

.  
. .  
. .  
. .

**Document Number:** GLM-QS-1700.1.2

**Revision:** Revision B

**Effective Date:** 5/14/2012

**Expiration Date:** 5/14/2017

## Glenn Safety Manual – Chapter 2

# Safety, Health and Environmental Training w/Change 2 (9/30/2015)

*Approved by: QS/Chief, Safety and Health Division*

*Distribution: BMS Library*

**NASA - Glenn Research Center  
Cleveland, OH 44135**

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

### Change Record

Rev.	Effective Date	Expiration Date	GRC25, Change Request #	Description
B	5/14/2012	5/14/2017	127	Biannual update
Change 1	5/14/2012	5/14/2017	N/A	Administrative changes to add front cover and change history log to comply with NPR 1400.1, deleted "The authority for the policies and procedures contained in this chapter is derived from the following documents," in Section 4.0 and added "The GRC shall implement requirements of the following documents"
Change 2	9/30/2015	5/14/2017	N/A	Administrative change to remove hyperlinks.

*\*\*Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

## Contents

1.0	PURPOSE.....	4
2.0	APPLICABILITY .....	4
3.0	BACKGROUND.....	4
4.0	POLICY.....	4
5.0	RESPONSIBILITIES .....	5
5.1	Glenn Research Center Director .....	5
5.2	Supervisors .....	5
5.3	Line Managers and Supervisors.....	5
5.4	Safety and Health Division.....	6
5.5	Employees .....	6
5.6	Human Capital Development Division (HCDD).....	7
6.0	REQUIREMENTS .....	7
6.1	Determination of Training Needs .....	7
6.1.1	Process of Determining Training Needs.....	7
6.1.2	Safety, Health, Environmental Training Matrix .....	7
6.2	Environmental, Occupational Health, and Safety Training .....	7
6.2.1	Target Groups.....	7
6.2.2	Target Group Training Needs.....	8
6.2.3	Training Areas.....	10
7.0	RECORDS.....	10
8.0	REFERENCES .....	10
	APPENDIX A.—DEFINITIONS AND ACRONYMS.....	11

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

## Chapter 2—Safety, Health and Environmental Training

*NOTE: The current version of this chapter is maintained and approved by the Safety and Health Division (SHeD). The last revision date of this chapter was May 2012. The current version is located on the Glenn Research Center intranet within the BMS Library. Approved by Chief of Safety and Health Division.*

### 1.0 PURPOSE

This chapter describes policies and procedures and assigns responsibilities pertaining to environmental, occupational health, and safety (EHS) training for NASA Glenn Research Center (GRC) employees.

*NOTE: This chapter is an overview of GRC's EHS training program. Section 6.2.2 of this document includes a discussion of the training all GRC employees shall complete and an overview of training requirements for certified personnel. For more specific information about required or recommended training for any one particular EHS discipline, please see the Environmental Programs Manual, the Glenn Safety Manual, or the Occupational Health Programs Manual chapter pertaining to that topic. These manuals are maintained by the Safety, Health and Environmental Division.*

### 2.0 APPLICABILITY

The procedures, responsibilities, and requirements set forth in this chapter apply to GRC civil servant employees, as well as GRC contractors in accordance with the terms of their contracts, and to other Government agency employees who support operations at Lewis Field, Plum Brook Station, and any facility under GRC cognizance.

This chapter *does not apply* to personnel who operate a test rig or any facility requiring a Safety Permit. The certifications of qualified facility operators working in the types of operations that require a safety permit are specified in Chapter 1A of the Glenn Safety Manual.

This chapter *does not apply* to personnel engaged in operations that already require skill certification by quality assurance organizations, such as soldering, brazing, crimping, and potting or to personnel performing inspections with dye penetrant and magnetic particles, ultrasound, radiography, magnaflux, and comparable operations.

Specific training for certifications is dependent on the task being conducted; all applicable codes, standards, and practices contained within the operation apply.

### 3.0 BACKGROUND

Employees need not only technical skill to do their jobs properly, they also shall have appropriate training in order to perform their work safely and with methods that are protective of the environment and occupational health.

Indeed, Occupational Safety and Health Administration (OSHA) regulations pertaining to basic program elements for Federal employees (29 Code of Federal Regulation (CFR) 1960) include provisions for safety and health training for supervisors (29 CFR 1960.55) and employees (29 CFR 1960.59) that are pertinent to the work being performed. In addition, training requirements described by Environmental Protection Agency regulations, as well as NASA environmental policies apply to certain personnel at GRC. In light of the many regulations and guidance documents aimed at protecting the safety and health of the work force, as well as the environment, this chapter clarifies the responsibilities and requirements pertaining to EHS training at GRC.

### 4.0 POLICY

It is GRC policy to ensure that GRC personnel are trained commensurate with the applicable safety, environmental and occupational health requirements that pertain to their jobs. Effective training ensures that the operation methodologies implemented are safe. In addition, it is NASA policy to make all operations as safe as possible through the proactive and effective use of design engineering and/or administrative controls to minimize, if not eliminate, any hazards. A third option, the use of personal protective equipment, is available to control hazards that cannot be totally abated or reduced to acceptable exposure limits.

The GRC shall implement requirements of the following documents:

- Executive Order 12196, Occupational Safety and Health Programs for Federal Employees

**Printed copies are uncontrolled and are not to be used for operational purposes.**

<b>Glenn Research Center Glenn Safety Manual</b>	<b>Title: Safety, Health and Environmental Training</b>	
	<b>Document No.:</b> GLM-QS-1700.1.2	<b>Rev.:</b> Revision B

- 29 CFR 1960, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, Subpart H
- NASA Procedural Requirement (NPR) 8715.3C, NASA General Safety Program Requirements
- NPR 1800.1C, NASA Occupational Health Program Procedures
- NPR 8621.1B, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping
- Glenn Level Policy Directive 8500.1, NASA Glenn Environmental Management System (EMS) Policy
- GRC Procedure GRC–P3.31, Training and Career Development.

*NOTE: The Human Capital Development Division (HCDD) is currently revising GRC–P3.3.1.*

## **5.0 RESPONSIBILITIES**

### **5.1 Glenn Research Center Director**

According to NPR 8715.3C, paragraph 7.3, NASA center directors shall oversee several aspects of the planning and implementation of their center’s safety training program. At GRC, these responsibilities are split between line managers and supervisors (see Section 0), SHED (see Section 5.4), and HCDD (see Section 0).

### **5.2 Supervisors**

**5.2.1** In accordance with NPR 8715.3C, NASA supervisors are responsible for the following:

- Formulating and documenting a comprehensive safety training program at their center (Requirement 32147)
- Developing and maintaining a center safety training plan
- Ensuring that system safety training is available to meet the needs of programmatic activities (Requirement 32116)

### **5.3 Line Managers and Supervisors**

In general, line managers and supervisors shall be primarily responsible for providing their personnel with a safe working environment, recognizing potential hazards in their areas, and budgeting resources for special training for their employees.

At GRC, in accordance with NPR 8715.3C, supervisors are responsible for the following:

- Ensuring that all of their personnel engaged in physical work are instructed in accident prevention and are fully informed of the hazards involved (Requirement 32301)
- Ensuring that training for all of their personnel engaged in electrical work includes first-aid procedures and cardiopulmonary resuscitation (Requirement 32302)
- Ensuring that all of their personnel at risk of exposure to cryogenic liquids receive training in correct first-aid measures for these liquids
- Ensuring that software safety personnel and project/program lead software safety analysts are trained to NASA Standard (STD) 8719.13, Software Safety, and NASA STD 8739.8, Standard for Software Assurance
- Ensuring that operators of motorized equipment have formal initial training, consisting of both classroom and operational testing to ensure operator proficiency, if operating the motorized equipment involves skills beyond those associated with normal, everyday operation of private motor vehicles (Requirement 32271)

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

- Ensuring that operators of motorized equipment have periodic refresher training and testing as determined by SHED and/or the employees' supervisors if operating the motor vehicle requires skills beyond those associated with normal, everyday operation of private motor vehicles (Requirement 32272)
- Identifying and including training for their personnel involved with jobs that are potentially hazardous in addition to the mandatory listing in paragraph 7.4.5 of NPR 8715.3C (also see Section 6.2.2.6)

Line managers and supervisors shall be responsible for ensuring that the employees working under them register for pertinent required EHS training. The annual Basic Environmental, Health, and Safety Training (BEHST) provided by HCDD assists employees in determining their training needs; however, supervisors may add or delete training courses from the list generated by this assessment tool on the basis of the knowledge they have of their employees' duties and the conditions of their work environment. Supervisors shall ensure that the EHS training courses needed by civil servant employees are listed in employees' individual development plans and/or performance plans.

#### 5.4 Safety and Health Division

In accordance with NPR 8715.3C, operations at GRC shall be reviewed annually to ensure that the implemented safety training program is working effectively. As such, SHED shall have an assessment and oversight role for EHS training efforts at GRC. SHED shall perform internal compliance evaluations in order to track the effectiveness of EHS programs. Regarding EHS training, this may include, but is not limited to, reviewing training requirements, courses, training records, and other documentation. Any findings noted by SHED as part of this assessment process shall be tracked until they are considered to be resolved, and actions will be taken in order to prevent recurrences, as necessary.

SHED shall also work closely with HCDD and will have a role in the continued development of HCDD's BEHST tool (see Section 6.1.1) as it pertains to EHS training. In addition, SHED may develop and present EHS training courses and materials, as necessary. Subject matter experts within SHED are available to provide guidance regarding training requirements and may be able to provide training, for specific EHS topic areas. See SHED Areas of Responsibility (Who to Call for Help!) for contact information.

In accordance with requirements described in NPR 8621.1B, Section 1.2.23 (c), SHED shall ensure that GRC employees are familiar with the roles and responsibilities documented in the Center Mishap Preparedness and Contingency Plan and the NPR. The Mishap and Close Call and Reporting training provided in order to meet this requirement is discussed in Sections 6.2.2.1, 6.2.2.4, and 6.2.2.5 of this document.

#### 5.5 Employees

All employees shall be responsible for:

- Conducting their work in compliance with all applicable EHS laws and regulations
- Exercising common sense, reasonable care, and caution regarding the safe performance of their work assignments
- Possessing knowledge of and implementing GRC Environmental, Health, and Safety (EHS) policies
- Completing the annual BEHST provided by HCDD and subsequently applying for any required EHS training courses, when available, or locating and applying for any offsite training courses, once the employee's supervisor has reviewed and approved and/or changed the list of courses needed (see Section 6.1) (EHS training courses needed by civil servant employees shall be listed in employees' individual development plans.)
- Using the safe emergency response procedures applicable to their individual work areas and work assignments
- Reviewing the building evacuation plan for each building they work in

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

## 5.6 Human Capital Development Division (HCDD)

HCDD shall be responsible for coordinating training courses with requestors, including courses from the NASA Safety Training Center. HCDD is responsible for providing the BEHST tool (see Section 6.1.1.) to all GRC employees. When the data gathered by HCDD regarding the needs assessment indicate that a significant number of personnel require training on a given topic, HCDD shall coordinate corresponding training sessions at GRC. HCDD publishes a training calendar on its HCDD website that shows dates of upcoming EHS training.

## 6.0 REQUIREMENTS

### 6.1 Determination of Training Needs

#### 6.1.1 Process of Determining Training Needs

Training may be obtained through a variety of sources including onsite and offsite training courses, academic instruction, topic-related conferences, Web-based instruction, and on-the-job training. For assistance with coordinating training courses, contact HCDD. The HCDD Web site contains schedules and announcements of training courses.

Obtaining the required or desired training depends on several factors including organizational and individual needs, type and complexity of research or equipment operation, availability of courses and instructors, and budget constraints.

The following process shall be followed to determine required training needs:

- (1) Employees complete the BEHST provided online in SATERN by HCDD.
- (2) The employees' supervisors review the results of the employees' training requirements and add or delete training courses as necessary. The results of these online needs assessments are provided to and interpreted by HCDD.
- (3) Employees are responsible for applying for the required course when available or for locating and applying for an offsite training course.
- (4) Supervisors are responsible for ensuring that their employees register for required training.
- (5) Employees register online for onsite or external training courses in the System for Administrative, Training and Educational Resources for NASA (SATERN).

#### 6.1.2 Safety, Health, Environmental Training Matrix

In addition to the needs assessment, the Safety, Health, and Environmental Training Matrix were developed by SHed. This matrix lists required and recommended (as per NASA, Federal, State, and/or local rules and regulations) EHS training alphabetically by subject matter.

## 6.2 Environmental, Occupational Health, and Safety Training

### 6.2.1 Target Groups

Appropriate instruction and job-related EHS information shall be required for all employees at GRC. Additional training may be required for the following individuals:

- Managers and supervisors
- Collateral duty safety personnel and area safety committee members (see Chapter 1A of the Glenn Safety Manual)
- Employee representatives

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

## 6.2.2 Target Group Training Needs

### 6.2.2.1 Managers and Supervisors

Basic EHS training shall be provided so that managers and supervisors can identify and report safety hazards in their work areas as well as identify and strive to eliminate employees' unhealthful and unsafe work behaviors. The training will help to develop requisite skills for implementing safety programs within work units, including training and motivating employees toward safe work practices and making them aware of their specific responsibilities in the programs.

Mishap and Close Call Reporting training shall be provided in order to ensure that managers and supervisors are familiar with the roles and responsibilities as documented within the Center Mishap Preparedness and Contingency Plan and NPR 8621.1B, including the proper reporting procedures in the event of a mishap or close-call event.

Managers and supervisors shall take Basic Safety, Health, & Environmental training and Mishap and Close Call Reporting training as described in this chapter once every 3 years. In addition, managers and supervisors shall complete Hazard Communication General Orientation training at least once so that they are aware of the hazards of the chemicals that they work with or encounter at GRC and the ways to protect themselves from those hazards. Laboratory supervisors shall complete this training every 3 years. These trainings are provided by SHED (however, those taking the training shall be responsible for signing up for it and completing it when it becomes available.) This training may be in either an instructor-led or a SATERN-based format. In addition, managers and supervisors (along with all GRC employees) shall take SATERN-based EMS (GRC's environmental management program) training on an annual basis.

The process for completing additional EHS training modules required to meet job-specific situations for certain employees is described in Section 6.1.1.

### 6.2.2.2 Collateral Duty Safety Personnel and Area Safety Committee Members

Upon appointment to a collateral duty safety position such as a directorate safety point-of-contact or to a safety committee, an employee will be provided with appropriate training commensurate with the scope of the assigned responsibilities. Training shall include NASA procedures for reporting, evaluating, and abating hazards; NASA procedures for reporting and investigating allegations of reprisal; recognition of hazardous conditions and environments; identification and use of occupational safety standards; and other appropriate rules and regulations.

### 6.2.2.3 Employee Representatives

GRC personnel who are representatives of employee groups, such as collective bargaining units, shall receive training information and materials that enable such groups to ensure safe working conditions and practices in the workplace.

### 6.2.2.4 Workplace Employees

All GRC employees shall take Safety, Health, & Environmental training and Mishap and Close Call Reporting training once every 3 years. All employees shall complete Hazard Communication General Orientation training at least once, but laboratory workers shall complete this training every 3 years. These trainings are provided by SHED (however, those taking the training shall be responsible for signing up for it and completing it when it becomes available.) This training may be in either an instructor-led or a SATERN-based format. For more information on these training modules, see Section 6.2.2.1. In addition, all GRC employees shall take SATERN-based EMS training on an annual basis.

The process for completing additional EHS training modules required to meet job-specific situations for certain employees is described in Section 6.1.1.

### 6.2.2.5 All New Employees

The following are required courses for all new employees:

- BEHST Hazard Communication General Orientation

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

- Personal Protective Equipment (as required)
- Environmental Management System (EMS)
- Mishap and Close Call Reporting

6.2.2.5 Verification: Civil Servant employee training records stored within SATERN. – Maintained and tracked by Human Capital Development Division (HCDD).

#### 6.2.2.6 Certified Personnel

Individuals performing certain tasks may require training over and above minimal safety and health awareness. These tasks include, but are not limited to, hearing conservation, respiratory protection, cranes and lifting devices, and material handling equipment. Additional tasks may require specific certification dependent on Federal or State standards. According to NPR 8715.3C, Chapter 7, Section 7.4.1, personnel who perform or control hazardous operations or use or transport hazardous material shall be trained and certified with the necessary knowledge, skill, judgment, and physical ability to do the job safely. The following GRC personnel who perform hazardous operations need to have safety certification:

- Air crew members (Federal Aviation Administration licensing may not be sufficient)
- Critical lift crane operators (the “critical” designation is determined from the replacement value, the uniqueness of the material lifted, and the hazards involved)
- Propellant or explosives users
- Propellant or explosives handlers
- Rescue personnel
- Self-contained atmospheric protective ensemble users
- Altitude chamber operators
- Heavy equipment operators (e.g., forklift)
- High-pressure liquid, vapor, or gas system operators (above 150 pounds per square inch gauge, psig)
- Electricians who work with high voltage (above 110 V)
- Confined space monitors
- Hyperbaric chamber operators
- Explosive-actuated tool operators
- Radiation (ionizing and non-ionizing) workers
- Tank farm workers
- Wind tunnel operators (if not covered by a safety permit)
- Welders
- Hazardous material users
- Crane operators (other than critical lift)
- Riggers for hoisting operations

Certification for individuals involved strictly with the handling, transport, or packaging of hazardous materials that will not otherwise disturb the integrity of the basic properly packaged shipping container that holds the hazardous material.

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

*NOTE: As stated in NPR 8715.3C, Chapter 7, this list is not necessarily all inclusive. See the SHED Environmental Programs Manual, Glenn Safety Manual, or Occupational Health Programs Manual for training and certification requirements related to specific topic areas.*

### 6.2.3 Training Areas

The safety and health training programs are structured to ensure, at a minimum, that pertinent information from the following is provided to GRC employees and to others as applicable:

- Essential features of Public Law 91–596, Occupational Safety and Health Act (1970)
- Essential features of Executive Order 12196, Occupational Safety and Health Programs for Federal Employees
- Requirements of 29 CFR 1960.59, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters
- NASA’s occupational health program procedures (See NPR 1800.1C)
- NASA’s general safety program requirements (see NPR 8715.3C)
- Individual employee rights and responsibilities regarding safety and health
- Specific job-related safety and health information such as hazards of the job; safe work practices; hazards of the work environment; use and care of personal protective equipment; first aid procedures; and reporting of injuries, illnesses, and hazardous conditions

### 7.0 RECORDS

- Civil servant employee training records stored within SATERN.—Maintained and tracked by HCDD.  
Even if the training was not web-based, training attendance and any associated test results can be uploaded to SATERN.
- Support service contractor training records.—Maintained and tracked by the applicable contractor organization.

### 8.0 REFERENCES

Document number	Document name
Executive Order 12196	Occupational Safety and Health Programs for Federal Employees. Feb. 26, 1980.
NPR 8715.3C	NASA General Safety Program Requirements.
NPR 1800.1C	NASA Occupational Health Program Procedures
NPR 8621.1B	NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping
GLPD 8500.1	NASA GRC Environmental Management System Policy
GRC–P3.31	Training and Career Development
Public Law 91–596.84 stat 1589.1970	Occupational Safety and Health Act (OSHA), 1970.
29 CFR 1960	Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.

**Printed copies are uncontrolled and are not to be used for operational purposes.**

Glenn Research Center Glenn Safety Manual	Title: Safety, Health and Environmental Training	
	Document No.: GLM-QS-1700.1.2	Rev.: Revision B

49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements.
49 CFR 171, Section 8	General Information, Regulations, and Definitions. Definitions and Abbreviations (which pertain to Hazardous Materials Regulations)

## APPENDIX A.—DEFINITIONS AND ACRONYMS

**Basic Environmental Health and Safety Training (BEHST)**

**Code of Federal Regulation (CFR)**

**Environmental Management System (EMS)**

**Environmental, Health, and Safety (EHS)**

**Glenn Research Center (GRC)**

**Hazard communication (HAZCOM)**

**Human Capital Development Division (HCDD)**

**NASA Procedure Requirement (NPR)**

**Occupational Safety and Health Administration (OSHA)**

**Safety and Health Division (SHeD)**

**Standard (STD)**

**System for Administration Training, and Educational Resources for NASA (SATERN)**

**Printed copies are uncontrolled and are not to be used for operational purposes.**