



Marshall Space Flight Center Safety, Health, & Environmental (SHE) Program

Safety, Health, and Environmental (SHE) Program Construction Awareness Training (SHE 101C)



Emergency Phones Numbers

- Emergencies: Call 911
(Ambulance, Fire, Security, and Chemical Spills)
 - ◆ **If you are calling on a cell phone, identify immediately you are on MSFC property so the call can be transferred to MSFC 911 emergency personnel to avoid critical delays**
- If there is an injury to personnel or damage to MSFC property, material, or equipment the following shall be notified:
 - ◆ Industrial Safety Branch (ISB)
 - ◆ Contracting Officer (CO) or Contracting Officer Technical Representative (COTR)
 - ◆ Facilities Management Office (FMO) Inspector



Reference Phone Numbers

- **Emergencies: Call 911**
(Ambulance, Fire, Security, and Chemical Spills – identify that you are on MSFC property if using cell phone)
- Industrial Safety Branch (ISB)– 544-0046
- Environmental Engineering (EEOH)– 544-4246
- Occupational Health (EEOH)– 544-2390
- MSFC Medical Center, Bldg 4249 – 544-2390
- Chemical Management – 544-4772
- Center Hazardous Waste Contractor – 544-9578
- Security – 544-HELP (4357) Option 1
- Contact the Facilities Management Office (FMO) Inspector

Note: Post these numbers at the worksite



Safety, Health, & Environmental (SHE) Program Objective

- To establish and implement a SHE Program that:
 - ◆ Prevents employee injuries, illnesses, and fatalities
 - ◆ Protects the environment through the ongoing planning, implementation, integration, and management control of these programs
 - ◆ Reduces the number of incidents
 - **MSFC, as a governmental contracting agency, has a responsibility to assure work performed on MSFC meets our safety, health, and environmental standards. [MPR 8715.1]**



MSFC and OSHA Requirements

- Contractor is responsible for complying with:
 - ◆ Public Law 91-596 to provide employees with safe and healthful working conditions, regardless of the location of the employees worksite
 - ◆ National Fire Protection Association (NFPA) 241, “Safeguarding Construction, Alteration and Demolition Operations”
 - ◆ Occupational Safety and Health Administration (OSHA) [29 CFR 1910 & 1926]
 - ◆ Environmental Protection Agency (EPA) Regulations [40 CFR]
 - ◆ FMO Technical Specifications for Repair and Construction (TSRC)
 - ◆ Marshall Program Requirements and Marshall Work Instructions (MPR/MWI) applicable to the work being performed
- The FMO inspector can assist in obtaining copies of MSFC MWIs or other documents
- The prime contractor shall ensure all MSFC requirements are flowed down to any sub-contractors supporting the work effort



Contractor Safety, Health, & Environmental (SHE) Representative

- Each prime construction contractor shall designate an employee to serve as the SHE point of contact (POC) [TSRC section 01 35 23]
- The name of the SHE representative for the contractor shall be posted at the worksite
- Each employee at the worksite shall be made aware of their roles and responsibilities in the MSFC SHE Program while working at MSFC (e.g., during a weekly toolbox meeting)

“Competent Person(s)”

- Is an individual who, by way of training and/or experience, is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. [29 CFR 1926.32(f) and TSRC section 01 35 23]
- Contractors shall identify their employees designated to serve as “competent person(s)” for the worksite
- FMO inspector and ISB inspectors shall be notified of the name of the person(s) that will serve as the contractor’s competent person(s)



Training

- Contractor shall instruct their employees in the recognition and avoidance of unsafe conditions and the regulations applicable to their work environment to control or eliminate any hazards or other exposure to illness or injury [29 CFR 1926.21(b)(2) and TSRC section 01 35 23]
- Employees shall be instructed on how to receive first-aid or medical attention 29 CFR 1926.23
 - ◆ Employees can receive medical attention for work related injuries at the MSFC Medical Center, Bldg 4249
- Each prime contractor shall conduct weekly Safety, Health, & Environmental (SHE) meetings [TSRC section 01 35 23]
 - ◆ A signed roster of all attendees and topics shall be maintained
 - ◆ These are subject to random ISB audits/verification
- All jobs shall have a safety assessment performed such as a Job Hazard Analysis (JHA) or Hazard Identification Checklist (HIC) - [TSRC section 01 35 23]



MSFC Permits

- Contact ISB at 544-0046 for Hot Work Permits:
 - ◆ Activities that produce an open flame such as oxy-fuel torches, portable furnaces, blow torches, gas or electric welding operations, flammable or combustible fuel heaters, etc.
 - ◆ Tar Kettles and torch-applied roofing systems
- Contact Oscar Ford at 544-6759 or (256) 603-7884 for Digging Permit
- Contact EEOH at 544-2390 for Confined Space Permits
- The FMO inspector will know if other permits are needed



Worksite Inspections

- The contractor shall designate a competent person to perform frequent and regular worksite inspections [29 CFR 1926.20(b)(2) and TSRC section 01 35 23]
- The MSFC ISB will conduct frequent inspections of the worksite
- The FMO inspector, the ISB inspectors, and/or anyone have the authority to “**halt work**” when hazardous conditions are discovered at the worksite that place employees in danger
- The hazardous condition shall be corrected before work is allowed to continue



General SHE Rules For ALL Employees

- Every employee has the authority to “halt” any operation if an unsafe act or condition exists; or if an activity has the potential to harm the environment [29 CFR 1926.20 and MPR 8715.1]
- Report all safety, health, and environmental problems, close calls, and mishaps to your supervisor, FMO inspector, and ISB
- Correct imminent dangers immediately, or secure the area and mark them with hazard warning signs to prevent injury to others or damage to property
- Become familiar with emergency procedures and follow them when necessary [29 CFR 1926.35]
- Wear Personal Protective Equipment (PPE) when the work requires it to be worn [29 CFR 1926.28]
 - ◆ The worksite shall be posted with the signage stating the correct PPE required to be worn while in the worksite area



Traffic Rules

- To be granted access to drive a vehicle on MSFC, a valid state driver's license and proof of vehicle insurance are required
- Seat belts are required to be worn **at all times** while the vehicle is moving
- Pedestrians **do not** have the right-of-way
- **Cell phone use is prohibited** on RSA/MSFC while operating a vehicle unless you use a hands-free device or speaker phone option
- When entering Redstone Arsenal gates during darkness, parking lights should be used
- Vehicles parked in unauthorized areas or areas not designated for parking are subject to citation
- Slow moving vehicles shall not use Rideout or Martin Road during rush-hours
- When a slow moving vehicle is on a MSFC road it shall:
 - ◆ Display a slow-moving vehicle emblem on the rear
 - ◆ Have red or amber flashing lights or beacon
 - ◆ Be escorted



Workplace Violence

- MSFC has zero tolerance for workplace violence
- Workplace violence and threatening behavior will not be tolerated
- Threatening behavior is a statement or “course or conduct” which would cause, or which actually causes, a person to believe that they are under threat of bodily injury or death
- Immediately report all acts of violence and any threatening behavior requiring immediate attention to Protective Services at 544–HELP (4357) Option 1 or dial 911
 - ◆ **On a cell phone, identify that you are on MSFC property**
 - This is required to be transferred to MSFC 911 emergency personnel to avoid critical delays
- All work performed on MSFC is subject to the MSFC Security Procedural Requirements in [MPR 1600.1]



Fire Protection/Housekeeping/ Lighting/Barricades

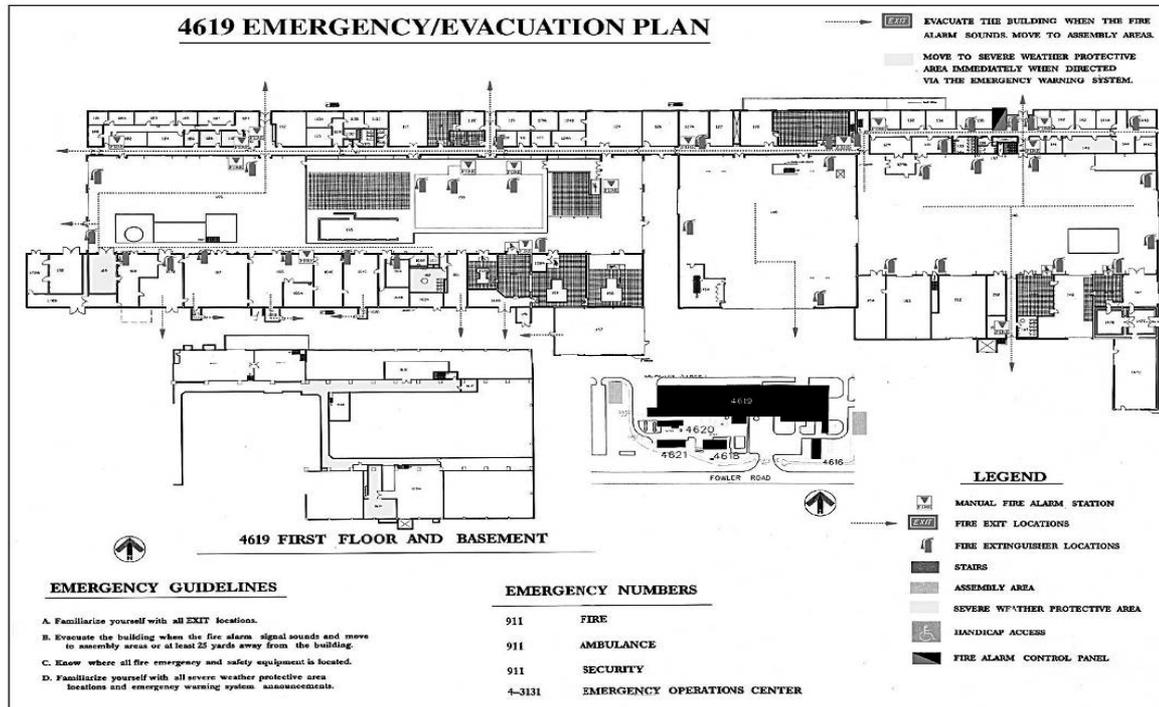
- Contractors are responsible to maintain an effective fire prevention program throughout all phases of the construction work [29 CFR 1926.24]
- Contractors are responsible to ensure scrap lumber with protruding nails and all other debris is cleared from the work area, stairs, passageways and removed regularly [29 CFR 1926.25(a)]
- Contractors are responsible to provide adequate lighting at the worksite, either natural or artificial [29 CFR 1926.26]
- Contractors are to erect barricades around all hazardous work areas (excavations, trenches, roof openings, etc.) and where access to the work area is to be controlled [TSRC section 01 35 23]

Severe Weather

- Threats of severe weather (lightning, severe thunderstorm), tornado watches/warnings/sightings at MSFC are announced over the MSFC Emergency Warning System (EWS)
- When emergency announcements are made over the EWS, all personnel are advised to follow instructions
- If directed to go to a protective area, go to the nearest building
An emergency/evacuation plan is posted in the building lobby showing the location of the protective areas within the building
- The FMO inspector will assist in locating a protective area adjacent to the job site prior to start of work
- The contractor shall ensure all employees are aware of what action to take in the event of severe weather or other emergency [29 CFR 1926.35]

Emergency/Evacuation Plans

The Emergency/Evacuation Plans Are Posted In MSFC Building Lobbies



Lockout/Tagout

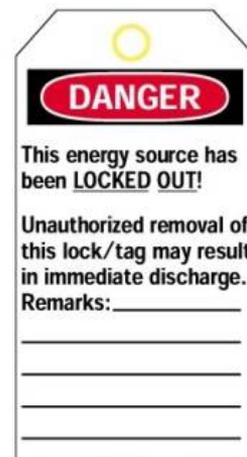
- Electrical, mechanical, gaseous, or liquid systems must be turned off, locked, and tagged to protect workers from accidental machine start up or unexpected energy release when working in the danger zone of the equipment/system [29 CFR 1926.417(b) & MWI 8715.2]
- Only **trained** and **certified** personnel in the MSFC Lockout/Tagout Program are authorized to place MSFC Lockout/Tagout devices on equipment/systems, and to remove these locks and tags
- FMO can schedule training for anyone needing MSFC Lockout/Tagout training
- The FMO inspector or ISB can help you with the MSFC standardized Lockout/Tagout devices

MSFC Standardized Lockout/Tagout Locks and Tags

Never tamper with or remove any lock or tag that has been placed on equipment. This can result in disciplinary action.



FRONT



BACK



Electrical

- No one is permitted to work in areas where they could come into contact with energized electrical circuits [29 CFR 1926.416]
- Consider all electrical wiring energized
- Never assume the electrical panels are properly labeled
- Working on energized electrical equipment is not allowed
- MSFC standardized Lockout/Tagout devices shall be used to place equipment in a safe work condition [MWI 8715.2]

In 2004, a fatality occurred at another NASA Center as a result of an employee failing to lockout an electrical circuit before beginning work.



Scaffolds

- Construction and use shall be in accordance with 29 CFR 1926.451
- Shall be designed by a “**qualified person**” and be constructed and loaded in accordance with that design [29 CFR 1926.451(a)(6)]
- Shall be inspected for visible defects prior to use daily by the contractor’s designated “**competent person**” [29 CFR 1926.451(f)(3)]
- Shall be provided with fall protection consisting of a guardrail system [29 CFR 1926.451(g)(4)]
- Employees who perform work while on the scaffold shall be trained by a person **qualified** to recognize the hazards associated with the type of scaffold being used [29 CFR 1926.454(a)]



Roofing

- All employees working on surfaces with an unprotected side/edge which is more than 6 feet above the next lower level shall be protected by a fall protection system. [MWI 8715.15, 29 CFR 1926.501(b)(1), (b)(10) & (b)(11)]
- A fall protection system shall always be provided while working on any MSFC building roof [29 CFR 1926.502(a)(2)]
 - ◆ The only exception to this is when it can be demonstrated to FMO and ISB that it is infeasible, or it will create a greater hazard to use conventional fall protection equipment
 - In these cases the contractor shall generate a site (building) specific Fall Protection Plan [MPR 8715.1, 29 CFR 1926.501(b)(2) & 502(k)]

In 2005, a fatality occurred at another NASA Center because an employee failed to wear fall protection equipment while working on a building roof near the edge.



Excavation/Trenching

- Construction and use shall be in accordance with 29 CFR 1926.651
- Slopes shall be dependent upon the soil type [29 CFR 1926.652]
- Shoring, when needed, shall be in accordance with 29 CFR 1926.652
- Shall have a guardrail/warning system adjacent to the edge to warn employees/mobile equipment of the opening [29 CFR 1926.501(b)(7) & 651(f)]
- Excavations, the adjacent areas, and protective systems shall be inspected daily by a **competent person** [29 CFR 1926.652(k)]
- Employees in an excavation shall be protected from a cave-in by an adequate protective system [29 CFR 1926.652(a)]
- Ramps used solely as a means of access and egress from excavations shall be designed by a “**competent person**” [29 CFR 1926.451(c)(1)]

Forklifts, Cranes, and Other Mobile Equipment

- All lifting equipment shall be in good condition and be proof load tested and tagged
- All lifting equipment shall be inspected prior to use by a **competent** person. [29 CFR 1926.550(a)(5)]
- If any MSFC owned equipment will be operated (forklifts, cranes, etc.), the operator shall require a MSFC certification [MWI 6430.1 and MWI 3410.1]
- The contractor shall ensure only employees qualified by training or experience are allowed to operate equipment and machinery [29 CFR 1926.20(a)(4)]
 - ◆ Forklifts – 29 CFR 1910.178(l)
 - ◆ Derricks/Cranes – 29 CFR 1910.179 (b)(8) & 1926.550(a)(5)
 - ◆ Aerial lift – 29 CFR 1926.453(b)(2)
- Proof of operator training can be requested by ISB inspectors or FMO inspectors



Examples Of Common OSHA Violations Found On Construction Sites

- Not wearing PPE – 29 CFR 1926.28(a)
- Lack of proper use or storage of compressed gas cylinders – 29 CFR 1926.350(a)
- Improper scaffold construction– 29 CFR 1926.451
- Not wearing fall protection on walking/working surfaces with open sides with a drop greater than 6 feet – 29 CFR 1926.501(b)(1)
- Inadequate cave-in protection around excavation sites – 29 CFR 1926.652(a)(1)
- Lack of ground fault protection on extension cords – 29 CFR 1926.404(b)
- Lack of guarding live parts operating at 50 volts or more – 29 CFR 1926.403(i)(2)
- Lack of protective covers for temporary lighting – 29 CFR 1926.405(a)(2)
- Not wearing fall protection while in aerial lift - 29 CFR 1926.453(b)(2)
- Improper use of ladder – 29 CFR 1926.1053



Chemical Management/Hazard Communication

- Container Labeling
 - ◆ Label should contain:
 - Name of material (as it appears on the SDS)
 - Physical and health hazards of the chemical
 - ◆ Replace torn, damaged, or illegible labels
- Safety Data Sheets (SDS)
 - ◆ SDS's shall be readily available for all chemicals on the job site
 - ◆ Everyone working with a hazardous chemical should access the SDS and review the information prior to using the material
- Chemical Inventory & Storage
 - ◆ Chemicals should be stored in appropriate cabinets/storage areas and/or sheltered from the weather with tarps, etc.
 - ◆ Segregate chemicals according to compatibility
 - ◆ Minimize quantities of stocked chemicals



Hazardous & Controlled Waste

- Waste Collection
 - ◆ Notify EEOH of wastes being generated
 - ◆ Complete MSFC Form 4072, “Process Waste Questionnaire” for a waste determination (MWI 8550.1, “Waste Management”) or call 544-9578
- Satellite Accumulation Areas (SAA)
 - ◆ Containers will be provided by Hazardous Waste Contractor and should be requested 3 days prior to need date
 - ◆ Ensure containers are secure and protected from vehicular traffic and rainfall
 - ◆ Turn in containers to EEOH when 90% full (liquids) or 100% full (solids)
 - ◆ Ensure that containers are sealed unless actively adding waste materials
 - ◆ When turned in, identify if a replacement container is required
 - ◆ Ensure that waste is segregated and labeled by type in different accumulation containers

Hazardous & Controlled Waste (cont'd)

- Typical hazardous and controlled wastes at construction sites that must be managed in satellite accumulation containers:
 - ◆ Paint cans, paint, and paint thinners
 - ◆ Free oil liquids and oil filters
 - ◆ Aerosol cans
 - ◆ Fluorescent light ballasts (may contain PCBs) & fluorescent lights (contains mercury)
 - ◆ Rags saturated with solvents or oil
 - ◆ Materials used for cleaning and degreasing of equipment, tanks, and piping
 - ◆ High Intensity Discharge (HID) lamps
 - ◆ Sandblast material
 - ◆ Paint chips from water-blasting operation, scraping, sandblasting, grinding, etc.
 - ◆ Process piping system cleaning operation fluids



Hazardous & Controlled Waste (cont'd)

- Empty Containers
 - ◆ Empty hazardous material containers shall be turned in to the Center Hazardous Waste Contractor (544-9578)
 - Ensure the containers are empty using practices commonly employed to remove materials from that type of container such as pouring, pumping, and aspirating (properly manage this material)
 - Ensure bungs and/or tops are secured prior to storage/turn-in
 - ◆ Containers that are damaged and will not seal shall be turned in (call 544-9578)

Storm Water

- Ensure the following:
 - ◆ Storage area neat and orderly
 - ◆ No spillage from material handling
 - ◆ Spill kits available
 - ◆ Containment system in good condition
 - ◆ No fluid leaking from vehicle and equipment
 - ◆ Limit exposure of hazardous materials to storm water



Spills

- For small spills (1 gallon or less)
 1. Locate and shut off spill source
 2. Contain the spill
 3. Remove oil from water or land areas
 4. Restore contaminated land areas

If you're unsure about cleaning up a small spill, call 911

- For large spills (> 1 gallon)
 1. Activate the MSFC Emergency Plan by calling 911 for any spill that cannot be controlled



Asbestos

- Asbestos can cause cancer and lung disease and should not be disturbed unless proper precautions are followed
- Asbestos may be present in the following building materials at MSFC:
 - ◆ Spray applied insulation
 - ◆ Heating, ventilation, and air conditioning and thermal system insulation
 - ◆ Floor tiles/adhesive, interior wallboard/exterior siding
 - ◆ Pipe insulation and gasket materials
- Avoid cutting, drilling, grinding, or otherwise damaging these materials or other building materials containing asbestos that can cause dust or fiber release and potential asbestos exposure without proper PPE

Lead

- When removing lead-based coatings:
 - ◆ Minimize dust
 - ◆ Collect and seal lead particulate waste in non-permeable accumulation containers



Recyclable Material at the Job Site

- ◆ Separate metals by type where feasible
- ◆ Do not burn waste material
- ◆ Recycle, where possible, all wood products including:
 - Pallets
 - Lumber cut-offs
 - Brush, branches, and trees
 - Crates





Air Emissions

- Reduce Dust Emissions on Dirt Roads and Grounds
 - ◆ Apply water if traffic or wind creates dust
 - ◆ Reduce speed of vehicles
- Refrigeration Equipment
 - ◆ Personnel working on MSFC refrigeration equipment that uses Class I or Class II ozone-depleting substances shall be serviced, repaired maintained, and certified according to 40 CFR, Part 82, Subpart A & Subpart F



EMS Awareness

- NASA-MSFC has an Environmental Management System (EMS) which allows the Center to systematically manage its environmental responsibilities
- NASA-MSFC EMS (MPR 8500.2, “MSFC Environmental Management System”)
 - ◆ Continually evaluates environmental performance
 - ◆ Involves all members of the organization, as appropriate
 - ◆ Actively involves Senior Management
- Environmental Policy: Enable Marshall's mission by providing environmental compliance and stewardship and a safe and healthful workplace.
- The management of construction projects is an integral part of the NASA-MSFC EMS