

# CASTNET

## Quality Assurance Project Plan

Appendix 5: CASTNET Health and Safety Plan

**The information contained in this document is for official use only.**

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# **Clean Air Status and Trends Network**

## **Quality Assurance Project Plan**

Revision 9.3

### **Appendix 5:**

#### **CASTNET Health and Safety Plan**

October 2019

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## SITE HEALTH AND SAFETY PLAN (HASP)

**Project Name:** Clean Air Status and Trends Network (CASTNET)

**Project:** Various locations nationwide

**Location:**

**Project No.:** 6064193003

**Task No:** 0001

This HASP addresses the health and safety hazards of each task conducted by Wood Environment & Infrastructure Solutions, Inc. (Wood) employees for this project, including the requirements and procedures for worker protection (per 29 CFR 1910.1200, the Wood Hazardous Waste Operations and Emergency Response Program, and the Integrated Health, Safety, and Environment [HSE] Manual). The HASP was developed based on the hazards known or suspected to be present at each site, specifically as they relate to the work to be conducted by Wood employees. Subcontractors are required to adopt this HASP and are responsible for reviewing and revising/amending the HASP to ensure that it addresses hazards unique to their operations.

The Site Health and Safety Officer (SHSO) can change or amend this document only with agreement from the Group Health, Safety, and Environment Manager. The SHSO must initial any change made to the HASP at the relevant section and document the amendment date below.

**This document must be kept on site at every CASTNET site.**

Prepared by: Marcus Stewart Wood Managing Office: Newberry FL

Approved by: Michael J. Smith 10/25/19  
 Site Health and Safety Officer Date

[Signature] 10/25/19  
 Field Operations Manager Date

[Signature] 10/25/19  
 Project Manager Date

\_\_\_\_\_  
 Group HSE Manager Date

Amendment(s): \_\_\_\_\_

All field personnel and site operators are required to read this HASP. SHSO will participate in the readiness review (Section 5.5.3 of QAPP Main Body) that will be held before initiating a work assignment. Similarly, a tailgate meeting will be held before every site calibration (Appendix B). All applicable sections of this HASP will be reviewed during this briefing. Important safety and health issues concerning tasks will be discussed and documented on the Tailgate Safety Meeting checklist (Appendix B). After reading the HASP and attending a field briefing, field personnel must sign the following acknowledgment statement:

**Wood Field Team Review:** I acknowledge that I have read the requirements of this HASP and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions answered regarding the HASP and its requirements prior to performing field activities. Health and safety training requirements applicable to my field activities at this site are current and will not expire during on-site activities.

Name	Date	Name	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

SUBCONTRACTORS

I have provided subcontractors who will be performing field activities on this site with a copy of this Site Health and Safety Plan and have thereby also informed the subcontractors that OSHA Standards 29 CFR 1910.1200, 29 CFR 1910.147 and 29 CFR 1926 (included as Appendices) apply to their field activities.

\_\_\_\_\_  
Project Manager

\_\_\_\_\_  
Date

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**Abbreviations**

AHA	Activity Hazard Analyses
HASP	Health and Safety Plan
HSE	Health, Safety & Environment
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
RAC	Risk Assessment Code
SCBA	self-contained breathing apparatus
SHSO	Site Health and Safety Officer
WBGT	wet-bulb globe temperature

The Clean Air Status and Trends Network (CASTNET) is a nationwide air quality monitoring network that began operating in 1991. The network provides long-term measurements of air pollutant concentrations in rural areas across the United States to determine compliance with ozone National Ambient Air Quality Standards and to evaluate the effectiveness of national and regional emission control programs. CASTNET is managed and operated by the U.S. Environmental Protection Agency (EPA) in cooperation with the National Park Service (NPS), the Bureau of Land Management (BLM), and other federal, state, tribal, and local partners. In 2017, the network operated 96 monitoring stations throughout the contiguous United States, Alaska, and Canada. Figure 1.1 shows the sites operated during 2017.

**Figure 1.1** CASTNET Sites Operational During 2017



During 2017, all but one CASTNET site measured weekly ambient concentrations of acidic pollutants, base cations, and chloride (Cl<sup>-</sup>) using a 3-stage filter pack with a controlled flow rate. Most CASTNET sites also include a temperature-controlled shelter and continuous O<sub>3</sub> monitoring system. O<sub>3</sub> concentrations were measured at 82 sites. The O<sub>3</sub> inlet and filter pack are located atop a 10-m tower. Figure 1.2 depicts a typical monitoring site. Some CASTNET sites also measure trace-level pollutants and meteorological parameters. Table 1.1 summarizes the monitoring network.

**Figure 1.2** Typical CASTNET Monitoring Site**Table 1.1** CASTNET Site Measurements

<b>CASTNET Site Measurements</b>	
<ul style="list-style-type: none"> <li> <b>96 sites</b>            94 locations (two sites co-located)            65 EPA            26 NPS            5 BLM            82 sites measure ozone            15 sites operate a filter pack only         </li> <li> <b>Trace Gas Sites</b>            NO<sub>y</sub>              6 EPA              2 NPS            NO<sub>x</sub>              1 NPS            SO<sub>2</sub>              1 EPA              2 NPS            CO              1 EPA              2 NPS         </li> <li> <b>36 Sites with Meteorological Measurements</b>            5 EPA sites            26 NPS sites            5 BLM sites         </li> </ul>	

Wood is under contract with EPA to operate 65 EPA-sponsored sites located across the U.S. (green locations in Figure 1.1). Each site is serviced by a local, trained site operator who visits the site every Tuesday and occasionally for repairs. In addition, each site is calibrated every six months by Wood or regional subcontractor personnel.

Special sampling at approximately 35-m is performed at HOW191, ME and DUK008, NC. Rooftop sampling is conducted at WFM007, NY. These three sites require the use of a safety harness to access the upper sampling locations. Trained Wood engineers/technicians service these sites and the Gainesville, FL health and safety officer inspects the harnesses annually. The standard 10-m tower at other sites is tilt-down (Figure 1.2) and requires no climbing to access the sampling.

This HASP, the CASTNET Corporate Health & Safety Program Manual, the requirements and procedures for worker protection (per 29 CFR 1910.1200, Hazard

communication), the Wood Hazardous Waste Operations and Emergency Response Program, and the Integrated Health, Safety, and Environment (HSE) Manual constitute CASTNET's site health and safety program. All accidents must be reported to the Health and Safety Officer immediately. The Health and Safety Officer will then report all accident information to the

Project Manager and the CASTNET Health and Safety Manager. Prompt reporting is essential for the prevention of future incidents in addition to the well-being of the affected individual or individuals.

## **1.0 Safety Operating Procedures**

### **1.1 General**

- Common sense should prevail at all times. Each individual is responsible for safely carrying out assigned tasks so as to not endanger themselves or others around them. Field equipment specialists are also responsible for maintaining routine communication with the CASTNET FOM.
- Site work and driving will normally be accomplished between 7 a.m. to 10 p.m. to allow the greatest possibility of obtaining help in an emergency. Work outside of these hours is discouraged but may occasionally be conducted at the discretion of the individual employee in consultation with the FOM.
- No eating or drinking will be permitted within the monitoring site while handling any sampling media or working on electrical equipment.
- No smoking within the shelter or within 50 feet (ft) of any site equipment. Any individual smoking in the vicinity of the site shall observe appropriate local precautions against grass fires and forest fires.
- In the event of a fire, all personnel onsite must evacuate immediately and call emergency services when they arrive at a safe location.
- Safety belts shall be worn in all vehicles. The belts should be completely secured before the vehicle is put into gear and moved for any distance.
- Injuries will be reported immediately to the employee's direct supervisor, the Health and Safety Representative and the Project Manager.
- Work directed by Wood shall be performed by a Wood employee, Wood consultant, or Wood subcontractor.
- Emergency routes, telephone numbers of local authorities, and location of the nearest medical facility must be posted in a conspicuous location onsite.
- Authorized visitors to the site shall be directed to a safe distance from the work being performed by Wood, its consultants, or its subcontractors.
- Animals are not permitted inside the site boundary.

**Figure 1.3** Fire Emergency Procedure

## 1.2 Equipment and Supplies

- Only safety equipment that meets or exceeds ANSI standards shall be used.
- A 16-unit first aid kit will be supplied at each site shelter. Field personnel will routinely and regularly check the stock conditions of the first aid kit. Any deficiencies will be reported to the FOM.
- Emergency routes, telephone numbers of local authorities, and the location of the nearest medical facility shall be posted in a conspicuous location onsite.

## 1.3 Weather Hazards

- No outdoor activity will take place during lightning, hail storms, heavy rain, blizzard conditions, or any other weather conditions that, in the opinion of the individual employee, represent an unreasonable hazard. Before arriving at each site, local conditions should be assessed to avoid danger from avalanche, wildfire, or other natural hazards.
  - Follow the 30:30 rule. Seek shelter when the time between seeing lightning and hearing thunder is less than 30 seconds. Remain sheltered until 30 minutes after seeing lightning or hearing thunder.
- Tower activity should be restricted to the daylight hours unless adequate lighting is provided for those working on a tower. This includes lowering the tilt-down towers for changing the filter packs and servicing O<sub>3</sub> and meteorological instruments, as appropriate. Additionally, please see section 1.5.

## 1.4 Electrical Hazards

- No eating or drinking will be permitted in the vicinity of any piece of electrical equipment which has its cover removed.
- Jewelry such as, rings, watches, bracelets, and necklaces shall not be worn while working inside electrical equipment.
- Power supplies or other high voltage devices shall not be repaired in the field but replaced with the power source disconnected or the power shut off at the breaker in the electrical panel.
  - Lock out/Tag out (LOTO) procedures (See Appendix C) will be utilized to ensure that the power supply remains secure against accidental activation.
    - Per Appendix C, LOTO procedures apply only to the air conditioning unit and floor heater at CASTNET sites. The associated breakers are identified at each site. If work is to be performed on either of these units a breaker lock out device will be used prior to commencement.
- When there is a chance that activation of an electrical circuit can produce physical harm or death, then the device shall be tagged identifying such information.

## 1.5 Tower Safety

Ten-meter aluminum tilt-down towers designed for single person operation are used at nearly all CASTNET sites. The worker remains at ground level. Exceptions are as follows:

- Individuals working above the ground shall secure themselves to the tower with a lifeline and safety harness or belt. Working at heights can only be done by trained individuals. HOW191, ME, DUK008, NC (scaffold towers at approximately 35 meters) and WFM007, NY (no tower – sampler is on a rooftop) require safety harnesses. This equipment will be provided by CASTNET and inspected by a competent person, the Gainesville office health and safety officer, prior to use in the field. See Appendix D for inspection and maintenance guidelines.
- Work above ground shall not be performed in high winds, if ice has accumulated on foot surfaces, or if an electrical storm is imminent.

## 1.6 Other Rules

Safety regulations specified by any site owner or for any facility at which work is performed will be observed. The Project Manager will determine these requirements and take steps to ensure compliance.

## 2.0 Site Description

QAPP Appendix 2 provides a list of CASTNET sites, including maps and directions from each site to a nearby hospital. Figure 2.1 shows a typical EPA-sponsored CASTNET site configuration, including instruments and their locations.

The following four general tasks will be performed at each site. More specific activities are listed in the subsequent table. See Table 9.1 for the PPE required for each task. Check the box to

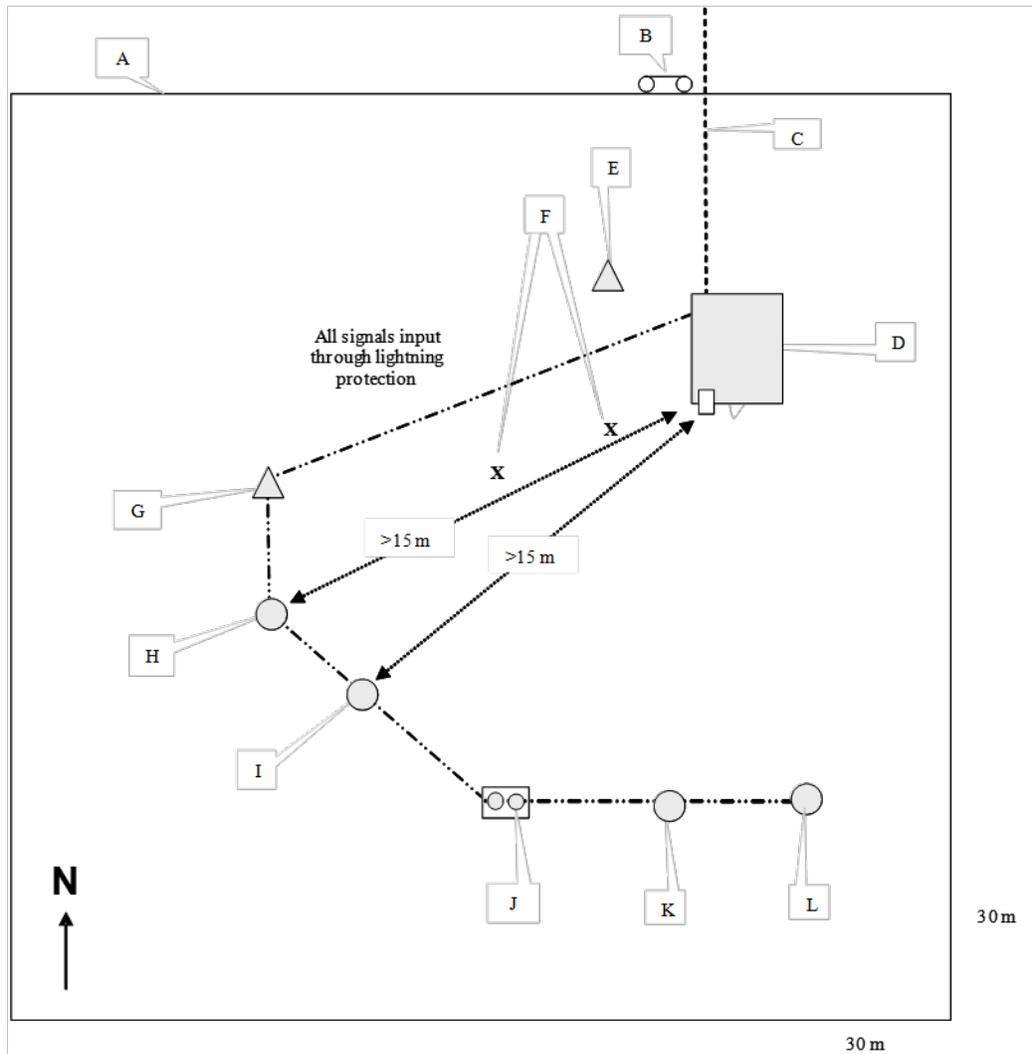
indicate whether a task will be conducted by Wood or subcontractor and whether an Activity Hazard Analysis (AHA) has been developed and included with this HASP.

Wood	Sub	Task	AHA Developed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Install Monitoring Systems	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Operate Monitoring Systems	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Calibrate and Repair Monitoring Systems	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Audit Monitoring Systems	<input checked="" type="checkbox"/>

Activity	Wood	Sub	Activity	Wood	Sub
Lift heavy equipment	<input type="checkbox"/>	<input type="checkbox"/>	Working from scaffolding	<input type="checkbox"/>	<input type="checkbox"/>
Travel on forest roads	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Working at heights >6 feet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exposure to hazardous inhalation atmospheres*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Exposure to stinging or biting insects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exposure to poisonous plants	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

\*Preventive measures against release. Not present onsite otherwise.

**Figure 2.1.** Typical EPA-Sponsored CASTNET Site Configuration

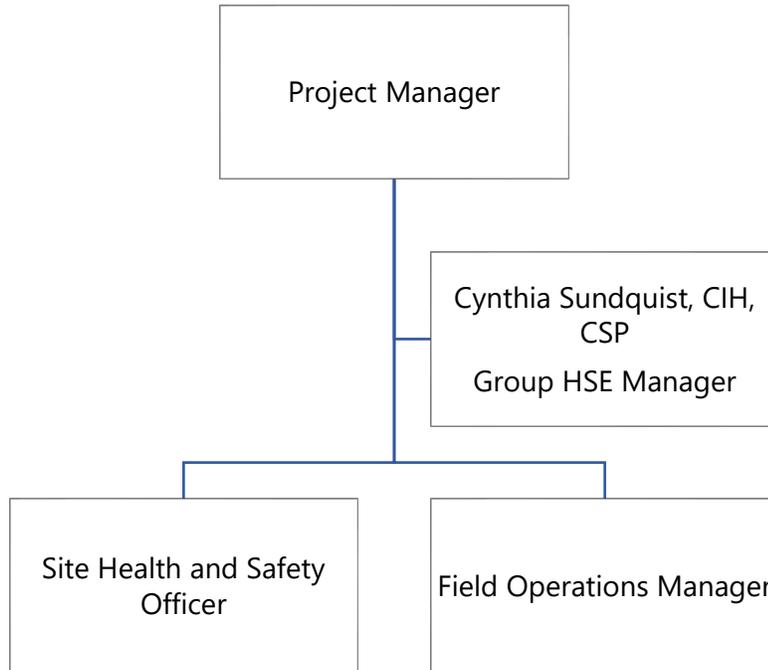


- A – Site Perimeter
- B – Stub Pole, Disconnect, Electric Meter
- C – 220 VAC/100 amp and Telephone Line (underground for at least the final 15 to 35 meters)
- D – 8' x 10' Aluminum Environmental Shelter (Temperature Controlled)
- E – Air Sampling Tower
- F – Approximate Position of Tower Tops when lowered
- G – Meteorological Tower
- H – Tipping Bucket Rain Gauge (> 15m from shelter)
- I – Solar Radiation Sensor (> 15m from shelter)
- J – NADP/NTN Wet/Dry Collection (optional)
- K – NADP/NTN NOAH IV Electronic Rain Gauge (optional)
- L – Wetness Sensor

### 3.0 Key Personnel and Health and Safety Responsibilities

Figure 3.1 shows the project organizational chart. Table 3.1 describes health and safety responsibilities for key project personnel.

**Figure 3.1.** Project Organizational Chart



**Table 3.1**  
**Key Personnel Health and Safety Responsibilities**

<b>GROUP HEALTH, SAFETY, &amp; ENVIRONMENT (HSE) MANAGER</b>	<b>FIELD OPERATIONS MANAGER</b>	<b>SITE HEALTH &amp; SAFETY OFFICER (SHSO)</b>	<b>PROJECT PERSONNEL</b>
<ul style="list-style-type: none"> <li>▪ Implement appropriate corporate health and safety policies, or environmental projects.</li> <li>▪ Approve HASP and amendments.</li> <li>▪ Maintain exposure monitoring records.</li> <li>▪ Notify Corporate Vice President of HSE in the event of an emergency situation.</li> <li>▪ Verify that corrective actions recommended on Incident Analysis Forms have been implemented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ See that personnel receive this plan; are aware of its provisions, including being aware of the potential hazards associated with site operations; are instructed in safe work practices; and are familiar with emergency procedures. Ensure that these actions are documented.</li> <li>▪ Determine that appropriate monitoring and PPE are available.</li> <li>▪ Monitor the Field Logbooks to ensure the health and safety work practices are employed.</li> <li>▪ Coordinate with SHSO so that emergency response procedures are implemented.</li> <li>▪ Ensure corrective actions recommended on Incident Analysis Forms are implemented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement project HASP; report to the Project Manager for action if any deviations from the anticipated conditions exist; and authorize the cessation of work at site investigations if necessary.</li> <li>▪ Confirm that personnel have the health and safety training to qualify them to perform their assigned tasks.</li> <li>▪ Conduct pre-entry briefing and ensure tailgate safety meetings are performed. Document meetings on Daily Tailgate Safety Meeting Checklist (Appendix B).</li> <li>▪ Verify that all monitoring equipment and PPE is operating correctly according to manufacturer's instructions and such equipment is used by on-site personnel. Implement site emergency and follow-up procedures.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Be familiar with and abide by the HASP.</li> <li>▪ Notify the SHSO of any special medical conditions (e.g., allergies).</li> <li>▪ Immediately report any incidents and/or unsafe conditions to the SHSO.</li> <li>▪ No individual may go on site where he/she does not have the required safety training.</li> </ul>

## 4.0 Worker Training

Upon designation of a specific project team, Table 4.1 will be completed to summarize the training experience of the project team with respect to 29 Code of Federal Regulations (CFR) 1910.147, 29 CFR Appendix C to Subpart M of Part 1926, and 29 CFR 1910.1200 and Wood Integrated HSE Manual.

Maintain copies of training certificates in project files. For example, maintain certificates or documentation of training for both Wood employees and subcontractors:

- First Aid/CPR.
- Hazard Communication.
- Documentation of Annual Fire Extinguisher training (if fire extinguishers are present at the Site).
- Documentation of Fall Protection training (if working at elevations).

**Table 4.1  
Training Records**

Role:	Required?	Field Team Members					
		Field Operations Manager (Add name)	Site Health and Safety Officer (Add name)	(Add name)	(Add name)	(Add name)	(Add name)
Training/Medical		Dates	Dates	Dates	Dates	Dates	Dates
First Aid <sup>1,2</sup>	X						
CPR <sup>1,2</sup>	X						
Hazard Communication	X						
Project Subcontractor Management <sup>3</sup>							
Fall Protection <sup>1</sup>	X						
Fire Extinguisher <sup>1</sup>	X						

<sup>1</sup> If applicable.

<sup>2</sup> At least one worker must be trained in First Aid/CPR.

<sup>3</sup> Required if acting as Field Operations Manager or SHSO.

## 5.0 Site Control

Most sites are fenced. Sites without fences have restricted access, e.g., by private land and remote/obscure locations. Some sites may not be fenced if they are near sensitive land or are publically visible. However, all towers and shelters are locked (including small footprint enclosures).

### Site Access

Access to the Site will be controlled using the following method(s):

- Sign in/sign out log     Guard  
 Identification badges     Other: Fencing and restricted access
- 

### General Safe Work Practices

General safe work practices to be implemented during work activities at this site are included in Table 5.1.

**Table 5.1  
General Safe Work Practices**

<ul style="list-style-type: none"> <li>▪ Smoking, eating, or drinking after entering the work zone and before decontamination will not be allowed. Use of illegal drugs and alcohol are prohibited.</li> <li>▪ Practice good housekeeping. Keep everything orderly and out of potentially harmful situations.</li> <li>▪ In an unknown situation, always assume the worst conditions.</li> <li>▪ Be observant of your immediate surroundings and the surroundings of others. It is a team effort to notice and warn of impending dangerous situations. Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.</li> <li>▪ Conflicting situations may arise concerning safety requirements and working conditions and must be addressed and resolved rapidly by the SHSO, and Project Manager to relieve any motivations or pressures to circumvent established safety policies.</li> <li>▪ Unauthorized breaches of specified safety protocol will not be allowed. Workers unwilling or unable to comply with the established procedures will be discharged.</li> </ul>
---

## 6.0 Hazard Analysis

### 6.1 Activity Hazard Analysis

AHAs have been performed for each task associated with this project. Example AHAs are given below and all provided in Appendix A.

**Activity-Specific AHAs:**

<input checked="" type="checkbox"/>	Lifting loads
<input checked="" type="checkbox"/>	Travel on forested roads
<input type="checkbox"/>	Parking
<input checked="" type="checkbox"/>	Handling trailers and related activities
<input type="checkbox"/>	Loading/unloading equipment
<input type="checkbox"/>	

**Hazard-Specific AHAs:**

<input checked="" type="checkbox"/>	Insect Stings and Bites
<input checked="" type="checkbox"/>	Hypothermia
<input checked="" type="checkbox"/>	Hyperthermia
<input checked="" type="checkbox"/>	Exposure to hazardous Inhalation atmospheres*
<input checked="" type="checkbox"/>	Exposure to poisonous plants
<input checked="" type="checkbox"/>	Handling electrical equipment

\*Preventive measures against release. Not present onsite otherwise.

## 7.0 Air Monitoring

As per project design, CASTNET sites are selected to perform rural, background level, monitoring of weekly concentrations of acidic pollutants, base cations, and chloride ( $\text{Cl}^-$ ) using a 3-stage filter pack and of hourly  $\text{O}_3$  concentrations using continuous analyzers. There are no ambient COCs and therefore no site safety-related air monitoring.

## 8.0 Dust Control

CASTNET sites were selected to characterize regional air quality and avoid local sources of dust and other pollutants. Site operators will note on Site Status Report Forms (e.g., Figure 3-2 in QAPP Main Body) the presence of dust and particulate material produced by open burning, forest fires, tilling, and nearby construction but these are not expected to reach levels of health and safety concern at CASTNET sites.

## 9.0 Personal Protective Equipment

In general, the PPE includes:

- Safety glasses
- Hard hats
- Safety shoes, and
- Lifelines and harness if working at elevation
- Hearing protection ( earmuffs, earplugs), if necessary
- High-visibility/reflective vest
- Work gloves (if necessary)

**Table 9.1**  
**Task-Specific PPE Requirements**

<b>Personal Protective Equipment</b>	General Site Work (inspections, maintenance, etc.)	Site Installations
Hard hat	X	X
Safety glasses/goggles	X	X
Lifelines/harnesses	A	A
Hearing protection (earmuffs, earplugs)	A	A
Steel-toed boots	A	A
High-visibility/reflective vest	A	A
Work gloves	A	A

X = required A = available

## 10.0 Emergency Response

Emergency response information is provided according to the Wood Hazardous Waste Operations and Emergency Response Program. CASTNET shelters provide protection in case of a storm or other short-term emergencies. Evacuation routes are specified.

### 10.1 Hospitals/Clinics

**A nearby hospital has been identified for all sites. Maps from CASTNET sites to hospitals are provided in QAPP Appendix 2, CASTNET Site Contact List. Written directions are also provided.**

**Table 10.1**  
**Emergency Contacts**

Name	Telephone Numbers		Date of Pre-Emergency Notification (If Applicable)
	Office	Cell/Home	
Fire Department:	911		
Hospital*:			
Police Department:	911		
WorkCare (early injury case management)	1-888-449-7787		
	Office	Cell/Home	
Site Health and Safety Officer:	352-333-6620	352-665-6620	
Client Contact**:			
Project Manager:			
Group HSE Manager: Cindy Sundquist (See also Figure 10.1 – Incident Flow Chart)	207-828-3309	207-650-7593 (C) 207-892-4402 (H)	
EPA (if applicable):			
Other: Ambulance	911		

\* Maps from CASTNET sites to hospitals and telephone numbers are provided in QAPP Appendix 2, CASTNET Site Contact List. Written directions are also provided.

\*\* Primary contact information provided in QAPP Appendix 2, CASTNET Site Contact List.

## 10.2 Emergency Response Equipment

The following emergency response equipment is required for this project and will be readily available.

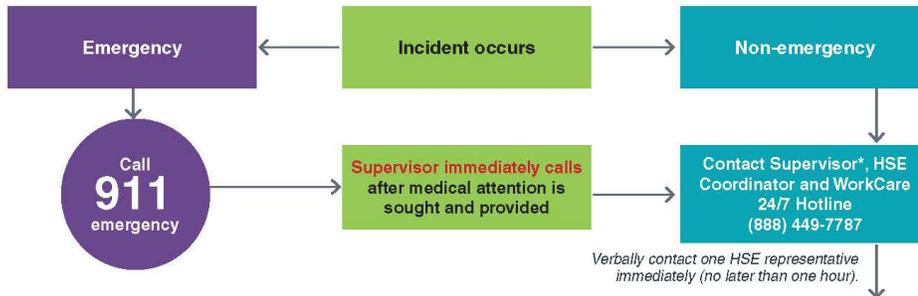
- Field first aid kit (including blood-borne pathogen kit/supplies)
- Fire extinguisher
  - Type A (combustible materials)
  - Type B (flammable liquids and gases)
  - Type C (does not conduct electricity – to be used on electrical equipment)
  - Type ABC
- Eyewash
- SCBA
- Shower
- Other: Respirator

**Figure 10.1. Incident Flow Chart**



# Incident flow chart

Call immediately



E&IS Corporate HSE department contact list		
Name/email	Office location	Contact information
Bruce Voss bruce.voss@woodplc.com	Cathedral City, CA	760.202.3737 (office) 951.897.6381 (cell)
Chad Barnes chad.barnes@woodplc.com	Phoenix, AZ	602.733.6000 (office) 480.495.9846 (cell)
Cindy Sundquist cynthia.sundquist@woodplc.com	Portland, ME	207.828.3309 (office) 207.650.7593 (cell) 207.892.4402 (home)
Gabe Sandholm gabe.sandholm@woodplc.com	Minneapolis, MN	612.252.3785 (office) 206.683.9190 (cell)
Lori Dowling lori.dowling@woodplc.com	Prince George, BC	250.564.3243 (office)
Philip Neville philip.neville@woodplc.com	Thorold, ON	905.687.6616 (office) 905.380.4465 (cell)
Tim Kihn tim.kihn@woodplc.com	Edmonton, AB	780.944.6363 (office) 780.717.5058 (cell)
Vladimir Ivensky (can call 24/7) vladimir.ivenky@woodplc.com	Plymouth Meeting, PA	610.877.6144 (office) 484.919.5175 (cell) 215.947.0393 (home)
Kirby Lastinger kirby.lastinger@woodplc.com	Lakeland, FL	836-667-2345 x207 (office) 863-272-4775 (cell)
Stephen Paxton stephen.paxton@woodplc.com	Kennesaw, GA	770-499-6842 (office) 678-270-0980 (mobile)
Chris Miele christopher.miele@woodplc.com	Capital Projects - Kirkland, WA	425-368-0946 (office) 425-864-9011 (mobile)

High potential near misses, workplace violence/harassment and security incidents, subcontractor incidents, regulatory inspections, spills, and property damage should be reported immediately to one of the above HSE Representatives.

\*Supervisor Responsible For:

- D&A Testing Coordination as per client and Wood E&IS requirements, Local/Client Notifications, and Completing Initial IAR within 24 hours and forwarding to Corporate HSE.

E&IS, North America | Rev. Dec 2017



### 10.3 Communications

On-site communications will be conducted as follows:

- |                                     |   |                                  |
|-------------------------------------|---|----------------------------------|
| <input checked="" type="checkbox"/> | Verbal  |                                  |
| <input type="checkbox"/>            | Two-way radio                                   |                                  |
| <input checked="" type="checkbox"/> | Cellular telephone                              |                                  |
| <input type="checkbox"/>            | Hand signals                                    |                                  |
|                                     | Hand gripping throat                            | Out of air, can't breathe        |
|                                     | Grip partner's wrist or both hands around waist | Leave area immediately           |
|                                     | Hands on top of head                            | Need assistance                  |
|                                     | Thumbs up                                       | OK, I am all right, I understand |
|                                     | Thumbs down                                     | No, negative                     |
| <input type="checkbox"/>            | Horn/siren                                      |                                  |
| <input type="checkbox"/>            | Other:  | _____                            |

Off-site communications will be conducted as follows:

- |                                     |                     |       |
|-------------------------------------|---------------------|-------|
| <input checked="" type="checkbox"/> | Cellular telephone  |       |
| <input type="checkbox"/>            | Landline/payphone – |       |
|                                     | location:           | _____ |
| <input type="checkbox"/>            | Other:              | _____ |

### 10.4 Emergency Response Procedures

In the event of an on-site emergency, the procedures delineated in Table 10.2 should be followed immediately.

For injuries requiring medical treatment beyond first aid, and for work-related vehicle incidents where one or more vehicles have been towed, the employee must submit a post-incident drug test. It is the responsibility of the Supervisor/Project Manager to ensure that the employee who has had an on-the-job incident (as defined in Wood Human Resource Policy HRM-PRO-100347 - US - DRUGS, ALCOHOL, TOBACCO AND SMOKING) submits to this required testing.

**Table 10.2  
Emergency Procedures**

<ul style="list-style-type: none"> <li>▪ The SHSO (or alternate) should be immediately notified via the on-site communication system. The SHSO will assume control of the emergency response.</li> <li>▪ The SHSO will notify the Project Manager and the client contact of the emergency. The SHSO will then contact the Eastern Group HSE Manager, who will contact the Vice President of HSE.</li> <li>▪ If applicable, the SHSO will contact off-site emergency responders (e.g., fire department, hospital, police department) and will inform the response team as to the nature and location of the emergency on site.</li> <li>▪ If applicable, the SHSO will evacuate the Site. Site workers should move to the predetermined evacuation point (see Site Map).</li> <li>▪ For small fires, flames should be extinguished using the fire extinguisher, if safe to do so and workers are trained. Large fires should be only handled by the local fire department.</li> <li>▪ If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and/or shower (if available).</li> <li>▪ If a worker is injured, first aid should be administered by a certified first aid provider.</li> <li>▪ An injured worker must be decontaminated appropriately.</li> <li>▪ After the response, the SHSO will follow up with the required company reporting procedures.</li> </ul>
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**10.5 Wood Early Injury Case Management Program**

If the emergency involves an injury to a Wood employee, the HSE Coordinator or Field Operations Manager will implement the Wood Early Injury Case Management Program. See procedures below.

<b>NON-EMERGENCY INCIDENT</b>	<b>EMERGENCY INCIDENT</b>
<p>Steps 1 &amp; 2 must be completed before seeking medical attention other than local first aid.</p> <ol style="list-style-type: none"> <li>1. Provide first aid as necessary. Report the situation to your immediate supervisor and HSE Coordinator (all incidents with the apparent starting event should be reported within 1 hour of occurrence).</li> <li>2. Injured employee:</li> </ol>	<ol style="list-style-type: none"> <li>1. Provide emergency first aid. Supervisor on duty must immediately call 911 or local emergency number; no employee may respond to outside queries without prior authorization. Any outside media calls concerning this incident must be referred immediately to Lauren Gallagher at 602-757-3211.</li> <li>2. Once medical attention is sought and provided, the supervisor must:</li> </ol>

NON-EMERGENCY INCIDENT	EMERGENCY INCIDENT
<b>Call WorkCare 24/7 Hotline*</b> <b>(888) 11-XPRTS or (888) 449-7787</b>	
<p>WorkCare will assess the situation and determine whether the incident requires further medical attention. During this process, WorkCare will perform the following:</p> <ul style="list-style-type: none"> <li>• Explain the process to the caller.</li> <li>• Determine the nature of the concern.</li> <li>• Provide appropriate medical advice to the caller.</li> <li>• Determine appropriate path forward with the caller.</li> <li>• Maintain appropriate medical confidentiality.</li> <li>• Help caller to execute path forward, including referral to the appropriate local medical facility.</li> <li>• Send an email notification to the Corporate HSE Department.</li> </ul>	<p>WorkCare will be responsible for performing the following:</p> <ul style="list-style-type: none"> <li>• Contact the treating physician.</li> <li>• Request copies of all medical records from clinic.</li> <li>• Send an email update to the corporate HSE department.</li> </ul>
<p>3. IMMEDIATELY after contacting WorkCare, send a brief email notification <u>and</u> inform verbally (direct contact is required) <u>one</u> of the HSE corporate representatives. See Figure 10.1.</p> <p>4. Make all other local notifications and client notifications.</p> <p>5. Local Supervisor, HSE Coordinator, SHSO, and any applicable safety committees must complete the preliminary investigation, along with the initial Incident Report within 24 hours.</p> <p>6. Corporate Loss Prevention Manager to complete Worker’s Compensation Insurance notifications as needed.</p> <p>7. Corporate HSE to conduct further incident notifications, investigation, include in statistics, classify, and develop lessons-learned materials.</p> <p><b>* NOTE: Step 2 is applicable only to the North American operations and to incidents involving Wood personnel. High-potential near misses, subcontractors’ incidents, regulatory inspections, spills, and property damages above \$1,000 should be reported immediately, following the directions in Step 3.</b></p>	

**Confined Space Entry**

Yes   No

     The task(s) for this project involves confined space entry.

If yes, see applicable AHA in Appendix A.

**Spill Containment**

Yes   No

The task(s) for this project involves drum/tank/container sampling, excavation, transportation, etc.

**10.6 Recordkeeping**

At the end of the project, the following items should be maintained in the project file:

<input checked="" type="checkbox"/>	HASP
<input checked="" type="checkbox"/>	Incident Analysis/Vehicle Incident Forms/Ground Disturbance Report (if applicable)
<input type="checkbox"/>	Log notebooks

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## **Appendix A: Activity Hazard Analysis**

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# AHA – Work at CASTNET Monitoring Sites Site Calibration, Operation, and Servicing



Activity/Work Task:	See Activity Table	Overall Risk Assessment Code (RAC) (Use highest code)				<b>M</b>	
Project Location:	EPA Sponsored CASTNET Sites	<b>Risk Assessment Code (RAC) Matrix</b>					
Contract Number:	EP-W-16-015	<b>Severity</b>	<b>Probability</b>				
Date Prepared:	9/25/18 <b>Date Accepted:</b>		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title):	Marcus Stewart/Sr II QA Rep.	Catastrophic	<b>E</b>	<b>E</b>	<b>H</b>	<b>H</b>	<b>M</b>
Reviewed by (Name/Title):		Critical	<b>E</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>L</b>
		Marginal	<b>H</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>
		Negligible	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>
<b>Notes:</b> (Field Notes, Review Comments, etc.)		Step 1: Review each <b>"Hazard"</b> with identified safety <b>"Controls"</b> and determine RAC (See above)					
This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Worker to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.		"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				<b>RAC Chart</b>	
		"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				<b>E = Extremely High Risk</b>	
		Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				<b>H = High Risk</b>	
						<b>M = Moderate Risk</b>	
				<b>L = Low Risk</b>			
	<b>MANAGEMENT OF CHANGE:</b> If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.						

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Specify: Hard Hat, safety glasses, gloves, steel toe work boots, high visibility safety vest, hearing protection, respirator, etc.) Refer to <a href="#">Minimum PPE Requirements</a> and specify as per risk assessment where required.	<b>Competent / Qualified Personnel:</b> Peter Yanczak, Health and Safety Officer <b>Training requirements:</b> List specific certification (as applicable) Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting	Inspect all PPE prior to use  Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service.

# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing



Job Steps	Hazards	Controls	RAC
1. Lifting Heavy Equipment and other ergonomic activities	Ergonomic Issues	Ergonomic Issues <ul style="list-style-type: none"> <li>Use safe lifting techniques</li> </ul>	Select One / shade cell colour: L
2. Communicating Hazards	Safety, crew unity	<ul style="list-style-type: none"> <li>Talk to each other.</li> <li>Let other crewmembers know when you see a hazard.</li> <li>Avoid working near known hazards.</li> <li>Always know the whereabouts of fellow crewmembers.</li> <li>Carry a radio and spare batteries or cell phone.</li> <li>Review Emergency Evacuation Procedures (see below).</li> </ul>	Select One / shade cell colour: L
3. Mobilization: Travel on Forest Roads	<ol style="list-style-type: none"> <li>Poor visibility</li> <li>Backing</li> <li>Clearing obstacles from roadway</li> <li>Carbon monoxide poisoning</li> <li>Vehicle wear/tear</li> <li>Animals on road</li> </ol>	<ol style="list-style-type: none"> <li>Use care in tall brush and grass, clear debris from roadways rather than trying to drive over or around</li> <li>Drive on the main roadway, avoid soft gravel shoulders, do not straddle a gravel berm or drive with wheels on berm, pull over and stop if you have to look at a map</li> <li>Slow down! Don't drive on the road if there is potential for resource or vehicle damage. Use 4WD drive to get out of trouble, not into trouble. Consider carrying and using chains if conditions warrant. Know how to put on chains, ask about road conditions before traveling.</li> <li>Follow from a safe distance. Pull off road when oncoming vehicle is passing</li> <li>Keep windows clean inside and out, keep dash clear. Maintain safe speeds, replace badly damaged or cracked windshields, make sure wipers are in good condition.</li> <li>Try to park so that you do not have to back up to leave. Use mirrors and a spotter, if you do not have a spotter, get out to check behind your vehicle before backing.</li> <li>Keep vehicle well ventilated when idling/heating by opening a window at least 6 inches.</li> <li>When descending forest roads, use a lower gear to control your speed, rather than the brakes. Take care of the vehicle you drive.</li> <li>Drive slowly, watch for animals.</li> </ol>	Select One / shade cell colour: M
4. Parking	Run-away vehicle	Use chock blocks when parking, set parking brake, do not leave vehicle unattended when it is running.	Select One / shade cell colour: L
5. Connecting trailer	Pinching fingers, mashing toes, back strain	Use caution, be aware of hand placement, use proper lifting techniques (i.e., lift with legs not the back, get assistance as necessary). Wear gloves, steel-toed shoes, and back support. Use trailer jack to lift tongue.	Select One / shade cell colour: L
6. Towing trailer if necessary in establishing a new monitoring site or when installing or replacing a tower.	Trailer disconnecting Tire Blowout Bearing seizure, failure Sway or whipping stopping	<ol style="list-style-type: none"> <li>Verify ball and coupler are same size, use safety chains crossed under coupler, use lock or bolt to secure coupler latch</li> <li>Inspect tires for wear and correct pressure</li> <li>Check for overheating during (after approximately 10 miles) each trip, repack at least once a year.</li> <li>Use slower speed, especially in windy situations. Increase following distance, extra weight of trailer increases stopping distance. Do not compensate for sway, hold steady course. Be alert when turning, do not "curb" the trailer tires.</li> </ol>	Select One / shade cell colour: L

# AHA – Work at CASTNET Monitoring Sites Site Calibration, Operation, and Servicing



7. Backing Trailer	Jack knifing, hitting objects	Physically inspect path yourself before backing, use a guide person, and avoid sharp turns.	<b>Select One / shade cell colour:</b> L
8. Lifting and carrying items	8A) Muscle strain/injury	8A) Muscle Strain/Injury Use proper lifting techniques when lifting heavy objects; get assistance or use mechanical device (dolly or cart).	<b>Select One / shade cell colour:</b> L
	8B) Slips/Trips/Falls	8A) Slips/Trips/Falls <ul style="list-style-type: none"> <li>• Slow down, watch out for spills, and clean up puddles.</li> <li>• Maintain clear passage; do not store items in aiseways.</li> <li>• Watch for obstacles in path.</li> <li>• Use activity appropriate equipment to reach overhead items (e.g., ladder, step stool)</li> <li>• Do not run up or down the stairs.</li> <li>• Always have one hand free to hold handrail when climbing up and down the stairs.</li> </ul>	<b>Select One / shade cell colour:</b> L
9. Wreck of vehicle while being driven	Wreck of vehicle while being driven	Wreck of vehicle while being driven <ul style="list-style-type: none"> <li>• All drivers shall be have proper license.</li> <li>• Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be used unsupervised.</li> <li>• Keep wind shields, windshield wipers, side mirrors and side windows clean</li> <li>• Drivers shall conduct a pre-operation vehicle safety check</li> <li>• Drivers shall plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer (spotter) when available. If an observer is not available, the driver shall walk around the vehicle to make sure rear is clear prior to backing. (Get out and look)</li> <li>• Seat belts shall be worn when driving by driver and passengers.</li> <li>• Choose the safest location possible to park equipment. Avoid parking in blind spots of other equipment.</li> <li>• If so equipped, driver is to be sure the back-up alarm is working</li> <li>• Adjust vehicle speed for load and weather. Tire chains should be utilized as dictated by weather conditions.</li> <li>• Operators should always check and be sure of load height.</li> <li>• When operating a vehicle off the roadway, be aware of possible hidden objects in the grass and unstable terrain.</li> <li>• Never allow anyone between truck and trailer when backing to hook trailer</li> <li>• Make sure tilt beds or ramps are secured before putting trailer in use</li> <li>• If carrying a load, perform periodic checks of equipment on long trips to assure the load is secure.</li> </ul>	<b>Select One / shade cell colour:</b> L



# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing

<p>11. Hypothermia</p>	<p>Cold Stress</p>	<p>Check weather prior to on outside activities; wear adequate clothing and gloves, if appropriate, for weather; rain wear where appropriate due to water spray to remain dry; maintain body temperature; recognize and treat any medical condition by calling 911 (or local emergency number) at once.</p> <div data-bbox="898 354 1633 1172" style="border: 1px solid black; padding: 10px;"> <div style="background-color: #000080; color: white; text-align: center; padding: 5px; font-weight: bold;">THE COLD STRESS EQUATION</div> <div style="text-align: center; font-weight: bold; margin-top: 10px;">             LOW TEMPERATURE + WIND SPEED + WETNESS              = INJURIES &amp; ILLNESS         </div> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="width: 45%;"> <p>When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result.</p> <p><b>Hypothermia</b> can occur when <i>land temperatures</i> are <b>above</b> freezing or <i>water temperatures</i> are below 98.6°F/ 37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.</p> </div> <div style="width: 50%;"> <table border="1" style="margin-top: 10px; font-size: small;"> <caption>Temperature and Wind Speed Risk Levels</caption> <thead> <tr> <th>Temperature (F/C)</th> <th>Wind Speed (MPH)</th> <th>Risk Level</th> <th>Freezing Time</th> </tr> </thead> <tbody> <tr> <td>30° F / -1.1° C</td> <td>0</td> <td>Little Danger (Caution)</td> <td>Freezing to Exposed Flesh within 1 Hour</td> </tr> <tr> <td>20° F / -6.7° C</td> <td>0</td> <td rowspan="2">Danger</td> <td rowspan="2">Freezing to Exposed Flesh within 1 Minute</td> </tr> <tr> <td>0° F / -17.8° C</td> <td>0</td> </tr> <tr> <td>-10° F / -23.3° C</td> <td>0</td> <td rowspan="3">Extreme Danger</td> <td rowspan="3">Freezing to Exposed Flesh within 30 Seconds</td> </tr> <tr> <td>-20° F / -28.9° C</td> <td>0</td> </tr> <tr> <td>-30° F / -34.4° C</td> <td>0</td> </tr> </tbody> </table> <p style="font-size: x-small; margin-top: 10px;">Adapted from: ACGIH Threshold Limit Values, Chemical Substances and Physical Agents Biohazard Indices, 1998-1999.</p> </div> </div> </div>	Temperature (F/C)	Wind Speed (MPH)	Risk Level	Freezing Time	30° F / -1.1° C	0	Little Danger (Caution)	Freezing to Exposed Flesh within 1 Hour	20° F / -6.7° C	0	Danger	Freezing to Exposed Flesh within 1 Minute	0° F / -17.8° C	0	-10° F / -23.3° C	0	Extreme Danger	Freezing to Exposed Flesh within 30 Seconds	-20° F / -28.9° C	0	-30° F / -34.4° C	0	<p>Select One / shade cell colour: L</p>
Temperature (F/C)	Wind Speed (MPH)	Risk Level	Freezing Time																						
30° F / -1.1° C	0	Little Danger (Caution)	Freezing to Exposed Flesh within 1 Hour																						
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0° F / -17.8° C	0																								
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U.S. Department of Labor  
 Occupational Safety and Health Administration  
 OSHA 3156  
 1998

# AHA – Work at CASTNET Monitoring Sites Site Calibration, Operation, and Servicing

<p>12. Hyperthermia</p>	<p>Heat stress</p>	<p>Check weather prior to work activities; Know signs/symptoms of heat-related illnesses: monitor yourself and coworkers; Block out direct sun or other heat sources; Use cooling fans/air-conditioning; rest regularly; Drink lots of water, about 1 cup every 15 minutes; Wear light weight, light colored, loose-fitting clothes, Avoid alcohol, caffeinated drinks, or heavy meals. Call 911 (or local emergency number) at once.</p>	<div style="text-align: center;"> <p><b>Protect Yourself</b></p> <h2 style="color: #0070C0;">Heat Stress</h2>  </div> <p>When the body is unable to cool itself by sweating, several heat-induced illnesses such as heat stress or heat exhaustion and the more severe heat stroke can occur, and can result in death.</p> <p><b>Factors Leading to Heat Stress</b> High temperature and humidity; direct sun or heat; limited air movement; physical exertion; poor physical condition; some medicines; and inadequate tolerance for hot workplaces.</p> <p><b>Symptoms of Heat Exhaustion</b></p> <ul style="list-style-type: none"> <li>• Headaches, dizziness, lightheadedness or fainting.</li> <li>• Weakness and moist skin.</li> <li>• Mood changes such as irritability or confusion.</li> <li>• Upset stomach or vomiting.</li> </ul> <p><b>Symptoms of Heat Stroke</b></p> <ul style="list-style-type: none"> <li>• Dry, hot skin with no sweating.</li> <li>• Mental confusion or losing consciousness.</li> <li>• Seizures or convulsions.</li> </ul> <p><b>Preventing Heat Stress</b></p> <ul style="list-style-type: none"> <li>• Know signs/symptoms of heat-related illnesses; monitor yourself and coworkers.</li> <li>• Block out direct sun or other heat sources.</li> <li>• Use cooling fans/air-conditioning; rest regularly.</li> <li>• Drink lots of water; about 1 cup every 15 minutes.</li> <li>• Wear lightweight, light colored, loose-fitting clothes.</li> <li>• Avoid alcohol, caffeinated drinks, or heavy meals.</li> </ul> <p><b>What to Do for Heat-Related Illness</b></p> <ul style="list-style-type: none"> <li>• Call 911 (or local emergency number) at once.</li> </ul> <p>While waiting for help to arrive:</p> <ul style="list-style-type: none"> <li>• Move the worker to a cool, shaded area.</li> <li>• Loosen or remove heavy clothing.</li> <li>• Provide cool drinking water.</li> <li>• Fan and mist the person with water.</li> </ul> <div style="text-align: center; margin-top: 20px;"> <p>For more complete information:</p>  <p><b>Occupational Safety and Health Administration</b> U.S. Department of Labor <a href="http://www.osha.gov">www.osha.gov</a> (800) 321-OSHA</p> </div> <div style="text-align: right; font-size: small; margin-top: 10px;"> <p>OSHA 315-101R16</p> </div>	<p>Select One / shade cell colour: L</p>
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# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing



<p>13. Onsite hazards</p>	<p>13A) Exposure to hazardous Inhalation atmospheres.</p>	<p>13A) Ensure that ozone analyzers are vented outside of the monitoring shelter.</p> <p>Handling of compressed gas cylinders.</p> <p>Oxygen deficiency; heavy object; gases under pressure; chemical (low concentrations); gases present are NH<sub>3</sub>, N Propyl Nitrate and a mixture of CO, SO<sub>2</sub> and NO.</p> <ul style="list-style-type: none"> <li>• A cylinder should always carry a legible label or stencil identifying its contents. Do not use the cylinder if the contents are not properly identified.</li> <li>• Labels or identifying markings on cylinders should face out such that they are clearly visible.</li> <li>• Ensure cylinders are stored and used in a dry, well ventilated area.</li> <li>• All cylinders, whether full or empty, must be secured in an upright position by a chain or strap system made for this purpose.</li> <li>• Cylinders should be stored out of direct sunlight and away from other heat sources. Cylinders should be stored at temperatures above freezing and below 125 degrees F.</li> <li>• Cylinder valves should be closed except when the cylinder is in active use.</li> <li>• Always use an appropriate pressure regulator with each cylinder.</li> <li>• Open cylinder valves and regulators slowly.</li> <li>• The main cylinder valve should always be opened before opening the downstream regulator valve.</li> <li>• Once the cylinder is installed, test for leaks. If gas leaks are detected, shut down the system, relieve pressure and tighten connections until leaks are corrected. If you cannot correct the problem, lock and tag out the system until repairs can be made by trained personnel.</li> <li>• Do not vent any gas inside a building without adequate ventilation.</li> <li>• Never bleed a cylinder below 25 pounds per square inch (psi).</li> <li>• If a cylinder valve leaks and it can be safely moved, take it outdoors and slowly empty the bottle. If moving the cylinder is not possible or safe, evacuate the area and call the fire department.</li> <li>• Any and all repairs and refilling shall be made only by qualified individuals.</li> <li>• Do not place a cylinder where it might become part of an electric circuit.</li> <li>• Cylinders that are not connected or in use, must be fitted with a valve protection cap.</li> <li>• Valve protection caps must be in place when cylinders are moved.</li> <li>• No tools, including wrenches and hammers shall be used to open or close cylinder valves.</li> <li>• Cylinder valves must be verified closed before moving the cylinder.</li> <li>• Larger cylinders, which cannot be easily carried, shall be moved using a wheeled cart.</li> <li>• Cylinders shall never be rolled or dragged, nor lifted by the valve cap.</li> <li>• Cylinders must never be violently struck or allowed to strike another object.</li> <li>• Foot protection meeting the most current ANSI Z41 standard for safety shoes is required when moving gas cylinders.</li> <li>• Safety glasses or other face and eye protection should be employed when installing or removing regulators.</li> </ul>	<p>Select One / shade cell colour: L</p>
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# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing

	<p>13B) Training – Identifying Poisonous Plants</p>	<p>13B) Provide training on identifying the specific poisonous plants that could be present at the site</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>POISON IVY</b> (<i>Rhus toxicodendron</i> L.)</p> </div> <div style="text-align: center;">  <p><b>POISON OAK</b> (<i>Rhus diversiloba</i>)</p> </div> <div style="text-align: center;">  <p><b>POISON SUMAC</b> (<i>Rhus toxicodendron vernix</i>)</p> </div> </div>	<p>Select One / shade cell colour: <b>M</b></p>
	<p>13B) 1. Poison Ivy</p> 	<p>13B) 1. Poison Ivy:</p> <ul style="list-style-type: none"> <li>• Grows everywhere in United States except Hawaii and Alaska.</li> <li>• In the East, Midwest, and the South, it grows as a vine.</li> <li>• In the Northern and Western United States, it grows as a shrub.</li> <li>• Each leaf has three leaflets.</li> <li>• Leaves are green in the summer and red in the fall.</li> <li>• In the late summer and fall, white berries may grow from the stems.</li> </ul>	<p>Select One / shade cell colour: <b>M</b></p>
	<p>13B) 2. Poison Oak</p> 	<p>13B) 2. Poison Oak:</p> <ul style="list-style-type: none"> <li>• Oak-like fuzzy leaves in clusters of three.</li> <li>• It has two distinct kinds:</li> <li>• Eastern poison oak (New Jersey to Texas) grows as a low shrub.</li> <li>• Western poison oak (Pacific Coast) grows to six-foot-tall clumps or vines up to 30 feet long.</li> <li>• It may have clusters of yellow berries.</li> </ul>	<p>Select One / shade cell colour: <b>L</b></p>
	<p>13B) 3. Poison Sumac</p> 	<p>13B) 3. Poison Sumac</p> <ul style="list-style-type: none"> <li>• Grows in standing water in peat bogs in the Northeast and Midwest and in swampy areas in parts of the Southeast.</li> <li>• Each leaf has clusters of seven to 13 smooth-edged leaflets.</li> <li>• The plants can grow up to 15 feet tall.</li> <li>• The leaves are orange in spring, green in summer and red, and orange or yellow in fall.</li> <li>• There may be clumps of pale yellow or cream-colored berries.</li> </ul>	<p>Select One / shade cell colour: <b>L</b></p>

# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing

	<p>13B) 4. Giant Hogweed</p>  <p>Giant Hogweed</p>  <p>Giant Hogweed Flower (clusters may reach up to 2.5 feet across)</p>  <p>Giant Hogweed Flower Leaves</p>  <p>Giant Hogweed Stem Thick stem with coarse hairs, Blistery dark purple splotches.</p>	<p>13B) 4. Giant Hogweed</p> <ul style="list-style-type: none"> <li>• Hogweed is a public health hazard. Its clear, watery sap has toxins that cause photo-dermatitis. Skin contact followed by exposure to sunlight produces painful, burning blisters that may develop into purplish or blackened scars. Contact with the eyes can cause temporary or permanent blindness.</li> <li>• Since its introduction into North America, this plant has become established in rich moist soils along roadsides, stream banks and waste ground. In the eastern US, it is known to occur in Maine, New York, Pennsylvania, Connecticut, and Massachusetts.</li> <li>• A biennial or perennial herb growing 8 to 15 feet tall, giant hogweed usually has a taproot or occasionally fibrous root. The hollow stems are 2 to 4 inches in diameter with dark reddish-purple splotches and coarse white hairs.</li> <li>• The deeply incised compound leaves grow up to 5 feet in width. Hairs on the underside of the leaf are stiff, dense and stubby.</li> <li>• The large umbrella-shaped flower heads are up to 2 1/2 feet in diameter across a flat top with numerous small flowers produced in mid-May through July.</li> <li>• Some plants die after flowering; others flower for several years. The plant produces flattened, 3/8 inch long, oval dry fruits that have a broadly rounded base and broad marginal ridges. Plants sprout in the early spring (or late winter in mild years) from the roots or from seed.</li> <li>• Grows in standing water in peat bogs in the Northeast and Midwest and in swampy areas in parts of the Southeast.</li> <li>• Each leaf has clusters of seven to 13 smooth-edged leaflets.</li> <li>• The plants can grow up to 15 feet tall.</li> <li>• The leaves are orange in spring, green in summer and red, and orange or yellow in fall.</li> <li>• There may be clumps of pale yellow or cream-colored berries.</li> </ul>	<p>Select One / shade cell colour: L</p>
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# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing



	13C) Hand Contact	13C) Hand Contact <ul style="list-style-type: none"> <li>Apply IvyX (or similar product) to hands, forearms and other potentially exposed parts of the body, prior to starting work in the morning and again right after lunch.</li> <li>Leather Gloves must be worn at all times when digging, screening or carrying field equipment.</li> <li>Leather gloves should be of sufficient length to cover the entire wrist and cuff of the shirt.</li> <li>Carefully remove gloves, without touching the exterior surface, when taking notes and prior to lunch or restroom breaks.</li> <li>Gloves that become worn should be replaced immediately.</li> <li>Do not scratch or rub the face or other exposed skin while wearing gloves.</li> <li>Workers will apply Tecnu (or similar product) to the hands and forearms immediately after removing their gloves, prior to lunch and again at the end of the day. Tecnu will help cleanse the urushiol oil from the skin before it can be absorbed. Sensitive individuals can also apply prior to showering in the evening.</li> </ul>	Select One / shade cell colour: L
	13C) 1. Arm Contact	13C) 1. Arm Contact <ul style="list-style-type: none"> <li>Apply IvyX (or similar product) to hands, forearms and other potentially exposed parts of the body, prior to starting work in the morning and again right after lunch.</li> <li>Wear light weight, long sleeved shirts as the sleeves will provide a physical barrier between the skin and any urushiol oil encountered. Disposable gauntlets may be worn over arms to keep oil from clothing as well.</li> <li>Have the sleeves pulled down to the base of the hand, covering the forearm and wrist (all exposed skin).</li> <li>Workers will apply Tecnu (or similar product) to the hands and forearms immediately after removing their gloves, prior to lunch and again at the end of the day. Tecnu will help cleanse the urushiol oil from the skin before it can be absorbed. Sensitive individuals can also apply prior to showering in the evening.</li> </ul>	Select One / shade cell colour: L
	13C) 2. Leg Contact	13C) 2. Leg Contact <ul style="list-style-type: none"> <li>Wear long pants and boots.</li> <li>Assume boots are contaminated with the urushiol oil and only handle with gloved hands.</li> </ul>	Select One / shade cell colour: L
	13D) Exposure from Handling Contaminated Equipment	13D) Exposure from Handling Contaminated Equipment <ul style="list-style-type: none"> <li>Exposure from Handling Contaminated Equipment</li> <li>Do not handle any field equipment that may have come in contact with poison ivy/oak/sumac without gloves.</li> <li>Decontaminate all equipment at the end of each workday with a solution of water and dish soap.</li> <li>Scrub all surfaces of the screens and shovels with a brush.</li> <li>Rinse with cool water using a portable garden sprayer.</li> </ul>	Select One / shade cell colour: L
	13D) 1. Exposure from Handling Contaminated Clothing	13D) 1. Exposure from Handling Contaminated Clothing <ul style="list-style-type: none"> <li>Wash clothing potentially contaminated with urushiol oil prior to wearing again.</li> <li>Handle contaminated clothing with gloves as the oil can remain on environmental surfaces for up to 5 years.</li> </ul>	Select One / shade cell colour: L

# AHA – Work at CASTNET Monitoring Sites

## Site Calibration, Operation, and Servicing



	13E) Contact with biting insects (i.e. spiders, bees, ticks, etc.)	13E) Contact with stinging/biting insects <ul style="list-style-type: none"> <li>Look for signs of insects. Discuss the types of insects expected at the Site and be able to identify them.</li> <li>Wear Modified Level D PPE as described in the HASP. In addition, wear long sleeve shirts, pants tucked into boots, and a hat. Wear light colored fabric in order to see insects. Protective netting that may be worn over your head/face maybe necessary in some instances.</li> <li>Avoid contact with the insects if possible.</li> <li>Inform your supervisor and the Site Health and Safety Supervisor if you have any allergies to insects and insect bites. Make sure you have identification of your allergies with you at all times and appropriate response kits if applicable.</li> <li>Get medical help immediately if you are bitten by a black widow or brown recluse, or if you have a severe reaction to any spider bite.</li> </ul>	Select One / shade cell colour: L
	13F) Electricity	13F) Exposure to electricity <ul style="list-style-type: none"> <li>Always make sure all electrically-powered sampling equipment is in good repair. Report any problems so the equipment can be repaired or replaced.</li> <li>Never do repairs on electrical equipment unless you are both authorized and qualified to do so.</li> <li>Use only correctly grounded equipment. Never use three-pronged cords which have had the third prong broken off.</li> <li>Watch for wires and connections which are damaged, worn or broken.</li> <li>Use a Ground Fault Circuit Interrupter (GFCI) when using electrically-powered sampling equipment outdoors or in a damp area. Do not handle any electrical equipment, including cords and plugs, with wet hands. Keep all sampling equipment (except the portion that is designed to be submersed in water) dry.</li> <li>When unplugging a cord, pull on the plug rather than the cord.</li> </ul>	Select One / shade cell colour: L
	13G) Working at height – (Currently applies only to White Face Mountain, NY – site WFM007)	13G) Working at height <ul style="list-style-type: none"> <li>Always wear an inspected and approved fall protection device.</li> <li>Only work at height after being trained in the proper use of your fall protection device.</li> <li>Always have a second person onsite when using fall protection devices.</li> </ul>	Select One / shade cell colour: L

# AHA – Work at CASTNET Monitoring Sites Site Calibration, Operation, and Servicing



## FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

NAME(S):

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SIGNED:

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DATE:

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SITE SUPERVISOR:

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SIGNED:

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DATE:

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## **Appendix B: Tailgate Safety Meeting Checklist**

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# Tailgate Safety Meeting



Site ID: \_\_\_\_\_ Project: CASTNET (6064193003)

Site H&S Officer: Michael Smith Signature: \_\_\_\_\_

Date: \_\_\_\_\_ Type of work to be done today: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Safety calls to Wood upon arrival and prior to departure: (904) 391-3777**

Safety call upon arrival (Time: \_\_\_\_\_)  Safety call prior to departure (Time: \_\_\_\_\_)

**Note: Safety calls are required if working alone.**

**Protective Clothing/Equipment suggested/required for all sites unless otherwise noted:**

Hard Sole Boots  Work Gloves  Clothing  Harness  Safety Glasses Other: \_\_\_\_\_

**Chemical Hazards:**  Ozone Buildup  CO/SO<sub>2</sub>/NO Buildup Other: \_\_\_\_\_

**Physical Hazards:**  Ladder Safety  Electrical Hazards  Hunting Activity Other: \_\_\_\_\_

**Biological Hazards:**  Poisonous Plants  Biting/Stinging Insects Other: \_\_\_\_\_

**Y N** Emergency Medical Information including directions to the nearest hospital are posted clearly inside the  
  shelter.

**Emergency Procedures: CPR, First Aid, Transport**

**Call SHS Officer Mike Smith (352) 665-6620**

**Call Field Operations Manager Ph# (352) 339-5394**

**Emergency Medical: Fire, Sheriff, Ambulance, Police-911**

**Hospital Location and Hospital:** \_\_\_\_\_

**Special Equipment:**  Power Tools (Type: \_\_\_\_\_) Other: \_\_\_\_\_

**Accidents/Incidents (include locations and dates of occurrence):**

\_\_\_\_\_  
\_\_\_\_\_

<u>ATTENDEES</u>	<u>DATE &amp; TIME</u>
_____	_____
_____	_____
_____	_____
_____	_____

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**Appendix C: E&I Control of Hazardous Energy (Lockout/Tagout)**  
**P.2.1.3 (US)**

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Procedure

# E&I Control of Hazardous Energy (Lockout/Tagout) P.2.1.3 (US)

<b>Document number:</b>	HSE-PRO-100260
<b>Document owner:</b>	Vice President of HSSE
<b>Document author:</b>	HSSE Operations Management Team
<b>Revision:</b>	0
<b>Revision date:</b>	19-Jul-2017
<b>This document supports</b>	HSSE

**About this document:** This program outlines establishes the minimum requirements for the protection of employees working on systems, machines, or equipment, where the unexpected energizing, start-up, or release of stored energy could cause injury. It shall be used to ensure that the system, machine, or equipment is isolated from all potentially hazardous energy sources and locked and tagged out prior to employees or subcontractors beginning work in the affected areas. This program also applies to work performed at or near deenergized electrical equipment and circuits.

**Who this document applies to:** This document applies to all employees in the Environment & Infrastructure (E&I) Business Function the United States

**Procedure**

HSE-PRO-100260 Rev. 0 Control of Hazardous Energy (LOTO) Program

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**Responsibility for this document:**

The functional responsibility for the development, review and maintenance of this document rests with the Corporate Vice President of Health, Safety, Security and Environment (HSSE) for Amec Foster Wheeler Environment & Infrastructure, Inc. Americas.

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## 1 Purpose and Scope

This program outlines establishes the minimum requirements for the protection of employees working on systems, machines, or equipment, where the unexpected energizing, start-up, or release of stored energy could cause injury. It shall be used to ensure that the system, machine, or equipment is isolated from all potentially hazardous energy sources and locked and tagged out prior to employees or subcontractors beginning work in the affected areas. This program also applies to work performed at or near deenergized electrical equipment and circuits.

This program applies to all Amec Foster Wheeler Environment & Infrastructure (E&I) Americas operations (including construction) that involve maintenance and servicing of machines and equipment in which the unexpected energizing or start-up of the machines or equipment, or release of stored energy could cause injury to employees or damage to property or equipment. The provisions of this Program shall be implemented prior to working on equipment containing or having the potential to contain hazardous energy sources.

This program is to be used at work locations where the client does not have a lockout/tagout program. If a client program is available, it will be used provided it is as restrictive as this Program. For operations conducted at locations controlled by another employer, that employer's program may be followed if all requirements outlined in this Program are met or exceeded.

Although this Program does not apply to the employees of a local utility company or other responsible entity, when a local utility company or other entity locates lines within an E&I work area, E&I employees will complete any actions required by this Program that have not been performed by the utility or other entity.

The requirements of this Program do not apply to the following:

- Work on cord- and plug-connected electrical equipment that, when unplugged, contains no stored energy and cannot be unexpectedly energized or started up, provided the employee working on the equipment always has exclusive control of the plug.
- Work performed by journeyed electricians on, near, or with conductors or equipment in electrical installations that are covered by the specific requirements of [29 CFR 1910 Subpart S](#).
- Equipment and facilities that are under the exclusive control of electrical utilities, including related equipment for communication, control, or metering.
- Routine operations, such as tool adjustments, provided the operation is repetitive and integral to use of the item, and hazards have been mitigated.
- Calibration of energized equipment when the equipment must be energized to be calibrated.

- Hot tap operations involving transmission and distribution systems containing gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided that it is demonstrated that:
  - Continuity of service is essential;
  - Shutdown of the system is unpractical;
  - Documented procedures are followed;
  - Special equipment is used that will provide proven, effective protection for the employees; and
  - Hot tap operations are only performed by those personnel with appropriate training and experience in the safe performance of hot tap operations.

## **2 Responsibilities**

### **2.1 Corporate Vice President of Health, Safety, Security and Environment**

The Corporate Vice President (VP) of Health, Safety, Security and Environment (Corporate VP of HSSE), or his designee, is responsible for conducting a periodic inspection at least annually to ensure that the procedure and the requirements of [29 CFR 1910.147](#) are being followed.

### **2.2 Group Health, Safety, Security & Environment Manager**

The Group Health, Safety, Security and Environment Manager is responsible for providing aid in the development and implementation of this as well as site-specific procedures within his/her Group.

### **2.3 Unit Manager/Project Manager**

The Unit Manager (UM)/Project Manager (PM) will ensure that employees and subcontractors hired to perform work on a system, machine, or equipment capable of releasing stored energy are knowledgeable in safe lockout/tagout procedures. In addition, the UM/PM shall have the following responsibilities:

- Ensuring that specific written procedures for locking/tagging out specific equipment operated by employees working at sites that they manage are developed, made available to appropriate personnel, and updated as necessary (See [Attachments 2](#) and [3](#)).
- Informing the site owner/operator of E&I's lockout/tagout Program, as necessary.
- Ensuring that work planning includes resources and time for lockout/tagout activities.
- Ensuring that requirements flow down to contractors through the contract.
- Ensuring locks and tags are available before they are expected to be needed.

- Ensuring that affected non-authorized employees receive awareness-level training, as appropriate.

## **2.4 Site Manager**

The SM is responsible for:

- Ensuring all authorized employees are trained in accordance with [29 CFR 1910.147, The Control of Hazardous Energy \(Lockout/Tagout\)](#), and Section 3.0 of this procedure
- Identifying all work activities requiring the isolation and lockout/tagout of hazardous energy sources
- Coordination with the facility point-of-contact to ensure notification of all affected employees
- Issuing the locks and tags to authorized employees and documenting on the [Lockout/Tagout Log](#) (Attachment 1)
- Developing equipment specific lockout/tagout procedures if none are available.

## **2.5 Office HSSE Coordinator**

Provide support, as needed, to ensure implementation of this Program.

## **2.6 Site Health and Safety Officer**

The Site Health and Safety Officer (SHSO) is responsible for implementing and enforcing this procedure, under the guidance of the Corporate VP of HSSE or Group HSSE Manager during project operations and activities. The SHSO is also responsible for documenting implemented procedures. Copies of Lockout/Tagout Logs will be maintained on file by the SHSO.

## **2.7 Subcontractors**

Subcontractor employees involved with the installation, repair, or demolition of a system, machine, or equipment that can store hazardous energy will either accept, or abide by, this SOP or their employer will provide an established written lockout/tagout procedure to E&I for review.

The subcontractor will provide employees trained in the hazards of uncontrolled energy sources and the measures that must be taken to control the hazards (lockout/tagout). Subcontractors will provide their own tags and/or locks for usage for tasks under their control.

### 3 Procedure

#### 3.1 Written Equipment Specific Lockout/Tagout Procedures

##### 3.1.1 Initial Evaluation

An initial evaluation of each piece of machinery, equipment or process where E&I employees will be performing servicing and maintenance activities, must be performed and shall identify potential exposures that must be isolated for maintenance, adjustment or servicing activities, or before certain operational activities can be performed. Several potential exposures requiring isolation before work can begin include, but are not limited to:

- **Electrical hazards:** direct contact with energized circuits or the unexpected electrical activation of machinery or processes.
- **Mechanical hazards:** exposure to moving machinery or components such as gears, levers, conveyers, fan blades, presses, saws, drills, pump shafts and couplings, etc. The power source(s) for machinery may be electric motors, gasoline or diesel engines, gases or steam, etc.
- **Pressure hazards:** direct contact with pressurized gases or liquids that may be released from tanks, pipes, valves, etc.
- **Thermal energy:** contact with steam systems, furnaces, open flames, burners, heaters, extremely cold liquids or gases, etc.
- **Stored energy hazards:** contact with electrical batteries, pressurized gas or liquids in tanks or pipes (pneumatic, hydraulic, etc.), mechanical springs or gravity systems, heat storage devices, etc.
- **Hazardous agents or chemicals:** contact with or exposure to hazardous agents or chemicals.
- Attachment 2 contains the [Hazardous Energy Control Identification worksheet](#) that can be used during this process.

##### 3.1.2 Specific Detailed Written Procedures

Each operation shall develop specific, detailed written procedures for locking/tagging out the equipment and processes identified during the evaluation except if **all** of the following elements exist:

1. The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.
2. The machine or equipment has a single energy source which can be readily identified and isolated.
3. The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
4. The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.

5. A single lockout device will achieve a locked-out condition.
6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
7. The servicing or maintenance does not create hazards for other employees.
8. The employer, in utilizing this exception, has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance.

These written procedures are a supplement to this Program and affected employees will be notified of the location of the specific lockout/tagout procedures. Copies of the procedures to be used at project sites shall also be attached to the site-specific health and safety plan (HASP) or other project health and safety documents. Under no circumstances will any work be done on equipment without the development/availability of equipment specific lockout/tagout procedures.

Attachment 3 contains an [Example Energy Control Procedure](#) that can be used as a guideline.

## **3.2 Control Devices**

The authorized employee will obtain a lock and tag from the SHSO or subcontractor supervisor. This issuance will be documented by the SHSO by making an entry on the [Lockout/Tagout Log](#), Attachment 1, or the subcontractor on a similar log.

A lock and tag shall be placed on each energy-isolating device used to de-energize an energy source (e.g., circuit and equipment), except as provided in Section 3.2.3 and/or Section 3.2.4 below. When more than one worker will be working on a piece of equipment, group lockout devices shall be used. One qualified worker will be assigned overall responsibility for the group lockout.

### **3.2.1 Locks**

All locks used for lockout devices shall be substantial enough to prevent removal without the use of excessive force and shall be distinctive in color. The locks shall not be used for any other purpose.

### **3.2.2 Tags**

Tags shall be constructed and printed so that exposure to weather conditions will not cause the tag to deteriorate or the message to become illegible. All tags shall have a standard message. The tag attachment means shall be non-reusable, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of not less than 50 pounds. Tag attachments shall be at least equivalent to a one-piece, all-weather tolerant nylon cable tie.

When any employee(s) attaches a lock and tag or tag alone, the employee(s) must note on each tag:

- Employee name or names;
- Date the tag was attached;
- The reason the tag was attached (e.g., repair, maintenance, etc.);
- The name of the equipment locked or tagged out.

Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement or energy isolating devices from the safe or off position.

Where Tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.

### **3.2.3 Locks without Tags**

A lock may be placed without a tag only under all of the following conditions:

- Only one circuit or piece of equipment is de-energized
- The lockout period does not extend beyond the work shift
- Employees or subcontractors exposed to the hazards associated with re-energizing the circuit or equipment are familiar with this procedure

### **3.2.4 Tags without Locks**

When machinery, equipment, or systems **can** be locked out, they must be locked out when they are serviced, maintained, or modified.

If machinery, equipment, or systems cannot be locked out, they must be tagged out with a level of safety equivalent to that of a lock, such as removing an isolating-circuit element or blocking a controlling switch.

Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Tags are subject to the same restrictions as locks for application and removal.

### **3.2.5 Blinds that Accept Lockout Devices**

All blind flanges or slip blinds installed to isolate equipment or systems during construction, maintenance, and repair or servicing shall have provision for the attachment of a tagout device.

### 3.2.6 New Equipment Must Accept Lockout Devices

Whenever a machine or equipment is replaced or undergoes a major repair or modification or whenever new equipment is purchased, energy isolation devices for that machine or equipment shall be designed to accept a lockout device.

### 3.3 Lockout/Tagout Procedure

Prior to the start of a project, the SHSO and the SM (or designee, or subcontractor supervisor) shall survey the work areas to identify activities that require the isolation of a system, machine, or equipment. Prior to the deactivation of a system, machine, or equipment, the SM shall notify the facility point-of-contact and all affected employees. If work is to be conducted at an E&I facility, the HSSE Coordinator and the Unit Manager will be responsible for surveying the work area and notify affected employees.

Lockout/Tagout procedures are to be strictly adhered to when isolation of equipment is necessary to protect workers performing maintenance, repairs or servicing against injury resulting from unexpected energizing or release of hazardous agents.

The lockout/tagout operation and removal of lockout/tagout devices prior to placing equipment or systems back in normal operation shall be carried out in the order of steps set forth below and following the Lockout/Tagout procedures developed specific to each piece of equipment.

The specific written procedures developed must provide a specific statement of the purpose of the procedure (e.g., access pulley system for service or repair), and specific instructions in how to complete all of the applicable elements described below. For example, the specific written procedures must:

- Identify the type(s) of energy systems determined
- Provide specific instructions in how to turn off or shut down the system
- Provide specific instructions in locating and isolating the energy isolating devices for the specific lockout/tagout procedure

#### 3.3.1 General Shut Down and Isolation Procedures

The following are general procedures for shutting down, locking out, testing and starting up equipment. These procedures should be used as a guide when developing the equipment specific procedures. ***These procedures alone are not specific enough to comply with OSHA requirements.*** Refer to Attachment 3 for an [Example Equipment Specific Energy Control Procedure](#).

1. Determine all of the type(s) of energy the system uses. NOTE: The word "system" as used here applies to all equipment, machinery, or systems.
2. Tell the SM, SHSO or if in the office, the Unit Manager and the HSSE Coordinator, what machinery, equipment, or system will be locked and tagged, and what related machinery, equipment, and systems will be affected by the lockout/tagout action.
3. Notify all employees who may be affected that the system will be out of service and locked/tagged out, and the reason for lockout/tagout.

4. Turn off or shut down the system.
5. Isolate the machinery, equipment, or system from the energy source(s).
6. Apply lock(s) and tag(s), ensuring only one key per lock exists and that key remains in his or her control until the lock is removed.
7. Relieve or restrain stored hazardous energy, such as energy in capacitors, springs, elevated machine members, rotating flywheels, and hydraulic systems, by shorting, repositioning, blocking, bleeding, or other appropriate action.
8. Verify that the machinery, equipment, or system is inoperable by using normal operating controls to attempt to start it. Make sure no one is in a location where equipment start-up or other release of hazardous energy may adversely affect him or her.
9. When there is a possibility that there could be a re-accumulation of stored energy that could rise to a hazardous level, verification of isolation will be continued until the work on the equipment is completed, or until the possibility of such accumulation no longer exists.
10. Perform any other tests to ensure that isolation has been achieved and stored hazardous energy is relieved, and return all operating controls to the neutral or "off" position.
11. Fill out a lockout/tagout form and give it to the SHSO or office HSSE Coordinator as soon as possible.
12. Necessary maintenance or service of the system may now be performed.

### **3.3.2 Removal of Locks and Tags, and Placing System Back in Service**

Only authorized workers may remove locks and tags. Workers shall remove only locks and tags that they placed, unless the SM/Unit Manager or SHSO/HSSE Coordinator directs them to remove locks and tags applied by others. This should be the exception, not the rule (see Section 3.3.5).

Locks and tags are removed using the following steps:

1. Check the machinery, equipment, or system and the immediate area to ensure that nonessential items have been removed and that the machinery, equipment, or system is read for safe operation.
2. Check the work area to ensure that all employees are safely positioned or removed from the area.
3. Verify that the controls are all in the neutral or "off" position.
4. Replace any guards removed for lockout.
5. Remove locks and tags.
6. Reenergize the machine, equipment, or system.
7. Check the machine, equipment, or system to ensure it can be operated safely.

8. Notify the SM/Unit Manager that the lock(s) and tag(s) have been removed and the item(s) is back in service. The SM/Unit Manager will fill in the "Date item was returned to service" on the Lockout/Tagout Form.
9. Notify other employees that the system or machine is back in service again.

### **3.3.3 Temporary Lock Removal (For Testing or Positioning Equipment)**

The procedures in this paragraph apply only to situations where lockout/tagout devices must be temporarily removed from the energy isolating device(s) so that the machine or equipment may be tested or positioned.

1. Clear the machine or equipment of tools and materials.
2. Make sure all employees are a safe distance from the equipment or system.
3. Notify affected and authorized employees that lockout/tagout devices are about to be removed.
4. Remove lockout/tagout devices.
5. Energize and proceed with testing or positioning.
6. De-energize all systems and reapply energy control measures to continue servicing and/or maintaining the machine or equipment.

### **3.3.4 Specific Requirements Concerning Valves**

More than almost all other energy isolation devices, valves have a tendency to leak. For this reason, a single closed and locked/tagged valve should not normally be relied on as a secure means of energy isolation where failure of the valve might result in hazard to personnel. Instead, when energy isolation is carried out on hazardous energy sources controlled by valves, use one of the following methods or another equally effective method:

1. Use a blank flange, a slip blind system, or other device that securely blocks the line, duct, or pipe.
2. Double block and bleed. "Double block and bleed" means the closure of a line, duct, or pipe by closing and locking/tagging two in-line valves and by opening and locking/tagging a drain or vent valve in the line between the two closed valves.

### **3.3.5 Removal of Lockout/Tagout Devices by Other Employees**

It is an E&I, and OSHA requirement, that each lockout or tagout device shall only be removed by the person who applied the device. There may be circumstances, however, that necessitate the removal of the lockout or tagout device by another individual, such as when the authorized employee who applied the lockout or tagout device is not available to remove it. The removal of another's lock or tag shall only be conducted if there is no other option (e.g., the employee is ill, has been terminated or is otherwise unable to return to work to remove the lock or tag). If this occurs, the lockout/tagout device may then only be removed under the direction of the Unit Manager, PM, SM, or their designee, provided that the following procedures are followed:

- The Unit Manager, PM, SM, or their designee will verify that the authorized employee who applied the device is not at the office or site.
- The Unit Manager, Project Manager, or their designee will make every effort to contact that employee and have them return to the facility/site to remove their lockout or tagout device. If it is not possible to locate the employee or it is not feasible for the employee to return, notify the employee that their lockout or tagout device will be removed in their absence.
- The Unit Manager, PM, SM, or their designee and a member of the crew who was working on the equipment in question may then remove the lock after determining that it is safe to do so. All such instances must be documented and reported to the SHSO/HSSE Coordinator.
- The Unit Manager, PM, SM, or their designee should try to obtain the key, if possible. (If not possible, insulated bolt cutters will be used.)
- The employee removing the lock shall review surrounding equipment and schematics to make sure related components are understood.
- The steps outlined in Section 3.3.2 shall be followed for the removal of the lockout or tagout device and the re-energizing of the equipment.
- The Unit Manager, PM, SM, or their designee shall verify that the authorized employee has been made aware that their lockout or tagout device has been removed before he/she resumes work at that facility.

### **3.3.6 Coordination with Other Employers**

When more than one crew, craft department, or group is involved, a designated Authorized Employee shall be assigned overall job-associated lockout/tagout responsibility. This Authorized Employee shall coordinate all affected workforces and ensure continuity of protection.

**Using Another Employer's Procedures** - In cases where a client or other employer's lockout/tagout procedures will be followed, E&I employees shall receive training in the specific lockout/tagout procedures prior to the start of those activities.

**Informing Other Employers** - At multi-employer work sites E&I will ensure that the other employers involved or affected by use of E&I lockout/tagout procedures are informed of the procedures contained in this Program as well as the equipment specific lockout or tagout procedures developed for the affected equipment.

**Company Employees Affected by Other Employer Procedures** - In circumstances where E&I employees may be affected by lockout/tagout procedures used by other employers, the Unit Manager or PM shall ensure that information about these procedures is obtained from other employers using lockout/tagout. The Unit Manager or PM shall ensure that this information is provided to employees potentially affected by the use of these procedures.

### **3.3.7 Periodic Inspections**

All specific, detailed, written energy control procedures developed as required by Section 3.1.2 of this Program **and** in use for a period of one year or more, shall be subject to periodic inspection at least annually to ensure that the procedure and the requirements of this Program are being followed (See [Attachment 4](#)).

The periodic inspection shall be conducted to correct any deviations or inadequacies identified and shall be conducted by an Authorized Employee other than the one(s) utilizing the energy control procedure being inspected.

The HSSE Coordinator/SHSO shall certify in writing (See [Attachment 4](#)) that the periodic inspection(s) have been performed. The certification shall include:

- The machine or equipment on which the lockout/tagout was being performed;
- The date of the inspection;
- The employees included in the inspection;
- The person performing the inspection; and
- If any deficiencies are noted, these shall also be listed along with the corrective action taken and the date the corrective action was implemented.

Certifications and documentation of any corrective actions shall be attached to the master copy of the procedure that was reviewed and retained for a period of not less than one full calendar year from the date of review.

## **4 Training and Awareness**

Each affected and authorized employee or subcontractor shall receive training.

### **4.1 Affected Employees**

Affected Employees shall be trained in:

- The purpose and use of the energy control procedures; and,
- The prohibition relating to attempts to restart or reenergize machines or equipment locked/tagged out.

### **4.2 Authorized Employees**

Authorized Employees shall be trained in:

- The recognition of hazardous energy sources, and in the type and magnitude of the energy available in the work place;
- The lockout/tagout procedures as described in this Program;

- The specific procedures developed for the specific system or equipment for which they will need to perform lockout/tagout; and,
- The limitations of tags including:
  - Tags are warning devices and do not provide the physical restraint that is provided by a lock;
  - Tags must not be removed from equipment without authorization from the person named on the tag;
  - Tags and their means of attachment must be made of materials that will be able to withstand the environmental conditions encountered in the workplace;
  - Tags should never be bypassed, ignored or otherwise defeated; and,
  - Tags must be securely attached to energy isolating devices to prevent accidental removal.

### **4.3 Requirement for Retraining**

**Significant Change** - Retraining shall be provided to Affected or Authorized employees whenever there is a change in their job assignment that affects their roles or responsibilities relating to lockout/tagout, a change in machines or equipment, or when there is a change in procedures.

**Performance Issues** - Additional retraining shall be provided at the discretion of the HSSE Coordinator whenever they have reason to believe that the procedures described in this Program are not being followed. Such retraining needs may be indicated as a result of periodic inspections described at Section 3.3.7 of this Program.

**Retraining Outcome** - Retraining shall reestablish employee proficiency in these procedures.

## **5 Records**

### **5.1 Documentation of Training**

Lockout/tagout training or retraining is to be documented in a manner that clearly demonstrates the level of training completed (i.e., Affected or Authorized Employee), the date training was completed, and who provided the training. Hard copies will be maintained locally by the HSSE Coordinator or SSHO. Training shall also be documented in the HSSE online Safety Training System Database.

### **5.2 Lockout/Tagout Logs**

[Lockout/Tagout Logs](#) (Attachment 1) will be maintained by the SHSO or subcontractor supervisor. Records of training and annual program inspections will be maintained in the project, office, or contract files.

## 6 Definitions

The following terms are used within this document.

Term	Definition
<b>Affected Employee</b>	Employees (including subcontractors) whose jobs require them to operate or use systems, machinery, or equipment that is being serviced or maintained or whose jobs require them to work in areas where service or maintenance is being performed.
<b>Authorized Employee</b>	A person who locks out and/or tags out systems, machinery, or equipment in order to perform service or maintenance on that system, machine, or equipment and has been properly trained in the control of hazardous energy sources.
<b>Energy isolating device</b>	A mechanical device that physically prevents the transmission or release of energy including, but not limited to the following: A manually operated circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.
<b>E&amp;I</b>	Amec Foster Wheeler Environment & Infrastructure Americas
<b>Energy Source</b>	Any source of electrical, pneumatic, chemical, thermal, or other energy.
<b>HSSE</b>	Health, Safety, Security and Environment
<b>Hot Tap</b>	A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.
<b>Lockout</b>	The placement of a lockout device on an energy isolating device, ensuring that the equipment being controlled cannot be operated until the lockout device is removed.
<b>Lockout Device</b>	A device that utilizes a positive means (e.g., lock, either key or combination type) to hold an energy isolating device

Term	Definition
	in a safe position and prevent the energizing of a machine or equipment.
<b>OSHA</b>	Occupational Safety and Health Administration (US)
<b>PM</b>	Project Manager
<b>PPE</b>	Personal protective equipment
<b>Qualified Person (Qualified Employee)</b>	<p>A person who can demonstrate by experience or training the ability to recognize potentially hazardous energy and its potential impact on workplace conditions and who has the knowledge to implement adequate methods and means for control and isolation of such energy; a qualified person shall also be trained and certified competent in:</p> <ul style="list-style-type: none"> <li>• Skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment</li> <li>• Skills and techniques necessary to determine the nominal voltage of exposed live parts</li> <li>• Minimum approach distances specified in Occupational Safety and Health Administration (OSHA) 29 CFR 1910.269, <a href="#">Electrical Power Generation, Transmission, and Distribution</a>, corresponding to the voltages to which the qualified employee will be exposed</li> <li>• Proper use of special precautionary techniques, personal protective equipment (PPE), insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electric equipment</li> </ul>
<b>Qualified electrical worker</b>	Means an electrical worker who has been trained in accordance with <a href="#">29 CFR 1910.331 through 1910.335</a> and <a href="#">1910.269</a> , and similar parts of <a href="#">29 CFR 1926</a> .
<b>Servicing and/or Maintenance</b>	Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, or maintaining and/or servicing machines or equipment. These activities include lubricating, cleaning, or un-jamming of machines or equipment and making adjustments or tool changes.
<b>SHSO</b>	Site Health and Safety Officer
<b>SM</b>	Site Manager
<b>Tagout</b>	The placement of a tagout warning device to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Term	Definition
<b>Tagout Device</b>	A prominent warning device or tag capable of being securely attached to an energy isolating device when it is placed in the “safe position” that identifies the applicator or authority who has control of the energy control procedure and contains information, instructions, or both to prevent the operation of an energy isolating device.
<b>UM</b>	Unit Manager
<b>Unqualified worker</b>	A person who has only received awareness-level training in the lockout/tagout Program
<b>VP</b>	Vice President

## 7 References

Document type	Document title	Document no.
Form	<a href="#">Lockout/Tagout Log</a>	HSE-FOR-100386
Form	<a href="#">Hazardous Energy Control Identification Worksheet</a>	HSE-FOR-100387
Form	<a href="#">Energy Control Procedure</a>	HSE-FOR-100388
Form	<a href="#">Certification of Lockout/Tagout Procedure Periodic Inspection Form</a>	HSE-FOR-100389

## 8 Revision History

Revision no.	Revision date	Summary of changes
0	July 2017	Reformatted into new template. Company name change.

## 9 Attachments

Attachment 1 - [Lockout/Tagout Log](#)

Attachment 2 - [Hazardous Energy Control Identification Worksheet](#)

Attachment 3 - [Energy Control Procedure](#)

**Procedure**

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Attachment 4 - [Certification of Lockout/Tagout Procedure Periodic Inspection Form](#)



**Procedure**



**ATTACHMENT 2 – HAZARDOUS ENERGY CONTROL IDENTIFICATION WORKSHEET**

**I. MACHINE IDENTIFICATION:**

Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_  
Serial #: \_\_\_\_\_  
Location of Equipment to be Evaluated: \_\_\_\_\_

**II. OPERATOR CONTROLS: (Type of controls available to the operator)**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**III. ENERGY SOURCES:**

Can machine be locked out a main power source? \_\_\_\_\_

____ Electrical	____ Thermal	____ Pneumatic
____ Pressurized	____ Hydraulic	____ Rotational
____ Chemical	____ Gas	____ Radiological
____ Suspended Parts	____ Vacuum	
____ Spring Tension or Compression		
____ Other: _____		

**IV. IDENTIFY ENERGY SOURCE AND LOCATION:**

#	Energy Source & Location	Lockable?	Type of Lock/Energy Control Device Needed	Method/Location for Controlling Residual Energy
1.				
2.				
3.				
4.				
5.				

**Procedure**

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**EXAMPLE  
HAZARDOUS ENERGY CONTROL IDENTIFICATION FORM**

**I. MACHINE IDENTIFICATION:**

Manufacturer: Witchcraft Magic  
Model: Widget Maker Deluxe  
Serial #: 124-1  
Location of Equipment to be Evaluated: Trinket Manufacturing Area

**II. OPERATOR CONTROLS: (Type of controls available to the operator)**

- 1. Toggle Switch
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

**III. ENERGY SOURCES:**

Can machine be locked out a main power source? \_\_\_\_\_

- |  |                                    |                                       |
|--|------------------------------------|---------------------------------------|
| <input checked="" type="checkbox"/> Electrical         | <input type="checkbox"/> Thermal   | <input type="checkbox"/> Pneumatic    |
| <input type="checkbox"/> Pressurized                   | <input type="checkbox"/> Hydraulic | <input type="checkbox"/> Rotational   |
| <input type="checkbox"/> Chemical                      | <input type="checkbox"/> Gas       | <input type="checkbox"/> Radiological |
| <input type="checkbox"/> Suspended Parts               | <input type="checkbox"/> Vacuum    |                                       |
| <input type="checkbox"/> Spring Tension or Compression |                                    |                                       |
| <input type="checkbox"/> Other: _____                  |                                    |                                       |

**IV. IDENTIFY ENERGY SOURCE AND LOCATION:**

#	Energy Source & Location	Lockable?	Type of Lock/Energy Control Device Needed	Method/Location for Controlling Residual Energy
1.	Electrical, Panel 123, Breaker Switch	Yes	Breaker lockout device/Hasp/Locks	Capacitor – Discharge rod Location identified on equipment
2.				
3.				

**Procedure**

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**ATTACHMENT 3 - ENERGY CONTROL PROCEDURE/PERMIT**

**Site/Office:** \_\_\_\_\_ **Permit Date:** \_\_\_\_\_

**I. MACHINE IDENTIFICATION:**

Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_ Serial #: \_\_\_\_\_

**II. PREPARATION:**

a. Authorized employee and persons participating in lockout procedure will prepare for shutdown and will inform all affected employees that he/she will be locking out this piece of equipment.

b. Obtain locks, keys, and the following energy isolating device(s):

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

**III. SHUTDOWN:**

a. Authorized employee and persons participating in lockout procedure will isolate all energy sources and turn them to the OFF position.

b. The following are the locations of all energy sources:

<b>Energy Source &amp; Location</b>	<b>Lockable?</b>	<b>Type of Lock/Energy Control Device Needed</b>
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

**IV. APPLY LOCKOUT DEVICES/ISOLATE ALL ENERGY SOURCES:**

**Procedure**

Authorized Employee and persons participating in lockout procedure will apply energy isolating device, locks, and tags to appropriate energy source.

**V. CONTROL RESIDUAL ENERGY:**

Authorized employee and persons participating in lockout procedure will control all residual energy by the following method(s):

- 1. \_\_\_\_\_ at Location \_\_\_\_\_
- 2. \_\_\_\_\_ at Location \_\_\_\_\_
- 3. \_\_\_\_\_ at Location \_\_\_\_\_

**VI. VERIFY EFFECTIVENESS:**

Authorized employee and persons participating in lockout procedure will verify lockout procedures are effective by:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

**VII. REMOVAL/RESTORE FROM LOCKOUT/TAGOUT**

- 1. Clear all nonessential tools/personnel from area and verify that all machine/ equipment components are operationally intact
- 2. Verify that controls are in Neutral
- 3. Replace all safety guards
- 4. Remove lockout/tagout devices
- 5. Notify affected employees that machine/equipment is ready for use
- 6. Reenergize machine/equipment

**VIII. AUTHORIZATION TO PERFORM WORK**

I certify that the above equipment/site is safe to perform work

*ISSUING AUTHORITY SIGNATURE:* \_\_\_\_\_

I certify that I understand the nature of the work and certify that the above conditions will be observed at all times

*PERFORMING AUTHORITY SIGNATURE:* \_\_\_\_\_

**IX. WORK COMPLETED PERMIT CLOSURE**

**Procedure**

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*PERFORMING AUTHORITY SIGNATURE:* \_\_\_\_\_ *DATE:* \_\_\_\_\_

*ISSUING AUTHORITY SIGNATURE:* \_\_\_\_\_ *DATE:* \_\_\_\_\_

**Procedure**

**EXAMPLE**

**Site/Office:** XYZ Site **Permit Date:** 9/18/13

**X. MACHINE IDENTIFICATION:**

Manufacturer: Witchcraft Magic  
Model: Widget Maker Deluxe Serial #: 124-1

**XI. PREPARATION:**

- a. Authorized employee and persons participating in lockout procedure will prepare for shutdown and will inform all affected employees that he/she will be locking out this piece of equipment.
- b. Obtain locks, keys, and the following energy isolating device(s):
  - 1. Breaker device
  - 2. Hasp
  - 3. \_\_\_\_\_

**XII. SHUTDOWN:**

- a. Authorized employee and persons participating in lockout procedure will isolate all energy sources and turn them to the OFF position.
- b. The following are the locations of all energy sources:

Energy Source & Location	Lockable?	Type of Lock/Energy Control Device Needed
1. <u>Electrical Panel 123, Breaker Switch #2</u>	<u>Yes</u>	<u>Breaker lockout device, Hasp, Locks</u>
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

**XIII. APPLY LOCKOUT DEVICES/ISOLATE ALL ENERGY SOURCES:**

Authorized Employee and persons participating in lockout procedure will apply energy isolating device, locks, and tags to appropriate energy source.

**Procedure**

**XIV. CONTROL RESIDUAL ENERGY:**

Authorized employee and persons participating in lockout procedure will control all residual energy by the following method(s):

- |  |             |  |
|--|-------------|--|
| 1. Discharge capacitor using discharge rod | at Location | Capacitor location identified in equipment |
| 2. _____                                   | at Location | _____                                      |
| 3. _____                                   | at Location | _____                                      |

**XV. VERIFY EFFECTIVENESS:**

Authorized employee and persons participating in lockout procedure will verify lockout procedures are effective by:

1. Turning toggle switch to on
2. Test electrical box on north end of equipment with multi-meter
3. \_\_\_\_\_

**XVI. REMOVAL/RESTORE FROM LOCKOUT/TAGOUT**

- a) Clear all nonessential tools/personnel from area and verify that all machine/ equipment components are operationally intact
- b) Verify that controls are in Neutral
- c) Replace all safety guards
- d) Remove lockout/tagout devices
- e) Notify affected employees that machine/equipment is ready for use
- f) Reenergize machine/equipment

**XVII. AUTHORIZATION TO PERFORM WORK**

I certify that the above equipment/site is safe to perform work

ISSUING AUTHORITY SIGNATURE: AMEC Employee authorizing work

I certify that I understand the nature of the work and certify that the above conditions will be observed at all times

PERFORMING AUTHORITY SIGNATURE: AMEC or Subcontractor employee doing the work

**XVIII. WORK COMPLETED PERMIT CLOSURE**

**Procedure**

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---

PERFORMING AUTHORITY SIGNATURE: AMEC emp who authorized  
the work DATE: \_\_\_\_\_

ISSUING AUTHORITY SIGNATURE: AMEC or Subcontractor who did  
the work DATE: \_\_\_\_\_



# ATTACHMENT 4 - CERTIFICATION OF LOCKOUT/TAGOUT PROCEDURE PERIODIC INSPECTION FORM

## I. MACHINE IDENTIFICATION:

Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_

Serial #: \_\_\_\_\_

## II. INSTRUCTIONS:

The inspection shall be conducted by an authorized employee who is not one of the authorized employees who uses the energy control procedures being inspected. The inspector must conduct a review of sufficient breadth to enable him/her to identify and correct, any deviations from, or inadequacies in, the energy control procedure. The inspection shall include:

- The observation of a representative number of authorized employees performing the lockout tagout tasks outlined in the equipment specific energy control procedures.
- A review of the employee’s responsibilities under the energy control procedures with **every authorized** employee (for either lockout or tagout).
- A review of the employee’s responsibilities under the energy control procedures with **every affected** employee (only required when tagout alone is used – no locks).

## III. EMPLOYEES REVIEWED:

Energy control procedures involve tagout only? \_\_\_\_\_

Record the name of the employee(s) included in the inspection and indicate whether they were observed performing the energy control procedures and if employee is an authorized employee.

Employee Name	Observed?	Authorized?

**Procedure**

**DEFICIENCIES AND CORRECTIVE ACTION:**

List any deficiencies noted along with the corrective action taken and the date the corrective action was implemented:

Deficiency	Corrective Action	Date Implemented
1.		
2.		
3.		
4.		
5.		

**IV. INSPECTION CONDUCTED BY:**

Name of Inspector: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_

**V. CERTIFICATION:**

I hereby certify that the periodic inspection, was conducted as required by 29 CFR 1910.147(c)(6).

_____	_____
<b>Name (Print)</b>	<b>Signature</b>
_____	_____
<b>Title</b>	<b>Date</b>

Attach this completed document to the master copy of the procedure that was reviewed and retain for a period of not less than one full calendar year from the date of review.

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## **Appendix D: E&I Fall Protection and Prevention S.2.2.5 (US)**

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Procedure

# E&I Fall Protection and Prevention

## S.2.2.5 (US)

<b>Document number:</b>	HSE-PRO-100284
<b>Document owner:</b>	Vice President of HSSE
<b>Document author:</b>	HSSE Operations Management Team
<b>Revision:</b>	0
<b>Revision date:</b>	24-Jul-2017
<b>This document supports</b>	HSSE

**About this document:** In accordance with Occupational Safety and Health Administration (OSHA) [29 CFR 1926 Subpart M, Fall Protection](#), and [29 CFR 1926.104, Safety Belts, Lifelines, and Lanyards](#), [1926.105, Safety Nets](#), and [1926.106, Working Over or Near Water](#), the purpose of this Procedure is to provide guidelines to ensure the safety of personnel working in areas where the potential exists for falls from elevated surfaces above 6 feet.

**Who this document applies to:** This document applies to all employees in the Environment & Infrastructure (E&I) Business Function the United States.

**Responsibility for this document:** The functional responsibility for the development, review and maintenance of this document rests with the Corporate Vice President of Health, Safety, Security and Environment (HSSE) for Amec Foster Wheeler Environment & Infrastructure, Inc. Americas.

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## 1 Purpose and Scope

In accordance with Occupational Safety and Health Administration (OSHA) [29 CFR 1926 Subpart M, Fall Protection](#), and [29 CFR 1926.104, Safety Belts, Lifelines, and Lanyards](#), [1926.105, Safety Nets](#), and [1926.106, Working Over or Near Water](#), the purpose of this Procedure is to provide guidelines to ensure the safety of personnel working in areas where the potential exists for falls from elevated surfaces above 6 feet.

This Procedure applies to all Amec Foster Wheeler Environment & Infrastructure (E&I) Americas personnel, personnel subcontracted to E&I, and visitors (including clients) of E&I who may work on or visit E&I job sites. All applicable Fall Protection regulations must be reviewed prior to commencing work.

## 2 Responsibilities

### 2.1 Corporate Vice President of Health, Safety, Security and Environment

The Corporate Vice President (VP) of Health, Safety, Security and Environment Director (HSSE) is responsible for ensuring that the fall protection and prevention procedure complies with federal and state OSHA requirements. The Corporate VP of HSSE or local HSSE Coordinator or designee with technical expertise, assists the Project Manager (PM) and/or Site Manager (SM) in determining the applicability of the fall protection procedures to tasks performed by employees and subcontractors.

### 2.2 Group Health, Safety, Security and Environment Manager

The Group Health, Safety, Security and Environment Manager is responsible for providing aid in the development and implementation of this as well as site-specific procedures within his/her Group.

### 2.3 Office HSSE Coordinator

Provide support, as needed, to ensure implementation of this Procedure.

### 2.4 Project Manager

The PM is responsible for incorporating the requirements of this Procedure into project plans, budgets, and activities. The PM is also responsible for providing the personnel, funds, and management support needed to implement the Fall Protection and Prevention procedure. The PM conducts assessments of fall protection.

### 2.5 Site Manager

The SM is responsible for ensuring:

- Compliance with this standard operating procedure (SOP)
- Personnel are trained in accordance with Section 6.0
- Adequate fall arrest equipment is on-site and in good working order

## **2.6 Site Health and Safety Officer**

The Site Health and Safety Officer (SHSO) is responsible for inspecting the work site to ensure compliance with this Procedure and providing technical assistance during project planning to ensure the best method for fall protection is used. The SHSO is also responsible for ensuring that adequate training regarding fall protection is administered to employees.

## **2.7 Subcontractors**

E&I subcontractors involved in project work where fall protection and prevention equipment/devices are warranted or required will either accept and abide by this SOP or provide an established written procedure to the E&I PM and/or SM for review.

If the subcontractor builds guardrails or other opening protection, the components and finished product(s) must meet OSHA requirements and those outlined in this SOP. Any fall protection equipment provided by the subcontractors for their employees or E&I employees must meet OSHA/ANSI requirements and those outlined in this SOP.

# **3 Procedure**

## **3.1 General Requirements**

Each Project that will have work at heights requiring fall prevention and/or protection will develop a written Site-Specific Fall Prevention and Protection Plan when conventional Fall Protection is demonstrated to create a greater hazard. Contact the Group HSSE Manager for assistance.

Each Project shall identify the on-site Designated Competent Person for fall prevention and protection, when one is required, and communicate this to all employees. In most instances, General Contractor shall fill this role. Contact the Group HSSE Manager for assistance in identifying an internal Competent Person if needed.

In every instance, the Project shall attempt to limit exposure to falls through utilization of administrative controls and engineering controls such as fall prevention. Fall exposure requiring the use of fall protection equipment is the last resort.

Safety nets, Controlled Access Zones, and Safety Monitoring Systems shall not be used as a means of fall protection or prevention.

Work at heights shall be evaluated during weather conditions that may increase the hazard of a fall, such as, but not limited to, snow, rain, icing, wind gusts of 35 MPH or sustained winds of 25 MPH or less based upon the work task being performed (e.g. employee[s] handling plywood or other material capable of excessive wind loads).

- Employees exposed to fall hazards shall be properly trained (refer to Training Section for Fall Protection Training requirements).
- The Site-Specific Fall Prevention and Protection Plan shall include means of rescue for every projected fall exposure.

### 3.2 Specific Planning

A task-specific fall protection shall be generated for all leading-edge work, pre-cast concrete erection, when the use of conventional Fall Protection is demonstrated to create a greater hazard, or if the complexity or magnitude of the assessed fall hazards dictates additional Fall Protection Planning.

The intent of the task-specific plan is to demonstrate the specific methods to be used to protect employees when conventional Fall Protection is not feasible or additional Fall Protection methods must be applied to provide for a safe work environment.

The Fall Protection Plan shall be reviewed and approved by the Group HSSE Manager and the PM or SM prior to implementation.

All persons working to a task-specific Fall Protection Plan shall be trained to the plan prior to beginning work.

A copy of the task-specific Fall Protection Plan shall be located and made available in the work area.

### 3.3 Fall Protection

Supervisors and employees shall complete an Activity Hazard Analysis (AHA) and review the specific hazards and mitigations prior to using Fall Protection. AHAs shall include an assessment of guarding to prevent exposure to moving equipment or entanglement hazards. Note: Site specific AHAs can act as the Fall Protection Plan for work that does not specifically require a plan as identified in section 3.2 – Specific Planning.

An approved harness with dual shock-absorbing lanyards with double-locking snap hooks shall be worn at all times (100% Fall Protection Rule) that an employee is exposed to a fall of six feet (6') or greater, when measuring from his/her feet. Unless an employee's harness is attached to a retractable device or a rope grab, at least one of the two lanyards shall be tied off to a substantial anchorage capable of supporting 5,000 pounds, or two (2) times the maximum intended load. Tails of retractable lanyards shall be no more than 24 inches to avoid being a tripping hazard.

On projects where Amec Foster Wheeler is required to follow the General Industry Standards (29 CFR 1910), the exposure height for fall protection is four feet (4') or greater.

Lanyards are to be tied off to a point above the D-ring of the employee's harness to reduce the total free fall distance to six feet (6') or less.

- If a situation occurs where tie-off above the D-ring is not feasible, or the fall distance is so limited that current equipment will not allow the employee(s) to avoid contact with a lower level, the SHSO and the Group HSSE Manager shall review the situation to determine a solution that will safeguard the employee.
- **NOTE:** Use of "extenders" or "cheaters" that increase the total free fall distance to greater than six feet (6') shall require a specific fall protection plan that is reviewed

and approved by the SHSO and Group HSSE Manager prior to use. In addition, the use of the “extenders/cheaters” will also require that their limits be identified on the AHA for each task for which the approval is allowed.

Amec Foster Wheeler has established a 100% Tie-Off Rule. This rule requires that personnel exposed to a fall greater than six feet (6’), four feet (4’) in a General Industry setting, shall, at all times, be connected to an appropriate anchorage point that can support 5,000 pounds per employee attached by means of an approved lanyard, rope grab or retractable lanyard. The only exception to this policy will be if the employee(s) are working to a situation-specific Fall Protection Plan approved by the Corporate VP of HSSE or Group HSSE Manager as well as the SHSO for the safe performance of a task where conventional Fall Protection methods cannot be achieved and appropriate Fall Protection methods have been identified and implemented.

### 3.4 Guardrail Systems

A guardrail system is a barrier erected to prevent employees from falling to lower levels. Guardrail systems, or other engineering controls, are the preferred form of fall protection.

- For work taking place at 4-feet (or above), a guardrail with a mid-rail is required to comply with [29 CFR 1910.23, Guarding Floor and Wall Openings and Holes](#).
- Work that is performed at 6 feet (or above) requires a guardrail to comply with [29 CFR 1926.501, Duty to Have Fall Protection](#).
- Work at 25 feet (or above) over water requires fall protection to comply with [29 CFR 1926.105, Safety Nets](#).

A guardrail shall consist of the following:

- A top rail, 42 inches (3.5-feet) plus or minus 3-inches above the surface
- A mid-rail, halfway between the top rail and the surface, or a screen extending from the top rail to the surface

Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within 2-inches of the top edge. When applied in a downward direction, the top edge shall not deflect to a height less than 39 inches.

For wood railings, the top rails and posts shall be at least 2-inch by 4-inch lumber, with posts spaced not more than 8 feet on center. The midrail shall be at least 1-inch by 6-inch lumber.

For pipe railings, the posts, top rails, and mid-rails shall be at least 1.5-inches in diameter (schedule 40 pipe) with posts spaced not more than 8-feet apart on centers.

Toeboards or screens shall be installed when there is a potential for material to fall onto personnel on a lower level. Toeboards shall be a minimum of 3.5-inches high and installed with a maximum clearance of 1/4 inch above the surface.

### 3.5 Fall Arrest Systems

Fall arrest systems are required when the use of guardrails or other engineering controls are not feasible. Fall arrest systems consist of an anchorage, connectors, and body harness, and may include a lanyard, deceleration device, lifeline, or a suitable combination of these. Examples of fall protection/arrest system components are shown in Attachment 1. Fall arrest system examples are shown in Attachment 2. Procedures for fall protection are as follows:

- All fall arrest equipment shall be appropriate for the task; shall meet the requirements of [29 CFR 1926.502\(d\)](#), [104](#), [105](#), [106](#); and shall be ANSI-approved.
- All fall arresting, descent control, and rescue equipment shall be approved and used in accordance with the manufacturer's recommendations.
- All fall arrest equipment shall be inspected before each use. Equipment that shows evidence of damage must be immediately tagged "Do Not Use." Some fall protection equipment inspection points are provided in Attachment 3.
- All fall arrest equipment used in a fall must be immediately turned over to the SHSO and not reused.
- Body belts may not be used in fall arrest systems.
- Snap-hooks shall be a locking type designed to prevent accidental disengagement.
- Do not use a lanyard with a snap-hook clipped onto its self unless it has specifically been designed to be used in this manner.
- To comply with the 100% Tie-Off Rule, double lanyard systems shall be required if disengagement of a lanyard is required for employee movement. At least one lanyard shall remain connected at all times during movement. The tail of retractable lanyard shall be no more than 24 inches long to avoid becoming a tripping hazard.

### 3.6 Positioning Device Systems

Positioning device systems and their use shall conform to the following provisions:

- Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet.
- Positioning device systems shall be inspected prior to each use for wear, damage, and other deterioration, and defective components shall be removed from service.
- The use of non-locking snap-hooks is prohibited
- Anchorage points for positioning device systems shall be capable of supporting two times the intended load or 3,000 pounds, whichever is greater.

### 3.7 Warning Line Systems

Warning line systems shall be utilized to inform personnel they are nearing an unprotected edge. If leading edge work is being conducted, they shall be erected not less than 6-feet from the unprotected edge. If other than leading edge work is being conducted, the warning lines shall be erected not less than 15 feet from the unprotected

edge. Warning Line Systems shall consist of ropes, wires, or chains, and supporting stanchions erected as follows:

- The warning line system shall be flagged at not more than 6-foot intervals with high-visibility material or a high-visibility tape or ribbon at least 2 1/2-inches wide.
- The warning line system shall be suspended in such a way that its lowest point is no less than 34 inches and its highest point no more than 39 inches.
- The stanchions, with line attached, shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally 30 inches above the surface.
- The warning line system shall have a minimum tensile strength of 500 pounds.
- The warning line system shall be secured to the stanchions in such a way that pulling on one section will not result in slack being pulled from other sections before the stanchion tips over.

### **3.8 Floor, Roof, and Wall Openings**

All floor openings shall be guarded by a standard guardrail or cover. Covering shall be secured in place to prevent accidental removal or displacement and shall be labeled "Caution: Hole - Do Not Remove."

Ladder-way floor openings or platforms shall be guarded by standard railings with standard toeboards on all exposed sides, except at the entrance to an opening, with the passage through the railing either a swinging gate or offset so that a person cannot walk directly into the opening.

Whenever there is a danger of falling through a skylight opening, the skylight shall be guarded by a fixed standard guardrail or cover capable of sustaining the weight of a 200-pound person.

Wall openings from which there is a drop of more than 4-feet to the surface below, and whose bottom opening is less than 3-feet above the upper working surface that leads to the wall opening, shall be guarded with a standard guardrail.

### **3.9 Structural Integrity of Walking and Working Surfaces**

The structural integrity of any roof or elevated surface shall be evaluated, prior to allowing access. Workers shall identify potentially weak areas, such as, excessive rusting, signs of deterioration, or if there are obvious differences in the roofing or walking surface materials used which could indicate different strength/weight bearing ability of the materials used. Workers shall not walk on surfaces that have excessive rusting, are deteriorating or are otherwise questionable unless deemed safe by a structural engineer. If the structural walking surface is questionable, alternate means of doing the work (e.g., using inspecting roofs using aerial lifts), shall be used.

## 4 Training and Awareness

Employees utilizing fall protection shall be trained in the following areas:

- The nature of fall hazards in the work area
- Correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used
- Use and operation of guardrail systems, personal fall arrest systems, safety net systems, safety monitoring systems, warning line systems, and other protection to be used
- Correct procedures for handling and storing equipment and materials and erecting protection from overhead hazards (e.g., falling objects from above)
- The role of employees in fall protection plans

Employees shall be retrained when:

- Changes in the workplace render previous training obsolete
- Changes in the types of fall protection systems or equipment to be used render previous training obsolete
- Their behavior on-site indicates that they have not retained the initial training or did not comprehend the importance of it.

## 5 Records

### 5.1 Inspection and Maintenance

Fall protection equipment shall be inspected for damage and deterioration prior to each use. Attachment 3 indicates inspection items of fall protection systems. Defective components shall be removed from service and submitted to the SHSO for repair or replacement.

When used, the SHSO shall inspect safety nets weekly for wear, damage, and other deterioration. Defective components shall be removed from service. Defective nets shall not be used.

Inspection and maintenance will be documented on the [Fall Protection System Inspection and Maintenance Record](#) (Attachment 4).

### 5.2 Training

A record of attendance at training sessions shall be maintained in the employee records. The record shall contain the name, social security number, employer's name, date of training, and the signature of the person who conducted the training. Training records will be maintained by the SHSO as part of the project and company records. Records of fall protection training shall also be entered into the on-line HSSE Safety Training System Database.

## 6 Definitions

The following terms are used within this document.

Term	Definition
<b>Anchorage</b>	Secure point of attachment for lifelines, lanyards, or deceleration device.
<b>ANSI</b>	American National Standards Institute.
<b>Body Belt</b>	A belt with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device. Body belts shall not be used by E&I employees or subcontractors working on an E&I job site.
<b>Body Harness</b>	Straps that may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, and that can be attached to a lanyard, lifeline, or deceleration device.
<b>Connector</b>	A device used to couple (connect) parts of the fall arrest system and positioning device systems together. It may be the independent component of a system (such as a carabiner) or it may be an integral component of the system (such as a buckle or D-ring sewn into a body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
<b>Deceleration Device (shock-absorbing unit)</b>	Any mechanism that dissipates a substantial amount of energy during a fall arrest, or otherwise limits the energy imposed on an employee during fall arrest. Examples include a rope grab, rip-stitch lanyard, woven lanyard, tearing or deforming lanyards, automatic self-retracting lanyards/lifelines, etc.
<b>E&amp;I</b>	Amec Foster Wheeler Environment & Infrastructure Americas
<b>Fall Arrest System</b>	A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and body harness, and may include a lanyard, deceleration device, lifeline, or suitable combination of these.
<b>Floor Hole</b>	An opening measuring less than 12 inches but more than 1 inch in its least dimension in any floor, roof, or platform through which materials, but not persons, may fall.
<b>Floor Opening</b>	An opening measuring 12 inches or more in its least dimension in any floor, roof, or platform through which persons may fall.

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<b>Term</b>	<b>Definition</b>
<b>Free Fall</b>	The act of falling before a fall arrest system begins to apply force to arrest the fall.
<b>Guardrail System</b>	A barrier erected to prevent employees from falling to lower levels.
<b>HSSE</b>	Health, Safety, Security and Environment
<b>Lanyard</b>	A flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the harness to a deceleration device, lifeline, or anchorage.
<b>Lower Levels</b>	Those areas or surfaces to which an employee can fall. This includes, but is not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.
<b>OSHA</b>	Occupational Safety and Health Administration (US)
<b>PM</b>	Project Manager
<b>PPE</b>	Personal protective equipment
<b>SHSO</b>	Site Health and Safety Officer
<b>Stanchion</b>	An upright bar, beam, or post used as a support.
<b>SM</b>	Site Manager
<b>UM</b>	Unit Manager
<b>Unprotected Sides and Edges</b>	Any side or edge of a walking/working surface that is at least 39 inches (3.25 feet) above ground surface and where there is no wall or guardrail system.
<b>Wall Opening</b>	An opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall.
<b>Warning System Line</b>	A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and that designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.
<b>VP</b>	Vice President

## 7 References

Document type	Document title	Document no.
Form	<a href="#">Fall Protection System Inspection and Maintenance Record</a>	HSE-FOR-100421

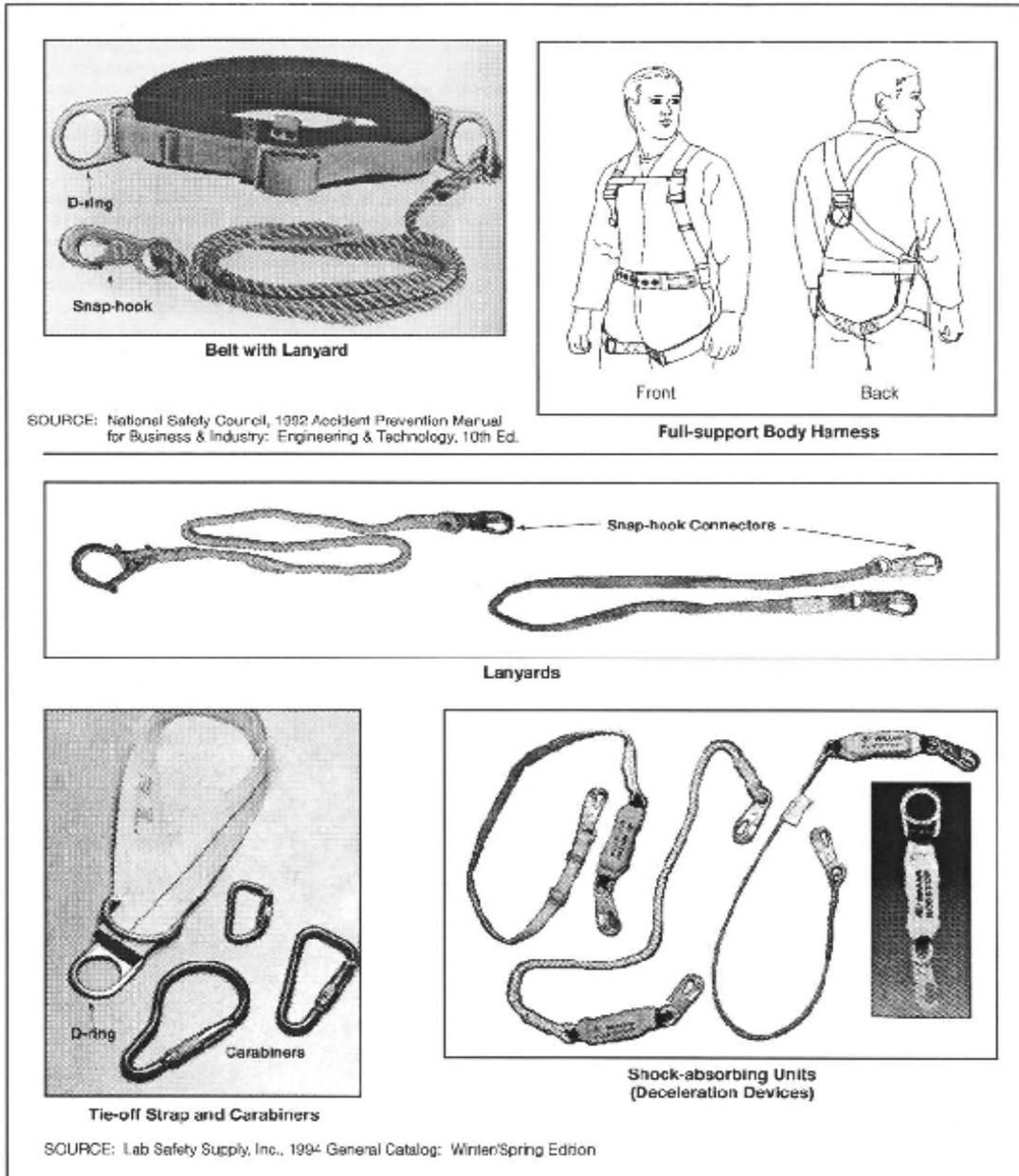
## 8 Revision History

Revision no.	Revision date	Summary of changes
0	May 2017	Reformatted into new template. Company name change.

## 9 Attachments

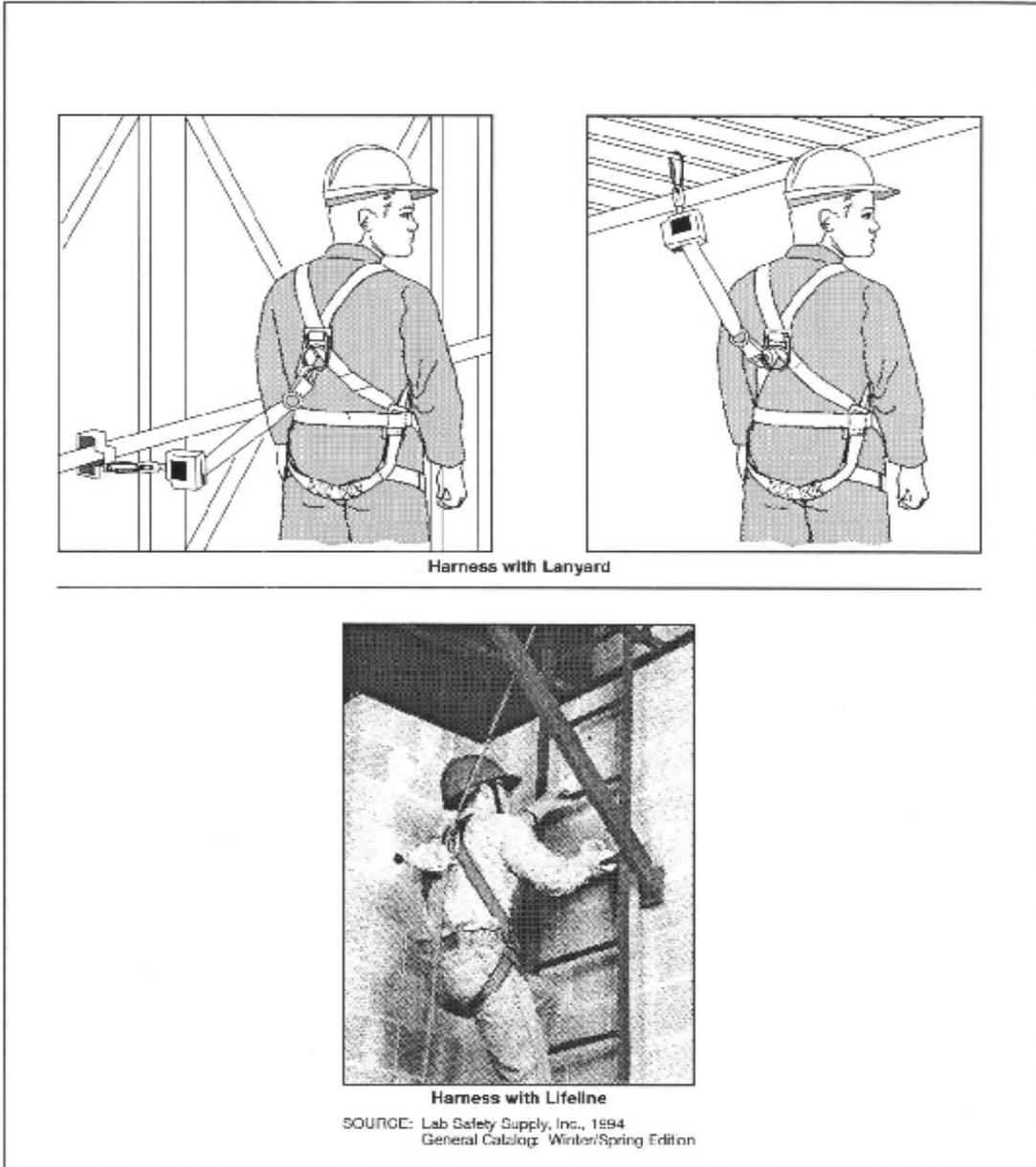
- Attachment 1 - Fall Arrest System Components
- Attachment 2 - Fall Arrest System Examples
- Attachment 3 - Fall Protection Equipment Maintenance and Inspection Guide
- Attachment 4 - [Fall Protection System Inspection and Maintenance Record](#)

ATTACHMENT 1 – FALL ARREST SYSTEM COMPONENTS



Fall Arrest System Components

**ATTACHMENT 2 – FALL ARREST SYSTEM EXAMPLES**



**Fall Arrest System Examples**



## ATTACHMENT 3 – FALL PROTECTION EQUIPMENT MAINTENANCE GUIDE

### Fall Protection Equipment Maintenance and Inspection Guide

Components	Lifetime (yrs) Service Shelf	System Rating*	Check at 3-6 mo. intervals
<b>Webbings</b> (Belts, harnesses, lanyards)	2-3	7 5,000 lb. OSHA - static 900 lb. OSHA for belts - dynamic 1800 lb. OSHA for harnesses - dynamic 600-800 lb. shock absorber - dynamic	<ul style="list-style-type: none"> <li>Cuts, wear, burns, pull one unit sample.</li> <li>Owner self-certifies every 6 months maximum</li> </ul>
<b>Ropes</b> (Lifelines, lanyards)	1-2	5 5000 lb. OSHA - static	<ul style="list-style-type: none"> <li>Synthetic: out in strand, paint, worn, dirt inside of rope For strength: pull end sample</li> <li>Cable: Kink, broken wire, terminations. Owner self-certifies every 6 months maximum.</li> </ul>
<b>Hardware</b>			
Hooks	3	5000 lb. OSHA - static	<ul style="list-style-type: none"> <li>Cracks, distortion, wear points, corrosion.</li> </ul>
D-rings	5	5000 lb. OSHA - static	<ul style="list-style-type: none"> <li>Low temperature service impact reliability.</li> </ul>
<b>Fall Devices - Locking</b>			
Rope grabs	1-3	1,000 lb. before slip	<ul style="list-style-type: none"> <li>Recertification.**</li> </ul>
Self-retracting lanyard/lifeline	1-2	3,000 lb. OSHA, static pull at drum	<ul style="list-style-type: none"> <li>Distortion, wear.</li> </ul>
Climbing protection device	5	350-450 lb. before slip 1,000 lb. proof load - static	<ul style="list-style-type: none"> <li>Cleaning difficulty.</li> <li>Compatible parts.</li> <li>Operates manually as intended</li> </ul>
<b>Personal Lowering Devices</b>			
Self-retracting lanyard/lifeline	1-2	4-9 ft/sec., ≠ 3,000 lb. line strength	<ul style="list-style-type: none"> <li>Recertification.**</li> </ul>
Controlled descent device	5	3-6 ft/sec., ≠ 3,000 lb. line strength	<ul style="list-style-type: none"> <li>Distortion, wear</li> </ul>
Descent control device	1-2	Overspeed limit, 5,000 lb. line strength	<ul style="list-style-type: none"> <li>Controlled payout, equipment readiness for emergency.</li> <li>Operates manually as intended.</li> </ul>

\* System Rating: Minimum break strength, maximum arrest force range.  
 \*\* Recertification: manufacturers offer reconditioning and inspection services.  
 ≠ Descent speed at 310 lbs. load.

Note 1: Metal goods should have no limit on shelf life expectation as long as they meet the current standards for use. Check date stamp on each piece of hardware before requesting information.  
 Note 2: Warning! Any broken stitches signal the need to remove any webbing product from service because failure could occur at any time with subsequent stresses.  
 Note 3: Old or obsolete models may not meet current industry specifications and should be replaced.  
 Note 4: UL means Underwriters' Laboratories.

Reprinted courtesy of J. Nigel Ellis.  
 SOURCE: Introduction to Fall Protection, J.Nigel Ellis, ASSE

**Procedure**

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**ATTACHMENT 4 – FALL PROTECTION EQUIPMENT MAINTENANCE AND INSPECTION RECORD**

Fall Protection Systems: \_\_\_\_\_ Date Purchased: \_\_\_\_\_  
Inspected by: \_\_\_\_\_ Date Inspected: \_\_\_\_\_ Date of Last Inspection: \_\_\_\_\_

Component(s)	Unacceptable Condition(s)	Condition Observed?	Date Corrected	Method of Correction
<b>Webbing</b>				
- Belts	▪ Cuts, wear, burn, pull one unit sample	<input type="checkbox"/>		
- Harnesses				
- Lanyards	▪ Not owner-certified (6 months max)	<input type="checkbox"/>		
<b>Ropes</b>				
- Lifelines	▪ Synthetic: paint, cut in strand, worn, dirt	<input type="checkbox"/>		
- Lanyards	inside of rope; For strength: pull end sample			
<b>Hardware</b>				
- Snap-hooks	▪ Cable: Kink, broken wire, terminations	<input type="checkbox"/>		
- D-Rings	▪ Cracks, distortion, wear points, corrosion	<input type="checkbox"/>		
<b>Locking Fall Devices</b>				
	▪ Not recertified/old models	<input type="checkbox"/>		
- Rope Grabs	▪ Distortion, wear	<input type="checkbox"/>		
- Self-Retracting Lanyards/ Lifelines	▪ Cleaning difficulty	<input type="checkbox"/>		
- Climbing Protection Devices	▪ Incompatible parts	<input type="checkbox"/>		
	▪ Does not operate manually as intended	<input type="checkbox"/>		
<b>Personal Lowering Devices</b>				
	▪ Not recertified/old models	<input type="checkbox"/>		
- Self-Retracting lanyard/ lifeline	▪ Distortion, wear	<input type="checkbox"/>		
- Controlled descent device	▪ Controlled payout, equipment not ready for	<input type="checkbox"/>		
- Descent control device	emergency	<input type="checkbox"/>		
	▪ Does not operate manually as intended	<input type="checkbox"/>		

**Procedure**

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## **Appendix E: E&I Hazard Communication P.2.1.4 (US)**

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Procedure

# E&I Hazard Communication P.2.1.4 (US)

<b>Document number:</b>	HSE-PRO-100262
<b>Document owner:</b>	Vice President of HSSE
<b>Document author:</b>	HSSE Operations Management Team
<b>Revision:</b>	0
<b>Revision date:</b>	19-Jul-2017
<b>This document supports</b>	HSSE

**About this document:** This Program outlines the measures required under the *Hazard Communication* standard, Fed/OSHA [29 CFR 1910.1200](#) and [Cal/OSHA Title 8, Section 5194](#). Amec Foster Wheeler Environment & Infrastructure Americas E&I operates in states other than California where a State OSHA program exists. This Program will need to compare with the individual state's health and safety regulations for consistency. The Hazard Communication Standard ensures that all potentially hazardous materials used by E&I employees are properly classified and handled. This Program also describes how the hazard's information is disseminated to the staff and how information regarding personal protective measures and monitoring procedures are consistent with applicable federal, state, and local regulations.

**Who this document applies to:** This document applies to all employees in the Environment & Infrastructure (E&I) Business Function the United States.

**Procedure**

HSE-PRO-100262 Rev. 0 Hazard Communication Program

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**Responsibility for this document:**

The functional responsibility for the development, review and maintenance of this document rests with the Corporate Vice President of Health, Safety, Security and Environment (HSE) for Amec Foster Wheeler Environment & Infrastructure, Inc. Americas.

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## 1 Purpose and Scope

This Program outlines the measures required under the *Hazard Communication* standard, Fed/OSHA [29 CFR 1910.1200](#) and [Cal/OSHA Title 8, Section 5194](#). Amec Foster Wheeler Environment & Infrastructure Americas E&I operates in states other than California where a State OSHA program exists. This Program will need to compare with the individual state's health and safety regulations for consistency. The Hazard Communication Standard ensures that all potentially hazardous materials used by E&I employees are properly classified and handled. This Program also describes how the hazard's information is disseminated to the staff and how information regarding personal protective measures and monitoring procedures are consistent with applicable federal, state, and local regulations.

This Program applies to all Amec Foster Wheeler Environment & Infrastructure (E&I) Americas locations where hazardous or toxic chemicals are ordered, stored, and used. This Program also applies to all E&I employees who may be exposed, under normal working conditions or foreseeable emergencies, to any hazardous or toxic chemical that is known to be present in their workplace. It is also applicable to all chemical manufacturers and distributors with whom the company does business and who are required to provide the company with Safety Data Sheets (SDSs).

## 2 Responsibilities

### 2.1 Corporate Vice President of Health, Safety, Security and Environment

The functional responsibility for the development, review and maintenance of this Program rests with Amec Foster Wheeler Environment & Infrastructure Americas' Corporate Vice President (VP) of Health, Safety, Security and Environment (HSE). The Corporate VP HSE is responsible for preparing and issuing the Hazard Communication Written Program (the Program), training materials, developing and making available instruction materials for the Program, and periodically evaluating the effectiveness of the Program.

Amec Foster Wheeler E&I offices and project sites must ensure that their management systems and health and safety plans contain arrangements to address the requirements of this Program.

### 2.2 Group Health, Safety, Security & Environment Manager

The Group Health, Safety, Security and Environment Manager acts as the VP of HSE's designee and is responsible for providing aid in the development and implementation of this as well as site-specific procedures within his/her Group.

### **2.3 Health, Safety, and Environment Coordinator or Site Health and Safety Officer**

The HSE Coordinator or Site Health and Safety Officer (SHSO) is assigned the primary responsibility for implementation of the Program, and for ensuring that the Program is in compliance with federal and state regulations, on the local level. The HSE Coordinator is responsible for ensuring all employees know how to access this program on onespace and access the location specific information. In addition, the HSE Coordinator/SHSO is responsible for maintaining the site inventory and up-to-date files of the SDSs for the office. The SHSO is responsible for identifying and amending the field site inventory and obtaining SDSs for inclusion in the site-specific Health and Safety Plan (HASP). If a user reports that a SDS is missing or was never sent, the HSE Coordinator will obtain one from the supplier, Group HSE Manager or the Corporate VP of HSE. The HSE Coordinator (and SHSO) maintains or shall obtain labeling materials for clearly marking containers of hazardous materials. The HSE Coordinator (or SHSO) is also responsible for arranging for new hire orientations including basic hazard communication training and ongoing hazard communication training as required.

### **2.4 User**

The user, defined as an employee or contractor, is responsible for attending safety meetings and training sessions, applying the health and safety information that is derived from them, and ensuring that a SDS is available for any chemical he/she uses or procures. If a SDS for a chemical does not arrive with the shipment of the chemical or is not available for any other reason, the user will notify the HSE Coordinator. The user shall also be responsible for ensuring that the chemicals in use in the work area are adequately labeled in accordance with this Program. The user shall be able to utilize the hazard warning information on the label and SDS. Any condition observed by the user that could impact worker health and safety must be reported to the supervisor, HSE Coordinator, or SHSO.

### **2.5 Supervisor**

The supervisor is responsible for ensuring that workers under his/her supervision are properly trained and provided with the necessary control measures and protective equipment to maintain a safe and healthful workplace.

## **3 Program**

### **3.1 Chemical List**

Any hazardous material in any quantity on E&I property or sites will be identified on a list by the HSE Coordinator (for office locations), SHSO (for sites), supervisor (for work areas), or designee. The information on the list includes the product identifier, (as referenced on the SDS), storage location, and quantity. The inventory may be compiled for the workplace as a whole or for individual work areas.

The inventory will be updated quarterly, or more frequently, as necessary. An example of an appropriate [Chemical Inventory Form](#) is provided as Attachment 1.

## **3.2 Hazard Determination**

### **3.2.1 Policies: Supplied Commercial Chemicals**

A hazard determination will be performed on all chemicals prior to their introduction into the workplace by the HSE Coordinator, SHSO, supervisor, or designee. For most raw materials and consumable products, E&I will rely on the supplier's hazard determination information, which will usually be in the form of a SDS. SDSs received by the HSE Coordinator, SHSO, supervisor, or designee will be reviewed to ensure that they are complete and that the information is accurate. The hazard determination will be conveyed to the ultimate user by labels, SDSs, and training. The HSE Coordinator, SHSO, supervisor, or designee will work with users to ensure that they have been informed of the necessary handling procedures, issued applicable personal protective equipment (PPE), and provided with any other information before the handling of a new hazardous material is permitted.

### **3.2.2 Reference Resources**

As a reference, E&I uses the following sources of information for comparison in determining if a substance is hazardous:

- [29 CFR 1910, Subpart Z \(Tables Z-1 to Z-3\), Toxic and Hazardous Substances, Occupational Safety and Health Administration \(OSHA\).](#)
- "Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices" American Conference of Governmental Industrial Hygienists (ACGIH), latest edition.

Sources of information for the determination of a substance as carcinogenic or potentially carcinogenic include:

- National Toxicology Program (NTP), Annual Report on Carcinogens, latest edition.
- International Agency for Research on Cancer (IARC) "Monographs", latest edition.
- "Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices", American Conference of Governmental Industrial Hygienists (ACGIH), latest edition.
- "Guide to Occupational Exposure Values" American Conference of Governmental Industrial Hygienists (ACGIH), latest edition.
- "Pocket Guide to Chemical Hazards", National Institute of Occupational Safety and Health, latest edition.

The HSE Coordinator, SHSO, supervisor, or designee can contact the Corporate VP of HSE or Group HSE Manager for assistance to obtain copies of the above reference materials.

### **3.3 Safety Data Sheets**

Hazardous chemicals received by the company shall be accompanied by SDSs corresponding to those substances. Each SDS shall be printed in English and contain the following information:

- Section 1, Identification;
- Section 2, Hazard(s) identification;
- Section 3, Composition/information on ingredients;
- Section 4, First-aid measures;
- Section 5, Fire-fighting measures;
- Section 6, Accidental release measures;
- Section 7, Handling and storage;
- Section 8, Exposure controls/personal protection;
- Section 9, Physical and chemical properties;
- Section 10, Stability and reactivity;
- Section 11, Toxicological information;
- Section 12, Ecological information;
- Section 13, Disposal considerations;
- Section 14, Transport information;
- Section 15, Regulatory information; and
- Section 16, Other information, including date of preparation or last revision.

SDSs that lack any of the above information will be investigated by the HSE Coordinator, SHSO, supervisor, or designee so that a complete SDS can be obtained.

#### **3.3.1 Safety Data Sheet Location**

The SDSs are to be readily available in to employees working with the chemicals. SDSs can be stored in binders, files, included in the site specific HASPs or stored electronically, as long as all affected employees know the location and have access to the information on a 24-hour basis.

#### **3.3.2 New Safety Data Sheets**

When new SDSs are received, from outside suppliers, the original or a copy must be forwarded to the supervisor or the HSE Coordinator/SSHO. The SDS must be filed in the binder, file, with the HASP or electronically, as soon as possible upon receipt. Any SDS revisions received that alert the company to an increased risk associated with a hazardous material will be provided to employees and involved contractors within 30 days of receipt.

### **3.4 Labeling and Product Identification of Containers**

#### **3.4.1 Policies: Supplied Commercial Materials**

Employees and contractors will be informed that they should check all incoming hazardous material container labels for the following information:

- Product identifier;
- Signal word;
- Hazard statement(s);
- Pictogram(s);
- Precautionary statement(s); and,
- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

Labels must be legible, in English, and prominently displayed. It is anticipated that all E&I U.S. staff will be able to read and communicate effectively in English. However, if/when applicable, for non-English speaking employees, information shall be presented in their language. No existing label will be removed or defaced on containers of hazardous materials. See Attachment 2 - Hazard Communication Standard: Labels and Pictograms

Manufacturers or vendors responsible for the shipment of improperly labeled materials shall be notified upon receipt of such materials. Recurring shipments of mislabeled or unlabeled chemicals from a manufacturer or vendor shall be cause for terminating business with the supplier.

#### **3.4.2 Repackaging**

Any material that is repackaged from the original label-bearing container to another container must be relabeled with a suitable substitute label containing the information listed in Section 3.4.1 unless the hazardous substance is for immediate use by the employee who performed the transfer. Contact the HSE Coordinator, SSSO, supervisor, or designee about acquiring GHS compliant labels.

### **3.5 Contractors and Subcontractors**

When contractors and subcontractors may potentially be exposed to hazardous materials, the HSE Coordinator, SHSO, supervisor, or designee will provide the contractor or subcontractor with copies of the SDSs. The HSE Coordinator, SHSO, supervisor, or designee will also be responsible for providing the product identity and location of hazardous materials to the contractor's representative. The SHSO or HSE Coordinator shall explain to the contractor or subcontractor the safe work practices used in the workplace specific to the chemical(s) being used on-site. This information will be provided by a written site-specific HASP or by direct instruction by the SHSO or site supervisor.

In instances where the contractor may bring hazardous materials onto the E&I site or project location, the HSE Coordinator, SHSO, supervisor, or designee will obtain the identities of, and the SDSs for, these materials from the contractor. The contractor will also explain to the HSE Coordinator, SHSO, supervisor, or designee the safe work practices specific to the chemicals being used on-site.

## **4 Training and Awareness**

Hazard Communication training is provided to all employees and contractors involved in the handling of hazardous materials. A majority of the training is devoted to familiarizing the attendees with the structure of and information supplied on SDSs. When practical, training will be done by reviewing the SDSs for individual chemicals in use. When a location or site has a large number of chemicals, or when the chemicals change frequently, training will be based on hazard categories (such as flammable liquids, corrosive materials, carcinogens). Example SDSs will be used to illustrate use and applicability of the health and safety information provided.

Employees will also receive training on how to read and interpret the information contained on the label of a hazardous material. Where applicable, employees must also be provided with information regarding the hazards associated with chemicals contained in unlabeled pipes, vessels and/or other containers in the work area.

### **4.1 Basic Course Content**

As part of the New Hire Orientation training, all employees receive basic Hazard Communication training from the HSE Coordinator and their supervisor. Information provided may be in the form of a booklet or handout. Instruction will cover the following:

- The requirements of this section;
- Any operations in their work area where hazardous chemicals are present;
- The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and safety data sheets (SDSs).
- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as any monitoring conducted, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
- The physical, health, simple asphyxiation, combustible dust, and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area;
- The measures employees can take to protect themselves from these hazards, including specific procedures E&I has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

- The details of the Amec Foster Wheeler E&I Hazard Communication Program, including an explanation of the labels received on shipped containers and the workplace labeling system used; the safety data sheet, including the order of information and how employees can obtain and use the appropriate hazard information.

Employees who attend the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training receive more extensive Hazard Communication training.

#### **4.2 Periodic Training**

As necessary, periodic training of the above described subjects should be conducted by the HSE Coordinator, SHSO, supervisor, or designee, as applicable. This training may take the form of SDS reviews for the hazardous materials used in the work area. Hazard Communication training shall be conducted any time a chemical hazard changes in the workplace.

Before a new hazardous material is introduced into the workplace or conducting a non-routine task, all involved users must receive training on the specific hazards of that chemical and safe work methods. This may be accomplished by a review of the SDS and the activity hazard analysis by the HSE Coordinator, SHSO, supervisor, or designee with the affected staff.

### **5 Records**

Training records with a brief description of the training and the trainer's name will be maintained in the online Training Database and local copies maintained by the HSE Coordinator or SHSO.

### **6 Definitions**

The following terms are used within this document.

<b>Term</b>	<b>Definition</b>
<b>CAS</b>	Chemical Abstracts Service
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation, and Liability Act
<b>Chemical</b>	Any substance used in or obtained by a chemical process or processes.
<b>Chemical Name</b>	The scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the

Term	Definition
	Chemical Abstracts Service (CAS) rules of nomenclature, or a name that will clearly identify the chemical for the purpose of conducting a hazard classification.
<b>Classification</b>	To identify the relevant data regarding the hazards of a chemical; review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical in this section. In addition, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.
<b>Common Name</b>	Any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.
<b>Container</b>	Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.
<b>E&amp;I</b>	Amec Foster Wheeler Environment & Infrastructure Americas
<b>Employee</b>	A worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.
<b>Employer</b>	A person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.
<b>EPA</b>	Environmental Protection Agency
<b>Exposure or Exposed</b>	Means that an employee is subjected, in the course of employment, to a chemical that is a physical or health hazard, and includes potential ( e.g. accidental or possible) exposure. "Subjected" in terms of health hazards includes any route of entry (e.g. inhalation, ingestion, skin contact or absorption.)
<b>Foreseeable Emergency</b>	Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of

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Hazard Communication Program

<b>Term</b>	<b>Definition</b>
	control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.
<b>GHS</b>	Globally Harmonized System
<b>HASP</b>	Health and Safety Plan
<b>Hazard Category</b>	The division of criteria within each hazard class, e.g., oral acute toxicity and flammable liquids include four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.
<b>Hazard Class</b>	The nature of the physical or health hazards, e.g., flammable solid, carcinogen, oral acute toxicity, etc.
<b>Hazard Not Otherwise Classified (HNOC)</b>	An adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in this section. This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed in this section, but the effect either falls below the cut-off value/concentration limit of the hazard class or is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Category 5).
<b>Hazard Statement</b>	A statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.
<b>Hazardous Chemical</b>	Any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified.
<b>HAZWOPER</b>	Hazardous Waste Operations and Emergency Response
<b>Health Hazard</b>	A chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard are detailed in <a href="#">Appendix A to §1910.1200—Health Hazard Criteria</a> .
<b>HSSE</b>	Health, Safety, Security and Environment

Term	Definition
<b>Immediate Use</b>	The hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.
<b>Importer</b>	The first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.
<b>IUPAC</b>	International Union of Pure and Applied Chemistry
<b>Label</b>	An appropriate group of written, printed or graphic information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.
<b>Label elements</b>	The specified pictogram, hazard statement, signal word and precautionary statement for each hazard class and category.
<b>Mixture</b>	A combination or a solution composed of two or more substances in which they do not react.
<b>OSHA</b>	Occupational Safety and Health Administration (US)
<b>Physical Hazard</b>	A chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. See <a href="#">Appendix B to §1910.1200—Physical Hazard Criteria</a> .
<b>Pictogram</b>	A composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under this standard for application to a hazard category. See Attachment 2 - Hazard Communication Standard: Labels and Pictograms.
<b>PPE</b>	Personal protective equipment
<b>Precautionary Statement</b>	A phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling.

**Procedure**

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Hazard Communication Program

<b>Term</b>	<b>Definition</b>
<b>Produce</b>	To manufacture, process, formulate, blend, extract, generate, emit, or repackage.
<b>Product Identifier</b>	The name or number used for a hazardous chemical on a label or in the SDS. It provides a unique means by which the user can identify the chemical. The product identifier used shall permit cross-references to be made among the list of hazardous chemicals required in the written hazard communication program, the label and the SDS.
<b>Pyrophoric Gas</b>	A chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130 degrees F (54.4 degrees C) or below.
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>Responsible Party</b>	Someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.
<b>Safety Data Sheet (SDS)</b>	Written or printed material concerning a hazardous chemical that is prepared in accordance with paragraph (g) of this section.
<b>SHSO</b>	Site Health and Safety Officer
<b>Signal Word</b>	A word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used in this section are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for the less severe.
<b>Simple Asphyxiant</b>	A substance or mixture that displaces oxygen in the ambient atmosphere, and can thus cause oxygen deprivation in those who are exposed, leading to unconsciousness and death.
<b>Substance</b>	Chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.
<b>Trade Secret</b>	Any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. <a href="#">Appendix E to §1910.1200—</a>

Term	Definition
	<a href="#">Definition of Trade Secret</a> , sets out the criteria to be used in evaluating trade secrets.
<b>Trade Secret</b>	Any confidential formula, pattern, process, device, information, or compilation of information used in an employer's business that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.
<b>Use</b>	To package, handle, react, emit, extract, generate as a byproduct, or transfer.
<b>Work Area</b>	A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.
<b>Workplace</b>	An establishment, job site, or project, at one geographical location containing one or more work areas.
<b>VP</b>	Vice President

## 7 References

Document type	Document title	Document no.
Form	<a href="#">Chemical Inventory Form</a>	HSE-FOR-100394
Guidance	<a href="#">Hazard Communication Standard: Labels and Pictograms</a>	HSE-GDS-100034

## 8 Revision History

Revision no.	Revision date	Summary of changes
0	May 2017	Reformatted into new template. Company name change.

## **9 Attachments**

Attachment 1 - [Chemical Inventory Form](#)

Attachment 2 - Hazard Communication Standard: Labels and Pictograms



## Attachment 2 – Hazard Communication Standard: Labels and Pictograms



# OSHA<sup>®</sup> BRIEF

## Hazard Communication Standard: Labels and Pictograms

OSHA has adopted new hazardous chemical labeling requirements as a part of its recent revision of the Hazard Communication Standard, 29 CFR 1910.1200 (HCS), bringing it into alignment with the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS). These changes will help ensure improved quality and consistency in the classification and labeling of all chemicals, and will also enhance worker comprehension. As a result, workers will have better information available on the safe handling and use of hazardous chemicals, thereby allowing them to avoid injuries and illnesses related to exposures to hazardous chemicals.

The revised HCS changes the existing Hazard Communication Standard (HCS/HazCom 1994<sup>1</sup>) from a performance-based standard to one that has more structured requirements for the labeling of chemicals. The revised standard requires that information about chemical hazards be conveyed on labels using quick visual notations to alert the user, providing immediate recognition of the hazards. Labels must also provide instructions on how to handle the chemical so that chemical users are informed about how to protect themselves.

The label provides information to the workers on the specific hazardous chemical. While labels provide important information for anyone who handles, uses, stores, and transports hazardous chemicals, they are limited by design in the amount of information they can provide. Safety Data Sheets (SDSs), which must accompany hazardous chemicals, are the more complete resource for details regarding hazardous chemicals. The revised

standard also requires the use of a 16-section safety data sheet format, which provides detailed information regarding the chemical. There is a separate [OSHA Brief on SDSs](#) that provides information on the new SDS requirements.

All hazardous chemicals shipped after June 1, 2015, must be labeled with specified elements including pictograms, signal words and hazard and precautionary statements. However, manufacturers, importers, and distributors may start using the new labeling system in the revised HCS before the June 1, 2015 effective date if they so choose. Until the June 1, 2015 effective date, manufacturers, importers and distributors may maintain compliance with the requirements of HazCom 1994 or the revised standard. Distributors may continue to ship containers labeled by manufacturers or importers (but not by the distributor themselves) in compliance with the HazCom 1994 until December 1, 2015.

This document is designed to inform chemical receivers, chemical purchasers, and trainers about the label requirements. It explains the new labeling elements, identifies what goes on a label, and describes what pictograms are and how to use them.

### Label Requirements

Labels, as defined in the HCS, are an appropriate group of written, printed or graphic informational elements concerning a hazardous chemical that are affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.

The HCS requires chemical manufacturers, importers, or distributors to ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information: product identifier; signal word; hazard statement(s); precautionary

<sup>1</sup> Prior to the 2012 update, the Hazard Communication Standard had last been amended in 1994. "HazCom 1994" refers to the version of the Hazard Communication Standard in effect directly prior to the 2012 revision, printed in the 1995 through 2011 versions of the Code of Federal Regulations. It is also available on OSHA's webpage.

statement(s); and pictogram(s); and name, address and telephone number of the chemical manufacturer, importer, or other responsible party.

- | Labels for a hazardous chemical must contain:  |
|--|
| <ul style="list-style-type: none"> <li>• Name, Address and Telephone Number</li> <li>• Product Identifier</li> <li>• Signal Word</li> <li>• Hazard Statement(s)</li> <li>• Precautionary Statement(s)</li> <li>• Pictogram(s)</li> </ul> |

To develop labels under the revised HCS, manufacturers, importers and distributors must first identify and classify the chemical hazard(s). Appendices A, B, and C are all mandatory. The classification criteria for health hazards are in Appendix A and the criteria for physical hazards are presented in Appendix B of the revised Hazard Communication Standard. After classifying the hazardous chemicals, the manufacturer, importer or distributor then consults Appendix C to determine the appropriate pictograms, signal words, and hazard and precautionary statement(s), for the chemical label. Once this information has been identified and gathered, then a label may be created.

**Label Elements**

The HCS now requires the following elements on labels of hazardous chemicals:

- **Name, Address and Telephone Number** of the chemical manufacturer, importer or other responsible party.
- **Product Identifier** is how the hazardous chemical is identified. This can be (but is not limited to) the chemical name, code number or batch number. The manufacturer, importer or distributor can decide the appropriate product identifier. The same product identifier must be both on the label and in section 1 of the SDS.
- **Signal Words** are used to indicate the relative level of severity of the hazard and

alert the reader to a potential hazard on the label. There are only two words used as signal words, “Danger” and “Warning.” Within a specific hazard class, “Danger” is used for the more severe hazards and “Warning” is used for the less severe hazards. There will only be one signal word on the label no matter how many hazards a chemical may have. If one of the hazards warrants a “Danger” signal word and another warrants the signal word “Warning,” then only “Danger” should appear on the label.

- **Hazard Statements** describe the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard. For example: “Causes damage to kidneys through prolonged or repeated exposure when absorbed through the skin.” All of the applicable hazard statements must appear on the label. Hazard statements may be combined where appropriate to reduce redundancies and improve readability. The hazard statements are specific to the hazard classification categories, and chemical users should always see the same statement for the same hazards no matter what the chemical is or who produces it.
- **Precautionary Statements** describe recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to the hazardous chemical or improper storage or handling. There are four types of precautionary statements: prevention (to minimize exposure); response (in case of accidental spillage or exposure emergency response, and first-aid); storage; and disposal. For example, a chemical presenting a specific target organ toxicity (repeated exposure) hazard would include the following on the label: “Do not breathe dust/fume/gas/mist/vapors/spray. Get medical advice/attention if you feel unwell. Dispose of contents/ container in accordance with local/regional/national and international regulations.”

A forward slash (/) designates that the classifier can choose one of the precautionary statements. In the example

above, the label could state, "Do not breathe vapors or spray. Get medical attention if you feel unwell. Dispose of contents in accordance with local/regional/national/international regulations." See Examples 1 and 2A of this document as an example.

In most cases, the precautionary statements are independent. However, OSHA does allow flexibility for applying precautionary statements to the label, such as combining statements, using an order of precedence or eliminating an inappropriate statement.

Precautionary statements may be combined on the label to save on space and improve readability. For example, "Keep away from heat, spark and open flames," "Store in a well-ventilated place," and "Keep cool" may be combined to read: "Keep away from heat, sparks and open flames and store in a cool, well-ventilated place." Where a chemical is classified for a number of hazards and the precautionary statements are similar, the most stringent statements must be included on the label. In this case, the chemical manufacturer, importer, or distributor may impose an order of precedence where phrases concerning response require rapid action to ensure the health and safety of the exposed person. In the self-reactive hazard category Types C, D, E or F, three of the four precautionary statements for prevention are:

- "Keep away from heat/sparks/open flame/hot surfaces. - No Smoking.";
- "Keep/Store away from clothing/.../combustible materials";
- "Keep only in original container."

These three precautionary statements could be combined to read: "Keep in original container and away from heat, open flames, combustible materials and hot surfaces. - No Smoking."

Finally, a manufacturer or importer may eliminate a precautionary statement if

it can demonstrate that the statement is inappropriate.

- **Supplementary Information.** The label producer may provide additional instructions or information that it deems helpful. It may also list any hazards not otherwise classified under this portion of the label. This section must also identify the percentage of ingredient(s) of unknown acute toxicity when it is present in a concentration of  $\geq 1\%$  (and the classification is not based on testing the mixture as a whole). If an employer decides to include additional information regarding the chemical that is above and beyond what the standard requires, it may list this information under what is considered "supplementary information." There is also no required format for how a workplace label must look and no particular format an employer has to use; however, it cannot contradict or detract from the required information.

An example of an item that may be considered supplementary is the personal protective equipment (PPE) pictogram indicating what workers handling the chemical may need to wear to protect themselves. For example, the Hazardous Materials Identification System (HMIS) pictogram of a person wearing goggles may be listed. Other supplementary information may include directions of use, expiration date, or fill date, all of which may provide additional information specific to the process in which the chemical is used.

- Pictograms are graphic symbols used to communicate specific information about the hazards of a chemical. On hazardous chemicals being shipped or transported from a manufacturer, importer or distributor, the required pictograms consist of a red square frame set at a point with a black hazard symbol on a white background, sufficiently wide to be clearly visible. A square red frame set at a point without a hazard symbol is not a pictogram and is not permitted on the label.

The pictograms OSHA has adopted improve worker safety and health, conform with the GHS, and are used worldwide.

While the GHS uses a total of nine pictograms, OSHA will only enforce the use of eight. The environmental pictogram is not mandatory but may be used to provide additional information. Workers may see the ninth symbol on a label because label preparers may choose to add the environment pictogram as supplementary information. Figure 1 shows the symbol for each pictogram, the written name for each pictogram, and the hazards associated with each of the pictograms. Most of the symbols are already used for transportation and many chemical users may be familiar with them.

Figure 1: Pictograms and Hazards

<p><b>Health Hazard</b></p>  <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive Toxicity</li> <li>• Respiratory Sensitizer</li> <li>• Target Organ Toxicity</li> <li>• Aspiration Toxicity</li> </ul>	<p><b>Flame</b></p>  <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophorics</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>	<p><b>Exclamation Mark</b></p>  <ul style="list-style-type: none"> <li>• Irritant (skin and eye)</li> <li>• Skin Sensitizer</li> <li>• Acute Toxicity (harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract Irritant</li> <li>• Hazardous to Ozone Layer (Non-Mandatory)</li> </ul>
<p><b>Gas Cylinder</b></p>  <ul style="list-style-type: none"> <li>• Gases Under Pressure</li> </ul>	<p><b>Corrosion</b></p>  <ul style="list-style-type: none"> <li>• Skin Corrosion/ Burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>	<p><b>Exploding Bomb</b></p>  <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
<p><b>Flame Over Circle</b></p>  <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<p><b>Environment (Non-Mandatory)</b></p>  <ul style="list-style-type: none"> <li>• Aquatic Toxicity</li> </ul>	<p><b>Skull and Crossbones</b></p>  <ul style="list-style-type: none"> <li>• Acute Toxicity (fatal or toxic)</li> </ul>

It is important to note that the OSHA pictograms do not replace the diamond-shaped labels that the U.S. Department of Transportation (DOT) requires for the transport of chemicals, including chemical drums, chemical totes, tanks or other containers. Those labels must be on the external part of a shipped container and must meet the

DOT requirements set forth in 49 CFR 172, Subpart E. If a label has a DOT transport pictogram, Appendix C.2.3.3 states that the corresponding HCS pictogram shall not appear. However, DOT does not view the HCS pictogram as a conflict and for some international trade both pictograms may need to be present on the label. Therefore, OSHA intends to revise C.2.3.3. In the meantime, the agency will allow both DOT and HCS pictograms for the same hazard on a label. While the DOT diamond label is required for all hazardous chemicals on the outside shipping containers, chemicals in smaller containers inside the larger shipped container do not require the DOT diamond but do require the OSHA pictograms. (See Example 2.)

Labels must be legible, in English, and prominently displayed. Other languages may be displayed in addition to English. Chemical manufacturers, importers, and distributors who become newly aware of any significant information regarding the hazards of a chemical must revise the label within six months.

#### Employer Responsibilities

Employers are responsible for maintaining the labels on the containers, including, but not limited to, tanks, totes, and drums. This means that labels must be maintained on chemicals in a manner which continues to be legible and the pertinent information (such as the hazards and directions for use) does not get defaced (i.e., fade, get washed off) or removed in any way.

The employer is not responsible for updating labels on shipped containers, even if the shipped containers are labeled under HazCom 1994. The employer must relabel items if the labels are removed or defaced. However, if the employer is aware of newly-identified hazards that are not disclosed on the label, the employer must ensure that the workers are aware of the hazards as discussed below under workplace labels.

#### Workplace Labels

OSHA has not changed the general requirements for workplace labeling. Employers have the option to create their own workplace labels. They can either provide all of the required information that is on the

label from the chemical manufacturer or, the product identifier and words, pictures, symbols or a combination thereof, which in combination with other information immediately available to employees, provide specific information regarding the hazards of the chemicals.

If an employer has an in-plant or workplace system of labeling that meets the requirements of HazCom 1994, the employer may continue to use this system in the workplace as long as this system, in conjunction with other information immediately available to the employees, provides the employees with the information on all of the health and physical hazards of the hazardous chemical. This workplace labeling system may include signs, placards, process sheets, batch tickets, operating procedures, or other such written materials to identify hazardous chemicals. Any of these labeling methods or a combination thereof may be used instead of a label from the manufacturer, importer or distributor as long as the employees have immediate access to all of the information about the hazards of the chemical. Workplace labels must be in English. Other languages may be added to the label if applicable.

If the employer chooses to use the pictograms that appear in Appendix C on the workplace (or in-plant) labels, these pictograms may have a black border, rather than a red border.

Employers may use additional instructional symbols that are not included in OSHA's HCS pictograms on the workplace labels. An example of an instructional pictogram is a person with goggles, denoting that goggles must be worn while handling the given chemical. Including both types of pictograms on workplace labels is acceptable. The same is true if the employer wants to list environmental pictograms or PPE pictograms from the HMIS to identify protective measures for those handling the chemical.

Employers may continue to use rating systems such as National Fire Protection Association (NFPA) diamonds or HMIS requirements for workplace labels as long as they are consistent with the requirements of the Hazard Communication Standard and the employees have immediate access to the specific hazard

information as discussed above. An employer using NFPA or HMIS labeling must, through training, ensure that its employees are fully aware of the hazards of the chemicals used.

If an employer transfers hazardous chemicals from a labeled container to a portable container that is only intended for immediate use by the employee who performs the transfer, no labels are required for the portable container.

#### **Sample Labels**

The following examples demonstrate how a manufacturer or importer may display the appropriate information on the label. As mentioned above, once the manufacturer determines the classification of the chemical (class and category of each hazard) using Appendices A and B, it would determine the required pictograms, signal words, hazard statements, and precautionary statements using Appendix C. The final step is to put the information on the label.

The examples below show what a sample label might look like under the revised HCS requirements. The examples break the labeling out into "steps" to show the order of information gathering and how label creation occurs. Step 1 is performing classification; step 2 is gathering full label information; and step 3 is creating the label.

These examples are for informational purposes only and are not meant to represent the only labels manufacturers, importers and distributors may create for these hazards.

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### Example 1: This example demonstrates a simple label.

#### The Substance:

HS85

Batch Number: 85L6543

#### Step 1: Perform Classification

Class: Acute Oral Toxicity; Category 4

#### Step 2: Gather Labeling Information

Pictograms:



#### Signal Word:

WARNING

#### Hazard Statements:

Harmful if Swallowed

#### Precautionary Statements:

##### Prevention:

- Wash hands and face thoroughly after handling.
- Do not eat, drink or smoke when using this product.

##### Response:

- If swallowed: Call a doctor if you feel unwell.<sup>2</sup>
- Rinse mouth

##### Storage:

None specified

##### Disposal:

- Dispose of contents/container in accordance with local/regional/national/international regulations.<sup>3</sup>

#### Step 3: Create the Label

Putting together the above information on HS85, a label might list the following information:

### Example 1: HS85 Label

<b>HS85</b> Batch number: 85L6543	
	
<b>Warning</b> Harmful if swallowed	
<p>Wash hands and face thoroughly after handling. Do not eat, drink or smoke when using this product. Dispose of contents/container in accordance with local, state and federal regulations.</p>	
<b>First aid:</b> If swallowed: Call a doctor if you feel unwell. Rinse mouth.	
GHS Example Company, 123 Global Circle, Anyville, NY 130XX	Telephone (888) 888-8888

<sup>2</sup> The manufacturer of this chemical determined that calling a doctor was the most appropriate emergency medical advice; therefore, it is listed as part of the first-aid procedures.

<sup>3</sup> The downstream users must familiarize themselves with the proper disposal methods in accordance with local, regional, state and federal regulations. It is impractical to expect the label preparer to list all potential regulations that exist.

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### Example 2: This example demonstrates a more complex label.

Example 2 is for a substance that is a severe physical and health hazard. For shipping packages of chemicals that will be transported in the United States (i.e., drums, totes, tanks, etc.), the U.S. DOT requires a DOT label(s) on the outside container(s) for hazardous chemicals. Two versions of this label are presented below to demonstrate the difference between an OSHA label with pictograms from the HCS and a DOT label required for transport of a shipping container.

#### The Substance:

OXI252 (disodiumflammy)  
CAS number: 111-11-11xx

#### Step 1: Perform Classification

Class: Oxidizing Solid, Category 1  
Class: Skin Corrosive, Category 1A

#### Step 2: Gather Labeling Information Pictograms:



Signal Word:  
DANGER

#### Hazard Statements:

- May cause fire or explosion; strong oxidizer
- Causes severe skin burns and eye damage

#### Precautionary Statements:

##### Prevention:

- Keep away from heat.
- Keep away from clothing and other combustible materials.
- Take any precaution to avoid mixing with combustibles.
- Wear protective neoprene gloves, safety goggles and face shield with chin guard.
- Wear fire/flame resistant clothing.
- Do not breathe dust or mists.
- Wash arms, hands and face thoroughly after handling.

#### Response:

- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
- IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash contaminated clothing before reuse.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- Immediately call poison center.<sup>4</sup>

#### Specific Treatment:

Treat with doctor-prescribed burn cream.<sup>5</sup>

#### In case of fire:

Use water spray. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

#### Storage:

Store locked up.

#### Disposal:

- Dispose of contents/container in accordance with local/regional/national/international regulations.<sup>3</sup>

#### Step 3: Create the Label

Putting together the above information on OXI252, a label might list the following information:

<sup>4</sup> In this example, the manufacturer determined that calling a poison control center is the most appropriate emergency medical advice.

<sup>5</sup> Not all SDSs will have direction for "specific treatment" on the label. This is only if the manufacturer specifically notes a certain treatment that needs to be used to treat a worker who has been exposed to this chemical.

Example 2A: OXI252 Label inner package label with OSHA pictograms

OXI252  
(disodiumflammy)  
CAS #: 111-11-11xx




**Danger**  
May cause fire or explosion; strong oxidizer  
Causes severe skin burns and eye damage

Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wear protective neoprene gloves, safety goggles and face shield with chin guard. Wear fire/ flame resistant clothing. Do not breathe dust or mists. Wash arms, hands and face thoroughly after handling. Store locked up. Dispose of contents and container in accordance with local, state and federal regulations.

**First aid:**  
IF ON SKIN (or hair) or clothing<sup>6</sup>: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash contaminated clothing before reuse.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
Immediately call poison center.  
Specific Treatment: Treat with doctor-prescribed burn cream.

**Fire:**  
In case of fire: Use water spray. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Great Chemical Company, 55 Main Street, Anywhere, CT 064XX Telephone (888) 777-8888

Example 2B: OXI252 Label meeting DOT requirements for shipping<sup>7</sup>

OXI252  
(disodiumflammy)  
CAS #: 111-11-11xx




**Danger**  
May cause fire or explosion; strong oxidizer  
Causes severe skin burns and eye damage

Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wear protective neoprene gloves, safety goggles and face shield with chin guard. Wear fire/ flame resistant clothing. Do not breathe dust or mists. Wash arms, hands and face thoroughly after handling. Store locked up. Dispose of contents and container in accordance with local, state and federal regulations.

**First aid:**  
IF ON SKIN (or hair) or clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash contaminated clothing before reuse.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a doctor.  
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
Immediately call poison center.  
Specific Treatment: Treat with doctor-prescribed burn cream.

**Fire:**  
In case of fire: Use water spray. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Great Chemical Company, 55 Main Street, Anywhere, CT 064XX Telephone (888) 777-8888

<sup>6</sup> There are occasions where label preparers may combine statements on the label. In this case the similar statements were combined and the most stringent were listed. For example, the first-aid pre-

cautionary statements were combined for exposure to skin, hair and clothing.

<sup>7</sup> DOT Labels must comply with the size requirements presented in 49 CFR 172.

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For more detailed information about labels and Safety Data Sheets (SDSs) under the revised Hazard Communication Standard, please refer to 29 CFR 1910.1200 - paragraphs (f) and (g), and Appendix C.

The revised Hazard Communication Standard and additional guidance materials are available on OSHA's Hazard Communication page, located at: [www.osha.gov/dsg/hazcom/index.html](http://www.osha.gov/dsg/hazcom/index.html).

Disclaimer: This OSHA Brief provides a general overview of the label requirements in the Hazard Communication Standard (see 29 CFR 1910.1200(f) and Appendix C of 29 CFR 1910.1200). It does not alter or determine compliance responsibilities in the standard or the Occupational Safety and Health Act of 1970. Since interpretations and enforcement policy may change over time, the reader should consult current OSHA interpretations and decisions by the Occupational Safety and Health Review Commission and the courts for additional guidance on OSHA compliance requirements.

This is one in a series of informational briefs highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

**For assistance, contact us. We can help. It's confidential.**



U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA (6742)

DSG BR-3636 2/2013

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## **Attachment A: Natural Disaster Preparedness and Response**

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**NATURAL DISASTER PREPAREDNESS AND RESPONSE**

Effective Date: 9/9/19

Reviewed by: Kevin P. Mishoe *Kevin P. Mishoe*  
 Field Operations  
 Manager

Reviewed by: Marcus O. Stewart *Marcus O. Stewart*  
 QA Manager

Approved by: Holton K. Howell *Holton K. Howell*  
 Project Manager

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Annual Review			
Reviewed by:	Title:	Date:	Signature:

**NATURAL DISASTER PREPAREDNESS AND RESPONSE**

**1.0 PURPOSE**

The purpose of this procedure is to provide guidance for the management of Clean Air Status and Trends Network (CASTNET) remote monitoring sites in the event of natural disasters.

**2.0 SCOPE**

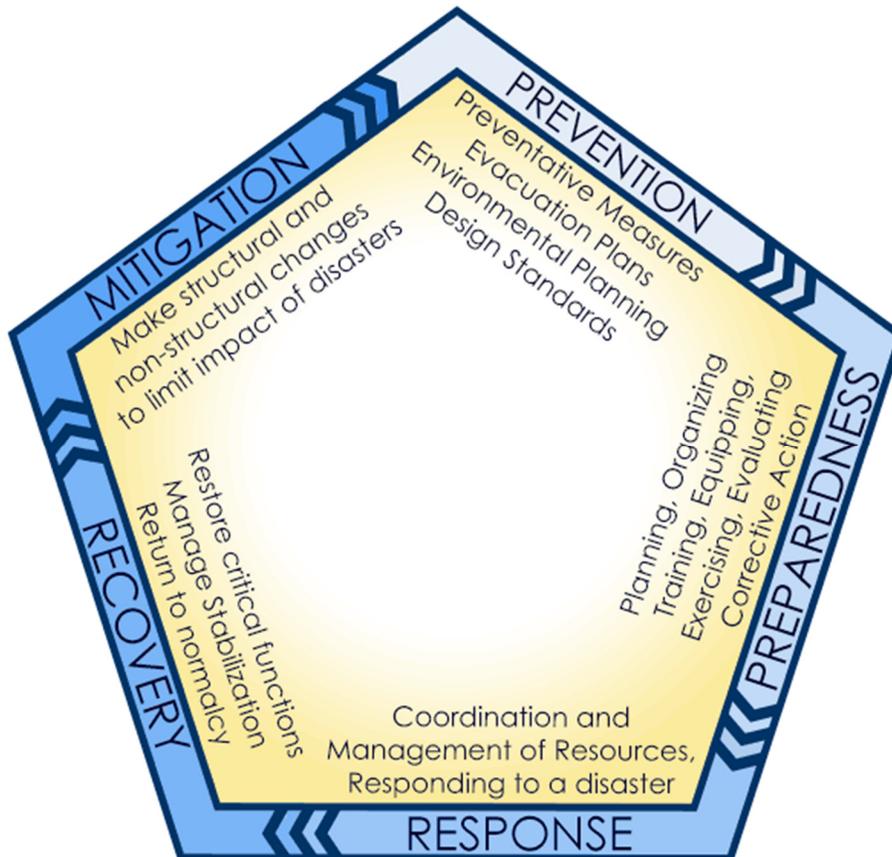
This procedure applies to all United States Environmental Protection Agency (EPA) sponsored CASTNET sites. In this document, natural disasters are defined as geological or meteorological events that pose potentially catastrophic risk. These types of disasters include:

- Severe Weather Events (e.g. Hurricanes, Tropical Storms, Tornadoes)
- Floods
- Wildfires
- Earthquakes

**3.0 SUMMARY**

The procedure is summarized in Figure 1 below:

**Figure 1. Prevention, Preparedness, Response, Recovery and Mitigation**



Source: Bexar County Office of Emergency Management

The steps depicted in Figure 1 will have varying degrees of effectiveness depending upon the type and severity of the event. For example, advance warning for an approaching storm may allow for emergency preparations ahead of any danger but such is not feasible for an earthquake.

#### 4.0 ROLES AND RESPONSIBILITIES

**Project Manager:** The Project Manager will work with the EPA Project Officer or their designee to determine whether emergency action (i.e. non-routine action to address the situation) is warranted for an event. Approves action/recovery plans and assigns personnel.

**Field Operations Manager:** The Field Operations Manager is responsible for the assessment of onsite conditions relating to the event, reporting this assessment to the Project Manager, ensuring action/recovery plans are properly executed, and notifying the Laboratory Operations Manager when the action plan requires cessation of filter pack sampling operations.

**Site Health and Safety Manager:** The Site Health and Safety Manager is responsible for ensuring the site (including site personnel) is prepared according to the existing Health and Safety Plan.

**Laboratory Operations Manager:** The Laboratory Operations Manager is responsible for halting the preparation of preparing and shipping filter packs pursuant to notification received from the Field Operations Manager.

**Project Team:** The Project Team as a whole will, in their usual project roles, execute the action/recovery plan and ensure that normal operation is restored post-recovery.

#### 5.0 PROCEDURES

The procedure for natural disaster preparedness and response is described in the following sections. Action/recovery plans will be event-dependent.

##### 5.1 Prevention

Preventive measures are designed to provide limit risk from disasters. The risk to personnel and to the project is limited by the project Health and Safety Plan along with the disaster plan (this document) and proper design standards for remote monitoring stations (e.g. sites located in a designated and maintained clearing, lightning protection, installed permanent structures adhere to building code standards).

##### 5.2 Preparedness

Preparedness focuses on readiness and generally consists of routinely evaluating the status of established prevention measures and taking corrective action for lack of adherence or if those measures are determined to be inadequate. CASTNET remote monitoring sites are visited each week by trained personnel who report site condition to project field operations technicians. Additionally, the stations and infrastructure are inspected by trained technicians during routine semi-annual inspection and servicing visits.

### **5.3 Response**

Response is comprised of the coordination and management of resources and measures taken for life/property/environmental safety. The response phase is a reaction to the occurrence of a disaster or emergency. The response phase begins when the CASTNET Project Manager contacts the EPA Project Officer and they agree to the creation and implementation of an action/response plan. The action/response plan will address the following:

- 5.3.1** Potential severity of the event and the time available to work safely on site.
- 5.3.2** Securing site structures and equipment during this safe period. For example, if a tropical storm is approaching this may entail removing instruments from the monitoring tower, securing them within the shelter, and laying the tower down at the base.
- 5.3.3** Associated work schedules.
- 5.3.4** Resources, including budget, required to secure the site and to restore the site to normal operation during the recovery phase.

### **5.4 Recovery**

Recovery consists of activities that restore functions. The goal of the recovery phase is to restore routine operation. The recovery phase begins after the threat to safety has subsided and recovery work at the site is feasible (e.g. roads are cleared, ground is sufficiently firm for vehicles or required reinstallation, etc.).

### **5.5 Mitigation**

Mitigation involves measures taken to limit the impact of disasters and emergencies (e.g. raising building elevation in a flood prone area).

**Figure 2. Elevated Monitoring Station – Beaufort, North Carolina**



## **6.0 REFERENCES**

1997 Uniform Building Code, Vol. 2: Structural Engineering Design Provisions

<http://www.alumatower.com/towers-telescoping-mast-systems/10-meter-meteorological-tower/> Accessed August 2, 2019

## **7.0 APPENDICES**

There are no appendices to this document.

## **8.0 ATTACHMENTS**

There are no attachments to this document.