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Glenn Safety Manual – Chapter 4

Student Safety and Health w/Change 2 (5/19/2016)

Approved by: QS/Chief, Safety and Health Division

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

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Change Record

Rev.	Effective Date	Expiration Date	GRC25, Change Request #	Description
Basic	5/17/11	5/17/16		
Change 1	4/14/14	5/17/16	N/A	Administrative changes to add front cover and change history log to comply with NPR 1400.1 and removed "These will include" and added "The GRC shall follow the requirements of" in Section 4.0 Policy.
Change 2	5/19/16	5/17/17	N/A	Administrative change to extend the expiration date to May 17, 2017, to allow more time to address the chapter revisions.

***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.*

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Chapter 4—Student Safety and Health

NOTE: The current version of this chapter is maintained and approved by the Safety and Health Division (SHeD). The creation date of this chapter was May 2011. The current version is located on Glenn intranet at <http://smad-ext.grc.nasa.gov/shed/pub/gsm/gsm-manual.pdf>. Approved by Chief of Safety and Health Division.

1.0 PURPOSE

This chapter describes policies and procedures and assigns responsibilities pertaining to Environmental, Health, and Safety (EHS) training for NASA Glenn Research Center (GRC) students and mentors.

NOTE: This chapter is an overview of GRC's EHS training program. Section 6.1 of this document identifies all the required training all Students shall complete.

2.0 APPLICABILITY

This chapter is applicable to all civil servant and contractor employees and summer program students (this includes students that are under the age of 18 and are considered a minor) assigned to GRC sites and to any NASA-controlled, Government-owned facilities associated with GRC. This includes any student who comes to GRC for a shadowing or internship program who is here for five days or more.

3.0 BACKGROUND

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

Occupational Safety and Health Administration (OSHA) regulations pertaining to basic program elements for Federal employees (29 Code of Federal Regulations (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 the policy of GRC to operate in a manner that provides a safe and healthful workplace for all employees, including the health and safety of minors under the age of 18 and summer staff, to comply with all applicable regulations. The GRC shall follow the requirements of OSHA 29 CFR Parts 1960, and 1910, NASA Safety and Occupational Health Policy Directives (NPRs), [Ohio Laws and rules for minors](#), [U.S. Department of Labor Wage and Hour Division, Child Labor Bulletin 101](#), and the [Wage and Hour \(WH\) Division 1330](#).

5.0 RESPONSIBILITIES

5.1 Supervisor shall

- Support mentors in order to host a student in providing a safe, healthy, and environmentally responsible work experience.

5.2 Educational Programs Office, Research and Technology, Chief shall

- Reinforce policy to their students by supporting Federally mandated training.

5.3 Mentor shall

- Ensure students complete all required training (see Section 6.1, Student Training).

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- Complete a NASA C-237 form, Personal Protective Equipment (PPE) Hazard Assessment Survey and Analysis form with the student. PPE use may trigger additional training requirements. Submit the form to SHeD for review. After the C-237 has been reviewed and approved by SHeD, the mentor shall retain a copy for reference and records.
- Encourage students to ask questions about tasks or procedures that are unclear or not understood.
- Complete the SHeD Student Checklist upon initial assignment with the student (see Appendix D).
- Review the [Building Emergency Information and Quick Reference Guide](#) for each building the students work in with their mentors (see GSM Chapter 27, Building Emergency Evacuation Plan Program).
- Mentors shall be responsible for the accountability of their students in the event of emergency evacuation.
- Require use of the Buddy System (see GSM Chapter 22, Buddy System).
- Inform students of potential hazards in their workarea: review safety procedures, review Laboratory Safety Operating Procedures (LSOP) if applicable (for Chemistry lab workers).
- Review pertinent Material Safety Data Sheets (MSDSs) relevant to the task and workarea with the students.
- Ensure student's work location is a safe one.
- In the event of an incident, mishap, or injury, work with the area supervisor to complete a [NASA Incident Reporting Information System \(IRIS\)](#) report.

5.4 Student shall

- Successfully complete the required training: Environmental Management Systems (EMS), Hazard Communication (HAZCOM), and Basic Environmental Health and Safety Training (BEHST).
- Complete checklist with mentors on their first day (see Appendix D).
- Report to their mentor or responsible supervisor if they notice any safety or health hazards (This is part of the SHeD Student Checklist, see Appendix D.).
- Use required PPE (safety clothing, hard hats, safety eyewear, and/or hearing protection) and get training on how to use them properly from their mentor or contact SHeD based on their C-237 PPE Hazard Assessment Survey and Analysis form.
- When PPE use is required, students shall receive SHeD-approved or delivered PPE awareness training and receive specific PPE training from their mentor.
- Follow safe work practices, as directed by their mentor and/or employer.
- Ask questions.
- Tell their mentor or area supervisor if they feel threatened or endangered at work (see [NPD 1600.3 Policy on Prevention of and Response to Workplace Violence](#)).
- Be aware of their environment at all times.
- Review the Building Evacuation Plan for each building they work in with their mentor or area supervisor. (See [Building Emergency Information and Quick Reference Guide](#) and GSM Chapter 27 Building Emergency Evacuation Plan Program.)
- Be involved in establishing lessons learned or improving their worksite safety and health program.
- Trust their instincts. If student is asked to perform a task that seems unsafe or makes he or she uncomfortable, the student is to check with their mentor before performing the task. Keeping safe is the first responsibility.
- Use proper waste disposal procedures per requirements of the mentor or area supervisor.

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- Avoid prohibited practices, see Section 6.3 and Appendix B with the Hazardous Occupations Orders specifications.

5.5 Safety and Health Division Chief or designee(s) shall

- Develop and update the written program as required, reviewing once annually.
- Review checklists.
- Complete periodic field reviews, findings and/or results regarding student awareness of EHS issues shall be provided to the appropriate Program Manager.
- Provide relevant training.
- Provide Student Program Managers of any changes to the mandatory safety training for students.
- Review completed forms.
- Review students' GRC237 PPE Hazard Assessment Survey and Analysis forms.
- Deliver or approve PPE awareness training when it is applicable.
- Complete hazard assessments when required.
- Recommend medical evaluations where required. Example, see Respirator Program (see OHPM Chapter 4, Respiratory Protection Program)
- Ensure conformance with GRC EHS program requirements.
- Provide MSDSs if needed.
- Report safety violations pertaining to students in accordance with SHED processes: permit reviews, building inspections, hazard assessments, audits, etc.
- Review incident reports and proposed corrective actions (see GSM Chapter 2, Safety, Health and Environmental Training, paragraph 5.4)

5.6 Human Capital Development Branch

See GSM Chapter 2, Safety, Health and Environmental Training, paragraph 5.5.

6.0 REQUIREMENTS

6.1 Student training

The following required training shall be completed by students:

- EMS
- HAZCOM
- BEHST
- Other safety, health, or environmental training may be required depending on the students assignment(s) and work location, (PPE is one example if applicable).

Verification.—Program manager must let Human Capital Development Branch (HCDB) know who need a particular course then HCDB assigns the course and tracks for completion in System for Administration, Training and Educational Resources for NASA (SATERN). All online training is tracked through SATERN by HCDB.

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6.2 Mentor documentation

- Mentors shall complete a SHeD Student Safety Checklist (see Appendix D) and submit to SHeD for review and approval.

Verification.—A list of who the mentors/students are shall be sent to SHeD from the various programs so that SHeD can e-mail checklists to mentors to complete and return to SHeD. (See Checklist in Appendix D)

- Mentors and students shall complete Form PPE GRC237, Hazard Assessment Survey and Analysis, and return it to SHeD

Verification.—PPE Form GRC237 Hazard Analysis Form shall be completed by mentors/students and returned to SHeD.

- Mentors shall review building emergency and evacuation procedures with students.

(See [Building Emergency Information and Quick Reference Guide](#) and GSM Chapter 27, Building Emergency Evacuation Plan Program.)

6.3 Prohibited Student Activities

To ensure the safety and health of students they shall not (prohibitions) perform the following activities.

- No operating handheld cell phones while driving. Texting while you are walking is discouraged; this could result in a slip or trip!
- Do not use portable media players or personal electronic devices (ear buds, etc.) in test cells, labs, or other environments that may contain safety hazards.
- Do not use equipment or perform tasks that you have not been trained on.
- Do not engage in horseplay or unsafe acts.
- Do not cross barricades.

6.3.1 Hazardous Occupations Orders

The Hazardous Occupations Orders (HOs) for Nonagricultural Employment shall be followed.

The Fair Labor Standards Act (FLSA) defines a minimum age of 18 years for any nonagricultural occupations which the Secretary of Labor “shall find and by order declare” to be particularly hazardous for 16- and 17-year-old persons, or detrimental to their health and well-being. This minimum age applies even when the minor is employed by the parent or person standing in place of the parent.

There are exceptions to some of these HOs that permit children younger than age 16 in agriculture, and children younger than age 18 in all other industries, to do particularly hazardous work if they are apprentices or student-learners.

NOTE: The Student Learner programs can be extended into the summer months to include employment at NASA GRC. Students in these programs have already had safety and OSHA hazardous training and have been approved by the State of Ohio to use power tools, table saws, drills, mills etc. NASA GRC can partner with the Cleveland Public School District and other Northeast Ohio Vocational School Districts to create an exceptional engineering technician feeder system that will allow GRC to engage, inspire, educate and employ the next generation of NASA Engineering Technicians.

The 17 HOs apply either on an industry basis, specifying the occupations in the industry that are not permitted, or an occupational basis irrespective of the industry in which found. Some of the HOs contain limited exemptions. As such, students shall not participate in the following operations at GRC.

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Table 6.1.—Hazardous Occupation Order (HO) Number Description

HO number	Description
1	Manufacturing and storing of explosives
5 ^a	Power-driven woodworking machines
6	Exposure to radioactive substances
8 ^a	Power-driven metal-forming, punching, and shearing machines
12 ^a	Power-driven balers, compactors, and paper processing machines
13	Manufacturing bricks, tile, and kindred products
14 ^a	Power-driven circular saws, band saws, chain saws, guillotine shears, wood chippers, and abrasive cutting discs
15	Wrecking, demolition, and ship breaking operations
16 ^a	Roofing operations and all work on or about a roof
17 ^a	Excavation operations

^a These HOs provide limited exemptions for 16- and 17-year-olds who are bona fide student-learners and apprentices. (See Appendix B).

7.0 RECORDS

- SHed Students Checklists, reviewed, approved, and maintained by SHed.
- PPE Form [GRC237](#), maintained by student mentors

8.0 REFERENCES

Document number	Document Name
GLM-QS-1700.1	NASA Glenn Safety Manual, Chapter 22, Glenn Buddy System
29 CFR, Subpart E of Part 570	The Hazardous Occupations Orders (HOs) for Non agricultural Employment orders
29 CFR Part 1910	Occupational Safety and Health Administration
29 CFR Part 1960.8(a)	Occupational Safety and Health Administration
29 CFR Part 1960 .8(b)	Occupational Safety and Health Administration
29 CFR Part 1959(a)	Training of Employees and employee representatives
NPD 1600.3	Policies on Prevention of and Response to Workplace Violence
NPR 8715.3C (7.2.1)	Safety Training and Personnel Certification
GLM-QS-1700.1	NASA Safety Manual, Chapter 27, Building Emergency Evacuation Plan Program
Human Capital Development Branch (HCDB)	Emergency and Evacuation Procedures Quick Reference Guide
Human Capital Development Branch (HCDB)	GRC Required Training Process
HCDB Required Training Request Form	GRC-482

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APPENDIX A.—DEFINITIONS AND ACRONYMS

Abrasive cutting disc.—A machine equipped with a disc embedded with abrasive materials used for cutting materials.

American National Standard Institute (ANSI)

Alcohol, Tobacco, Firearms and Explosives (ATF)

Applicable ANSI Standard.—American National Standard Institute Standards or a newer standard that the Secretary of Labor has certified as being as protective of minors as those listed. The ANSI standards for scrap paper balers and paper box compactors govern the manufacture and modification of the equipment, the operation and maintenance of the equipment, and employee training.

Baler.—A powered machine designed or used to compress materials other than paper and cardboard boxes, with or without binding, to a density or form that will support handling and transportation as a material unit without requiring a disposable or reusable container.

Band saw.—A machine equipped with an endless steel band having a continuous series of notches or teeth, running over wheels or pulleys, used for sawing materials.

Basic Environmental Safety and Health Training (BEHST)

Chain saw.—A machine that has teeth linked together to form an endless chain used for cutting materials.

Circular saw.—A machine equipped with a thin steel disc having a continuous series of notches or teeth on the periphery, mounted on shafting, and used for sawing materials.

Code of Federal Regulations (CFR)

Compactor.—A powered machine that remains stationary during operation, designed or used to compact refuse other than paper or cardboard boxes into a detachable or integral container or into a transfer vehicle.

Crane.—A power-driven machine for lifting and lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. The term shall include all types of cranes, such as cantilever gantry, crawler, gantry, hammerhead, ingot pouring, jib, locomotive, motor-truck, overhead traveling, pillar jib, pintle, portal, semi-gantry, semi-portal, storage bridge, tower, walking jib, and wall cranes.

Derrick.—A power-driven apparatus consisting of a mast or equivalent members held at the top by guys or braces, with or without a boom, for use with a hoisting mechanism or operating ropes. The term shall include all types of derricks, such as A-frame, breast, Chicago boom, gin-pole, guy, and stiff-leg derrick.

Driver.—Any individual who in the course of employment drives a motor vehicle at any time.

Elevator.—Any power-driven hoisting or lowering mechanism equipped with a car or platform which moves in guides in a substantially vertical direction. The term shall include both passenger and freight elevators (including portable elevators or tiering machines), but shall not include dumbwaiters.

Environmental Health and Safety (EHS)

Environmental Programs Manual (EPM)

Explosives and articles containing explosive components.—Includes ammunition, black powder, blasting caps, fireworks, high explosives, primers, smokeless powder, and all explosives and explosive materials as defined in 18 U.S.C.841(c)-(f) and the implementing regulations at 27 CFR Part 555. The terms included any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, as well as all goods identified in the most recent list of explosive materials published by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), Department of Justice. This list may be found through the [ATF Web site](#).

An area meeting the following criteria shall be deemed a nonexplosives area:

- None of the work performed in the area involves the handling or use of explosives

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- The area is separated from the explosives area by a distance not less than that prescribed in the American Table of Distances for the protection of inhabited buildings
- The area is separated from the explosives area by a fence or is otherwise located so that it constitutes a definite designated area
- Satisfactory controls have been established to prevent employees under 18 years of age within the area from entering any area in or about the plant which does not meet criteria a through c.

Fair Labor Standards Act (FLSA)

Glenn Research Center (GRC)

Glenn Safety Manual (GSM)

Gross vehicle weight.—Includes the truck chassis with lubricants, water, and full tank or tanks of fuel, plus the weight of the cab or driver’s compartment, body, and special chassis and body equipment, and payload.

Guillotine shear.—A machine equipped with a moveable blade operated vertically and used to shear materials. The term shall not include other types of shearing machines, using a different form of shearing action, such as alligator shears or circular shears.

Human Capital Development Branch (HCDB)

Hazardous Communication (HAZCOM)

Hazardous Occupation Orders (HOs)

Helper.—A person who assists in the operation of a machine covered by this section by helping place materials into or remove them from the machine.

High-lift truck.—A power-driven industrial type of truck used for lateral transportation that is equipped with a power-operated lifting device usually in the form of a fork or platform capable of tiering loaded pallets or skids one above the other. Instead of a fork or a platform, the lifting device may consist of a ram, scoop, shovel, crane, revolving fork, or other attachments for handling specific loads. The term shall mean and include high-lift trucks known under such names as forklifts, fork trucks, fork lift trucks, tiering trucks, backhoes, front-end loaders, skid loaders, skid-steer loaders, Bobcat loaders, or stacking trucks, but shall not mean low-lift trucks or low-lift platform trucks that are designed for the transportation of but not the tiering of materials.

Hoist.—A power-driven apparatus for raising or lowering a load by the application of a pulling force that does not include a car or platform running in guides. The term shall include all types of hoists, such as base-mounted electric, clevis suspension, hook suspension, monorail, overhead electric, simple drum, and trolley suspension hoists.

Incident Reporting Information System (IRIS)

Information Technology (IT)

Ionizing radiation.—Alpha and beta particles, electrons, protons, neutrons, gamma, and x-ray and all other radiations that produce ionizations directly or indirectly, but does not include electromagnetic radiations other than gamma and x-ray.

Manlift.—A device intended for the conveyance of persons that consists of platforms or brackets mounted on, or attached to, an endless belt, cable, chain or similar method of suspension; with such belt, cable, or chain operating in a substantially vertical direction and being supported by and driven through pulleys, sheaves or sprockets at the top and bottom. The term shall also include truck- or equipment-mounted aerial platforms commonly referred to as scissor lifts, boom-type mobile elevating work platforms, work assist vehicles, cherry pickers, basket hoists, and bucket trucks.

Material Safety Data Sheet (MSDS)

Minor.—Anyone under 18 years of age.

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Motor vehicle.—Any automobile, truck, truck tractor, trailer, semitrailer, motorcycle, or similar vehicle propelled or drawn by mechanical power and designed for use as a means of transportation but shall not include any vehicle operated exclusively on rails.

NASA Policy Directive (NPD)

NASA Procedural Requirements (NPR)

Occasional and Incidental.—No more than one-third of the 17-year-old driver’s work time in any workday and no more than 20 percent of the 17-year-old driver’s work time in any workweek.

Occupational Programs Manual (OHPM)

Occupational Safety and Health Administration (OSHA)

Off-bearing.—The removal of material or refuse directly from a saw table or from the point of operation. Operations not considered as off-bearing within the intent of this section include:

The removal of material or refuse from a circular saw or guillotine-action veneer clipper where the material or refuse has been conveyed away from the saw table or point of operation by a gravity chute or by some mechanical means such as a moving belt or expulsion roller; and

The following operations when they do not involve the removal of materials or refuse directly from a saw table or point of operation: The carrying, moving, or transporting of materials from one machine to another or from one part of a plant to another; the piling, stacking, or arranging of materials for feeding into a machine by another person; and the sorting, tying, bundling, or loading of materials.

On or about a roof.—Includes all work performed upon or in close proximity to a roof, including carpentry and metal work, alterations, additions, maintenance and repair, including painting and coating of existing roofs; the construction of the sheathing or base of roofs (wood or metal), including roof trusses or joists; gutter and downspout work; the installation and servicing of television and communication equipment such as cable and satellite dishes; the installation and servicing of heating, ventilation and air conditioning equipment or similar appliances attached to roofs; and any similar work that is required to be performed on or about roofs.

Operating or assisting to operate.—All work that involves starting or stopping a machine covered by this section, placing materials into or removing materials from a machine, including clearing a machine of jammed materials, paper, or cardboard, or any other work directly involved in operating the machine. The term does not include the stacking of materials by an employee in an area nearby or adjacent to the machine where such employee does not place the materials into the machine.

Operator.—A person who operates a machine covered by this section by performing such functions as starting or stopping the machine, placing materials into or removing them from the machine, or any other functions directly involved in operation of the machine.

Outside helper.—Any individual, other than a driver, whose work includes riding on a motor vehicle outside the cab for the purpose of assisting in transporting or delivering goods.

Paper box compactor.—A powered machine that remains stationary during operation, used to compact refuse, including paper boxes, into a detachable or integral container or into a transfer vehicle.

Paper products machine.—All power-driven machines used in (1) remanufacturing or converting paper or pulp into a finished product, including preparing such materials for recycling; or (2) preparing such materials for disposal. The term applies to such machines whether they are used in establishments that manufacture converted paper or pulp products, or in any other type of manufacturing or nonmanufacturing establishment. The term also applies to those machines which, in addition to paper products, process other material for disposal.

Personal Protective Equipment (PPE)

Plant or Establishment Manufacturing or Storing Explosives or Articles Containing Explosive Components.—The land with all the buildings and other structures thereon used in connection with the manufacturing or processing or storing of explosives or articles containing explosive components.

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Power-driven woodworking machines.—All fixed or portable machines or tools driven by power and used or designed for cutting, shaping, forming, surfacing, nailing, stapling, wire stitching, fastening or otherwise assembling, pressing or printing wood, veneer, trees, logs, or lumber.

Reciprocating saw.—A machine equipped with a moving blade that alternately changes direction on a linear cutting axis used for sawing materials.

Risk.—The probability of a hazard or condition that increases the likelihood of injury, illness, fatality or loss of work time.

Roofing operations.—All work performed in connection with the installation of roofs, including related metal work such as flashing and applying weatherproofing materials and substances (such as waterproof membranes, tar, slag or pitch, asphalt prepared paper, tile, composite roofing materials, slate, metal, translucent materials, and shingles of asbestos, asphalt, wood, or other materials) to roofs of buildings or other structures. The term also includes all jobs on the ground related to roofing operations such as roofing laborer, roofing helper, materials handler, and tending a tar heater.

Safe.—Free of hazards and conditions that lead to injury, illness, fatality, and loss of work time.

Safety and Health Division (SHeD)

System for Administration, Training, and Educational Resources for NASA (SATERN) Scrap paper baler.—A powered machine used to compress paper and possibly other solid waste, with or without binding, to a density or form that will support handling and transportation as a material unit without requiring a disposable or reusable container.

Self-luminous compound.—Any mixture of phosphorescent material and radium, mesothorium, or other radioactive element.

Wage and hourly (WH)

Wood chipper.—A machine equipped with a feed mechanism, knives mounted on a rotating chipper disc or drum, and a power plant used to reduce to chips or shred such materials as tree branches, trunk segments, landscape waste, and other materials.

Workroom.—The entire area bounded by walls of solid material and extending from floor to ceiling.

Wrecking, demolition, and ship-breaking operations.—All work, including cleanup and salvage work, performed at the site of the total or partial razing, demolishing, or dismantling of a building, bridge, steeple, tower, chimney, or other structure, ship or other vessel.

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APPENDIX B.—HAZARDOUS OCCUPATIONS ORDERS (HOS) FOR NONAGRICULTURAL EMPLOYMENT

HO 1 - Manufacturing or Storage Occupations Involving Explosives

The following occupations in or about plants or establishments manufacturing or storing explosives or articles containing explosive components are prohibited:

1. All occupations in or about any plant or establishment (other than retail establishments or plants or establishments of the type described in subparagraph 2. below) manufacturing or storing explosives or articles containing explosive components *except* where the occupation is performed in a “non-explosives area” as defined in subparagraph 3 below.
2. The following occupations in or about any plant or establishment manufacturing or storing small arms ammunition not exceeding 0.60 caliber in size, shotgun shells, or blasting caps when manufactured or stored in conjunction with the manufacture of small arms ammunition:
 - a. All occupations involved in the manufacturing, mixing, transporting, or handling of explosive compounds in the manufacture of small arms ammunition and all other occupations requiring the performance of any duties in the explosives area in which explosive compounds are manufactured or mixed.
 - b. All occupations involving the manufacturing, transporting, or handling of primers and all other occupations requires the performance of any duties in the same building in which primers are manufactured.
 - c. All occupations involved in the priming of cartridges and all other occupations requiring the performance of any duties in the same workroom in which rim fire cartridges are primed.
 - d. All occupations involved in the plate loading of cartridges and in the operation of automatic loading machines.
 - e. All occupations involved in the loading, inspecting, packing, shipping, and storage of blasting caps.

HO 5 - Power-Driven Woodworking Machine Occupations

The following occupations involved in the operation of power-driven woodworking machines are prohibited:

1. The occupation of operating power-driven woodworking machines including supervising or controlling the operation of such machines, feeding material into such machines, and helping the operator to feed material into such machines, but not including the placing of material on a moving chain or in a hopper or slide for automatic feeding.
2. The occupations of setting up, adjusting, repairing, oiling, or cleaning power-driven woodworking machines.
3. The operations of off-bearing from circular saws and from guillotine-action veneer clippers.

Exemption

The exemption for student-learners and apprentices applies to HO 5.

HO 6 - Occupations Involving Exposure to Radioactive Substances and to Ionizing Radiation

The following occupations are prohibited:

1. Any work in any workroom in which:
 - a. radium is stored or used in the manufacture of self-luminous compound;
 - b. self-luminous compound is made, processed, or packaged;
 - c. self-luminous compound is stored, used, or worked upon;

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- d. incandescent mantles are made from fabric and solutions containing thorium salts, or are processed or packaged;
 - e. other radioactive substances are present in the air in average concentrations exceeding 10 percent of the maximum permissible concentrations in the air recommended for occupations exposure by the National Committee on Radiation Protection, as set forth in the 40-hour week column of Table One of the National Bureau of Standards Handbook No. 69 entitled *Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and In Water for Occupational Exposure* issued June 5, 1959.
2. Any other work which involves exposure to ionizing radiations in excess of 0.5 rem per year.

HO 7 - Power-Driven Hoisting Apparatus Occupations

The following occupations involved in the operation of power-driven hoisting apparatus are particularly hazardous for minors between 16 and 18 years of age:

1. Work of operating, tending, riding upon, working from, repairing, servicing, or disassembling an elevator, crane, derrick, hoist, or high-lift truck, except operating or riding inside an unattended automatic operation passenger elevator. Tending such equipment includes assisting in the hoisting tasks being performed by the equipment.
2. Work of operating, tending, riding upon, working from, repairing, servicing, or disassembling a manlift or freight elevator, except 16- and 17-year-olds may ride upon a freight elevator operated by an assigned operator. Tending such equipment includes assisting in the hoisting tasks being performed by the equipment.

Exemption

HO 7 does not prohibit the operation of an automatic elevator and an automatic signal operation elevator provided that the exposed portion of the car interior (exclusive of vents and other necessary small openings), the car door, and the hoistway doors are constructed of solid surfaces without any opening through which a part of the body may extend; all hoistway openings at floor level have doors which are interlocked with the car door so as to prevent the car from starting until all such doors are closed and locked; the elevator (other than hydraulic elevators) is equipped with a device which will stop and hold the car in case of over speed or if the cable slackens or breaks; and the elevator is equipped with upper and lower travel limit devices which will normally bring the car to rest at either terminal and a final limit switch which will prevent the movement in either direction and will open in case of excessive over travel by the car. ²

HO 8 - Power-Driven Metal Forming, Punching, and Shearing Machine Occupations

The following occupations are prohibited:

1. The occupations of operator of or helper on the following power-driven metal forming, punching, and shearing machines:
 - a. All rolling machines, such as beading, straightening, corrugating, flanging, or bending rolls; and hot or cold rolling mills.
 - b. All pressing or punching machines, such as punch presses *except* those provided with full automatic feed and ejection and with a fixed barrier guard to prevent the hands or fingers of the operator from entering the areas between the dies; power presses; and plate punches.
 - c. All bending machines, such as apron brakes and press brakes.
 - d. All shearing machines, such as guillotine or squaring shears; alligator shears; and rotary shears.
 - e. All hammering machines, such as apron brakes and press brakes.
 - f. The occupations of setting-up, adjusting, repairing, oiling, or cleaning these machines including those with automatic feed and ejection.

Exemption

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The exemption for student-learners and apprentices applies to HO 8.

HO 12 - Occupations involved in the operation of balers, compactors, and paper-products machines

The following occupations are prohibited in any type of establishment (manufacturing, nonmanufacturing, retail, wholesale, service, etc.):

1. The occupations of operating or assisting to operate any of the following power-driven paper-products machines:
 - a. Arm-type wire stitcher or stapler, circular or band saw, corner cutter or mitering machine, corrugating and single- or double-facing machine, envelope die-cutting press, guillotine paper cutter or shear, horizontal bar scorer, laminating or combining machine, sheeting machine, or vertical slotter.
 - b. Scrap paper balers and paper box compactors, including those machines that process other materials in addition to paper.
 - c. Platen die-cutting press, platen printing press, or punch press which involves hand feeding of the machine.
2. The occupations of operating or assisting to operate any baler that is designed or used to process materials other than paper.
3. The occupations of operation or assisting to operate any compactor that is designed or used to process materials other than paper.
4. The occupations of setting up, adjusting, repairing, oiling, or cleaning any of the machines listed in paragraphs (a)(1), (2), and (3) of this section.

Exemptions

1. The exemption for student-learners and apprentices applies to HO 12.
2. Section 13(c)(5) of the FLSA permits 16- and 17-year-old employees to load, but not operate or unload, certain scrap paper balers and paper box compactors if all of the following conditions are met:
 - a. the scrap paper balers and the paper box compactors must meet an applicable American National Standard Institute (ANSI) Standard as discussed in the following chart:⁵

In order for employers to take advantage of the limited exception discussed in this section, the <i>scrap paper baler</i> must meet one of the following ANSI Standards:	In order for employers to take advantage of the limited exception discussed in this section, the <i>paper box compactor</i> must meet one of the following ANSI Standards:
ANSI Standard Z245.5-1990	ANSI Standard Z245.2-1992
ANSI Standard Z245.5-1997	ANSI Standard Z245.2-1997
ANSI Standard Z245.5-2004	ANSI Standard Z245.2-2004
ANSI Standard Z245.5-2008	ANSI Standard Z245.2-2008

- b. the scrap paper balers and paper box compactors cannot be operated while being loaded;
- c. the scrap paper balers and paper box compactors include an on-off switch incorporating a key-lock or other system and the control of the system is maintained in the custody of employees who are 18 years of age or older;
- d. the on-off switch of the scrap paper balers and paper box compactors is maintained in an off position when the equipment is not in operation; and

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- e. the employer posts a notice on each scrap paper baler and each paper box compactor that 16- and 17-year-olds will be loading which states (*see* §:570.63(c)):
 - the equipment meets an appropriate ANSI Standard mentioned above, or a more recent applicable ANSI Standard that the Secretary of Labor has certified as being as protective of minors as those listed above – *Note: the specific standard must be listed on the notice in its entirety*;
 - Sixteen- and 17-year-old employees may only load the scrap paper baler and paper box compactor; and
 - Any employee under the age of 18 may not operate or unload the scrap paper baler and paper box compactor.⁶

HO 13 - Occupations Involved in the Manufacture of Brick, Tile, and Kindred Products

The following occupations involved in the manufacture of clay construction products and of silica refractory products are prohibited:

1. All work in or about establishments in which clay construction products are manufactured, except
 - a. work in storage and shipping;
 - b. work in offices, laboratories, and storerooms; and
 - c. work in the drying departments of plants manufacturing sewer pipe.
2. All work in or about establishments in which silica brick or other silica refractories are manufactured except work in offices.
3. Nothing in this section shall be construed as permitting employment of minors in any occupations prohibited by any other HO issued by the Secretary of Labor.

HO 14 - Occupations Involving the Operation of Circular Saws, Band Saws, Guillotine Shears, Chain Saws, Reciprocating Saws, Wood Chippers, and Abrasive Cutting Discs

The following occupations are prohibited in any type of establishment (manufacturing, non-manufacturing, retail, wholesale, and service, etc.):

1. The occupations of operator of or helper on the following power-driven fixed or portable machines *except* for machines equipped with full automatic feed and ejection: circular saws, band saws, and guillotine shears.
2. The occupations of operator of or helper on the following power-driven fixed or portable machines: chain saws, reciprocating saws, wood chippers, and abrasive cutting discs.
3. The occupations of setting-up, adjusting, repairing, oiling, or cleaning circular saws, band saws, guillotine shears, chain saws, reciprocating saws, wood chippers, and abrasive cutting discs.

Exemption

The exemption for student-learners and apprentices applies to HO 14.

HO 15 - Occupations Involved in Wrecking, Demolition, and Ship Breaking Operations

All occupations in wrecking, demolition, and ship breaking operations are prohibited.

HO 16 - Occupations in Roofing Operations and All Work on or About a Roof

All occupations in roofing operations and all work on or about a roof are prohibited.

Exemption

The exemption for student-learners and apprentices applies to HO 16.

HO 17 - Occupations in Excavation Operations

The following occupations in excavation operations are prohibited:

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1. Excavating, working in, or backfilling (refilling) trenches, *except*
 - a. manually excavating or manually backfilling trenches that do not exceed four feet in depth at any point, or
 - b. working in trenches that do not exceed four feet in depth at any point.
2. Excavating for buildings or other structures or working in such excavations, *except*
 - a. manually excavating to a depth not exceeding four feet below any ground surface adjoining the excavation, or
 - b. working in an excavation not exceeding such depth, or
 - c. working in an excavation where the side walls are shored or sloped to the angle of repose.
3. Working within tunnels prior to the completion of all driving and shoring operations.
4. Working within shafts prior to the completion of all sinking and shoring operations.

Exemption

The exemption for student-learners and apprentices applies to HO 17.

Special Provisions Permitting the Employment of Certain Minors in Places of Business that Use Machinery to Process Wood Products

Section 13(c)(7) of the Fair Labor Standard Acts (FLSA) permits the employment of certain minors between the ages of 14 and 18, inside and outside of places of businesses where machinery is used to process wood products.

This exemption applies only to a minor who is:

- a. exempt from compulsory school attendance beyond the eighth grade either by statute or judicial order, and,
- b. supervised in the work place by an adult relative or adult member of the same religious sect or division as the minor.

Although a minor meeting these requirements maybe employed inside and outside of places of businesses that use machinery to process wood products—activities normally prohibited by Child Labor Regulation No. 3 and HO 4—the minor is still prohibited from operating, or assisting to operate, any power-driven woodworking machines. This prohibition includes the starting and stopping of the machines and the feeding of materials into the machines as well as the off-bearing of materials from the machines.

Such minors are also prohibited from cleaning, oiling, setting-up, adjusting and maintaining the machines. Minors 14 and 15 years of age must be employed in compliance with the remaining occupations and hours standards of CL Regulation No. 3. In addition, such minors must be protected from wood particles or other flying debris within the workplace by a barrier appropriate to the potential hazard of such wood particles or flying debris or by maintaining a sufficient distance from machinery in operation. The minors are also required to use personal protective equipment to prevent exposure to excessive levels of noise and sawdust.

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APPENDIX C.—VERIFICATION ELEMENT SUMMARY

6.1 – Verification – Human Capital Development Branch SATERN records review

6.2 – Verification – Checklists, See Appendix D

6.2 – Verification – PPE Form GRC237

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APPENDIX D.—SAFETY AND HEALTH DIVISION (SHeD) STUDENT CHECKLISTS FOR GRC

The checklist is intended to serve as a reminder to mentors that students (i.e., graduate students, summer students) need instructions in order to safely carry out their work in the laboratory. Mentors that have new students/returning students shall go through this checklist with the student upon arrival.

Basic Safety

The student knows that speed limit at Lewis Field is 25 MPH (Plum Brook speed limit is 35 MPH unless otherwise marked) and slow to 5 MPH (Plum Brook 10 MPH) when approaching the main gate. Yes___ No___

Student has been instructed the exit route must be accessible, with no storage of materials in aisles, corners or passageways. Yes___ No___

If student spots a fire and has not had fire extinguisher training, student is requested to move to the nearest safe area and call 911 from a NASA phone or 216 433-8888 (emergency telephone number at Plum Brook is 419.621.3222) from a cell phone. Yes___ No___

Student has been instructed to report any hazards or unsafe conditions to their Mentor. Yes___ No___

Student is aware cell phone use while driving is not allowed on center. Yes___ No___

Student has been instructed where to go in the event of a building evacuation and to check in with their mentor. Yes___ No___

Students are aware that if the injury is life threatening or very severe they should call 911 from a NASA telephone or 433-8888 (Plum Brook emergency number 419-621-3222) from a cell phone; otherwise they should come to the clinic for evaluation. Yes___ No___

Student has been instructed to make it their responsibility to perform their duties in a safe manner. Yes___ No___

Students are aware of not parking next to curb that are painted “red” or in spaces marked government vehicle or handicap only. Yes___ No___

Student shall not cross barricades nor enter construction work areas. Yes___ No___

Students shall not enter hazardous areas without NASA escort. Yes___ No___

Students have filled out the C237 PPE Hazard Assessment Survey and Analysis form. Yes___ No___

Students has been instructed they shall not text and drive. Yes___ No___

Students have been given all emergency numbers at Glenn Research Center and Plum Brook. Yes___ No___

Student has been instructed, while driving to stop for pedestrians at all crosswalks. Yes___ No___

Comments: _____

Student Name: _____ Date: _____

Student Signature: _____

Mentor Name: _____ Room: _____ Phone# _____ M/S _____

Reviewed By: _____

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**Safety and Health Division (SHeD)
Student Checklist for the Laboratory**

The checklist is intended to serve as a reminder to mentors that students (i.e., graduate students, summer students) need instructions in order to safely carry out their work in the laboratory. Mentors that have new students/returning students are asked to go through this checklist with the student upon arrival in the laboratory.

Basic Laboratory Safety

The student has been instructed on the appropriate measures to take in case of chemical spill. Yes___ No___

Students are aware that if the injury is life threatening or very severe they should call 911 from a NASA telephone or 433-8888 (Plum Brook emergency telephone number 419-621-3222) from a cell phone; otherwise they should come to the clinic for evaluation Yes___ No___

The mentor has also provided their emergency contact numbers and designated an alternate contact where applicable. Yes___ No___

The student has been provided and instructed on how to wear the necessary PPE suitable footwear with closed toes (NO SANDALS, NO HEELS, NO CANVAS), long hair tied back, and anything that hangs is avoided. Yes___ No___

The student has been instructed not to eat, chew gum, drink, store food in the lab or place food in “Chemical Only” refrigerators. Yes___ No___

The student has been instructed to not to work alone. Yes___ No___

The student has been instructed in the proper way to remove of PPE (laboratory coat, gloves, safety glasses, hearing protection, etc. Yes___ No___

The student has been instructed not to wear laboratory coats and gloves outside designated laboratory areas. Yes___ No___

The student has been instructed on how to transport chemicals safely within the laboratory and building. Yes___ No___

The student has attended HAZCOM or Lab Standard Training. Yes___ No___

The student has been instructed on how to locate MSDSs-on-line and in the MSDS database (contact 3-8824 or 4-3294 (Plum Brook) for help). Yes___ No___

Students has been instructed they shall not text and drive. Yes___ No___

Students have been given all emergency numbers at Glenn Research Center and Plum Brook. Yes___ No___

Student has been instructed, while driving to stop for pedestrians at all crosswalks. Yes___ No___

Student is aware cell phone use while driving is not allowed on center. Yes___ No___

Student has been instructed where to go in the event of a building evacuation and to check in with their mentor. Yes___ No___

The student knows that speed limit at Lewis Field is 25 MPH (Plum Brook speed limit is 35 MPH unless otherwise marked) and slow to 5 MPH (Plum Brook 10 MPH) when approaching the main gate. Yes___ No___

Student has been instructed to make it their responsibility to perform their duties in a safe manner. Yes___ No___

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Students are aware of not parking next to curb that are painted "red" or in spaces marked government vehicle or handicap only. Yes___ No___

Student has been instructed not cross barricades nor enters construction work areas. Yes___ No___

Students has been instructed not enter hazardous areas without NASA escort. Yes___ No___

Comments: _____

Student Name: _____ Date: _____

Student Signature: _____

Mentor Name: _____ Room: _____ Phone# _____ M/S _____

Reviewed By: _____