection equipment unless allowed by the equipment manufacturer. Marker ink may contain chemicals that can be damaging to harness and lanyard materials.

3.8.3.6 The contractor shall include fall protection planning details within or as an appendix to their PSHP or equivalent service contractor-required plan.

3.8.4 Scaffolding

Personnel working on scaffold platforms where the potential exists for a fall 6 feet or greater shall be protected by fall protection systems (e.g., guardrails, fall arrest, fall restraint).

3.8.5 Tower Climbing Operations

3.8.5.1 Prior to tower climbing, the following should be considered and addressed for safety and acceptability:

- a. Weather conditions
- b. Coordination with Fire Rescue
- c. Documentation of the rescue plan
- d. Safe transport of equipment/tools
- e. Tower energy sources have been made safe
- f. At least two climbers are present and trained to climb towers
- g. Whenever possible, drones or other methods of eliminating tower climbing hazards should be used.

3.8.6 Roofs As Walking Working Surfaces

Positive fall protection shall be utilized when performing work activities on metal roofs or other surface types that can become slippery due to rain and condensation or create trip hazards due to raised seams.

3.8.7 Prohibited Equipment / Work

3.8.7.1 Safety nets, as defined by 29 CFR 1926.502, section c, shall not be used for fall protection at KSC.

Note: Safety debris nets can only be used as falling object protection, not as worker fall protection.

3.8.7.2 Waist Belts shall not be used for fall protection on KSC.

Note: This includes waist belts used as position restraint devices.

3.9 Fire Protection and Prevention

3.9.1 Hot Work Permits

The contractor shall request, through the COR, a “Hot Work Permit” before performing involving burning, welding, open flame, torch down roofing, land clearing (burning), grinding, soldering, or similar operations.

3.10 Pressure Vessels and Pressurized Systems

3.10.1 Contractors shall meet American Society of Mechanical Engineers (ASME) B31.3 Process Piping and ASME Section VIII Boiler and Pressure Vessel Code, as applicable, for all temporary test setups that involve pressurized hardware.

3.10.2 Contractors shall demonstrate compliance by:

- (1) Developing a sketch of the proposed test setup with component/part numbers identified,
- (2) Describing the proposed test,
- (3) Providing relief device calculations (if applicable),
- (4) Performing a hazard assessment and control area determination and providing to the KSC Pressure Vessels and Pressurized Systems (PVS) manager for review, and
- (5) Providing catalog cut sheets of components used.

3.10.3 This information must be provided to the KSC Pressure Systems Manager (PSM) utilizing the KSC PVS Exclusion Request Form, KSC Form 50-261, and must be approved by the PSM before initial pressurization.

Note: Contact the KSC PSM for guidance and examples of exclusions.

3.11 Industrial Hygiene

The contractor shall comply with [KNPR 1840.19, KSC Industrial Hygiene Programs](#).

Contractors shall demonstrate compliance by:

- a. Performing a health hazard assessment and providing it to the Industrial Hygiene Officer (IHO) for review, and
- b. Documenting hazard controls and mitigations for the identified hazards

This information must be provided to, and approved by, the IHO before commencing operations that involve health hazards.

3.11.1 Heat Stress

3.11.1.1 The contractor's PSHP, or an equivalent service contractor required safety and health plan, shall address how employees will be protected from heat stress, heat exhaustion, and heatstroke. The contractor may reference the [KSC Environmental Health Services – Heat Stress Index](#).

Note: Heat advisory warnings are issued through the KSC Duty Office in the same manner as other weather watches and warnings.

3.11.1.2 The contractor shall ensure employees are trained on recognizing the signs and symptoms of heat stress injuries and the proper actions to take in the case of a heat stress injury.

3.11.1.3 The site supervisor should ensure all contractor employees on-site take breaks as necessary to prevent heat-related illnesses.

3.12 Radiation Protection

The contractor shall comply with [KNPR 1860.1, KSC Ionizing Radiation Protection Program](#), [KNPR 1860.2, KSC Non-Ionizing Radiation Protection Program](#), and will also comply with applicable Federal, state, and local regulations for these types of activities.

APPENDIX A: DEFINITIONS

Adverse Weather: Winds exceeding 50 knots, heavy rain or hail, or the potential for lightning within five nautical miles that could affect the area within 30 minutes.

Authority Having Jurisdiction: The individual, designated by the Center Director, responsible for enforcing the requirements of this standard (including those adopted by reference) and for approving equipment, materials, an installation, or a procedure. The Authority Having Jurisdiction enforces the requirements of the International Code Council model codes (adopted by reference) functioning as the Building Official.

Close Call: An event in which there is no injury or only minor injury requiring first aid and/or no equipment or property damage, or minor equipment or property damage of less than \$20,000, or no injury or only minor injury requiring first aid, but which possesses a potential to cause a mishap.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and who has the authorization to take prompt corrective measures to eliminate them.

Confined Space: A space that is large enough and configured so that a worker can bodily enter and perform assigned work and has limited or restricted means of entry or exit, (e.g., tanks, vessels, storage bins, vaults, pits, and spaces that may have a limited entry), and is not designed for continuous human occupancy.

Contractor: Government prime contractor personnel primarily providing construction services for the agency focused on the alteration, modification, repair, demolition, design-build, and new construction of buildings, facilities, real property, and launch support structures and systems for NASA at KSC. The contractor's scope is primarily covered under the parameters of KNPR 8715.7.

Contracting Officer (CO): A person with the authority to enter into, administer, and terminate contracts and make related determinations and findings.

Contracting Officer's Representative (COR): An individual, including a contracting officer's technical representative (COTR), designated and authorized in writing by the contracting officer to perform specific technical or administrative functions.

Critical Lift – OSHA: Lifts exceeding 75 percent of the rated capacity of the crane, and lifts involving more than one crane during steel erection operations.

Critical Lift – NASA: Lifts where failure/loss of control presents an elevated risk of serious injury, loss of life, or loss of one-of-a-kind articles, high-dollar items, or major facility components whose loss would have a serious programmatic or institutional impact, including all lifts of personnel with a crane.

Excavation: Any man-made cut, cavity, trench, or depression in an earthen surface, formed by earth removal.

Exposure: The process by which a chemical, electrical, or physical agent enters the body through any route of entry including inhalation, ingestion, absorption through the skin, or physical contact. Potential for exposure exists where air contaminants are present or where hazardous materials can make contact with the skin.

Facility: The buildings, containers, or equipment that contains or supports a process.

Fall Protection Program Administrator: An individual with the skills, experience, and abilities to ensure effective management of the employer's fall protection program. This includes a working knowledge of current fall protection regulations, standards, fall protection equipment, and systems.

Hazardous Operation: Any operation or other work activity that, without implementation of proper mitigations, has a high potential to result in loss of life, serious injury to personnel or public, or damage to property due to the material or equipment involved or the nature of the operation/activity itself.

Hot Work: A work activity that by its nature creates a source of ignition that is capable of initiating fires or explosions, e.g., electrical or gas welding, cutting, brazing, grinding, or similar flame or spark-producing operations.

Hot Work Permit: KSC Welding and Burn Permit issued through KSC Fire Protection Services for operations at KSC.

Imminent Danger: An impending or threatening situation that, if left uncorrected, is likely to result in serious injury or property damage.

Industrial Hygiene (IH): The profession devoted to the prevention of occupational illness or disease associated with exposures to hazardous materials and physical agents.

Infeasible (fall protection): Impossible to perform the work using a conventional fall protection system, (i.e., guardrail system, or fall arrest/restraint system) or that it is technologically and/or physically impossible to use any one of these systems to provide compliant fall protection.

Job Hazard Analysis (JHA): A hazard assessment technique that focuses on the steps of a task to identify and mitigate hazards before they result in injury (physical or health) to personnel or damage to property. The JHA process focuses on the relationship between the worker, the task, the tools, and the work environment. The goal is to identify all uncontrolled hazards, and then take the steps/actions to eliminate or reduce the hazards to an acceptable risk level. The terms "JHA," "Job Safety Analysis," and Activity Hazard Analysis," are synonymous.

Lightning Hazard Notification Area (LHNA): An area used by the 45th Weather Squadron, based at CCSFS for estimating the presence of lightning hazards in the protected zones.

Lockout/Tagout (LOTO): The process of configuring equipment in a temporary condition in which the release of energy is prevented from endangering personnel performing *servicing or maintenance*. The placement of a lock/tag on the energy isolating device, following an established procedure, indicates the energy isolating device will not be operated until the removal of the lock/tag per the established procedure.

Mishap: An undesired and unexpected event that results in an injury requiring more than first aid, occupational illness to personnel, or damage to property of at least \$20,000. Reference NPR 8621.1 for defined levels of NASA mishaps.

Mobile Elevated Work Platform (MEWP): Machine/device intended for moving persons, tools, and materials to work positions, consisting of at least a work platform with controls, an extending structure, and a chassis.

Noncompliance: A violation of an OSHA Standard or a provision of this document.

Notice of Safety Violation (NOSV): The NOSV is a formal record of hazardous conditions that require immediate intervention and corrective action. The NOSV is used to document workplace conditions or practices, either willful or non-willful “that could cause an accident or illness that would most likely result in death or serious physical harm” as defined by OSHA’s Executive Order 12196, or 29 CFR Part 1960. The NOSV can also be used to document “other-than-serious” repeat violations or to provide a formal record in situations where the contractor displays a lack of concern or effort in properly addressing identified hazardous conditions. NOSVs are initiated by NASA safety and coordinated with the project CO/COR for disposition, approval, and delivery to the contractor. Once issued, the contractor is required to develop and implement corrective actions before the violation can be closed.

Nuts and Bolts: Pre-work meeting to discuss safety, environmental, and operational concerns/aspects of a construction project before fieldwork begins.

Platform: A work surface elevated above lower levels. Platforms can be constructed using individual wood planks, fabricated planks, fabricated decks, and fabricated platforms.

Pressure Vessels and Pressurized Systems (PVS): Any assembly of components designed to produce, store, convey, and/or use a fluid under positive or negative gauge pressure.

Qualified Person: A person who, by possession of a recognized degree, licensing (electrical), certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

Safety: The freedom from conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or harm to the environment.

Safety Data Sheet: Technical information on chemical products published by the chemical manufacturer, formulator, or importer. The Safety Data Sheets contains the product name, ingredients, toxicity, physical and chemical characteristics, fire and explosion data, health hazard information, and emergency and disposal procedures.

Serious Accident/Incident: An accident/incident resulting in an injury or illness requiring prompt medical treatment or in situations such as fires, facility, or government property damage (estimated at \$20,000 or more), hazardous material or chemical spills, threatening behavior, or workplace violence, explosions, bomb threats or a wild animal sighting that poses an immediate threat to any employee.

Service Contractor: A contract that directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task rather than to furnish an end item of supply. A *service contract* may be either a nonpersonal or personal contract. It can also cover services

performed by either professional or nonprofessional personnel whether on an individual or organizational basis (FAR Part 37.101).

Stop Work Authority (Safety): Authority provided to all employees at KSC to stop work or work tasks that pose an imminent danger to the employee(s) performing the work or others in the area. The authority is limited to the location where the imminent danger is present.

Stop Work Order (Safety): A directive from the CO to cease part or all jobsite work for not following safety and health procedures, imminent danger situations or conditions, accumulation of safety violations, etc.

Violation: An omission or commission, a condition, or a situation that conflicts with the procedures, standards, and requirements of safety and health standards.

Violation (Repeat): Occurring more than once; usually after it being previously identified; may be classified as minor or serious.

APPENDIX B: ACRONYMS

ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CCSFS	Cape Canaveral Space Force Station
CFR	Code of Federal Regulation
CO	Contracting Officer
COR	Contracting Officer Representative
IH	Industrial Hygiene
IHO	Industrial Hygiene Officer
JHA	Job Hazard Analysis
KNPR	Kennedy NASA Procedural Requirement
KSC	John F. Kennedy Space Center
LDEM	Lifting Devices and Equipment Manager
LHNA	Lightning Hazard Notification Area
LOTO	Lockout Tagout
MEWP	Mobile Elevated Work Platform
mph	miles per hour
NASA	National Aeronautics and Space Administration
NGR	Neutral Ground Resistors
NFPA	National Fire Protection Association
nm	nautical mile
NOSV	Notice of Safety Violation
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PSM	Pressure Systems Manager
PSHP	Project-Specific Safety and Health Plan
PVS	Pressure Vessels and Pressurized Systems

SMA	Safety and Mission Assurance
SRD	Self-Retracting Device

APPENDIX C: LIGHTNING HAZARD NOTIFICATION AREAS

Lightning Hazard Notification Area – An area used by the 45th Weather Squadron, based at CCSFS for estimating the presence of lightning hazards in the protected zones. LHNAs were created as an efficient way of managing risk due to lightning hazards in areas with high concentrations of personnel and critical operations. At KSC, there are five LHNAs captured in Figure C-1 with the specific radius shown in Table C-2.

If the location of the worksite is greater than the radius of the nearest LHNA, the Phase I and II notifications may not provide adequate lead time to safely halt operations and seek shelter.



Figure C-1 LHNA TIS View

Table C-2 LHNA Locations

LHNA NAME	CENTER COORDINATES (LATITUDE, LONGITUDE)	RADIUS (NAUTICAL MILES - nm)	RADIUS (STATUTE MILES - mi)	RADIUS (FEET - ft)
Mid-Course Radar (MCR)	28.755017, - 80.774314	Less than 0.10 nm	Less than 0.12 mi	Less than 608 ft
Shuttle Landing Facility (SLF)	28.614750, - 80.693056	1.60 nm	1.84 mi	9723 ft
Launch Complex 39 (LC39)	28.613486, - 80.618639	1.10 nm	1.27 mi	6684 ft
VAB / BFF	28.578194, - 80.650833	1.15 nm	1.33 mi	6988 ft
Industrial Area	28.521600, - 80.658600	1.50 nm	1.73 mi	9115 ft