



Langley Procedural Requirements

LPR 1740.6 H**Effective Date: Nov. 08, 2022****Expiration Date: Nov. 08, 2027**

Subject: Personnel Safety Certification

Responsible Office: Safety and Mission Assurance Office

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Change History Log

Revision	Date	Description of Change
H	05/31/2022	Major revision of document to include updated requirements, provide additional clarity on responsibilities, and fix formatting inconsistencies.

PREFACE

P.1 PURPOSE

- a. This Langley Procedural Requirement (LPR) sets forth qualification and training requirements for certification of personnel to handle engineering models, ground support equipment, space flight test and research articles, test and qualifications articles, facility equipment hardware, chemicals, radiation, lasers, explosives, and other hazardous materials. It specifies the certification processes to be followed to obtain the worker certification and recertification.
- b. Personnel who perform or control hazardous operations or use or transport hazardous material shall be trained and certified as having the necessary knowledge, skill, judgment, and physical ability (if specified in the job classification) to do the job safely as per NASA Procedural Requirement (NPR) 8715.1 and NPR 1800.1.

P.2 APPLICABILITY

- a. This Langley Procedural Requirement (LPR) is applicable to all NASA Langley Research Center (LaRC) organizations and all federal civil service personnel on Center.
- b. This LPR is applicable to contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, agreements, or grants.
- c. Noncompliance with the requirements of this LPR may result in appropriate disciplinary action against civil service personnel or sanctions against contractors in accordance with the terms of their contracts.
- d. 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.
- e. In this directive, all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

- a. Standards for Protection against Radiation, 10 CFR pt. 20.
- b. Occupational Safety and Health Standards, 29 CFR pt. 1910.
- c. Safety and Health Regulations for Construction, 29 CFR pt. 1926.
- d. General Information, Regulations, and Definitions, 49 CFR pt. 171.

- e. Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans, 49 CFR pt. 172.
- f. NPR 1800.1, NASA Occupational Health Program Procedures.
- g. NPR 8715.1, NASA Safety and Health Programs.
- h. NPR 8715.3, NASA General Safety Program Requirements.

P.4 APPLICABLE DOCUMENTS

- a. Occupational Safety and Health Standards, 29 CFR pt. 1910.
- b. Training Requirements, 29 CFR §1926.454
- c. General Information, Regulations, and Definitions, 49 CFR pt. 171.
- d. Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans, 49 CFR pt. 172.
- e. NPR 1800.1, NASA Occupational Health Program Procedures.
- f. NPR 3792.1, NASA's Plan for a Drug Free Workplace.
- g. NPR 7900.3, Aircraft Operations Management.
- h. NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping.
- i. NPR 8715.1, NASA Safety and Health Programs.
- j. NPR 8715.5, Range Flight Safety Program.
- k. LPR 1710.5, Ionizing Radiation.
- l. LPR 1710.6, Electrical Safety.
- m. LPR 1710.7, Safety Program for the Handling and Use of Explosives at Langley Research Center.
- n. LPR 1710.8, Non-Ionizing Radiation.
- o. LPR 1710.10, Langley Research Center Energy Control Program (Lockout/Tagout).
- p. LPR 1710.12, Potentially Hazardous Materials – Hazard Communication Standard.
- q. LPR 1710.13, Chemical Hygiene Plan.
- r. LPR 1710.16, Aviation Operations and Safety Manual.
- s. LPR 1710.40, Langley Research Center Pressure Systems Handbook.
- t. LPR 1740.2, Langley General Safety Program Requirements.
- u. LAPD 1050.1, Authority to Enter into Space Act Agreements.

- v. LAPD 1700.2, Safety Assignments and Responsibilities.
- w. LMS-CP-7151, Obtaining Waivers for Langley Management System (LMS) Requirements.
- x. LMS-CP-8715, Facility Risk Tier Determination.
- y. LMS-OP-1800.1, Medical Protocols.
- z. LF 1, Appointment of Facility Coordinator(s)/Facility Safety Head(s).
- aa. LF 60, Confined Space Entry Permit.
- ab. LF 61, Lifting Certification Card.
- ac. LF 65, Worker Certification Card.
- ad. LF 66, Worker Appointment and Certification Form.
- ae. LF 113, Forklift Hands-On Proficiency Certification.
- af. LF 121, LaRC Safety Documentation Review for Certified Operators.
- ag. LF 122, Facility Safety Awareness and Procedure Review for Certified Operators.
- ah. LF 159, Appointment for Operator Certification.
- ai. LF 260, Orientation Survey for Facility Safety Heads or Facility Coordinators.
- aj. LF 261, Documentation Review for Facility Safety Heads (FSH) and Facility Coordinators (FC).
- ak. LF 318, Explosives Safety Permit Request.
- al. LF 347, Scaffolding Authorization Card.
- am. LF 381, Laboratory Specific Chemical Hygiene Plan (CHP) Information.
- an. LF 403, Craft Specific Authorization Card (blue).
- ao. LF 425, Shop Machine Authorization Card (yellow).
- ap. LF 451, Safety Operator Appointment Form.
- aq. LF 453, NASA Langley Safety Operators Permit.
- ar. LF 492, Radiation Worker's Certification Card.
- as. LF 498, Safety Permit.
- at. LF 519, Safety Operator Field Verifier Appointment Form.
- au. LF 566, Lockout/Tagout "Hands-on Proficiency" Certification.
- av. LF 567, Field Verifier Checklist.
- aw. LF 571, Shop Machine Safety Operator Appointment Form.
- ax. NASA-STD-5006, General Welding Requirements for Aerospace Materials.
- ay. NASA-STD-8719.9, Lifting Standard.

- az. NASA-STD-8719.12, Safety Standard for Explosives, Propellants, and Pyrotechnics.
- ba. OCHMO-STD-1880.1, NASA Aviation Medical Certification Standards.
- bb. ASME B30.2, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist).
- bc. ASME, Boiler and Pressure Vessel Code, Section IX.
- bd. International Air Transport Association (IATA) Dangerous Goods Regulations¹.
- be. NFPA 70E, Standard for Electrical Safety in the Workplace.

P.5 MEASUREMENT/VERIFICATION

Certifications are tracked via the appropriate Langley forms. The Safety and Mission Assurance Office (SMAO) maintains a list of certification cards issued.

P.6 CANCELLATION

LPR 1740.6, dated January 13, 2018

Title

Date

DISTRIBUTION:

Approved for public release via the Langley Management System; distribution is unlimited.

¹ <https://www.iata.org/publications/dgr/Pages/index.aspx>

CHAPTER 1: INTRODUCTION

1.1 PURPOSE

1.1.1 This document specifies the certification requirements for personnel who perform selected functions at LaRC that require unique occupational safety qualifications.

1.2 SCOPE

1.2.1 This document defines the specific requirements of civil service and contractor personnel, as well as research associates and others who require certification. This document addresses the following:

- a. Training requirements for certification,
- b. Responsibilities and qualifications,
- c. Documentation required to authorize certification,
- d. Certification card requirements, and
- e. Medical examination and surveillance requirements.

1.3 GENERAL

1.3.1 LaRC has established personnel safety certification standards to ensure that individuals performing specified functions are trained to:

- a. Perform their work in accordance with applicable safety and health standards,
- b. Ensure that required high-risk operations are conducted in a safe and healthful environment, and
- c. Ensure that the highest standards of safety and performance are maintained while accomplishing the Center's mission.

1.4 RESPONSIBILITIES

1.4.1 Supervisors shall:

- a. Manage the personnel safety certification process for their personnel.
- b. Ensure that personnel performing the functions are properly trained and certified.
- (1) Supervisors shall take possession of their personnel's certification cards when notified by the Safety and Facility Assurance Branch (SFAB) Head or representative that an individual failed to meet the recertification requirements.
- (2) Supervisors shall inform personnel that they are not allowed to perform the job/task(s) related to the certification until they meet the certification requirements.
- c. Ensure that any task requiring a safety certification is defined by a work process, a Job Hazard Analysis (JHA), or other procedures (e.g., safety permit, standard operating procedures).
- d. Complete and submit an LF 66 to the LaRC Occupational Health Clinic prior to appointments for civil service workers.

Note: Supervisors of contractors shall process a form equivalent to LF 66 in accordance with the appropriate contract and company policies for their workers.

1.4.1 Facility Safety Heads shall verify that personnel performing work within their facility are certified.

1.5 APPLICABILITY

1.5.1 These personnel safety certification guidelines and procedures shall apply to civil servants, contractors, research associates, and others (hereafter, contractors, research associates, and others will be referred to as contractors in this document) who perform these functions.

1.6 WAIVERS

1.6.1 Request for waivers to any of the requirements in this LPR shall be submitted to SFAB in writing and processed in accordance with LMS-CP-7151, "Obtaining Waivers for Langley Management System (LMS) Requirements."

1.7 MEDICAL SURVEILLANCE REQUIREMENTS

1.7.1 Some of the functions governed by the LaRC personnel safety certification process require medical surveillance. To expedite the process, the Center has established a series of LaRC Occupational Medicine Examination Protocols (OMEs) for the positions that require such surveillance. The medical examinations required for certification are outlined in LMS-OP-1800.1, "Medical Protocols." Each chapter of this LPR will identify if medical surveillance is required to obtain a certification.

1.8 CERTIFICATION DOCUMENTATION

1.8.1 The official documents to be used in processing individuals for safety certification are outlined in each chapter of this LPR.

1.8.2 All contracts/agreements awarded by LaRC shall require that contractor personnel comply with the safety certification processes identified in this LPR.

1.8.3 The contracting company shall establish their safety certification process using forms that are equivalent to the forms identified in each chapter of this LPR.

Table 1.1, Personnel Safety Certification Documentation

Position Title	Document(s) Required to Process	Certification Issued	Certification Period	Relevant Chapter
Aerial Lift Operator	LF 66	LF 65	4 years	21
Certified Explosives Worker	LF 66	LF 65	3 years	4
Chemical Worker	LF 66	LF 65	4 years	29
Confined Space Worker	--	None	N/A	26
Craft Specific Safety Operator (CSSO)	LF 451	LF 403	4 years	14
DOT HAZMAT Handler (with CDL)	LF 66	None	3 years	27
Electrical Safety Operator (Over 600V)	LF 451, LF 566, LF 567	LF 453	4 years	13
Electrical Safety Operator (600V or Less)	LF 451, LF 566, LF 567	LF 453	4 years	12
FSH/FC for High and Medium Risk Facilities	LF 1	--	--	32
FSH/FC for Low Risk Facilities	LF 1	--	--	33
Fall Protection Authorized User (High Worker)	LF 66	LF 65	2 years	30
Firefighter and Rescue Personnel	City of Hampton			3
Flight Crewmember	See NPR 7900.3 and LPR 1710.16			2
Forklift Operator	LF 66, LF 113	LF 65	3 years	24
Hazardous Waste Operator	LF 66	--	--	35
Heavy Equipment Operator	N/A			25
Interim Response Team	Appointment Letter	--	--	34
Ionizing Radiation Worker	--	LF 492	2 years	28
Lifting Operator	LF 66	LF 61	4 years	22
Mechanical Safety Operator	LF 451, LF 566, LF 567	LF 453	4 years	10
Mechanical with Electrical (600V or Less) Safety Operator	LF 451, LF 566, LF 567	LF 453	4 years	11
Non-Ionizing Radiation (Laser) Worker	--	LF 492	3 years	19
Process System Operator	LF 121, LF 122	LF 159	4 years	17
Qualified Electrical Person (Over 600V)	--	--	--	7
Qualified Electrical Person (600V or Less)	--	--	--	8
Qualified Industrial Person	--	--	--	9

Position Title	Document(s) Required to Process	Certification Issued	Certification Period	Relevant Chapter
Range Safety Officer (RSO)	Appointment Letter	--	--	20
Respirator User	LF 66	LF 65	1 year	5
Rigger for Lifting Operations	--	LF 65	4 years	23
Safety Operator Field Verifier (FV)	LF 519	None	4 years	16
Scaffold User/Inspector/Erector	--	LF 347	4 years	31
Self-Contained Underwater Breathing Apparatus (SCUBA) User (Diver)	N/A			6
Shop Machine Safety Operator (SMSO)	LF 571	LF 425	4 years	15
Welder/Brazer	LF 66	Welder Qualification Record	6 months	18

CHAPTER 2: FLIGHT CREWMEMBER CERTIFICATION

2.1 INTRODUCTION

2.1.1 Applicable NASA Requirements: NPR 8715.1 and NPR 7900.3

2.2 RESPONSIBILITIES

2.2.1 The Chief of Flight Operations (CFO) shall ensure that all flight crewmembers are appropriately trained and certified to perform their assigned flight duties.

2.3 QUALIFICATIONS

2.3.1 Certification qualifications of flight crewmembers are defined in LPR 1710.16, "Aviation Operations and Safety Manual," and NPR 7900.3, "Aircraft Operations Management."

2.4 MEDICAL SURVEILLANCE

2.4.1 Medical requirements of flight crewmembers are defined in OCHMO-STD-1880.1, "NASA Aviation Medical Certification Standards."

CHAPTER 3: FIREFIGHTER AND RESCUE PERSONNEL CERTIFICATION

3.1 INTRODUCTION

3.1.1 Applicable NASA Requirements: NPR 8715.1

3.1.2 The Fire Fighters and Emergency Medical Technicians (EMT) are City of Hampton employees. Under the agreement between NASA and the City of Hampton, the city is to provide certified Fire Fighters and EMT under state and local regulations.

3.2 RESPONSIBILITIES

3.2.1 The LaRC Fire Chief shall have the overall management responsibility for the fire protection program.

3.2.2 Under the process outlined in LAPD 1050.1, the Center and the Fire Chief will maintain or enter into agreements with Hampton, Virginia, and Langley Air Force Base emergency services and fire departments.

3.2.2.1 The objective of these agreement(s) is to provide fully staffed, trained, and equipped fire response forces for fire suppression, aircraft emergencies, emergency medical services, pre-fire planning, inspection services, and specialized fire safety training.

3.3 MEDICAL SURVEILLANCE

3.3.1 Personnel who perform work as firefighters and rescue personnel shall follow all medical requirements as required by the City of Hampton.

CHAPTER 4: CERTIFIED EXPLOSIVES WORKER

4.1 INTRODUCTION

4.1.1 Applicable NASA Requirements: NPR 8715.1, NASA-STD 8719.12, and LPR 1710.7

4.1.2 A Certified Explosives Worker is an individual who:

- a. Has the training, knowledge, and experience necessary to perform assigned explosives work in a competent and safe manner.
- b. Is responsible for conducting explosives activities at LaRC in accordance with all applicable policies and requirements.

4.1.3 The listing of an individual's name in the "Certified Explosives Workers" section of a signed LF 318, "Explosives Safety Permit (ESP) Request," indicates that their supervisor has reviewed and approved their training and qualifications as a Certified Explosives Worker for explosive work performed in accordance with the approved operating procedures for that permit.

4.1.4 Security and law enforcement personnel who use explosives materials and/or devices (including small arms ammunition) are not included in this designation.

4.1.4.1 These personnel will be trained and certified per the Agency and other law enforcement requirements.

4.1.5 Personnel who are to work with explosives materials or devices shall be trained in accordance with the provisions of NASA-STD-8719.12, "Safety Standard for Explosives, Propellants, and Pyrotechnics," and in the procedures applicable to the explosives operations they will be performing.

4.1.6 Personnel engaged in explosives work shall possess the knowledge, experience, skills, work practices, and attitude necessary to perform all work safely and effectively. Failure to demonstrate safe practices or display of a poor attitude when working with explosives will result in removal from explosives work.

4.2 RESPONSIBILITIES

4.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who handle, operate, manipulate, or who have any other type of physical control over the use of explosives or related equipment or material are trained and certified for that purpose.
- b. Have met the training requirements of NASA-STD-8719.12.

4.2.1 Facility Safety Heads (FSHs) shall ensure that only Certified Explosives Workers who possess a current LF 65 are handling, manipulating, or controlling explosives and related equipment within their facilities.

4.3 QUALIFICATIONS

4.3.1 Certified Explosives Workers shall:

- a. Have a basic knowledge of the state, federal, and local regulations and laws that apply to the transportation, storage, use, and disposal of explosive materials and devices.
- b. Have met the training requirements of NASA-STD-8719.12.
- c. Complete all other training that is specific to the work to be performed in accordance with the requirements in NASA-STD-8719.12 and LPR 1710.7.

Note: Equivalent training may be approved by the Explosives Safety Officer.

- d. Be able to identify and understand the potential hazards involved in their assigned tasks.

4.3.2 When a civil servant candidate satisfies the requirements in Paragraph 4.3.1, the Safety and Facility Assurance Branch (SFAB) shall issue an LF 65, "Worker Certification Card," that is valid for three years from the date on the card.

4.3.3 Contracting companies shall issue a certification card equivalent to an LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 4.3.1.

4.3.4 Certified Explosives Workers shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

4.3.5 Newly trained Certified Explosives Workers shall receive hands-on experience under the direct supervision of a knowledgeable, experienced Certified Explosives Worker.

4.3.5.1 Direct supervision shall continue until the new worker demonstrates the ability to work without supervision in the opinion of the Certified Explosives Worker and the Explosives Safety Officer.

4.3.6 To maintain certification, Certified Explosives Workers shall:

- a. Re-apply for certification every three years by following the same procedure as outlined in Paragraph 4.3.1.

4.3.7 Certified Explosives Workers who have not worked with explosives for one year shall be re-trained, including hands-on training, before being permitted to work without direct supervision of a current Certified Explosives Worker.

4.3.8 Termination of Certification

4.3.8.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Certified Explosives Workers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Explosives Workers.
- b. Personnel shall immediately stop performing work as Explosives Workers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.

- d. Civil Service personnel shall immediately surrender the LF 65 to the LaRC Safety Manager or designee, who will return the LF 65 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

4.4 MEDICAL SURVEILLANCE

4.4.1 Personnel requiring certification as Certified Explosives Workers shall undergo and pass medical examinations in compliance with LaRC Occupational Medicine Examination Protocols (OMEPS).

4.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

4.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

4.4.4 When completing LF 66, the appropriate protocol to select in Section B is "Ordnance (explosives)."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

4.4.5 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

4.4.5.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

4.5 DOCUMENTATION

4.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, "Worker Certification Card."
- b. LF 66, "Worker Appointment and Certification Form."

CHAPTER 5: RESPIRATOR USER

5.1 INTRODUCTION

5.1.1 Applicable NASA Requirements: LPR 1800.1

5.1.2 All personnel authorized to wear respiratory protection equipment, with the exception of voluntary use of disposable single use filtering face pieces, shall be certified as Respirator Users.

5.2 RESPONSIBILITIES

5.2.1 Supervisors shall ensure that personnel within their organization who use respiratory protective equipment are trained and certified for that purpose.

5.2.2 Safety and Facility Assurance Branch (SFAB) shall provide Respirator Users with basic respirator training or ensure that they receive a similar training.

5.3 QUALIFICATIONS

5.3.1 Civil servant Respirator Users shall:

- a. Apply to be Respirator Users by completing and submitting an LF 66.
- b. Complete Respirator User training provided by SFAB.
- c. Have a qualitative or quantitative fit test performed by a qualified individual specifically trained and assigned responsibility for providing respirator fit tests in accordance with 29 CFR §1910.134.

5.3.2 When a candidate satisfies the requirements in Paragraph 5.3.1, the SFAB designated Industrial Hygienist (IH) shall issue an LF 65, "Worker Certification Card," that is valid for one year from the date on the permit.

5.3.3 The LF 65 shall identify the personnel and the manufacturer(s), model(s), and size(s), of the respirator and the card expiration date.

5.3.4 SFAB shall maintain a list of civil service personnel who are authorized to use respirators at LaRC.

5.3.5 To maintain certification, civil servant Respirator Users shall:

- a. Re-apply for certification every year by following the same procedure as outlined in Paragraph 5.3.1.

5.3.6 Contractor personnel Respirator Users shall:

- a. Apply to be Respirator Users by completing and submitting an appropriate form comparable to LF 65 provided by their company.
- b. Complete Respirator User training.
- c. Have a qualitative or quantitative fit test performed by a qualified individual specifically trained and assigned responsibility for providing respirator fit tests in accordance with 29 CFR §1910.134.

5.3.6.1 The contracting company's form shall provide information equivalent to that required by LF 65 and contain an approval process.

5.3.6.2 Contracting companies shall issue a certification card equivalent to LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 5.3.6.

5.3.7 Contractor personnel who are authorized to use respirators shall be listed on a contractor company authorization list.

5.3.8 Termination of Certification

5.3.8.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Respirator Users:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Respirator Users.
- b. Personnel shall immediately stop performing work as Respirator Users.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil Service personnel shall immediately surrender the LF 65 to the LaRC Safety Manager or designee, who will return the LF 65 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

5.4 MEDICAL SURVEILLANCE

5.4.1 Personnel requiring certification as Respirator Users shall undergo and pass medical examinations in compliance with LaRC Occupational Medicine Examination Protocols (OMEPS).

5.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

5.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

5.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is "Respirator."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

5.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

5.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

5.5 DOCUMENTATION

5.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, "Worker Certification Card."
- LF 66, "Worker Appointment and Certification Form."

CHAPTER 6: SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA) USER (DIVER)

6.1 INTRODUCTION

6.1.1 Applicable NASA Requirements: NPR 8715.1

6.1.2 There are currently no SCUBA activities at LaRC.

6.1.3 In the case that a SCUBA activity is required for a project, LaRC personnel shall follow Johnson Space Center (JSC) SCUBA guidelines and requirements.

CHAPTER 7: QUALIFIED ELECTRICAL PERSON (OVER 600V)

7.1 INTRODUCTION

7.1.1 Applicable NASA Requirements: LPR 1710.6

7.1.2 Personnel who work on electrical equipment or systems over 600V shall be required to be trained and understand the requirements in this LPR and LPR 1710.6, "Electrical Safety."

7.2 RESPONSIBILITIES

7.2.1 Supervisors shall ensure that personnel within their organization who work on electrical equipment over 600V are trained and qualified.

7.3 QUALIFICATIONS

7.3.1 Qualified Electrical Persons shall:

- a. Be technically trained and experienced in the work methods required by their electrical work assignments and shall have safety training on the operation of the equipment and the use of safe work practices.
- b. Complete safety training on the hazards involved prior to performing the work.
- c. Take refresher technical training to maintain job certification requirements.

7.3.2 Any person who works with electrical equipment or systems over 600V shall complete the following minimum electrical safety training requirements:

- a. Attend NFPA 70E training at a frequency of every three years.
Note: This training shall be a minimum length of eight hours of instructor-led training.
- b. Attend High Voltage/29 CFR §1910.269 training at a frequency of every three years.
Note: This training shall be a minimum length of two hours of instructor-led training.
- c. Attend CPR/AED training at the frequency of the certifying organization (e.g., American Heart Association). This training will be a minimum length of two hours of instructor-led training.
Note: This training shall be a minimum length of two hours of instructor-led training.

7.3.3 An individual who is undergoing on-the-job electrical technical training and who has demonstrated competence in performing work safely shall be considered qualified if the individual is under the direct supervision of a Qualified Electrical Person.

7.3.4 Technical training commensurate with the assignments of the Qualified Electrical Person shall be documented and meet the requirements of the individual's job description.

7.3.5 Termination of Certification

7.3.5.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Qualified Electrical Persons:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Qualified Electrical Persons.
- b. Personnel shall immediately stop performing work as Qualified Electrical Persons.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.

7.4 MEDICAL SURVEILLANCE

7.4.1 Personnel requiring certification as Qualified Electrical Persons shall not be required to undergo medical examinations prior to safety certification.

7.5 DOCUMENTATION

7.5.1 Supervisors shall maintain Qualified Electrical Person qualification records.

CHAPTER 8: QUALIFIED ELECTRICAL PERSON (600V OR LESS)

8.1 INTRODUCTION

8.1.1 Applicable NASA Requirements: LPR 1710.6

8.1.2 Personnel who work on electrical equipment or systems 600V or less shall be required to be trained and understand the requirements in this LPR and LPR 1710.6, "Electrical Safety."

8.2 RESPONSIBILITIES

8.2.1 Supervisors shall ensure that personnel within their organization who work on electrical equipment 600V or less are trained and qualified.

8.3 QUALIFICATIONS

8.3.1 Qualified Electrical Persons shall:

- a. Be technically trained and experienced in the work methods required by their electrical work assignments and shall have safety training on the operation of the equipment and the use of safe work practices.
- b. Complete safety training on the hazards involved prior to performing the work.
- c. Take refresher technical training to maintain job certification requirements.

8.3.2 Any person who works on electrical equipment or systems 600V or less shall have completed the following minimum electrical safety training requirements:

- a. Attend NFPA 70E training at a frequency of every three years.
Note: This training shall be a minimum length of eight hours of instructor-led training.
- b. Attend CPR/AED training at the frequency of the certifying organization (e.g., American Heart Association). This training will be a minimum length of two hours of instructor-led training.

8.3.3 An individual who is undergoing on-the-job electrical technical training and who has demonstrated competence in performing work safely shall be considered qualified if the individual is under the direct supervision of a Qualified Electrical Person.

8.3.4 Technical training commensurate with the assignments of the qualified electrical person shall be documented and meet the requirements of the person's job description.

8.3.5 Termination of Certification

8.3.5.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Qualified Electrical Persons:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Qualified Electrical Persons.
- b. Personnel shall immediately stop performing work as Qualified Electrical Persons.
- c. Supervisors shall notify SFAB that the personnel's certification has been

revoked.

8.4 MEDICAL SURVEILLANCE

8.4.1 Personnel requiring certification as Qualified Electrical Persons shall not be required to undergo medical examinations prior to safety certification.

8.5 DOCUMENTATION

8.5.1 Supervisors shall maintain Qualified Electrical Person qualification records (e.g., NFPA 70E and AED/CPR certifications).

CHAPTER 9: QUALIFIED INDUSTRIAL PERSON

9.1 INTRODUCTION

9.1.1 Applicable NASA Requirements: LPR 1710.10

9.1.2 Personnel who work on industrial equipment **and** are required to become the second person for a Qualified Electrical Person shall be required to be trained and understand the requirements in this LPR.

9.2 RESPONSIBILITIES

9.2.1 Supervisors shall ensure that personnel within their organization who work on industrial equipment and are required to become the second person for a Qualified Electrical Person are trained and qualified.

9.3 QUALIFICATIONS

9.3.1 Any person who works on industrial equipment and is required to become the second person for a Qualified Electrical Person shall complete the following minimum safety training requirements:

- a. Attend NFPA 70E training at a frequency of every three years.
Note: This training shall be a minimum length of eight hours of instructor-led training.
- b. Attend CPR/AED training at the frequency of the certifying organization (e.g., American Heart Association). This training will be a minimum length of two hours of instructor-led training.
- c. Complete safety training on the hazards involved prior to performing work as a Qualified Electrical Person.

9.3.2 Termination of Certification

9.3.2.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Qualified Industrial Persons:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Qualified Industrial Persons.
- b. Personnel shall immediately stop performing work as Qualified Industrial Persons.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.

9.4 MEDICAL SURVEILLANCE

9.4.1 Personnel requiring certification as Qualified Industrial Persons shall not be required to undergo medical examinations prior to safety certification.

9.5 DOCUMENTATION

9.5.1 Supervisors shall maintain Qualified Industrial Person qualification records (e.g., NFPA 70E and AED/CPR certifications).

CHAPTER 10: MECHANICAL SAFETY OPERATOR

10.1 INTRODUCTION

10.1.1 Applicable NASA Requirements: LPR 1710.10

10.1.2 All individuals who are going to perform Lockout/Tagout (LOTO) procedures on mechanical equipment shall be trained, qualified, and certified to perform these functions as a Mechanical Safety Operator (SO).

10.1.3 A Mechanical SO shall be a civil servant or an on-site contractor who has experience on the equipment or type of equipment to which RL/RT (Red Lock/Red Tag) lockout may be performed.

10.2 RESPONSIBILITIES

10.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who conduct LOTO on mechanical equipment are trained, qualified, and certified to be a Mechanical SO.
- b. Recommend candidates for the Mechanical SO certification (both civil servants and on site-contractors) by completing an LF 451.

10.2.2 The LaRC Safety Manager or designee shall keep completed LF 451 packets, along with the results of the Safety and Facility Assurance Branch (SFAB) written test on file.

10.3 QUALIFICATIONS

10.3.1 As a minimum, and prior to working as Mechanical SOs, candidate personnel shall successfully complete the following steps:

- a. Meet the following prerequisite:
 - (1) Have the technical skills to perform the duties of a Mechanical SO.
- b. Complete an LF 451 with supervisor.
- c. Complete an LF 566 under the supervision of certified Mechanical Safety Operator(s).
- d. Complete an LF 567 with a Mechanical Field Verifier (FV).
- e. Pass a written test administered by SFAB.

Note: This process is also outlined in the instructions on LF 451.

10.3.2 When a candidate satisfies the requirements in Paragraph 10.3.1, SFAB shall issue an LF 453, "NASA Langley Safety Operators Permit," that is valid for four years from the date on the permit.

10.3.3 To maintain certification, Mechanical SOs shall:

- a. Attend the annual Safety Operator Refresher Training offered by SFAB.
- b. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 10.3.1.

10.3.4 Termination of Certification

10.3.4.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Mechanical SOs:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Mechanical SOs.
- b. Personnel shall immediately stop performing work as Mechanical SOs.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 453 to the LaRC Safety Manager or designee, who will return the LF 453 to SFAB.

10.4 MEDICAL SURVEILLANCE

10.4.1 Personnel requiring certification as Mechanical SOs shall not be required to undergo medical examinations prior to safety certification.

10.5 DOCUMENTATION

10.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 451, "Safety Operator Appointment Form."
- b. LF 453, "NASA Langley Safety Operators Permit."
- c. LF 566, "Lockout/Tagout "Hands-on Proficiency" Certification."
- d. LF 567, "Field Verifier Checklist."

CHAPTER 11: MECHANICAL WITH ELECTRICAL (600V OR LESS) SAFETY OPERATOR

11.1 INTRODUCTION

11.1.1 Applicable NASA Requirements: LPR 1710.10

11.1.2 All individuals who are going to perform Lockout/Tagout (LOTO) procedures on mechanical equipment with electrical sources of 600V or less shall be trained, qualified, and certified to perform these functions as a Mechanical with Electrical (600V or Less) Safety Operator (Mechanical SO with Electrical).

11.1.2.1 This certification includes performing LOTO of electrical isolation devices for non-electrical work.

11.1.3 A Mechanical SO with Electrical shall be a civil servant or an on-site contractor who has experience on the equipment or type of equipment to which Red Lock/Red Tag (RL/RT) lockout may be performed.

11.2 RESPONSIBILITIES

11.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who perform servicing or maintenance on mechanical equipment or systems by LOTO electrical isolation devices are trained, qualified, and certified to be a Mechanical SO with Electrical.
- b. Recommend candidates for the Mechanical SO with Electrical certification (both civil servants and on site-contractors) by completing an LF 451.

11.2.2 The LaRC Safety Manager or designee shall keep completed LF 451 packets, along with the results of the Safety and Facility Assurance Branch (SFAB) written test on file.

11.3 QUALIFICATIONS

11.3.1 As a minimum, and prior to working as Mechanical with Electrical SOs, candidate personnel shall successfully complete the following steps:

- a. Meet the following prerequisites:
 - (1) Have the technical skills to perform the duties of a Mechanical with Electrical SO, and
 - (2) Attend NFPA 70E training.

Note: This training shall be a minimum length of eight hours of instructor-led training.

- b. Complete an LF 451 with supervisor.
- c. Complete an LF 566 under the supervision of certified Mechanical Safety Operator(s) with Electrical.
- d. Complete an LF 567 with both a Mechanical and an Electrical (600V or Less) Field Verifier (FV).

Note: A separate LF 567 is required for each of the mechanical and electrical field verifications.

- e. Pass a written test administered by SFAB.

Note: This process is also outlined in the instructions on LF 451.

11.3.2 When a candidate satisfies the requirements in Paragraph 11.3.1, SFAB shall issue an LF 453, "NASA Langley Safety Operators Permit," that is valid for four years from the date on the permit.

11.3.3 To maintain certification, Mechanical SOs with Electrical shall:

- a. Attend the annual Safety Operator Refresher Training offered by SFAB.
- b. Attend an abbreviated NFPA 70E training every three years.
- c. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 11.3.1.

11.3.4 Termination of Certification

11.3.4.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Mechanical SOs with Electrical:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Mechanical SOs with Electrical.
- b. Personnel shall immediately stop performing work as Mechanical SOs with Electrical.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 453 to the LaRC Safety Manager or designee, who will return the LF 453 to SFAB.

11.4 MEDICAL SURVEILLANCE

11.4.1 Personnel requiring certification as Mechanical SOs with Electrical shall not be required to undergo medical examinations prior to safety certification.

11.5 DOCUMENTATION

11.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 451, "Safety Operator Appointment Form."
- b. LF 453, "NASA Langley Safety Operators Permit."
- c. LF 566, "Lockout/Tagout "Hands-on Proficiency" Certification."
- d. LF 567, "Field Verifier Checklist."

CHAPTER 12: ELECTRICAL SAFETY OPERATOR (600V OR LESS)

12.1 INTRODUCTION

12.1.1 Applicable NASA Requirements: LPR 1710.10

12.1.2 All individuals who are going to perform Lockout/Tagout (LOTO) procedures on electrical equipment with electrical sources of 600V or less shall be trained, qualified, and certified to perform these functions as an Electrical Safety Operator (SO) (600V or Less).

12.1.3 An Electrical SO shall be a civil servant or an on-site contractor who has experience on the equipment or type of equipment to which Red Lock/Red Tag (RL/RT) lockout may be performed.

12.2 RESPONSIBILITIES

12.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who conduct LOTO on electrical equipment with electrical sources of 600V or less are trained, qualified, and certified to be an Electrical SO.
- b. Recommend candidates for the Electrical SO certification (both civil servants and on site-contractors) by completing an LF 451.

12.2.2 The LaRC Safety Manager or designee shall keep completed LF 451 packets, along with the results of the Safety and Facility Assurance Branch (SFAB) written test on file.

12.3 QUALIFICATIONS

12.3.1 As a minimum, and prior to working as Electrical SOs, candidate personnel shall successfully complete the following steps:

- a. Meet the following prerequisites:
 - (1) Have the technical skills to perform the duties of an Electrical SO, and
 - (2) Attend NFPA 70E training.

Note: This training shall be a minimum length of eight hours of instructor-led training.

- b. Complete an LF 451 with supervisor.
- c. Complete an LF 566 under the supervision of certified Electrical Safety Operator(s) (600V or Less).
- d. Complete an LF 567 with an Electrical (600V or Less) Field Verifier (FV).
- e. Pass a written test administered by SFAB.

Note: This process is also outlined in the instructions on LF 451.

12.3.2 When a candidate satisfies the requirements in Paragraph 12.3.1, SFAB shall issue an LF 453, "NASA Langley Safety Operators Permit," that is valid for four years from the date on the permit.

12.3.3 To maintain certification, Electrical SOs shall:

- a. Attend the annual Safety Operator Refresher Training offered by SFAB.
- b. Attend NFPA 70E training every three years.
Note: This training shall be a minimum length of eight hours of instructor-led training.
- c. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 12.3.1.

12.3.4 Termination of Certification

12.3.4.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Electrical SOs:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Electrical SOs.
- b. Personnel shall immediately stop performing work as Electrical SOs.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 453 to the LaRC Safety Manager or designee, who will return the LF 453 to SFAB.

12.4 MEDICAL SURVEILLANCE

12.4.1 Personnel requiring certification as Electrical SOs shall not be required to undergo medical examinations prior to safety certification.

12.5 DOCUMENTATION

12.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 451, "Safety Operator Appointment Form."
- b. LF 453, "NASA Langley Safety Operators Permit."
- c. LF 566, "Lockout/Tagout "Hands-on Proficiency" Certification."
- d. LF 567, "Field Verifier Checklist."

CHAPTER 13: ELECTRICAL SAFETY OPERATOR (OVER 600V)

13.1 INTRODUCTION

13.1.1 Applicable NASA Requirements: LPR 1710.10

13.1.2 All personnel who are going to perform Lockout/Tagout (LOTO) procedures on electrical equipment with electrical sources of over 600V shall be trained, qualified, and certified to perform these functions as an Electrical Safety Operator (SO) (Over 600V).

13.1.3 An Electrical SO shall be a civil servant or an on-site contractor who has experience on the equipment or type of equipment to which Red Lock/Red Tag (RL/RT) lockout may be performed.

13.2 RESPONSIBILITIES

13.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who conduct LOTO on electrical equipment with electrical sources of over 600V are trained, qualified, and certified to be an Electrical Safety Operator (Over 600V).
- b. Recommend candidates for the Electrical SO certification (both civil servants and on site-contractors) by completing an LF 451.

13.2.2 The LaRC Safety Manager or designee shall keep completed LF 451 packets, along with the results of the Safety and Facility Assurance Branch (SFAB) written test on file.

13.3 QUALIFICATIONS

13.3.1 As a minimum, and prior to working as Electrical SOs, candidate personnel shall successfully complete the following steps:

- a. Meet the following prerequisites:
 - (1) Have the technical skills to perform the duties of an Electrical SO, and
 - (2) Attend NFPA 70E training.

Note: This training shall be a minimum length of eight hours of instructor-led training.

- b. Complete an LF 451 with supervisor.
- c. Complete an LF 566 under the supervision of certified Electrical Safety Operator(s) (Over 600V).
- d. Complete an LF 567 with an Electrical (Over 600V) Field Verifier (FV).
- e. Pass a written test administered by SFAB.

Note: This process is also outlined in the instructions on LF 451.

13.3.2 When a candidate satisfies the requirements in Paragraph 13.3.1, SFAB shall issue an LF 453, "NASA Langley Safety Operators Permit," that is valid for four years from the date on the permit.

13.3.3 To maintain certification, Electrical SOs shall:

- a. Attend the annual Safety Operator Refresher Training offered by SFAB.
- b. Attend NFPA 70E training every three years.
- c. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 13.3.1.

13.3.4 Termination of Certification

13.3.4.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Electrical SOs:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Electrical SOs.

13.3.1 Personnel shall immediately stop performing work as SOs.

- b. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- c. Personnel shall immediately surrender the LF 453 to the LaRC Safety Manager or designee, who will return the LF 453 to SFAB.

13.4 MEDICAL SURVEILLANCE

13.4.1 Personnel requiring certification as Electrical SOs shall not be required to undergo medical examinations prior to safety certification.

13.5 DOCUMENTATION

13.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 451, "Safety Operator Appointment Form."
- b. LF 453, "Safety Operators Permit."
- c. LF 566, "Lockout/Tagout "Hands-on Proficiency" Certification."
- d. LF 567, "Field Verifier Checklist."

CHAPTER 14: CRAFT SPECIFIC SAFETY OPERATOR (CSSO)

14.1 INTRODUCTION

14.1.1 Applicable NASA Requirements: LPR 1710.10

14.1.2 All personnel who are going to perform Lockout/Tagout (LOTO) procedures as a Craft Specific Safety Operator (CSSO) shall be trained, qualified, and certified to perform these functions.

14.1.3 A CSSO shall be a civil servant or an on-site contractor who has experience on the equipment or type of equipment to which a craft specific lockout may be performed.

14.2 RESPONSIBILITIES

14.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who conduct craft specific lockouts are trained, qualified, and certified to be a CSSO.
- b. Recommend candidates for the CSSO (both civil servants and on site-contractors) by completing an LF 451.

14.3 QUALIFICATIONS

14.3.1 As a minimum, and prior to working as CSSOs, candidate personnel shall successfully complete the following steps:

- a. Understand the requirements in LPR 1710.10 and other relevant programs (e.g., LPR 1710.6 and LPR 1710.40).
- b. Be a SO in the field in which they are being certified.

14.3.2 When a candidate satisfies the requirements in Paragraph 14.3.1, SFAB shall issue an LF 403, "Craft Specific (CS) Authorization Card," that is valid for four years from the date on the permit.

14.3.3 To maintain certification, Craft Specific Safety Operators shall:

- a. Attend the annual Safety Operator Refresher Trainer offered by the Safety and Facility Assurance Branch (SFAB).
 - b. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 14.3.1.
- (1) Re-apply for the appropriate SO certification every four years by following the procedure outlined in the relevant chapter of this LPR.

14.3.4 Termination of Certification

14.3.4.1 Upon termination of employment, the certification has lapsed, or personnel no longer need to be certified as CSSOs:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as CSSOs.
- b. Personnel shall immediately stop performing work as CSSOs.

- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 403 to the LaRC Safety Manager or designee, who will return the LF 403 to SFAB.

14.4 MEDICAL SURVEILLANCE

14.4.1 Personnel requiring certification as CSSOs shall not be required to undergo medical examinations prior to safety certification.

14.5 DOCUMENTATION

14.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 403, "Craft Specific (CS) Authorization Card."
- b. LF 451, "Safety Operator Appointment Form."

CHAPTER 15: SHOP MACHINE SAFETY OPERATOR (SMSO)

15.1 INTRODUCTION

15.1.1 Applicable NASA Requirements: LPR 1710.10

15.1.2 All individuals who are going to perform Lockout/Tagout (LOTO) procedures on shop machine equipment shall be trained, qualified, and certified to perform these functions as Shop Machine Safety Operator (SMSO).

15.2 RESPONSIBILITIES

15.2.1 Supervisors shall:

- a. Recommend candidates for the SMSO certification (both civil servants and on site-contractors) by completing an LF 571.

15.3 QUALIFICATIONS

15.3.1 As a minimum, and prior to working as SMSOs, candidate personnel shall:

- a. Meet the following prerequisites:
 - (1) Have the technical skills to perform the duties of a SMSO.
- b. Understand the requirements in LPR 1710.10.
- c. Complete an LF 571.
- d. Pass a written test administered by the Safety and Facility Assurance Branch (SFAB).

Note: This process is also outlined in the instructions on LF 571.

15.3.2 When a candidate satisfies the requirements in Paragraph 15.3.1, SFAB shall issue an LF 425, "Shop Machine Authorization Card (yellow)," that is valid for four years from the date on the permit.

15.3.3 To maintain certification, SMSOs shall:

- a. Attend the annual SMSO Refresher Training offered by SFAB.
- b. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 15.3.1.

15.3.4 Termination of Certification

15.3.4.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as SMSOs:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as SMSOs.
- b. Personnel shall immediately stop performing work as SMSOs.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 425 to the LaRC Safety Manager or designee, who will return the LF 425 to SFAB.

15.4 MEDICAL SURVEILLANCE

15.4.1 Personnel requiring certification as SMSOs shall not be required to undergo medical examinations prior to safety certification.

15.5 DOCUMENTATION

15.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 425, "Shop Machine Authorization Card (yellow)."
- b. LF 571, "Shop Machine Safety Operator Appointment Form."

CHAPTER 16: SAFETY OPERATOR FIELD VERIFIER (FV)

16.1 INTRODUCTION

16.1.1 Applicable NASA Requirements: LPR 1710.10

16.1.2 To be certified as a Field Verifier (FV), candidates shall demonstrate they understand and can convey specifics of the Lockout/Tagout (LOTO) process to potential Safety Operators (SOs) in their specific fields.

16.2 RESPONSIBILITIES

16.2.1 The Field Verifier shall:

- a. Use an LF 567 to verify that the candidate seeking authorization as an SO has a working knowledge of the system(s), energy sources, and hazards of those system(s), and the controls required for effective LOTO, in line with the candidate's expected SO duties.
- b. Ensure the SO understands that:
 - (1) The SO's safety and the safety of the Protected Employees depend on the SO's ability to lockout a system safely, and
 - (2) The SO has the authority and responsibility to refuse to lockout a system if they do not feel qualified to do so or if for any reason they think their safety or anyone else's safety will be compromised.

16.2.2 Supervisors shall recommend candidates through the submittal of an LF 519.

16.2.3 The appropriate Systems Committee (e.g., Electrical Systems Committee or Pressure Systems Committee) shall vet candidates to ensure that the candidates have the technical knowledge for the position.

16.3 QUALIFICATIONS

16.3.1 As a minimum, and prior to working as Safety Operator Field Verifiers, candidate personnel shall successfully complete the following steps:

- a. Be a NASA LaRC Safety Operator or have met all the requirements to be a SO per LF 451 and the relevant SO chapter of this LPR.
- b. Have three years of relevant experience after completion of the apprenticeship on equipment for the type of equipment on which SO candidates will be certified to perform Red Lock/Red Tag (RL/RT) lockout.

16.3.2 SFAB shall maintain a list of certified Field Verifiers.

16.3.3 When a candidate satisfies the requirements in Paragraph 16.3.1, SFAB shall add the individual's name to the list of FVs on the SFAB website.

16.3.4 To maintain certification, Safety Operator Field Verifiers shall:

- a. Attend the annual Safety Operator Refresher Training offered by the Safety and Facility Assurance Branch (SFAB).

- b. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 16.3.1.
- (1) Re-apply for the appropriate SO certification every four years by following the procedure outlined in the relevant chapter of this LPR.

16.3.5 Termination of Certification

16.3.5.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Field Verifiers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Field Verifiers.
- b. Personnel shall immediately stop performing work as Field Verifiers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.

16.4 MEDICAL SURVEILLANCE

16.4.1 Personnel requiring certification as Field Verifiers shall not be required to undergo medical examinations prior to safety certification.

16.5 DOCUMENTATION

16.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 519, "Safety Operator Field Verifier (FV) Appointment Form."
- b. LF 451, "Safety Operator Appointment Form."
- c. LF 566, "Lockout/Tagout "Hands-on Proficiency" Certification."
- d. LF 567, "Field Verifier Checklist."

CHAPTER 17: PROCESS SYSTEMS OPERATOR

17.1 INTRODUCTION

17.1.1 Applicable NASA Requirements: NPR 8715.1

17.1.2 Process Systems Operator certification shall be required for personnel who operate a medium- or high-risk facility such as ones containing wind tunnels, flight simulators, high energy equipment/systems, or equipment/systems under configuration control that require trained operators.

17.1.3 All LaRC pressure systems, new, existing, temporary, and permanent, shall be operated by certified Process Systems Operators with additional training in High-Pressure Systems unless the pressure system is excluded from this requirement per LPR 1710.40.

17.1.4 Personnel training shall be determined and structured according to the job being performed and the number of users required to operate the facility.

17.2 RESPONSIBILITY

17.2.1 Supervisors shall:

- a. Ensure that personnel within their organizations who operate, manipulate, or who have any other type of physical control over the use of process systems equipment are trained and certified for that purpose.
- b. Be responsible for ensuring the overall implementation of a training and certification program that is consistent with this LPR.

17.2.2 FSHs shall:

- c. Ensure certifications are documented on an LF 159, "Appointment for Operator Certification."
- d. Ensure that only personnel who are listed on a current LF 159 are operating, manipulating, or controlling process systems equipment within their facilities.

17.2.3 The FSH and FC:

- a. Shall identify applicable documentation (e.g., Safety Analysis Report (SAR) or pressure systems documents, facility emergency procedures, Lockout/Tagout program) required for certification on the following Langley forms:
 - (1) LF 121, "LaRC Safety Review for Certified Operators."
 - (2) LF 122, "Facility Safety Awareness and Procedures Review for Certified Operators."
- b. Document the certification process to certify Process Systems Operators in the Facility Resume.

17.2.4 The FSH, FC, and Supervisor shall:

- a. Develop and tailor the required training, to include classroom and/or on-the-job training, to the specific system/ equipment.

17.2.5 The FSH and Supervisor shall:

- a. Ensure Process System Operators meet the following requirements after a Critical Design Review (CDR) and prior to an Integrated Systems Review (ISR) for facility modifications:
 - (1) Review the redlined facility documents (e.g., Process and Instrumentation Drawings (P&IDs), SOPs, SAR, Drawings, Checklists, Software Configuration Management Plans (SCMPs)).
 - (2) Review any new Operator/Instructional manuals.
 - (3) Review and perform a procedural walk through of new systems with redlined operating procedures or checklists.

17.3 QUALIFICATIONS

17.3.1 As a minimum, and prior to receiving certification, Process Systems Operators shall successfully complete the specific training developed by the facility to operate process systems.

17.3.2 As a minimum, the Process Systems Operators shall:

- a. Review and understand the applicable safety-related documents in the Langley Management System (LMS).
- b. Show a working knowledge, paying particular attention to safety awareness, of the hardware associated with their respective areas of responsibility.
- c. Show a working knowledge of written operating procedures/checklists for proper operation of the process system.

17.3.3 There are three levels of Process System Operator certification. The criteria for each certification level are identified as follows:

- a. **Level 3** (lowest level of certification) – The individual shall be capable of operating, monitoring, and servicing the system or equipment during facility operations.
 - (1) The individual shall be able to detect an unsafe condition or incorrect action.
 - (2) The individual shall be capable of recovering or safely bringing the system or equipment off-line.
 - (3) The individual shall have a Level 2 technician available but not necessarily working in an over-the-shoulder situation.
 - (4) The Level 2 technician shall be within the operational area.
- b. **Level 2** (medium level of certification) – The individual shall meet all the requirements of Level 3.
 - (1) The individual shall be skillful in inspecting hardware prior to facility operation and after operation.
 - (2) The individual shall be able to bring the system or hardware from a secured or off state to an operating mode.

(3) The individual shall be able to secure the system or equipment and bring them down to an off or safe state.

c. **Level 1** (highest level of certification) – The individual shall be capable of operating and trouble-shooting facility systems/equipment.

(1) The individual shall meet all of the requirements of Level 2 certification.

(2) The individual shall be capable of identifying hardware or software malfunctions and performing minor system repair.

17.3.4 An individual shall initially be trained to meet the minimum requirements to perform Level 3 certification activities.

17.3.5 For an individual to obtain a Level 2 or Level 1 certification, the facility training/certification requirements shall specify a structured review process that includes the FSH, the individual's supervisor, and at least one other individual at the same or higher certified level knowledgeable of the system operations.

17.3.6 The certification shall be documented by the FSH on an LF 159, "Appointment for Operator Certification."

17.3.7 The certification shall identify the equipment involved and the area and certification level for each individual. Upon successful completion of testing and evaluation, the individual can operate the pressure system for which training and certification has occurred.

17.3.8 The certification shall be valid for four years from the date of issue.

17.3.9 Process Systems Operators who are required to operate a High-Pressure System as part of their duties shall also complete additional training as applicable to the facility for which the candidate is being trained and as agreed upon by the FSH, FC, and supervisor. This training may include:

- a. High-Pressure Systems Operations and Flexible Hose Safety (SMA-HQ-WBT-301),
- b. ARC-Compressed Gas Safety (ARC-001-04),
- c. Completion of SATERN training or equivalent training shall be documented on LF 122.

Note: Course registration is available through SATERN.

17.3.9.1 On-the-Job Training

17.3.9.1.1 A Process System Operator High-Pressure System On-the-Job Training (OJT) is provided by the OJT trainer. Training continues until the trainer is satisfied that the candidate is proficient at operating high-pressure systems. Proof of OJT is provided by checking "Yes" in the column "Require High Pressure System Training" on the LF 159 and subsequent trainer's signature on this line.

17.3.9.1.2 OJT should cover the following activities applicable to the facility for which the candidate is being trained and as agreed upon by the FSH, FC, and supervisor. These activities may include:

- a. Assembling high-pressure systems (e.g., k-bottle to regulator, pressure panel to pressure vessel);
- b. Inspecting pressure systems (e.g., physical condition, design conformance, calibration, certification dates);
- c. Operating high-pressure systems (e.g., pressurizing and venting vessels using pressure panels);
- d. Troubleshooting (e.g., finding leaks at mechanical fittings and through valves);
- e. Rendering a system “safe” when work stops;
- f. Disassembling high-pressure systems;
- g. Emergency shutdown/safeing procedures and awareness of system hazards; and
- h. Awareness of system-unique parameters/requirements (e.g., environmental, contamination, cleanliness).

17.3.10 To maintain certification, Process Systems Operators shall:

- a. Attend refresher training annually or as technology advances, equipment fails, operating errors, or changes at the facility dictate.

Note: Annual refresher training for certified individuals shall be documented using LF 121 and LF 122 and include review of the current safety procedures and directives, safety interlocks, and emergency response procedures.

- b. Attend recertification training.
- c. Re-apply for certification every four years.

Note: Renewal certification shall require demonstration of proficiency and operating skill.

17.3.11 For an individual to maintain a Level 2 or Level 1 certification, the facility training/certification requirements shall specify a structured review process that includes the FSH, FC, the individual's supervisor, and at least one other individual at the same or higher certified level knowledgeable of the system operations.

17.3.12 Break in Service/Return to Service

17.3.12.1 Each facility shall have a method of information exchange to inform a certified operator of equipment and/or procedural modifications that have occurred during a break in service.

17.3.12.2 When a certified Process Systems Operator returns to operate a facility after a break in service of 90 days or more, the facility training/certification requirements shall specify a structured review process that includes the FSH, FC, the individual's

supervisor, and at least one other individual at the same or higher certified level knowledgeable of the system operations prior to facility operation.

17.3.12.3 An individual shall be declared disqualified when knowledge and understanding of facility operations cannot be demonstrated.

17.3.12.4 If personnel fail to demonstrate knowledge and understanding of the facility operations, their certification will be revoked.

17.3.13 Termination of Certification

17.3.13.1 Upon termination of employment, suspension or revocation of certification for poor operation practices or negligence, or when personnel no longer need to be certified as Process Systems Operators:

- a. Supervisors shall notify the personnel that they are can no longer perform work as Process Systems Operators.
- b. Personnel shall immediately stop performing work as Process Systems Operators.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.

17.4 MEDICAL SURVEILLANCE

17.4.1 Personnel requiring certification as Process Systems Operators shall not be required to undergo a medical examination prior to safety certification.

17.5 DOCUMENTATION

17.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 121, "LaRC Safety Review for Certified Operators."
- b. LF 122, "Facility Safety Awareness and Procedures Review for Certified Operators."
- c. LF 159, "Appointment for Operator Certification."

CHAPTER 18: WELDER/BRAZER

18.1 INTRODUCTION

18.1.1 Applicable NASA Requirements: NPR 8715.1, NASA-STD-5006

18.1.2 All personnel who perform welding/brazing operations shall be certified in accordance with ASME Boiler and Pressure Vessel Code, Section IX.

18.1.3 Welders/Brazers at LaRC include both civil service and contract personnel.

18.1.4 Certification as to the type of welding the worker is authorized to make is documented by the Safety and Facility Assurance Branch (SFAB).

18.2 RESPONSIBILITIES

18.2.1 Supervisors shall ensure that personnel within their organizations who perform welding operations are trained and certified for that purpose.

18.2.2 The LaRC Welding Standard Practice Engineer (SPE) shall:

- a. Be responsible for welding quality and shall track the results of all welding tests conducted under their authority.

18.3 QUALIFICATIONS

18.3.1 As a minimum, and prior to working as Welders/Brazers, candidate personnel shall:

- a. Successfully complete an intensive on-the-job training or apprenticeship program.
- b. Successfully demonstrate the ability to complete a sound weldment in accordance with the invoked welding code.

18.3.2 When a civil servant candidate satisfies the requirements in Paragraph 18.3.1, SFAB shall create a Welder Qualification Record for the individual to use to document welding operations.

18.3.3 Contracting companies shall issue a Welder Qualification Record equivalent to LaRC's for their personnel that certifies that the holder has successfully satisfied the requirements in Paragraph 18.3.1.

18.3.4 Welders/Brazers shall have their Welder Qualification Records on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

18.3.5 To maintain certification, Welders/Brazers shall:

- a. Submit to periodic retests as deemed necessary by the Welding SPE.
- b. Ensure all work conducted is included in concurrency logs to document that they have performed that operation within a six month period.

18.3.6 Termination of Certification

18.3.6.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Welders/Brazers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Welders/Brazers.
- b. Personnel shall immediately stop performing work as Welders/Brazers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.

18.4 MEDICAL SURVEILLANCE

18.4.1 All personnel requiring certification as Welders/Brazers shall first undergo and pass a baseline and annual eye examination in compliance with LaRC Occupational Medicine Examination Protocols (OMEPS).

18.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

18.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

18.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is "Welding."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

18.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

18.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

18.5 DOCUMENTATION

18.5.1 The documents associated with obtaining and maintaining certification are:

- a. Welder/Brazer Concurrency Logs.
- b. Welder Qualification Records.

CHAPTER 19: NON-IONIZING RADIATION (LASER) WORKER

19.1 INTRODUCTION

19.1.1 Applicable NASA Requirements: NPR 8715.1

19.1.2 All personnel who operate, manipulate, or who have any other type of physical control over the use of class 3B or class 4 lasers shall be trained and safety-certified as Non-Ionizing Radiation (Laser) Workers.

19.1.3 Certified Laser Workers shall be listed by name on the safety permit (LF 498) associated with the non-ionizing radiation work.

19.1.4 Laser Workers at LaRC include both civil service and contractor personnel.

19.1.5 Questions concerning this certification requirement shall be directed to the Radiation Safety Officer (RSO).

19.2 RESPONSIBILITIES

19.2.1 Supervisors shall ensure that personnel within their organizations who operate, manipulate, or who have any other type of physical control over the use of non-ionizing, radiation-producing equipment or material are trained and certified for that purpose.

19.2.2 FSHs shall ensure that only personnel who possess a current LF 492, "Radiation Worker's Certification Card," are operating, manipulating, or controlling non-ionizing radiation-producing equipment within their facilities.

19.3 QUALIFICATIONS

19.3.1 As a minimum, and prior to working as Laser Workers, candidate personnel shall:

- a. Attend non-ionizing safety training (provided by RSO).
- b. Pass written test administered by the RSO at the non-ionizing safety training.

19.3.2 Personnel can sign up for the non-ionizing safety training by contacting the RSO.

19.3.3 When candidate personnel satisfy the requirements in Paragraph 19.3.1, SFAB shall issue an LF 492, "Radiation Worker's Certification Card," that is valid for three years from the date on the card.

19.3.4 Prior to working on a task involving non-ionizing radiation operations, Laser Workers shall:

- a. Review LPR 1710.8, LPR 1740.2, and LPR 1800.1.
- b. Review emergency procedures (provided by FSH).
- c. Review radiation safety procedures and safety permits (LF 498) relevant to duties associated with non-ionizing radiation work.

19.3.5 To maintain certification, Laser Workers shall:

- a. Have the LF 492 revalidated by SFAB every three years through completion of the non-ionizing radiation refresher training (provided by the RSO).

19.3.6 Termination of Certification

19.3.6.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Laser Workers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Laser Workers.
- b. Personnel shall immediately stop performing work as Laser Workers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 492 to the LaRC Safety Manager or designee, who will return the LF 492 to SFAB.

19.4 MEDICAL SURVEILLANCE

19.4.1 Personnel requiring certification as Laser Workers shall not be required to undergo medical examinations prior to safety certification.

19.5 DOCUMENTATION

19.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 492, "Radiation Worker's Certification Card."

CHAPTER 20: RANGE SAFETY OFFICER

20.1 INTRODUCTION

20.1.1 Applicable NASA Requirements: NPR 8715.5

20.1.2 Range Safety Officers (RSOs) shall be qualified NASA civil servants, such as aerospace engineers for Uninhabited Aerial Systems (UAS) in the Research Services Directorate (RSD).

20.1.3 Once certified and appointed, RSOs shall take direction from RSD and report as necessary to the Director of the Safety and Mission Assurance Office (SMAO).

20.1.4 The Center Range Flight Safety Lead (CRFSL) is responsible for safety and oversight during a range operation involving UAS. The LaRC CRFSL has the authority to hold or abort the operation, or take a risk mitigation action, which includes terminating the flight.

20.1.5 The LaRC CRFSL is a Center-appointed position under the LaRC safety management organization, SMAO. The CRFSL works for, and takes direction from, the LaRC crewed flight organization's Chief of Flight Operations (CFO).

20.1.6 The CRFSL shall be a qualified RSO and be identified as such in their description of duties.

20.1.7 Typical duties of Range Safety Officers

20.1.7.1 For each range operation, a Range Safety Officer conducts simulation scenarios (e.g., emergency of the day); develops and implements operational range safety requirements, plans, procedures, and checklists; provides an independent safety assessment; and ensures that all range safety flight commit criteria are satisfied prior to flight initiation. A RSO shall be present during all UAS range operations conducted under the authority of Langley Research Center.

20.1.7.2 For any vehicle that has a Flight Termination System (FTS), a Range Safety Officer shall:

- a. Develop flight termination activation criteria.
- b. Perform real-time monitoring of the vehicle flight path/trajectory, vehicle systems, range safety systems, and the performance of the FTS.
- c. Make a flight termination decision when performance of the vehicle violates preplanned termination criteria or presents an unplanned, unacceptable hazard to the public, personnel, or property.

20.2 RESPONSIBILITIES

20.2.1 It is the responsibility of the RSD supervisor to ensure that personnel within their organization who fall under the parameters outlined in this chapter are trained and certified under the safety certification requirements for a Range Safety Officer.

20.3 QUALIFICATIONS

20.3.1 Qualifications for personnel who perform a range safety function (including RSOs and personnel responsible for range safety systems and range safety analysis) shall include:

- a. Successful completion of knowledge-based training (self-study and/or classroom) applicable to the range safety function.
- b. Successful completion of instructor-led, hands-on training on how to perform the range safety function followed by satisfactory on-the-job performance as a trainee, as applicable.
- c. Proficiency demonstrated to a qualified range safety professional during simulation scenarios that exercise hands-on operations of range safety systems and use of safety decision-making tools or processes, as applicable.
- d. Proficiency demonstrated to a qualified range safety professional during exercises of nominal and contingency actions, as applicable.

20.3.2 The training program for range safety personnel shall:

- a. Provide qualified personnel to support nominal and contingency range operations.
- b. Include a recurring training process to ensure personnel retain their qualifications.
- c. Include a requalification process for personnel who lose qualification status, such as someone who exhibits substandard performance or has temporary health problems.
- d. Include a documentation process that captures the qualification, recurring training, and requalification status of all range safety personnel.

20.3.3 Termination of Certification

20.3.3.1 Section not applicable to Range Safety Officers.

20.4 MEDICAL SURVEILLANCE

20.4.1 Personnel requiring certification as RSOs shall not be required to undergo medical examinations prior to safety certification.

20.5 DOCUMENTATION

20.5.1 The CRFSL shall be appointed in writing by the Center Director.

20.5.2 RSOs shall be appointed in writing by the Center Director.

CHAPTER 21: AERIAL LIFT OPERATOR

21.1 INTRODUCTION

21.1.1 Applicable NASA Requirements: NPR 8715.1, NASA-STD-8719.9

21.1.2 Aerial Lift Operators shall be trained and safety certified to operate the aerial lift equipment that is authorized for use on Center. This certification is documented on LF 65, "Worker Certification Card."

21.1.3 A separate safety certification shall be required to operate each individual type of equipment defined by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1926, subpart L and 29 CFR 1910, subpart F.

21.1.4 Certain equipment and tasks (e.g., operating an extensible or articulating boom platform, tasks from an aerial lift that expose the user to a fall hazard) also require a Fall Protection Authorized User certification. Contact SFAB with any questions regarding certifications required for specific equipment or tasks.

21.2 RESPONSIBILITIES

21.2.1 Supervisors of organizations that use aerial lift equipment shall ensure that personnel who operate the equipment are trained and certified in compliance with this document.

21.3 QUALIFICATIONS

21.3.1 As a minimum, and prior to working as Aerial Lift Operators, candidate personnel shall successfully complete the appropriate training and safety certification authorizing them to operate the equipment, including written tests and proficiency examinations.

21.3.2 As a minimum, and prior to working as an Aerial Lift Operators, candidate personnel shall:

- a. Complete the Aerial Lift Operator training class provided by SFAB addressing the following:
 - (1) Safety,
 - (2) Emergency procedures,
 - (3) General performance standard and requirements,
 - (4) Pre-operational checks,
 - (5) Donning and doffing a fall protection harness and understanding selection of restraint lanyards,
 - (6) Safety related defects and symptoms for aerial lift devices, and
 - (7) Complete sufficient hands-on training to be able to demonstrate proficiency to a certified operator on the specific type of equipment.
- b. Pass a written test administered by SFAB at the Aerial Lift Operator training.
- c. Pass a proficiency examination administered by a qualified Lifting Operator.
- d. Pass a medical examination.

21.3.3 Testing Requirements

21.3.3.1 Testing of Aerial Lift Operators shall include written examinations that contain appropriate questions addressing the work to be performed.

21.3.3.2 Candidate personnel shall successfully pass the appropriate written test that establishes that they have safety and operational knowledge of the aerial lift equipment they will be certified to operate.

21.3.3.3 The test questions shall address, as a minimum, the following subject areas:

- a. Safety applications;
- b. Knowledge of equipment limitations and capabilities;
- c. Knowledge of equipment operations and control systems;
- d. Equipment care and damage reporting requirements;
- e. High voltage and electrical operational restrictions;
- f. Use of required safety equipment;
- g. Wind restrictions, ground conditions restrictions, and ground slope restrictions;
- h. Emergency operation procedures;
- i. Safety zone requirements;
- j. Lifting restrictions; and
- k. Weight restrictions.

21.3.4 Proficiency Examination Requirements

21.3.4.1 Candidate personnel shall successfully pass the appropriate proficiency examination that establishes that they have safety and operational knowledge of the aerial lift equipment they will be certified to operate.

21.3.4.2 Proficiency testing for Aerial Lift Operators shall include, as a minimum, demonstrated performance of work functions listed below:

- a. Aerial lift buckets operations,
- b. Full-range of operation of the bucket from ground and bucket stations,
- c. Knowledge of safety rules and regulations,
- d. Positioning of bucket,
- e. Equipment inspection procedures, and
- f. Outrigger deployment (if applicable).

21.3.4.3 Experience Requirements

Note: High Reach Bucket Truck Operators shall be required to acquire a class B commercial driver's license with an air brake endorsement.

21.3.4.4 Personnel undergoing safety certification training shall be assisted by an additional safety certified operator during the operation of any aerial lift equipment.

21.3.5 When a civil servant candidate satisfies the requirements in Paragraph 21.3.2, the Safety and Facility Assurance Branch (SFAB) shall issue an LF 65, "Worker Certification Card," that is valid for four years from the date on the card.

21.3.6 Contracting companies shall issue a certification card equivalent to LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 21.3.2.

21.3.7 The LF 65 or contractor equivalent shall list, on the reverse side of the card, the specific aerial lift equipment the worker is certified to use.

21.3.8 Aerial Lift Operators shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

21.3.9 To maintain certification, Aerial Lift Operators shall:

- a. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 21.3.2.
- b. Complete annually "Aerial Lift Refresher Training Online" (LARC-ALT-ONLINE) in SATERN.

21.3.10 Termination of Certification

21.3.10.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Aerial Lift Operators:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Aerial Lift Operators.
- b. Personnel shall immediately stop performing work as Aerial Lift Operators.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil Service personnel shall immediately surrender the LF 65 to the LaRC Safety Manager or designee, who will return the LF 65 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

21.4 MEDICAL SURVEILLANCE

21.4.1 Personnel requiring certification as Aerial Lift Operators shall undergo and pass medical examinations in compliance with LaRC Occupational Medicine Examination Protocols (OMEPS).

21.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

21.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

21.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is "Motive Equip (Aerial)."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

21.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

21.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

21.5 DOCUMENTATION

21.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, "Worker Certification Card."
- b. LF 66, "Worker Appointment and Certification Form."

CHAPTER 22: LIFTING OPERATOR

22.1 INTRODUCTION

22.1.1 Applicable NASA Requirements: NPR 8715.1, NASA-STD-8719.9

22.1.2 Lifting Operators are individuals who operate overhead, mobile, or permanently installed cranes, derricks, portable or fixed hoisting assemblies, winches, and general equipment such as wire ropes, slings, hooks, bridles, riggings, and other fittings critical to handling/lifting operations.

22.1.3 These examples are not all-inclusive, and the operation of specific equipment may require additional safety certification at the discretion of the Safety and Facility Assurance Branch (SFAB).

22.1.4 There are two levels of Lifting Operator certification: Lifting Operator and Critical Lift Operator.

22.1.5 LaRC does not issue mobile crane certification. If this type of certification is needed, personnel are required to complete this certification offsite through an accredited certification training company.

22.2 RESPONSIBILITIES

22.2.1 Supervisors shall ensure that personnel under their responsibility are trained and certified in compliance with this document to operate special handling equipment or perform lifting operations.

22.3 QUALIFICATIONS

22.3.1 The criteria for each of the two certification levels are identified as follows:

a. Lifting Operator

- (1) Lifting Operators perform non-critical lifts. Noncritical lifts involve routine lifting operations and are governed by standard industry rules and practices except as supplemented with unique NASA testing, operations, maintenance, inspection, training, and personnel certification requirements contained in this chapter and the NASA Lifting Standard (NASA-STD-8719.9).

b. Critical Lift Operator

- (1) Critical Lift Operators are Lifting Operators who perform critical lifts. Critical lifts involve operations 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 serious programmatic or institutional impact; or, hoisting of personnel with a mobile crane or derrick.

22.3.2 An individual shall initially be trained to meet the minimum requirements to perform as a Lifting Operator.

22.3.3 Lifting Operators

22.3.3.1 As a minimum, and prior to working as Lifting Operators, candidate personnel shall:

- a. Complete Lifting Operator training class provided by SFAB.
- b. Pass a written test administered by SFAB at the Lifting Operator training.
- c. Pass a proficiency examination administered by a qualified Lifting Operator.
- d. Pass a medical examination.

22.3.3.2 Lifting Operator Testing Requirements

22.3.3.2.1 Testing of Lifting Operators shall include a written examination that contains questions addressing the work to be performed.

22.3.3.2.2 The test questions shall, as a minimum, address the following subject areas:

- a. Basic layout and function of equipment
- b. Equipment operation
- c. Equipment inspection
- d. Critical Lift definition and determination
- e. Knowledge of rigging hardware application and limitations
- f. Equipment safety features
 - (1) Hook latch
 - (2) Limit switches
 - (3) Warning devices
 - (4) Load monitoring devices
- g. Understanding of center of gravity (CG) and load weight and how they affect the operation;
- h. Calculation of sling tension loads;
 - i. Use of common slings and hitches;
 - j. Selection of sizes and use of chocks;
 - k. Use of hand signals;
 - l. Safety applications; and
- m. Knowledge of quality assurance requirements.

22.3.3.3 Lifting Operator Proficiency Examination Requirements

22.3.3.3.1 Lifting Operator candidates shall be required to pass a proficiency examination administered by a qualified Lifting Operator before they are safety certified.

22.3.3.3.2 The proficiency examination shall be tailored to the specific type(s) of equipment for which the personnel is being certified.

22.3.3.3.3 Proficiency examination for Lifting Operators shall include, as applicable to type of equipment to be certified, performance of the work functions listed below:

- a. Conducting a series of basic load attachments involving a determination of weight and CG;
- b. Selecting method of attachment (e.g., sling positions and locations, shackles, swivel hoist rings);
- c. Selecting hooks, bridles, slings, and other rigging;
- d. Hand signaling a typical lift, move, and relocation of load (including load control), and pendant line assembly;
- e. Demonstrating knowledge of hand signals used with overhead cranes as defined in ASME B30.2;
- f. Operating overhead or gantry cranes;
- g. Operating portable lifting cranes;
- h. Demonstrating operational proficiency in:
 - (1) Equipment and rigging hardware inspection,
 - (2) Positioning crane for lift,
 - (3) Lifting and braking with load,
 - (4) A series of load placements.

22.3.3.4 When a civil servant candidate satisfies the requirements in Paragraph 22.3.3.1, SFAB shall issue an LF 61, "Lifting Certification Card," that is valid for four years from the date on the card.

22.3.3.4.1 The LF 61 shall list the specific type of equipment the Lifting Operator is certified to operate.

22.3.3.4.2 Lifting Operators shall be restricted to operating the specific type of equipment listed on their LF 61.

22.3.3.5 Lifting Operators shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

22.3.3.6 Contracting companies shall issue a certification card equivalent to LF 61 that certifies that the holder has successfully satisfied the requirements in Paragraph 22.3.3.1.

22.3.3.7 To maintain certification, Lifting Operators shall:

- a. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 22.3.3.1.

22.3.4 Critical Lift Operator

22.3.4.1 As a minimum, and prior to working as Critical Lift Operators, candidate personnel shall:

- a. Be a certified Lifting Operator.
- b. Complete a proficiency examination to the LaRC Lifting Device and Equipment Manager (LDEM).

22.3.4.2 Critical Lift Operator Proficiency Examination

22.3.4.2.1 Critical Lift Operator candidates shall be required to pass a proficiency examination before they are certified. Personnel can contact the LDEM to set up the exam.

22.3.4.2.2 The Critical Lift Operator proficiency examination shall include:

- a. Conducting a series of typical load attachments (e.g., location of CG, weight determination, and selecting lifting devices such as hooks, bridles, slings, and so forth);
- b. Hand signaling a lift operation;
- c. Demonstrating finesse and proficiency in operations using in special pieces of lifting equipment (e.g., lifting, braking, load control and placement) with and without hand signals; and
- d. Understanding and demonstrating ability to follow detailed written procedures.

22.3.4.3 When a civil servant candidate satisfies the requirements in Paragraph 22.3.4.1, the LDEM shall sign the candidate's LF 61, "Lifting Certification Card," certifying the candidate as a Critical Lift Operator for four years from the date on the card.

Note: Personnel's Critical Lift Operator certifications shall be renewed on the same schedule as their Lifting Operator certifications. Therefore, the first certification cycle as a Critical Lift Operator may not be four years if not done at the same time as the Lifting Operator certification (e.g., if an individual completes the Critical Lift Operator certification two years into being a Lifting Operator, the Critical Lift Operator status will only be valid for two years and will have to be renewed when the individual re-certifies as a Lifting Operator. From then on, the two certifications will be "synced" and be on the same four-year renewal schedule.).

22.3.4.4 Contracting companies shall issue their personnel a certification card equivalent to LF 61 that certifies that the holder has successfully satisfied the requirements in Paragraph 22.3.4.1.

Note 1: The LDEM will perform the proficiency examination for onsite contractor personnel, but it is the contractor company's responsibility to certify its employees and issue their certification cards.

Note 2: The LDEM will determine if proficiency examinations are required for offsite contractors performing lifting operations on Center.

22.3.4.5 Critical Lift Operators shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

22.3.4.6 To maintain certification, Critical Lift Operators shall:

- a. Maintain Lifting Operator certification.
- b. Complete a proficiency examination with the LaRC LDEM when re-certifying as a Lifting Operator.

22.3.5 Termination of Certification

22.3.5.1 Upon termination of employment, suspension or revocation of certification for poor operation practices or negligence, or when personnel no longer need to be certified as Lifting Operators:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Lifting Operators.
- b. Personnel shall immediately stop performing lifting operations.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil Service personnel shall immediately surrender the LF 61 to the LaRC Safety Manager or designee, who will return the LF 61 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

22.4 MEDICAL SURVEILLANCE

22.4.1 Personnel requiring certification as Lifting Operators shall undergo and pass medical examinations in compliance with LaRC Occupational Medicine Examination Protocols (OMEPS).

22.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

22.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

22.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is "Crane."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

22.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

22.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

22.5 DOCUMENTATION

22.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 61, "Lifting Certification Card."
- b. LF 66, "Worker Appointment and Certification Form."

CHAPTER 23: RIGGER FOR LIFTING OPERATIONS

23.1 INTRODUCTION

23.1.1 Applicable NASA Requirements: NPR 8715.1, NASA-STD-8719.9

23.1.2 Riggers are individuals who are trained and certified specializing in the lifting and moving of extremely large or heavy objects, often with the assistance of a crane or derrick. They are typically required for complex lifts, cases where load weight and center of gravity are unknown, or lifts using more than one crane.

23.1.3 The use of certified offsite contract riggers for projects at LaRC shall be subject to approval by the LaRC Lifting Device and Equipment Manager (LDEM).

23.2 RESPONSIBILITIES

23.2.1 Supervisors shall ensure that personnel under their responsibility are trained and certified in compliance with this LPR to conduct rigging operations.

23.3 QUALIFICATIONS

23.3.1 As a minimum, and prior to working as Riggers, candidate personnel shall:

- a. Be certified as a LaRC Lifting Operator.
- b. Complete required Rigger training.
- c. Receive a certification from an accredited training company or SFAB.

23.3.2 The training course from the accredited training company shall cover, as a minimum, the following:

- a. Hands-on training;
- b. Estimating load weight and center of gravity calculations;
- c. Identifying lifting points;
- d. Determining and selecting the appropriate rigging devices to be used based on loading and work requirements;
- e. Performing pre-use inspection of rigging and lift points;
- f. Identifying and attaching rigging with knowledge of hitch configurations and load angle factors, rigging capacities, and load integrity;
- g. Understanding load dynamics and associated hazards;
- h. Selecting of rigging components; and
- i. Developing rigging procedures.

23.3.3 LaRC periodically offers a third party rigging training on Center. Personnel can register for this training through SATERN.

Note 1: Although the rigging training is in-person, personnel will sign up online through SATERN by registering for the course "LaRC-RGT." Once they have completed the course, the LaRC Human Resources Training Office will log attendance in SATERN, and the Safety and Facility Assurance Branch (SFAB)

Safety Specialist will notify civil servant personnel when their certification cards are ready for pickup.

Note 2: Space permitting, contractor personnel can attend the third party rigging training offered on Center, but it remains the responsibility of their contracting company to issue them their Rigger certification cards.

23.3.4 Candidates who complete a third party rigging training offsite shall submit proof of certification to the LDEM.

23.3.5 When a civil servant candidate satisfies the requirements in Paragraph 23.3.1, SFAB shall issue an LF 65, "Worker Certification Card," that is valid for four years from the date on the card.

23.3.6 Contracting companies shall issue a certification card equivalent to LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 23.3.1.

23.3.7 Riggers shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

23.3.8 To maintain certification, Riggers shall:

- a. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 23.3.1.
- b. Maintain Lifting Operator certification.

23.3.9 Termination of Certification

23.3.9.1 Upon termination of employment, suspension or revocation of certification for poor operation practices or negligence, or when personnel no longer need to be certified as Riggers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Riggers.
- b. Personnel shall immediately stop performing work as Riggers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil Service personnel shall immediately surrender the LF 61 to the LaRC Safety Manager or designee, who will return the LF 61 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

23.4 MEDICAL SURVEILLANCE

23.4.1 Personnel requiring certification as Riggers shall not be required to undergo medical examinations prior to certification.

Note: Personnel requiring certification as Riggers will be completing a medical examination as part of the Lifting Operator certification requirements.

23.5 DOCUMENTATION

23.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, "Worker Certification Card."

CHAPTER 24: FORKLIFT OPERATOR

24.1 INTRODUCTION

24.1.1 Applicable NASA Requirements: NPR 8715.1, NASA-STD-8719.9

24.1.2 Forklift Operators are individuals who operate forklifts and powered industrial trucks.

24.1.3 Additional motive equipment operators may require safety certification at the discretion of the Safety and Facility Assurance Branch (SFAB).

24.2 RESPONSIBILITIES

24.2.1 Supervisors shall ensure that personnel under their responsibility are trained and certified in compliance with this document to operate special handling equipment or perform critical lifting.

24.3 QUALIFICATIONS

24.3.1 As a minimum, and prior to working as Forklift Operators, candidate personnel shall:

- a. Complete the Forklift Operator training class provided by SFAB addressing the following:
 - (1) Safety,
 - (2) Emergency procedures,
 - (3) General performance standard,
 - (4) Requirements,
 - (5) Pre-operational checks, and
 - (6) Safety related defects and symptoms for forklifts.
- b. Pass a written test administered by SFAB at the Forklift Operator training.
- c. Pass a proficiency examination administered by a qualified Forklift Operator.
- d. Pass a medical examination.

24.3.2 Testing Requirements

24.3.2.1 Testing requirements for Forklift Operators shall include written examinations that contain appropriate questions addressing the demands of the work to be performed.

24.3.2.2 Forklift Operators shall successfully pass the appropriate written test, establishing that the worker has operational safety and knowledge of forklift use.

24.3.2.3 The test questions shall address, as a minimum, the following subject areas:

- a. Safety applications and safety inspections;
- b. Knowledge of equipment limitations, capabilities, and design considerations;
- c. Knowledge of equipment operations and control systems;

- d. Equipment care and damage reporting requirements;
- e. Use of required safety equipment;
- f. Ground slope restrictions;
- g. Emergency operation procedures;
- h. Lifting, moving, and setting-down load restrictions;
- i. Weight restrictions; and
- j. Approved accessories.

24.3.3 Proficiency Examination Requirements

24.3.3.1 Forklift Operators shall complete sufficient hands-on training to be able to demonstrate proficiency to a certified operator on the specific type of equipment.

24.3.3.2 Hands-on proficiency testing for Forklift Operators shall be required before they can be safety certified.

24.3.3.3 An LF 113, "Forklift Hands-On Proficiency Certification," shall be used to document and certify that worker qualifications have been satisfied for civil servants.

24.3.3.4 This hands-on proficiency testing shall include, as a minimum:

- a. Demonstrating proper use of forklift controls,
- b. Following proper procedures for unattended forklifts,
- c. Demonstrating competency in basic maneuvering skills,
- d. Demonstrating competency in picking up a load,
- e. Demonstrating competency in driving with a load,
- f. Demonstrating competency in stacking a load, and
- g. Demonstrating competency in loading/unloading a trailer, rail car, or other vehicle.

24.3.4 When a civil servant candidate satisfies the requirements in Paragraph 24.3.1, the Safety and Facility Assurance Branch (SFAB) shall issue an LF 65, "Worker Certification Card," that is valid for three years from the date on the card.

24.3.5 Contracting companies shall issue a certification card equivalent to LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 24.3.1.

24.3.5.1 The contractor-issued card shall have an expiration date not to exceed three years per OSHA requirements.

24.3.6 The LF 65 or contractor equivalent shall list, on the reverse side of the card, the specific forklift equipment the Forklift Operator is certified to use.

24.3.7 Forklift Operators shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

24.3.8 To maintain certification, Forklift Operators shall:

- a. Re-apply for certification every three years by following the same procedure as outlined in Paragraph 24.3.1.
- b. Complete annually "Forklift Refresher Training Online" (LARC-FLT-ONLINE) in SATERN.

24.3.9 Termination of Certification

24.3.9.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Forklift Operators:

- d. Supervisors shall notify the personnel that the personnel can no longer perform work as Forklift Operators.
- e. Personnel shall immediately stop performing work as Forklift Operators.
- f. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- g. Civil Service personnel shall immediately surrender the LF 65 to the LaRC Safety Manager or designee, who will return the LF 65 to SFAB.
- h. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

24.4 MEDICAL SURVEILLANCE

24.4.1 Personnel requiring certification as Forklift Operators shall undergo and pass medical examinations in accordance with LaRC Occupational Medicine Examination Protocols (OMEPS).

24.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

24.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

24.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is "Forklift."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

24.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

24.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

24.5 DOCUMENTATION

24.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, "Worker Certification Card."
- b. LF 66, "Worker Appointment and Certification Form."
- c. LF 113, "Forklift Hands-On Proficiency Certification."

CHAPTER 25: HEAVY EQUIPMENT OPERATOR

25.1 INTRODUCTION

25.1.1 Applicable NASA Requirements: NPR 8715.1

25.1.2 There are currently no civil servant heavy equipment activities at LaRC.

25.1.3 In the case that a heavy equipment activity is required for a project, LaRC personnel shall contact SFAB for guidelines and requirements.

CHAPTER 26: CONFINED SPACE WORKER

26.1 INTRODUCTION

26.1.1 Applicable NASA Requirements: NPR 8715.1

26.1.2 All individuals who participate in the entry of permit-required confined spaces shall be properly trained prior to entry in accordance with this document.

26.1.3 Confined Space Workers include all personnel who will be entrants, attendants, or entry supervisors.

26.1.4 Confined spaces normally include, but are not limited to, boilers, furnaces, degreasers, storage tanks, test chambers, vessels, tunnels, compartments, pits, vats, sewers, underground utility vaults, manholes, certain locations within aircraft and spacecraft when not in flight, and any other location not specifically defined here that is designated a confined space (see LPR 1740.2).

26.1.5 A permit-required confined space is a confined space that has one or more of the following characteristics:

- a. Contains or has a potential to contain a hazardous atmosphere;
- b. Contains a material that has the potential for engulfing an entrant;
- c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and/or
- d. Contains any other recognized serious safety or health hazard.

26.1.6 Certified Confined Space Workers shall be listed by name on the confined space entry permit (LF 60) associated with the confined space work.

26.2 RESPONSIBILITIES

26.2.1 Entry supervisors and safety representatives shall ensure that Confined Space Workers are trained to understand their duties in accordance with the permit.

26.3 QUALIFICATIONS

26.3.1 As a minimum and prior to working as Confined Space Workers, candidate personnel shall receive training specific to the confined space, and covering the following subjects:

- a. Hazard recognition;
- b. Proper respiratory protection for confined spaces;
- c. Use of atmospheric testing devices to include training on the manufacturers' specified field checks, normal use, and specific limitations of the equipment;
- d. Lockout and tagging procedures;
- e. Use of special equipment and tools;
- f. Emergency and rescue methods and procedures; and
- g. Emergency entry and exit procedures.

26.3.2 Termination of Certification

26.3.2.1 Section not applicable to Confined Space Workers.

26.4 MEDICAL SURVEILLANCE

26.4.1 There are no medical examination requirements for personnel to perform work as Confined Space Workers.

26.5 DOCUMENTATION

26.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 60, "Confined Space Entry Permit."

CHAPTER 27: DOT HAZMAT HANDLER

27.1 INTRODUCTION

27.1.1 Applicable NASA Requirements: NPR 8553.1

27.1.2 All individuals who handle, transport, or package hazardous materials (HAZMAT) but do not otherwise disturb the integrity of the basic properly-packaged shipping container that holds the hazardous material shall be trained and certified to perform these functions.

27.2 RESPONSIBILITIES

27.2.1 Supervisors shall ensure that personnel within their organizations who function as U.S. Department of Transportation (DOT) HAZMAT handlers are trained and qualified.

27.3 QUALIFICATIONS

27.3.1 As a minimum, and prior to working as HAZMAT Handlers, candidate personnel shall:

- a. Be trained in accordance with 49 CFR pt. 171 and 49 CFR pt. 172.
- b. Meet requirements related to the personnel's DOT function-specific duties; and
- c. Have general awareness/familiarization with:
 - (1) Safety,
 - (2) Security awareness, and
 - (3) Facility specific security plan training.

27.3.2 Training

27.3.2.1 Personnel who transport/ship hazardous materials by highways shall have proper training per DOT every three years.

27.3.2.2 Personnel who transport/ship materials by air shall have proper training per DOT every two years and follow the International Air Transport Association (IATA) Dangerous Goods Regulations².

27.3.2.3 Training records shall be kept in accordance with 49 CFR.

27.3.2.4 Training records shall be retained for each HAZMAT individual for three years from the date of the last training and for 90 days after the individual leaves the company/organization.

27.3.3 Personnel who transport hazardous materials listed on the DOT table of Hazardous Materials (49 CFR §172.101) that require placarding over public roads (off-Center) shall have a valid state commercial driver's license (CDL), with an endorsement H for hazardous materials.

² <https://www.iata.org/publications/dgr/Pages/index.aspx>

27.3.4 Termination of Certification

27.3.4.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Hazmat Handlers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Hazmat Handlers.
- b. Personnel shall immediately stop performing work as Hazmat Handlers.

27.4 MEDICAL SURVEILLANCE

27.4.1 Personnel requiring certification as HAZMAT Handlers shall not be required to undergo medical examinations unless they are a driver who transports hazardous materials over public roads and have a CDL with a HAZMAT endorsement.

27.4.2 Personnel who require certification as drivers who transports hazardous materials over public roads and with a CDL with a HAZMAT endorsement shall undergo and pass medical examinations in compliance with LaRC Occupational Medicine Examination Protocols (OMEPS).

27.4.3 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

27.4.4 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

27.4.4.1 When completing LF 66, the appropriate protocol to select in Section B is "DOT Truck Driver."

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

27.4.5 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPS.

27.4.5.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

27.5 DOCUMENTATION

27.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 66, Worker Appointment and Certification Form.

CHAPTER 28: IONIZING RADIATION WORKER

28.1 INTRODUCTION

28.1.1 Applicable NASA Requirements: NPR 1800.1 and NPR 8715.1

28.1.2 All personnel who operate, manipulate, or who have any other type of physical control over the use of ionizing radiation producing equipment or material shall be required to be trained and safety certified as Ionizing Radiation Workers.

28.1.3 Additionally, personnel who are likely to receive in a year an occupational dose in excess of 100 mrem (1 mSv), as a result of LaRC operations, shall be trained and certified as a radiation worker.

28.1.4 Certified Ionizing Radiation Workers shall be listed by name on the safety permit (LF 498) associated with the ionizing radiation work.

28.1.5 Ionizing Radiation Workers on LaRC include both civil service and contractor personnel.

28.1.6 Questions concerning this certification requirement shall be directed to the Radiation Safety Officer (RSO).

28.2 RESPONSIBILITIES

28.2.1 Supervisors shall ensure that personnel within their organizations who work with ionizing radiation are trained and certified in compliance with this document.

28.2.2 FSHs shall ensure that personnel within their facilities, who fall under the parameters outlined in this chapter, are trained and certified under the safety certification requirements of an Ionizing Radiation Worker.

28.3 QUALIFICATIONS

28.3.1 As a minimum, and prior to working as Ionizing Radiation Workers, candidate personnel shall:

- a. Attend ionizing safety training (provided by the RSO).
- b. Pass written test administered by the RSO at the ionizing safety training.

28.3.2 Personnel can set up an ionizing safety training by contacting the RSO.

28.3.3 When candidate personnel satisfy the requirements in Paragraph 28.3.1, SFAB shall issue an LF 492, "Radiation Worker's Certification Card," that is valid for two years from the date on the card.

28.3.4 Ionizing Radiation Workers shall have their cards on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

28.3.5 Prior to working on a task involving ionizing radiation operations, Ionizing Radiation Workers shall:

- a. Review LPR 1710.5, LPR 1740.2, and LPR 1800.1.
- b. Review emergency procedures (provided by FSH).
- c. Review radiation safety procedures and safety permits (LF 498) relevant to

duties associated with ionizing radiation work.

28.3.6 To maintain certification, Ionizing Radiation Workers shall:

- a. Have the LF 492 revalidated by SFAB every two years through completion of the ionizing radiation refresher training (provided by the RSO).

28.3.7 Termination of Certification

28.3.7.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Ionizing Radiation Workers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Ionizing Radiation Workers.
- b. Personnel shall immediately stop performing work as Ionizing Radiation Workers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Personnel shall immediately surrender the LF 492 to the LaRC Safety Manager or designee, who will return the LF 492 to SFAB.

28.4 MEDICAL SURVEILLANCE

28.4.1 Personnel requiring certification as Ionizing Radiation Workers shall not be required to undergo medical examinations prior to safety certification.

28.5 DOCUMENTATION

28.5.1 The documents associated with obtaining and maintaining certification are:

- b. LF 492, "Radiation Worker's Certification Card."

CHAPTER 29: CHEMICAL WORKER

29.1 INTRODUCTION

29.1.1 Applicable NASA Requirements: NPR 1800.1, LPR 1710.13, and LPR 1710.12

29.1.2 LaRC civil service and contractor personnel who conduct operations or perform functions using materials listed on LF 498, "Safety Permit," shall be classified as Chemical Workers.

29.1.3 The LF 498 process shall include a determination of and requirements for Potentially Hazardous Materials (PHM) personnel training and certification including hazard communication, CHP, periodic refresher, and medical surveillance.

29.1.4 LaRC civil service and contractor personnel who conduct operations or perform functions under an LF 381, "Laboratory Specific Chemical Hygiene Plan (CHP) Information," shall be classified as Chemical Workers.

29.1.5 The LF 381 process shall include a determination of and requirements for certification including hazard communication, CHP, periodic refresher, and medical surveillance.

29.2 RESPONSIBILITIES

29.2.1 Supervisors shall:

- a. Ensure that their personnel who are under a safety permit or a chemical hygiene plan are trained and certified in compliance with this chapter.
- b. Discuss yearly with their personnel who are classified as Chemical Workers if they need to continue their certified status.

29.2.2 Supervisors and FSHs shall be trained regarding hazards and appropriate protective measures so they can be available to answer questions from personnel and provide daily monitoring of safe work practices.

29.2.3 As new hazards are introduced, the CHP shall be updated and additional training shall be provided to all affected individuals. The supervisor is responsible for maintaining training records.

29.2.4 The Safety and Facility Assurance Branch (SFAB) is responsible for providing safety training to Chemical Workers and maintain a database of certified Chemical Workers.

29.2.5 The SFAB Industrial Hygienist (IH) staff shall perform assessments of site PHM health risks and provide copies of the report to the FSHs and the LaRC Safety Manager.

29.3 QUALIFICATIONS

29.3.1 As a minimum, and prior to working as Chemical Workers, candidate personnel shall:

- a. Complete general laboratory safety training offered by SFAB.
- b. Be familiar with LPR 1710.13, LF 381, and LF 498 procedures for their operation

and/or facility.

- c. Pass a medical examination.

29.3.2 When a civil servant candidate satisfies the requirements in Paragraph 29.3.1, SFAB shall issue an LF 65, "Worker Certification Card," that is valid for four years from the date on the card.

29.3.3 Contracting companies shall issue a certification card equivalent to LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 29.3.1.

29.3.3.1 Certified Chemical Workers shall have their LF 65 or equivalent on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

29.3.4 To maintain certification, Chemical Workers shall:

- b. Review PHM Safety Permits, as applicable.
- c. Review and sign annually Chemical Hygiene Plans, as applicable.
- d. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 29.3.1.

29.3.5 Chemical Hygiene Plan Training

29.3.5.1 The designated Chemical Hygiene Officers (CHOs) shall be responsible for providing CHP training.

29.3.5.2 SFAB IH staff shall provide support to the CHP training as appropriate.

29.3.6 Termination of Certification

29.3.6.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Chemical Workers:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Chemical Workers.
- b. Personnel shall immediately stop performing work as Chemical Workers.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil Service personnel shall immediately surrender the LF 65 to the LaRC Safety Manager or designee, who will return the LF 65 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

29.4 MEDICAL SURVEILLANCE

29.4.1 Personnel requiring certification as Chemical Workers shall undergo and pass medical examinations in accordance with LaRC Occupational Medicine Examination Protocols (OMEPS).

29.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

29.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be

made until the LF 66 has been received by the Clinic.

29.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is “Chemical Lab” for all Chemical Workers. In addition, the following should be selected, if applicable to the Chemical Worker’s duties: “Arsenic,” “Benzene,” “Beryllium,” “Cadmium,” “Chromium VI,” “Formaldehyde,” “Hydrazines,” “Isocyanates,” “Lead,” “Inorganic Mercury,” “Methylene Chloride,” “Pesticides,” and/or “Silica Dust.”

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

29.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPs.

29.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

29.5 DOCUMENTATION

29.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, “Worker Certification Card.”
- b. LF 66, “Worker Appointment and Certification.”
- c. LF 381, “Laboratory Specific Chemical Hygiene Plan (CHP) Information.”
- d. LF 498, “Safety Permit.”

CHAPTER 30: FALL PROTECTION AUTHORIZED USER

30.1 INTRODUCTION

30.1.1 Applicable NASA Requirements: NPR 8715.1 and LPR 1740.2

30.1.2 It is NASA's policy to provide fall protection for any walking-working surface where a person is exposed to a fall to a lower level. LaRC's priority is to focus on eliminating, mitigating, and/or controlling fall hazards before an individual is exposed.

30.1.3 If a fall hazard cannot be engineered out of a task, personnel shall be required to use personal fall protection systems for that task.

30.1.4 A personal fall protection system is a system (including all components) an employer uses to provide protection from falling or to safely arrest an individual's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

30.1.5 Personnel who are required to use personal fall protection systems to perform any task shall be certified as Fall Protection Authorized Users.

30.1.6 Personnel who work on walking-working surfaces where Occupational Safety and Health Administration (OSHA)-compliant guardrails have been installed are not required to be certified.

30.1.7 Fall Protection Authorized Users at LaRC may be either civil service or contractor personnel. The specific documents that shall be required to be processed and issued for both of these classes of workers are identified in this chapter.

30.1.8 Certain equipment and tasks (e.g., operating an extensible or articulating boom platform, tasks from an aerial lift that expose the user to a fall hazard) also require an Aerial Lift Operator certification. Contact the Safety and Facility Assurance Branch (SFAB) with any questions regarding certifications required for specific equipment or tasks.

30.2 RESPONSIBILITIES

30.2.1 Supervisors shall refer all fall hazard questions to the LaRC Safety Manager or designee for advice and guidance.

30.2.2 Supervisors shall ensure that all personnel under their supervision designated as Fall Protection Authorized Users maintain their certification.

30.3 QUALIFICATIONS

30.3.1 As a minimum, and prior to working as Fall Protection Authorized Users, candidate personnel shall:

- a. Receive formal classroom training in fall protection from a qualified person.
- b. Receive hands-on training by a qualified person.
- c. Pass a medical examination.

30.3.2 Training for Fall Protection Authorized Users shall include:

- a. Their responsibilities under applicable fall protection regulations;

- b. The nature of the fall hazards in the work area and how to recognize them;
- c. Fall hazard elimination and control methods;
- d. The procedures to be followed to minimize those hazards and how to use written fall protection procedures;
- e. How to inspect, anchor, assemble and use the fall protection equipment commonly used;
- f. Physical demonstration by trainee on how to inspect, anchor, assemble and use fall protection equipment commonly used in the location where they work; and
- g. Fall protection rescue procedures.

30.3.3 When a civil servant candidate satisfies the requirements in Paragraph 30.3.1, SFAB shall issue an LF 65, "Worker Certification Card," that is valid for two years from the date on the card.

30.3.4 Contracting companies shall issue a certification card equivalent to LF 65 that certifies that the holder has successfully satisfied the requirements in Paragraph 30.3.1.

30.3.4.1 Certified Fall Protection Authorized Users shall have their LF 65 or equivalent on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

30.3.5 To maintain certification, Fall Protection Authorized Users shall:

- a. Re-apply for certification every two years by following the same procedure as outlined in Paragraph 30.3.1.

30.3.6 Termination of Certification

30.3.6.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Fall Protection Authorized Users:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Fall Protection Authorized Users.
- b. Personnel shall immediately stop performing work as Fall Protection Authorized Users.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil Service personnel shall immediately surrender the LF 65 to the LaRC Safety Manager or designee, who will return the LF 65 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

30.4 MEDICAL SURVEILLANCE

30.4.1 Personnel requiring certification as Fall Protection Authorized Users shall undergo and pass medical examinations in accordance with LaRC Occupational Medicine Examination Protocols (OMEPS).

30.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

30.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

30.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is “High Worker (Fall Protection).”

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

30.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPs.

30.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

30.5 DOCUMENTATION

30.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 65, “Worker Certification Card.”
- b. LF 66, “Worker Appointment and Certification Form.”

CHAPTER 31: SCAFFOLD USER/INSPECTOR/ERECTOR

31.1 INTRODUCTION

31.1.1 Applicable NASA Requirements: 29 CFR 1926.454

31.1.2 The Safety and Facility Assurance Branch (SFAB) conducts a multi-tier training course for LaRC personnel with responsibilities regarding the use, movement, inspection, and/or erection of scaffolding.

31.2 RESPONSIBILITIES

31.2.1 Supervisors shall ensure that all personnel under their supervision who use, move, inspect, and/or erect scaffolding are provided training appropriate to their level of involvement.

31.2.2 The LaRC Safety Manager shall make Class I appointments.

31.2.3 SFAB shall work with supervisors to identify specific training needs.

31.2.4 SFAB will provide training rosters to contractors as proof of class participation to their contracting companies for certification consideration.

31.2.5 SFAB can assist with finding third party courses for Class II certification listed below.

31.3 QUALIFICATIONS

31.3.1 Prior to the use, movement, inspection, and/or erection of scaffolding, candidate personnel shall have the appropriate training as specified below. Personnel can schedule training by calling (757) 864-7233, (4-SAFE).

31.3.2 There is one general awareness course and three classes of scaffolding certification. The criteria for each are as follows:

- a. **General User** – This User Training is a general awareness course designed for personnel who will only be using scaffolding (i.e., not assembling or inspecting).

Note: No certification cards are issued for this level.

- b. **Class III Inspector** – This certification is for personnel who will be inspecting scaffolding and consists of the following:

- (1) Complete User Training.
- (2) Inspection overview class.
- (3) Hands-on training.

- c. **Class II Erector** – This certification is for personnel who will be assembling/erecting scaffolding and consists of the following:

- (1) Complete Class III training.
- (2) Scaffold Erector course – Third-party scaffold erector course of 8-16 hours of instruction.

Note: This course shall be provided at the expense of the candidate's organization.

- (3) Fall Protection User training may be required if erecting scaffolding over 10 feet tall. See Chapter 30, if applicable.
- d. **Class I Appointee** – This appointment is for personnel who assist in the hands-on portion of the Class III training course and are available to assist the Center with scaffolding related issues and consists of the following:
 - (1) Complete Class II training.
 - (2) Additional education or experience in safety.
 - (3) Appointed by the LaRC Safety Manager.

31.3.3 When a civil servant candidate satisfies the requirements in Paragraph 31.3.2, SFAB shall issue an LF 347, "Scaffolding Authorization Card," that is valid for four years from the date on the card.

31.3.4 Contracting companies shall issue a certification card equivalent to LF 347 that certifies that the holder has successfully satisfied the requirements in Paragraph 31.3.2.

31.3.5 Scaffold Inspectors/Erectors shall have the card on-hand or readily accessible, as proof of their certification, while performing applicable tasks.

31.3.6 To maintain certification, Scaffold Users/Inspectors/Erectors shall:

- a. Re-apply for certification every four years by following the same procedure as outlined in Paragraph 31.3.2.

31.3.7 To maintain certification, Class I Appointees shall:

- b. Maintain Class II Erector certification.

31.3.8 Termination of Certification

31.3.8.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Scaffold Users/Inspectors/Erectors:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Scaffold Users/Inspectors/Erectors.
- b. Personnel shall immediately stop performing work as Scaffold Users/Inspectors/Erectors.
- c. Supervisors shall notify SFAB that the personnel's certification has been revoked.
- d. Civil service personnel shall immediately surrender the LF 347 to the LaRC Safety Manager or designee, who will return the LF 347 to SFAB.
- e. Contractor personnel shall surrender their equivalent certification card to their contracting company safety representative.

31.4 MEDICAL SURVEILLANCE

31.4.1 Personnel requiring certification as Scaffold Users/Inspectors/Erectors shall not be required to undergo medical examinations prior to safety certification.

31.5 DOCUMENTATION

31.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 347, "Scaffolding Authorization Card."

CHAPTER 32: FACILITY SAFETY HEADS AND FACILITY COORDINATORS FOR HIGH AND MEDIUM RISK FACILITIES

32.1 INTRODUCTION

32.1.1 Applicable NASA Requirements: LAPD 1700.2

32.1.2 Facility Safety Heads are responsible for activities within their facilities as defined in LAPD 1700.2.

32.1.3 Risk Classification

32.1.3.1 LaRC facilities have been classified using three risk levels, High (FR1), Medium (FR2), and Low (FR3) Risk, in accordance with LMS-CP-8715. Facility risks may be found in the Facility Safety Personnel Listing (FSPL) database (fspl.larc.nasa.gov).

32.1.3.2 Each facility classified as a High and Medium Risk Facility shall develop a detailed Facility Certification Program Training to certify new Facility Safety Heads (FSHs) and Facility Coordinators (FCs) and alternates. See Appendix C for Facility Certification Training Program guidance.

32.2 RESPONSIBILITIES

32.2.1 The Facility Owner's appointed representative shall:

- a. Sign off on the completed Facility Certification Training Program documentation, and
- b. Appoint the Review Board Chairperson.

32.2.2 The Chair of the Review Board shall ensure new FSH/FC candidates demonstrate their knowledge and understanding towards satisfactorily discharging their duties.

32.2.3 The Facility Certification Training Program shall:

- a. Be signed by the Facility Owner (Director Level) appointed representative, the supervisor(s)/facility manager responsible for the operation of the facility, and the LaRC Safety Manager.
- b. Be tailored to the specific systems and/or equipment and developed by the Facility Owner (Director Level) appointed representative, FC, FSH, supervisor, and other facility personnel.
- c. Identify applicable documentation (e.g., Safety Analysis Report (SAR), pressure systems documents, facility emergency procedures, energy control program (lockout/tagout), LaRC and Agency requirements, Occupational Safety and Health Administration (OSHA) regulations) required for the certification.
- d. Be documented by the FC as part of the facility documentation (e.g., in the Facility Resume or Langley Management System, under a configuration management system, or in other documentation that is easily accessible) under the Facility Owner's control.

32.3 QUALIFICATIONS

32.3.1 FSH/FC candidates shall complete the Facility Certification Training Program and demonstrate their knowledge and completion of the on-the-job training to the Review Board.

32.3.2 The certification process shall require the FSH/FC candidates to:

- a. Demonstrate working knowledge of the specific systems, equipment, work activities, and materials associated with the facility.
- b. Demonstrate working knowledge of the facility safety risks/hazards and their mitigation measures/practices.
- c. Demonstrate working knowledge of the written operating procedures/checklists for proper operation of the facility high-risk systems.

32.3.3 Certification Process

32.3.3.1 The Facility Owner (Director Level) shall appoint an individual (i.e., Review Board Chairperson) to oversee the certification process.

32.3.3.1.1 The Review Board shall consist of at least the following members: Review Board Chairperson, a FSH, a FC (if available from the same facility), a representative from the Safety and Facility Assurance Branch (SFAB), and a supervisor from the facility that is familiar with the facility operations.

32.3.3.2 The Facility Owner appointed representative shall appoint a mentor(s) for the FSH/FC candidate to provide guidance in the training and certification process.

32.3.3.3 Upon completion of the training identified in the Facility Certification Training Program, the Review Board shall conduct an oral interview to ascertain the candidate's level of knowledge and understanding of their responsibilities and functions in the facility.

32.3.3.4 After successful completion of the prescribed Facility Certification Training Program, the Review Board Chairperson shall submit an LF 1 to recommend appointment of the candidate to the FSH or FC position.

32.3.3.5 The Alternate FSH and FC positions will be required to follow the same certification process.

32.3.3.6 In case there is not an appointed FSH or FC, the FSH or FC candidate shall be appointed on a temporary basis (six months) so they can complete the necessary training certification requirements.

32.3.4 FSH/FC candidates shall:

- a. Have an appropriate engineering, science, or technical background demonstrated through education and/or experience.
- b. Complete successfully the respective Facility Certification Training Program.
- c. Demonstrate successfully to the Review Board their knowledge and understanding of their roles and responsibilities as a FSH and/or FC.

- d. Be familiar with SFAB safety databases (e.g., Safety Concerns, Chemical Material Tracking System (CMTS), Audit Tracking System (ATS)) necessary for their daily functions.
- e. Attend a 30-Hour OSHA Training for General Industry or equivalent prior to or within one year of being appointed as a FSH or FC or alternate.

32.3.5 To maintain certification, FSH and FC shall:

- a. Attend the yearly FSH/FC training conducted by SMAO.

32.4 MEDICAL SURVEILLANCE

32.4.1 Personnel requiring certification as FSHs and FCs for High and Medium Risk Facilities shall not be required to undergo medical examinations prior to safety certification.

32.5 DOCUMENTATION

32.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 1, "Appointment of Facility Coordinator(s)/Facility Safety Head(s)."
- b. Facility Certification Training Program.

32.5.2 SFAB shall keep the documentation for each respective candidate in the FSPL database.

CHAPTER 33: FACILITY SAFETY HEADS AND FACILITY COORDINATORS FOR LOW RISK FACILITIES

33.1 INTRODUCTION

33.1.1 Applicable NASA Requirements: LAPD 1700.2

33.1.2 Risk Classification

33.1.2.1 LaRC facilities have been classified using three risk levels, High (FR1), Medium (FR2), and Low (FR3) Risk, in accordance with LMS-CP-8715. Facility risks may be found on the Facility Safety Personnel Listing (FSPL) database (fspl.larc.nasa.gov).

33.2 RESPONSIBILITIES

33.2.1 Facility Safety Heads (FSHs) are responsible for activities within their facilities as defined in LAPD 1700.2.

33.3 QUALIFICATIONS

33.3.1 Qualifications for personnel who perform FSH and Facility Coordinate (FC) functions shall include a technical background demonstrated through education and/or experience as required by the Facility Owner.

33.3.2 The FSH and/or FC shall be appointed by processing an LF 1 in FSPL.

33.3.3 After notification from the Safety and Facility Assurance Branch (SFAB) of an appointment to be FSH or FC, candidates shall:

- a. Complete an LF 260.
- b. Complete an LF 261.
- c. Maintain the completed LF 260 and 261 in the Facility Resume.
- d. Attend a 30-Hour Occupational Safety and Health Administration (OSHA) Training for General Industry or equivalent prior to or within one year of being appointed as a FSH or FC.
- e. Be familiar with SFAB safety databases (e.g., Safety Concerns, Chemical Material Tracking System (CMTS), Audit Tracking System (ATS)) necessary for their daily functions.
- f. Complete the training documented on the Facility Certification Training Program within six months of being appointed.

33.3.4 To maintain certification, FSH and FC shall:

- a. Attend the yearly FSH/FC training conducted by SMAO.

33.4 MEDICAL SURVEILLANCE

33.4.1 Personnel requiring certification as FSHs and FCs for Low Risk Facilities shall not be required to undergo medical examinations prior to safety certification.

33.5 DOCUMENTATION

33.5.1 The documents associated with obtaining and maintaining certification are:

- a. LF 1, "Appointment of Facility Coordinator(s)/Facility Safety Head(s)."
- b. LF 260, "Orientation Survey for Facility Safety Heads or Facility Coordinators."
- c. LF 261, "Documentation Review for Facility Safety Heads (FSH) and Facility Coordinators (FC)."
- d. Facility Certification Training Program.

CHAPTER 34: INTERIM RESPONSE TEAM (LARC INTERNAL OR LARC PROJECTS)

34.1 INTRODUCTION

34.1.1 Applicable NASA Requirements: NPR 8621.1

34.2 RESPONSIBILITIES

34.2.1 The Interim Response Team (IRT) member(s) shall:

- a. Assist Incident Commander as requested.
- b. Accept responsibility of the incident site from Incident Commander until relieved by the investigative authority.
- c. Preserve evidence, document the scene, identify witnesses, and collect debris.
- d. Only federal personnel on the IRT can support the Center's Safety Office in impounding data and collecting witness statements (written statements when possible).
- e. For mishaps at contractor or sub-contractor sites, the IRT will work through the contracting officer, with the guidance from the legal advisor, to obtain and impound data.
- f. Advise the supervisor/Contracting Officer Representative (COR) or Contracting Officer (CO) if drug testing is required per the NPR 3792.1, "Plan for a Drug Free Workplace."

Note: Per NPR 3792.1, the supervisor shall initiate drug testing after mishap if the mishap results in a fatality or personal injury requiring immediate hospitalization or in damage estimated to be in excess of \$10,000 to Government or private property.

- g. Adhere to the personal protective equipment (PPE) requirements as defined by the center's Safety Office personnel or Incident Commander.
- h. Provide all available mishap data and evidence to the investigative authority.

34.3 QUALIFICATIONS

34.3.1 The IRT members shall meet the requirements in Paragraph 34.2.1 and shall have specific training to perform specific tasks (e.g., take pictures of the scene, impound data, interview witnesses).

34.3.2 Personnel assigned to be part of the Center or a program/project IRT shall complete all IRT training requirements contained in NPR 8621.1.

34.3.3 The Safety and Mission Assurance Office (SMAO) Director shall appoint by letter Center IRT members.

34.3.4 The appropriate program/project manager shall appoint by letter program/project IRT members.

34.4 MEDICAL SURVEILLANCE

34.4.1 Personnel requiring certification as IRT members shall not be required to undergo a medical examination prior to safety certification.

34.5 DOCUMENTATION

34.5.1 The documents associated with obtaining and maintaining certification are:

- a. Appointment letter from the SMAO Director or program/project manager, as applicable.

CHAPTER 35: HAZARDOUS WASTE OPERATOR

35.1 INTRODUCTION

35.1.1 Applicable NASA Requirements: NPR 1800.1 and 29 CFR §1910.120

35.1.2 The Center does not train or certify Hazardous Waste Operators.

35.2 RESPONSIBILITIES

35.2.1 Supervisors shall ensure that personnel within their organizations who perform hazardous waste operations on the Center are trained and certified for that purpose.

35.2.2 The organization (civil servant or contractor) shall ensure personnel are certified in accordance with 29 CFR §1910.120 training requirements.

35.3 QUALIFICATIONS

35.3.1 As a minimum, and prior to working as Hazardous Waste Operators, candidate personnel shall:

- a. Complete training that meets or exceeds the 29 CFR §1910.120 training requirements.

Note: The training shall include hands-on performance of the work tasks.

- b. Meet all OSHA-applicable requirements.
- c. Pass a medical examination.

35.3.2 To maintain certification, Hazardous Waste Operators shall:

- a. Attend an eight-hour refresher training annually.

35.3.3 Termination of Certification

35.3.3.1 Upon termination of employment, the certification has lapsed, or when personnel no longer need to be certified as Hazardous Waste Operators:

- a. Supervisors shall notify the personnel that the personnel can no longer perform work as Hazardous Waste Operators.
- b. Personnel shall immediately stop performing work as Hazardous Waste Operators.
- c. Supervisors shall notify the Safety and Facility Assurance Branch (SFAB) that the personnel's certification has been revoked.

35.4 MEDICAL SURVEILLANCE

35.4.1 Personnel requiring certification as Hazardous Waste Operators shall undergo and pass medical examinations in accordance with LaRC Occupational Medicine Examination Protocols (OMEPS).

35.4.2 Civil servants shall receive examinations at the LaRC Occupational Health Clinic.

35.4.3 Supervisors shall initiate the request for medical examination through the submission of an LF 66 to the LaRC Occupational Health Clinic. No appointment will be made until the LF 66 has been received by the Clinic.

35.4.3.1 When completing LF 66, the appropriate protocol to select in Section B is “HAZWOPER.”

Note: When submitting an LF 66 to initiate a new medical protocol, all other protocols the individual is following should also be included on the LF 66.

35.4.4 Contracts issued by LaRC shall require the same level of examinations for contractor personnel in accordance with LaRC OMEPs.

35.4.4.1 Examination requirements for contractor personnel are the responsibility of the contracting company.

35.5 DOCUMENTATION

35.5.1 Training documentation shall be maintained by the personnel’s organization.

35.5.2 The documents associated with obtaining and maintaining certification are:

- a. LF 66, “Worker Appointment and Certification Form.”
- b. Certificate of completion from third party training facility.
- c. Certificate of completion of annual refresher training.

APPENDIX A. ACRONYMS

AED	Automated External Defibrillator
ATS	Audit Tracking System
CFO	Chief of Flight Operations
CDL	Commercial Driver's License
CG	Center of Gravity
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
CMTS	Chemical Material Tracking System
CO	Contracting Officer
COR	Contracting Officer Representative
CPR	Cardiopulmonary resuscitation
CRFSL	Center Range Flight Safety Lead
CSSO	Craft Specific Safety Operator
DOT	Department of Transportation
EMT	Emergency Medical Technician
ESP	Explosives Safety Permit
FC	Facility Coordinator
FSH	Facility Safety Head
FTS	Flight Termination System
FV	Field Verifier
IATA	International Air Transport Association
IH	Industrial Hygienist
IRT	Interim Response Team
HAZMAT	Hazardous Materials
JHA	Job Hazard Analysis
JSC	Johnson Space Center
LAPD	Langley Policy Directive
LaRC	Langley Research Center
LDEM	Lifting Device and Equipment Manager
LF	Langley Form

LMS	Langley Management System
LMS-CP	Langley Center Procedure
LOTO	Lockout Tagout
LPR	Langley Procedural Requirement
NPR	NASA Procedural Requirement
OJT	On-the-Job Training
OMEF	Occupational Medicine Examination Protocol
OSHA	Occupational Safety and Health Administration
P&ID	Process and Instrumentation Drawing
PHM	Potentially Hazardous Materials
RL/RT	Red Lock/Red Tag
RSD	Research Services Directorate
RSO	Radiation Safety Officer, Range Safety Officer
SAR	Safety Analysis Report
SCMP	Software Configuration Management Plan
SCUBA	Self-Contained Underwater Breathing Apparatus
SFAB	Safety and Facility Assurance Branch
SMAO	Safety and Mission Assurance Office
SMSO	Shop Machine Safety Operator
SO	Safety Operator
SOP	Standard Operating Procedure
SPE	Standard Practice Engineer
UAS	Uninhabited Aerial System

APPENDIX B. OTHER CERTIFICATIONS PER NPR 8715.1

The following certifications are identified in NPR 8715.1 but are not currently used/required at LaRC:

- a) Altitude Chamber Operator
- b) Hyperbaric Chamber Operator
- c) Tank Farmer Worker
- d) Centrifuge Operator

APPENDIX C. FACILITY CERTIFICATION PROGRAM TRAINING GUIDELINES

C.1 This appendix provides the guidelines to develop a Facility Certification Program

All Facility Training plans should include the FC/FSH documentation reading requirements listed in LF 261, "Documentation Review for Facility Safety Heads (FSH) and Facility Coordinators (FC)." Below is a strawman guide, as well as an example plan for further reference.

FC/FSH Facility Training Plan Guideline/Strawman

{Minimum Required Signatures}

Signature Page

Facility Owner (Director Level) representative

Supervisor/Facility Manager responsible for facility operations

Safety and Facility Assurance Branch representative

Facility Coordinator/Facility Safety Head Training Program
The {Facility}, Langley Research Center

The Overview of the FC Training Program

The Details of the FC Training Program

FC/FSH Training Syllabus

{Depending on the complexity of the Facility systems, it is recommended that the training and testing by the Review Board/Team is broken into Phases}

Document:	Document Identifier:	Read:	Trainer Review:	Knowledge Test:

CS FC/FSH Training Syllabus

{Depending on the complexity of the Facility systems, it is recommended that the training and testing by the Review Board/Team is broken into Phases}

Facility Specific Training:

Demonstrate proficiency in the facility systems and subsystems listed for this phase in the following areas:

FUNCTION	SYSTEM COMPONENTS
LOCATION	CONTROLS AND CONTROL LOGIC
OPERATING LIMITS	INSTRUMENTATION
INTERLOCKS	HAZARDS
SPECIAL CONSIDERATION	PREVENTIVE MAINTENANCE

Facility Systems: See Note 1	Read:	Trainer Review:	Knowledge Test:

Note 1: Consult SAR, SOPs, Drawings, CCR/CNS Archives, and knowledgeable facility personnel as required to facilitate learning these systems.

Practical Application of Training

Upon satisfactory completion of the Training items delineated above, the FC/FSH candidate will assume responsibility for performing the following tasks:

Task	Transfer Date
<i>None for this Phase-I Panel Review</i>	

Bold print indicates that while the FC/FSH in Training is responsible for this task, the trainee will follow facility procedure (signature requirement) for implementation.

Example of an Existing FSH Training Plan

**NASA LaRC Unitary Plan Wind Tunnel
Facility Safety Head
Training Plan**

Facility Safety Head (FSH) Training Program

The Unitary Plan Wind Tunnel (UPWT), Langley Research Center

The Overview of the FSH Training Program

This document provides the guidelines to train and certify personnel for the Facility Safety Head position at the UPWT. A trainee is expected to have sound engineering background and should learn the systems and subsystems of the facility by interacting with center and facility personnel, referring to facility drawings, Langley Procedural Requirements (LPR), Langley Policy Directives (LAPD), Center Procedures (CP), Standard Operating Procedures (SOP), Integrated Operating Procedures (IOP), Administrative Instruction Procedures (AIP) and Standard Emergency Procedures (SEP) pertinent to the facility.

The training material is divided into four phases. The respective trainers will review the trainee's knowledge and sign off the relevant areas in each phase. On completion of a particular phase, the trainee will be interviewed by a Review Board consisting of experts to evaluate and certify the trainee for the position. The recommendations of the Review Board will be documented and areas of deficiencies identified. Satisfactory completion of the training requirements is necessary to proceed to the next phase of the training program. On successful completion of the training program, the candidate will be certified for the position through processing Langley Form (LF 1). A copy of the certification should be documented in the Facility Resume.

The Details of the FSH Training Program

Each facility has a designated Facility Safety Head (FSH) responsible for activities within his/her facility. Guides such as LPR 1740.4 ("Facility System Safety Analysis and Configuration Management"), LPR 1710.40 ("Safety Regulations Covering Pressurized Systems"), and LAPD 1150.2 ("Boards Panels, Committees, Councils, and Teams") are strictly followed by the FSH.

The FSH must demonstrate a working knowledge and proficiency of the items listed below to the satisfaction of the Review Board. The FSH trainee must demonstrate proficiency in:

1) Hazards (Ref: Facility Safety Analysis Report))

- Identifies credible hazards associated with the operation of the facility
- Draws Center resources to define the hazards in terms of severity and probability
- Assesses the control/mitigation for those hazards
- Makes decisions on recommendations toward reduction of the severity and/or probability of occurrence

2) Working Knowledge of Facility Systems and Sub-systems

- Tunnel Circuit and its Components
- Main Drive and its Components
- Air Storage and Supply System
- Instrumentation Air Systems
- High Pressure Air System
- Steam Systems
- Cooling Systems
- Lubrication Systems
- Hydraulic Systems
- Vacuum Systems
- Test Section Configuration
- Tunnel Vent System
- Tunnel Control System & Interlocks
- Monitoring, Micro Processor Systems
- Model Mounting and Instrumentation
- Automatic Test Sequencing (ATS)
- Pitch/Roll System
- Balance Loads Monitoring System (BLMS)

3) Key Activities

- Processes waivers and deviations from procedures and drawings
- Develops/updates/approves operating procedures
- Conducts Test Readiness reviews
- Participates in design reviews

- Updates facility safety and performance issues to Senior Management

4) LaRC and Facility Procedures

- LPRs, LAPDs, and Standards
- Facility Standard, Maintenance, and Emergency Procedures
- Standard Engineering Practices

(A detailed understanding of the system safety procedures, policies, and guidelines and understanding their application in operating, maintaining, and upgrading)

5) Facility Configuration Controlled Documentation CMOL (Configuration Management On-Line System)

- Facility Operating Procedures, Fire Safety, Roof top Access control
- Preventive maintenance and schedule
- Process & Instrumentation Drawings (P&ID)
- Safety Analysis Report (SAR)
- PSCM, "Pressure Systems Configuration Management"
- ACMP, "Asbestos Configuration Management Program"
- Facility Resume
- Facility Baseline Drawing List
- Document Archive

The Unitary Plan Wind Tunnel FSH performs safety related duties as delineated in prescribing document LPR 1740.2, "Facility Safety Requirements." These policies are supported by the regulations and standards established by the American National Standards Institute (ANSI), the Occupational Safety and Health Administration (OSHA), and the National Aeronautics and Space Administration (NASA).

Phase I Training

Document:	LMS Identifier:	Read:	Trainer Review:	Knowledge Test:
Safety Program	LAPD 1700.1			
Facility Safety Requirements	LPR 1740.2			
Wind Tunnel Test Planning	LMS-CP-0502			
Wind Tunnel Model Build-Up and Installation	LMS-CP-0503			
Conducting a Wind Tunnel Test	LMS-CP-0504			
Closing Out a Wind Tunnel Test	LMS-CP-0505			
Reporting Injuries, Illnesses, and Compensation Claims	LMS-CP-4760			
Asbestos Configuration Management Program	24-ACMP			
Wind Tunnel Model Systems Criteria	LPR 1710.15			
UPWT Document Archive	FCMS			

UPWT FSH Training Program Syllabus – Phase I

Document:	LMS Identifier:	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
Safety Program	LAPD 1700.1			
Facility Safety Requirements	LPR 1740.2			
Response to Wind Tunnel Test Requests	LMS-CP-0501			
Wind Tunnel Test Planning	LMS-CP-0502			
Wind Tunnel Model Build-Up and Installation	LMS-CP-0503			
Conducting a Wind Tunnel Test	LMS-CP-0504			
Closing Out a Wind Tunnel Test	LMS-CP-0505			
Selection, Calibration, Use, Control, Recall, Procurement, and Storage of Measuring and Test Equipment (M&TE)	LMS-CP-0506			
Reporting Injuries, Illnesses, and Compensation Claims	LMS-CP-4760			
Asbestos Configuration Management Program	24-ACMP			
Wind Tunnel Model Systems Criteria	LPR 1710.15			
Unitary Plan Wind Tunnel Pre-Operational Procedures	24-PR			
Unitary Plan Wind Tunnel Operational Procedure	24-OP			

Unitary Plan Wind Tunnel Post Operational Procedures	24-PO			
Unitary Wind Tunnel Weekly Operating Checklist	24-MOP-CL			
Startup/Ready Ancillary Equipment Checklist	24-PR-CL			

Facility Specific Training:

Facility Systems: See Note 1	Document Identifier: (If available)	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
1) High Pressure Air				
1800 PSI Subsystem	24-1800A-PSCM			
300 PSI Subsystem	24-300A-PSCM			
2) Cooling systems				
Cooling tower subsystem				
3) Tunnel Circuit	NASA-TP-1905			
4) Tunnel Main Drive	NASA-TM-81368			
5) Programmable Logic Controllers				
6) Process Control Systems & Microprocessors				

Note 1: Consult UPWT SAR, SOPs, Drawings, Checklist, TTR Archives, and knowledgeable facility personnel as required to facilitate learning these systems.

Practical Application of Training:

Upon satisfactory completion of the Training items delineated above, the Facility Safety Head in training will assume responsibility for performing the following tasks:

Task:	Transfer Date:
Asbestos Abatement Plan Management	
UPWT Document Archive	
Accident Reporting	

Bold print indicates that while the trainee is responsible for this task, the trainee must devise solution and receive current FSH approval before implementation.

UPWT FSH Training Program Syllabus – Phase II

Document:	LMS Identifier:	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
Facility Change Request Process	LMS-CP-4710			
Emergency Management Plan (EMP)	LAPG 1046.1			
Langley Research Center Energy Control Program (Lockout/Tagout)	LPR 1710.10			
Wind Tunnel Model Systems Criteria	LPR 1710.15			
Facility System Safety Analysis	LPR 1740.4			
Personnel Safety Certification	LPR 1740.6			
Safety Analysis Report	24-SAR			
UPWT Facility Resume				
Quality Control Procedure for UPWT Test Data				

Document:	Document Identifier:	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
BLMS Operation Manual	Wyle Document NASA-DID-600			
BDDU Operation Manual	Wyle Document HD523-096R1-D0			
Facility Safety Head TRR Checklist				

Facility Specific Training:

Facility Systems: See Note 1	Document Identifier: (If available)	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
1) Vacuum System	24-15V-PSCM			
2) Hydraulic System	24-600P-PSCM			
3) Lift and Lube Oil Systems	24-2000Q1-PSCM 24-2000Q2-PSCM			
4) Vent System				

Note 1: Consult UPWT SAR, SOPs, Drawings, Checklist, TTR Archives, and knowledgeable facility personnel as required to facilitate learning these systems.

Practical Application of Training:

Upon satisfactory completion of the Training items delineated above, the Facility Safety Head in training will assume responsibility for performing the following tasks:

Task:	Transfer Date:
Safety Analysis Report	
UPWT Facility Resume	
Safety Clearance Procedures (Lockout/Tag out)	
BLMS/BDDU Setup	
Test Readiness Review	
After Hours Duty	
Operator Certifications/Qualifications	

Bold print indicates that while the trainee is responsible for this task, the trainee must devise solution and receive current FSH approval before implementation.

UPWT FSH Training Program Syllabus – Phase III

Document:	LMS Identifier:	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
Langley Research Center Occupational Health Program	LPR 1800.1			
Langley Research Center (LaRC) Standards for the Acquisition of Threaded Fasteners (Bolts)	LAPD 5330.3			
Engineering Drawing System	LPR 7320.1			
Electrical Safety	LPR 1710.6			
Fire Protection Program	LPR 1710.11			
Potentially Hazardous Materials – Hazard Communication Standard	LPR 1710.12			
Langley Forms 44, 44A, 95, 164, 496	LF 44, LF 44A, LF 95, LF 164, LF 496			
Langley Research Center Pressure Systems Handbook	LPR 1710.40			
Safety Program for the Recertification and Maintenance of Ground-Based Pressure Vessels and Piping Systems (PVS)	LPR 1710.42			
Langley Research Center Standard for the Evaluation of Socket and Branch Connection Welds	LPR 1710.41			

Facility Specific Training:

Facility Systems: See Note 1	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
1) Valve Identification Chart (numbering/location)			
2) Steam			
3) Hydraulic Systems			
4) Data Acquisition System			
5) Test Section			
Model Support System			
Test Techniques			
6) Automatic Test Sequencing			
7) Pitch/Roll System			
8) Video Monitoring			
9) Interfaces with Safety Interlocks (Kirk Keys)			

Note 1: Consult SAR, SOPs, Drawings, CCR/CNS Archives, and knowledgeable facility personnel as required to facilitate learning these systems. *Procedure still being developed.

Practical Application of Training:

Upon satisfactory completion of the Training items delineated above, the Facility Safety Head in training will assume responsibility for performing the following tasks:

Task:	Transfer Date:
Facility Pressure Systems re-certification	
Fire Safety	
Facility Audits and Surveys	
Personnel Training	
Safety Meeting/Training	
Drawing Updates	
Model Design Reviews	
Model Buyoff	

Bold print indicates that while the trainee is responsible for this task, the trainee must devise solution and receive current FSH approval before implementation.

UPWT FSH Training Program Syllabus – Phase IV

Document:	LMS Identifier:	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
LaRC Environmental and Energy Management	LAPD 8500.1			
Environmental and Energy Program Manual	LPR 8500.1			
Approval Authorities for Signs and Directory Boards	LAPD 1500.5			

Langley Research Center (LaRC) Policy for Controlling Keys, Combinations, and Locks	LAPD 1600.6			
Ionizing Radiation	LPR 1710.5			
Langley Research Center Occupational Health Program	LPR 1800.1			
NASA Langley Research Center (LaRC) Maximum Work Time Policy	LAPD 1700.5			
Langley Research Center Requirements for Safety-Critical Products	LAPD 4520.1			
UPWT Facility Baseline Drawing List	24-FBL			

Facility Specific Training:

Facility Systems: See Note 1	Read: Initial/Date	Trainer Review: Initial/Date	Knowledge Test: Initial/Date
1) Lubrication Systems			
Main Drive			
2) Emergency Power Backup System			
3) UPWT Power Supply Systems			
4) Make-up Air Subsystem			
5) Refrigerant Dryer Subsystem			
6) Oxygen Monitoring System			
7) Graphics Control Panel			
8) Electrical Station			

Note 1: Consult SAR, SOPs, Drawings, CCR/CNS Archives, and knowledgeable facility personnel as required to facilitate learning these systems.

Practical Application of Training:

Upon satisfactory completion of the Training items delineated above, the Facility Safety Head in training will assume responsibility for performing the following tasks:

Task:	Transfer Date:
Facility Environmental Coordinator	
Facility Modifications using the TTR System	
Modifying/Drafting Maintenance Procedures	

Bold print indicates that while the trainee is responsible for this task, the trainee must devise solution and receive current FSH approval before implementation.

Example of an Existing FSH Training Plan

**NASA LaRC B1293C Advanced Materials
& Processing Branch
Facility Safety Head
Training Plan**

Facility Safety Head (FSH) Training Program

B1293C Advanced Materials & Processing Branch (AMPB), Langley Research Center

The Overview of the FSH Training Program

This document provides the guidelines to train personnel for the Facility Safety Head position at B1293C. A trainee is expected to have sound safety and chemical background and should learn the processes and procedures that occur in the facility by interacting with center and facility personnel, referring to facility drawings, Langley Procedural Requirements (LPR), Langley Policy Directives (LAPD), Center Procedures (CP), Standard Operating Procedures (SOP), and Standard Emergency Procedures (SEP) pertinent to the facility.

The training material is divided into two phases. The respective trainers will review the trainee's knowledge, sign off the relevant areas in each phase, and answer any questions the trainee might have. Satisfactory completion and understanding of the training requirements is necessary to proceed to the next phase of the training program.

The Details of the FSH Training Program

Each facility has a designated Facility Safety Head (FSH) responsible for activities within his/her facility. Guides such as LPR 1740.2 ("Facility Safety Requirements"), LPR 1740.4 ("Facility System Safety Analysis"), LPR 1740.6 ("Personnel Safety Certification"), LPR 1800.1 ("LaRC Occupational Health Program"), LPR 1710.12 ("Potentially Hazardous Materials-Hazard Communication Standard"), and LPR 1710.40 ("Langley Research Center Pressure Systems Handbook"), and LPR 1710.10 (Langley Research Energy Control Program (Lockout/Tagout) are strictly followed by the FSH.

The FSH must demonstrate a working knowledge of the items listed below to the satisfaction of the trainer. The FSH trainee must demonstrate proficiency in:

1) Hazards (Ref: Facility Safety Analysis Report))

- Identifies credible hazards associated with the operation of the facility
- Draws Center resources to define the hazards in terms of severity and probability
- Assesses the control/mitigation for those hazards
- Makes decisions on recommendations toward reduction of the severity and/or probability of occurrence

2) Key Activities

- Processes waivers and deviations from procedures and drawings
- Reviews/updates/approves operating procedures, PHM permits and lab specific chemical hygiene plans (CHPs)
- Conducts monthly safety meetings and facility safety head inspections

- Reviews and approves Form 44s, Form 66s and Form 475s
- Participates in design reviews
- Updates facility and chemical safety issues to Senior Management

3) LaRC and Facility Procedures

- LPRs, LAPDs, and Standards
- Facility Standard, Maintenance, and Emergency Procedures
- Standard Engineering Practices

4) Facility Configuration Controlled Documentation CMOL (Configuration Management On-Line System)

- Facility Operating Procedures, Fire Safety, Roof top Access control
- Preventive maintenance and schedule
- Process & Instrumentation Drawings (P&ID)
- Safety Analysis Report (SAR)
- PSCM, "Pressure Systems Configuration Management"
- ACMP, "Asbestos Configuration Management Program"
- Facility Resume
- Facility Baseline Drawing List

The Advanced Materials Processing Branch FSH performs safety related duties as delineated in prescribing document LPR 1740.2, "Facility Safety Requirements." These policies are supported by the regulations and standards established by the American National Standards Institute (ANSI), the Occupational Safety and Health Administration (OSHA), and the National Aeronautics and Space Administration (NASA).

B1293C FSH Training Program Syllabus – Phase I

Document:	LMS Identifier:	Read:	Trainer Review:
Emergency Management Plan (EMP)	LPR 1046.1		
Safety Program	LAPD 1700.1		
Safety Assignments & Responsibilities	LAPD 1700.2		
LaRC Occupational Health Program	LPR 1800.1		
Langley Research Center Energy Control Program (Lockout/Tagout)	LPR 1710.10		
Facility Safety Requirements	LPR 1740.2		
Facility System Safety Analysis	LPR 1740.4		
Langley Research Center Pressure Systems Handbook	LPR 1710.40		
Personnel Safety Certification	LPR 1740.6		
Bloodborne Pathogens	LPR 1800.3		
Ergonomics Program	LPR 1820.2		
Langley Research Center Noise Control and Hearing Conservation Program	LPR 2710.1		
Hurricane Response and Recovery Plan	LPR 8715.1		

Applicable Documents:

Document:	Procedure Identifier:	Read: Initial/Date	Trainer Review: Initial/Date
Office Ergonomics Evaluation Checklist	LF 19		
Confined Space Entry Permit	LF 60		
Worker Certification Card	LF 65		
Worker Appointment and Certification Form	LF 66		
Supervisor's Report of Accident	LF 95		
LaRC Safety Documentation Review for Certified Operators	LF 121		
Facility Safety Awareness and Procedure Review for Certified Operators	LF 122		
Appointment for Operator Certification	LF 159		
Report of LaRC Safety/Health Concern/Close Call	LF 164		
Job Hazard Analysis (JHA) Worksheet	LF 275		
Safety Operator Appointment Form	LF 451		
NASA Langley Safety Operators Permit	LF 453		
Lockout/Tagout Records	LF 496		
Safety Permit	LF 498		
LaRC Facility Pre-Hurricane Checklist	LF 515H9		
Safety Permit – Pressurized Systems	LF 533		
Lockout/Tagout "Hands-on Proficiency" Certification	LF 566		
Dig Permit Request Process	LMS-CP-1750		

Conducting a Facility Safety Head Monthly Inspection	LMS-CP-4709		
Facility Change Request Process	LMS-CP-4710		
Reporting Injuries, Illnesses, and Compensation Claims	LMS-CP-4760		
Obtaining Waivers for Langley Management System (LMS) Requirements	LMS-CP-7151		
B1293A/C Facility Resume	See FC for location		

B1293C FSH Training Program Syllabus – Phase 2

Document:	LMS Identifier:	Read: Initial/Date	Trainer Review: Initial/Date
LaRC Fire Protection Program	LPR 1710.11		
Potentially Hazardous Materials- Hazard Communication Standard	LPR 1710.12		
Chemical Hygiene Plan	LPR 1710.13		
Ionizing Radiation	LPR 1710.5		
Electrical Safety	LPR 1710.6		
Safety Program for the Handling and Use of Explosives at Langley Research Center	LPR 1710.7		
Non-Ionizing Radiation	LPR 1710.8		
Facility Configuration Management	LPR 7123.2		
Environmental and Energy Program Manual	LPR 8500.1		
LaRC Integrated Spill Contingency Plan	LPR 8715.12		

Applicable Documents:

Document:	Document Identifier:	Read: Initial/Date	Trainer Review: Initial/Date
Safety Permit Request-Radioactive Material	LF 38		
Hazardous Material – Procurement, Inventory, and Storage Record	LF 44		
Radiation Hazard Form	LF 44A		
Safety Permit Request – Radiation Machine	LF 48		
Radioactive Material Transfer	LF 56		
Chemical Worker's Certification Card	LF 62		
Safety Permit Request-Hazardous Material	LF 118		
Explosives Inventory Form	LF 137		
Explosives Safety Permit Request	LF 318		
Explosives Safety Permit	LF 319		
Laboratory Specific Chemical Hygiene Plan (CHP) Information	LF 381		
LaRC Energized Electrical Work Permit	LF 416		
Radiation Worker's Certification Card	LF 492		
Facility Configuration Management Audit Process	LMS-CP-1741.2		
Precious Metals Procurement	LMS-CP-4110		
Acquisition of Hazardous Materials	LMS-CP-4759		
Welding/Brazing	LMS-CP-5698		