

FFPO Procedure Blue Sheet Form

A. Procedure Title (list manual, procedure series, or specific procedure #)

SPR Accident Prevention Manual
Section 17 Environmental Factors

B. Procedure Name/series type (i.e., operations, maintenance, etc.) E S & H

C. Check (✓) one of the following:

1. Procedure(s) accepted “as is” with terminology replaced as denoted in the Site Procedures Approved Terminology Replacement List for the FFPO SPR M&O contract.

2. In addition to the changes in approved terminology for the FFPO SPR M&O contract, improvements to the procedure are warranted:

Category 1 Finding (Resolution prior to contract start)

Category 2 Finding (Resolution within 90 days of contract start)

Category 3 Finding (Resolution to the Issues Management program)

D. Comments/Notes:

E. Forward a copy of this form to the FFPO Director, Business Management for revision tracking.

Signed

FFPO Reviewer Signature

02/26/14

Date

Steve Mahan

FFPO Reviewer Print Name

Site Procedures Approved Terminology Replacement List

Approved Terminology Replacements	
Terminology to be Replaced	Substituted Verbiage
AGSC	M&O Contractor or MOC
Boeing	M&O Contractor or MOC
Construction Management Services or CMS contractor	M&O Contractor or MOC
DynMcDermott or DM or Company	M&O Contractor or MOC
DM Contract No.	M&O Contract
Organizational Changes	
William Gibson or "Hoot"	DOE Project Manager or DOE PM
Robert (Bob) McGough or DM Project Manager or CEO	MOC Project Manager or MOC PM
Randy Sutton (Acting) or DM General Counsel	MOC General Counsel or MOC GC
Scott Landry or DM APM, O&M and COO	MOC APM, O&M
APM, Cavern Integrity	Senior Director, Cavern Integrity
Colleen Yates or DM APM, Business Operations and CFO	MOC APM, Business Operations and CFO
APM, Security and Emergency Preparedness or Director, Security and Emergency Preparedness Division	Senior Director, Security & Emergency Preparedness
Henry Schmidt, Jordan Jones, or Duane Johnson	Senior Director, Security & Emergency Preparedness
Leslie Williams or APM, Data Systems or Data Systems Director	Senior Director, Data Systems
William Bozzo or DM APM, ES&H	MOC APM, ES&H
Walt Newcomb or DM Director, Energy & Sustainability	Director, Environmental
J.P. Martinez or DM APM, Engineering	MOC APM, Engineering

ACRONYMS

- AGSC ASRC Gulf States Constructors
- APM Assistant Project Manager
- ASRC Arctic Slope Regional Corporation
- CAS Contractor Assurance System
- CFO Chief Financial Officer
- COO Chief Operating Officer
- ES&H Environment, Safety, and Health
- GC General Counsel
- M&O Management and Operating
- MOC Management and Operating Contractor
- O&M Operations and Maintenance
- PM Project Manager

17. ENVIRONMENTAL FACTORS

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17.1. THERMAL STRESS MANAGEMENT PROGRAM

This section provides the procedures to manage the prevention of temperature-related illnesses at SPR sites. It is based on American Conference of Industrial Hygienists (ACGIH) thermal stress evaluation criteria.

17.1.1. Background

SPR sites are located in subtropical regions, and the subtropical temperature combined with humid Gulf Coast air increases the risk of heat-related disorders. Although not as frequently, there is also the possibility of cold-related disorders during the winter months.

17.1.2. Purpose and Scope

- a. The Thermal Stress Management Program provides guidance in the recognition, evaluation, and control of conditions that could lead to temperature-related illnesses.
- b. It provides a means to reduce the risk of temperature-related illnesses to acceptable levels while maintaining operational efficiency.
- c. Monitoring the work environment is required whenever the combination of air temperature, radiant heating, and humidity might exceed the heat stress screening criteria established by the ACGIH.

- d. The work environment must also be monitored according to ACGIH screening criteria during cold weather (especially while working around water).

17.1.3. Acclimation State and Heat Tolerance

- a. Acclimation is the body's ability to adapt to different environmental conditions.
 1. Generally, a period of five days of work in a new environment is necessary for an individual to become acclimated to new conditions and decrease their susceptibility for experiencing a heat-related illness.
 2. Additionally, five days away from a work environment in which an individual is accustomed to working increases their susceptibility for heat-related illnesses upon their return to their usual work environment.
 3. When personnel have been away from their usual work environment for more than five days, supervisors should monitor employees for re-acclimation to the environment.
- b. Supervisors should further ensure that all unacclimated workers are aware of the increased risk for developing heat-related illnesses.
- c. Occupational Exposure Limit temperatures for unacclimated workers are less than those for acclimated workers because of the increased risk for development of heat-related symptoms.

17.1.4. Procedures

17.1.4.1. Task Evaluation

All field tasks have been identified as a potential thermal stressor.

- a. For heat-related stressors:
 1. Temperature will be monitored from 1 March through 31 October each year, as well as whenever conditions warrant outside of this timeframe.
 2. The Storage sites retrieve the RealFeel® temperature from the AccuWeather internet site (www.accuweather.com) at approximately 10 AM, 12 PM, and 2 PM, and provide the readings to site personnel. Supervisors should check on the employees throughout the day.
- b. For cold-related stressors:
 1. If the accuweather temperature is 50 degrees and below and there is wind, assess the need for additional controls as specified in 17.2.2.

17.1.5. Control Development and Implementation

Controls have been developed that should be part of all tasks and are listed below as routine controls. Additional listed controls can be implemented by the supervisor, based on environmental conditions and task characteristics.

17.1.5.1. Routine Controls

Routine controls prevent the progression of minor heat-related disorders, if they occur.

- a. Fluid Replacement – Cool, non-carbonated, non-caffeinated liquids (both electrolyte-replenishment drinks and water) are provided close to the work area.
 1. Workers are encouraged to drink small amounts frequently throughout the day (for example, one 4-6 ounce cup every 20 minutes).
 2. During strenuous work, fluid replacement should be approximately one liter per hour.

3. Scheduling – Strenuous work shall be planned for the cooler part of the day (for example, morning), when possible. Whenever possible, high-risk heat exposure tasks/projects (such as tank cleaning) will not be scheduled while the Heat Stress Management Program is in effect.
- b. Self-Determination – Workers are allowed to monitor their own condition for adverse physical conditions and are given latitude to limit themselves.
 1. They shall interrupt work if excessive discomfort is detected.
 2. Supervision will encourage a slower pace for tasks to avoid injury.

17.1.5.2. Additional Controls

- a. When the RealFeel® values are greater than 81° F, the following controls are instituted: line of sight buddy system and enhanced hydration protocol.
 1. Buddy System is a process in which two people, the buddies, operate together as a single unit so that they are able to monitor and help each other. Buddies must stay in one another's line of sight (no farther than 200 feet). Required when the RealFeel® temperature reaches 81°F, but is less than 106°F.
 2. Personal heat stress monitoring is recommended to verify that thermal stress management plan is working.
- b. In addition to these controls, one or more of the following may be instituted
 1. Check Times – A line supervisor or their designee seeks explicit confirmation from workers that each can continue work without experiencing heat stress.
 - a) The line supervisor observes the workers closely to determine if there are obvious symptoms of heat disorders or if there is any sense of diminished capacity.
 - b) Checks are done at intervals throughout the day.
 - c) If workers indicate they cannot continue, work is immediately interrupted and rest is required.
 2. Increased Rest Time – Longer rest times are required when RealFeel® temperature is 81° or employees show signs of heat-related disorders.
 - a) During the evaluation of tasks to establish heat stress controls, the amount of rest time normally afforded the task shall be taken into account.
 3. Ice Cooling Garments – Ice vests can be worn under work clothes to provide cooling for periods up to four hours.
 4. Reflective Shielding – Reduce radiant heat transfer in the work area. Reflective shields provide protection against heating effects of sunrays.
 5. Portable Evaporative Coolers – These fans blow air across water, delivering a fine water mist with the air. Use these for localized cooling where air-conditioning is not possible.
 6. Core body temperature will be monitored using a representative sample (10% of the exposed workforce) and recorded.
- b. The supervisor, working with the site safety specialist, should decide the number and type of additional controls.

17.1.5.3. Non-essential Work Stoppage

- a. When the RealFeel® temperature reaches/exceeds 106° F, all non-essential field work will cease.
- b. Essential field work will be allowed to continue with the following controls in place:
 1. The per hour maximum work will be 40 consecutive minutes or less. Per hour minimum rest period will be at least 20 consecutive minutes. Actual work/rest regimen shall be determined by the supervisor or site safety specialist via employee monitoring during task.

2. Rest periods shall be in a shaded area with some additional means of cooling and seating for personnel.
3. Immediate work area buddy system as appropriate (line of sight is not permissible).
 - a) Enhanced Buddy System is a process in which two people, the buddies, operate together as a single unit so that they are able to monitor and help each other. Buddies must stay in close proximity of one another (no further than 20 feet).
4. Sufficient water or electrolyte drink shall be provided for a hydration schedule of one Liter per hour per employee, minimum.
5. Engineering controls (ventilated work area, canopy shade over work area, etc.) will be used.
6. Administrative controls (such as scheduling heavy work in the morning or evening during cooler temperatures) will be utilized.
7. Personal heat stress monitoring will be performed according to the Work Instruction posted on the DM S&H SharePoint page.

Note

The work regimen shall be decreased if employees show or report signs of heat stress.

17.1.5.4. Protecting yourself from Heat Stress

- a. Monitor your physical condition and your coworkers for signs and symptoms of heat stress.
- b. Wearing light-colored, loose-fitting, breathable clothing, such as cotton, is preferable.
- c. Avoid non-breathable synthetic clothing.
- d. Gradually build up to heavy work.
- e. Schedule heavy work during the coolest parts of the day.
- f. Take more breaks when doing heavier work, and in high heat and humidity.
- g. Take breaks in the shade or a cool area.
- h. Drink water frequently. Drink enough water that you never become thirsty. Avoid alcohol, caffeine, and carbonated beverages.
- i. Be aware that protective clothing or personal protective equipment may increase the risk of heat-related illness.

WARNING

Working at RealFeel® temperatures at 106° or above requires special care to avoid heat stress. If at any time workers feel ill or unable to continue, rest periods should be increased or work should stop.

17.1.5.5. Awareness Safety Meeting

- a. An awareness safety meeting shall be held annually for line supervisors and all personnel performing work outdoors for extended time periods.
- b. Examples of these personnel are maintenance personnel, field operators, and workover crew members.
- c. The meeting should be held during the required monthly safety meeting, preferably during the months of March or April before the onset of extreme summertime heat.
- d. Suggested Topics for Heat Stress Awareness Safety Meeting.
 1. Signs and symptoms of heat stress

2. Factors contributing to heat stress
 - a) Certain medications (check precautions provided with medications)
 - b) Consumption of alcohol and caffeine
 - c) Age and physical condition
 - d) Consuming heavy meals prior to heat exposure
 - e) Failing to consume sufficient fluid
3. Preventing heat stress – The Heat Stress Management Program
 - a) Occupational Exposure Limits
 - b) Acclimation
 - c) Routine controls
 - d) Additional controls
 - e) Work Stoppage conditions
4. Heat stress measurements
 - a) RealFeel® temperature readings
 - b) Personal heat strain monitoring

NOTE

As stated in the subcontract boilerplate, contractors working on the site shall follow the procedures in this section or submit an equal to or better heat stress program for review and approval.

17.2. COLD STRESS MANAGEMENT PROGRAM**17.2.1. Overview**

The goal of the cold stress management program is to provide awareness and other information regarding potential injuries related to workers exposed to extreme cold, or who work in cold environments. Information provided should be used as a tool to reduce potential cold stress injuries.

17.2.2. Protecting Yourself from Cold Stress (NIOSH)

- a. Monitor your physical condition and that of your coworkers.
- b. Wear appropriate clothing:
 1. wear several layers of loose clothing for insulation
 2. Avoid tight clothing as it reduces blood circulation to the extremities.
 3. Note: some clothing may restrict movement resulting in a hazardous situation.
- c. Protect ears, face, hands and feet in extremely cold or wet weather.
- d. Boots should be waterproof and insulated.
- e. Wear a hat and/or helmet liner to reduce the loss of body heat from your head.
- f. Move into warm locations during breaks; limit the amount of time outside.
- g. Carry extra socks, gloves, hats, jacket, blankets, a change of clothes and a thermos of hot liquid.
- h. Include chemical hot packs in your first aid kit.
- i. Avoid touching cold metal surfaces with bare skin.

17.2.3. Symptoms of Cold Stress

The symptoms for cold stress are gradual depending on body temperature, and include the following.

- a. Pain in the extremities (fingers and toes) is the first sign of danger.
- b. Severe shivering will begin when the core body temperature falls to 95 °F.
- c. Severe hypothermia occurs below a core body temperature of 91.4 °F.

17.2.4. Prevention of Cold Stress Injury or Illness

- a. Where RealFeel® temperatures are 50°F or less, employees shall perform very detailed work with small parts indoors whenever possible.
- b. When working outside in windy conditions, employees shall utilize wind breaks when possible.
- c. The buddy system, maintaining line of sight contact, shall be utilized when employees work outdoors on equipment for longer than 20 consecutive minutes.
 1. Buddy System is a process in which two people, the buddies, operate together as a single unit so that they are able to monitor and help each other. Buddies must stay in one another's line of sight (no farther than 200 feet). Required when RealFeel® temperature is between 50°F and 32°F.
- d. At 32°F RealFeel® the buddy must be in close proximity, using the Enhanced Buddy System
 1. Enhanced Buddy System is a process in which two people, the buddies, operate together as a single unit so that they are able to monitor and help each other. Buddies must stay in one another's line of sight and in close proximity (no further than 20 feet). Required when the RealFeel® temperature is at or below 32°F.

NOTE

Use of vibration creating equipment (such as impact wrenches and jackhammers) is not permitted when RealFeel® temperature is below 40°F unless control measures are in place to raise the RealFeel® temperature above the 40°F limit. These measures may include, but are not limited to windbreaks, impact gloves, rotation of workers (every 5 minutes), warming or heating the areas with approved heating devices, and establishing climate controlled area until work begins.

Contact a NOLA IH for approval of control measures prior to start of work.

17.2.5. Extra Precautions While Working Around Water

- a. Employees should work under the buddy system.
- b. A means of rescue shall be determined.
- c. Boats should have insulating blankets on board to wrap employees who fall into the water.
- d. Employees should utilize cabin area of boats whenever possible during cold weather. Slicker suits should be available for boat crews/passengers if they do not have access to cabin area.
- e. Immediate rescue for man overboard is required.

NOTE

Personal Floatation Devices (PFD's) are required when working over or near water where the danger of drowning exists.

17.3. OTHER ENVIRONMENTAL FACTORS**17.3.1. Rodents, Snakes, and Insects**

- a. Insects, Spiders, and Ticks
 1. To protect yourself from biting and stinging insects, wear long pants, socks, and long-sleeved shirts.
 2. Use insect repellents that contain DEET or Picaridin.
 3. Treat bites and stings with over-the-counter products that relieve pain and prevent infection.
 4. Avoid fire ants; their bites are painful and cause blisters.
 5. Severe reactions to fire ant bites (chest pain, nausea, sweating, loss of breath, serious swelling or slurred speech) require immediate medical treatment.
- b. Rodents and Wild or Stray Animals
 1. Dead and live animals can spread diseases, such as Rat Bite Fever and Rabies.
 2. Avoid contact with wild or stray animals.
 3. Avoid contact with rats or rat-contaminated buildings.
 4. If you can't avoid contact, wear protective gloves and wash your hands regularly.
 5. Get rid of dead animals as soon as possible.
 6. If bitten/scratched, get medical attention immediately.
- c. Snakes
 1. Watch where you place your hands and feet when removing debris. If possible, don't place your fingers under debris you are moving. Wear heavy gloves.
 2. If you see a snake, step back and allow it to proceed.
 3. Wear boots at least 10 inches high or protective leggings addressed in the PPE section.
 4. Watch for snakes sunning on fallen trees, limbs or other debris.
 5. A snake's striking distance is about 1/2 the total length of the snake.
 6. If bitten, note the color and shape of the snake's head to help with treatment.
 7. Keep bite victims still and calm to slow the spread of venom in case the snake is poisonous.
 8. Seek medical attention as soon as possible.
 9. Do not cut the wound or attempt to suck out the venom.
 10. Apply first aid: lay the person down so that the bite is below the level of the heart, and cover the bite with a clean, dry dressing.
- d. Alligators
 1. Stay away from alligators
 2. If you have a close encounter with an alligator a few yards away, back away slowly.
 3. Never make the mistake of thinking that an alligator is slow and lethargic. Alligators are extremely quick and agile and will defend themselves when cornered.
 4. If you see an alligator in the roadway or work area, DO NOT attempt to move it! Notify supervisor immediately so the alligator can be handled safely.

5. Be aware of surroundings when working above or near water that alligators may inhabit.

17.4. TABLES: ENVIRONMENTAL FACTORS

TABLE 17.1. THERMAL STRESS MANAGEMENT PROGRAM ROLES AND RESPONSIBILITIES	
Position or Department	Responsibility
Site Director	<ol style="list-style-type: none"> a. Provide managers and supervisors with resources to maintain an adequate work pace while implementing heat stress control measures. b. Document the designee who will retrieve RealFeel® temperatures if the Site Safety Specialist cannot.
Line Supervisors	<ol style="list-style-type: none"> a. Be responsible for ensuring RealFeel® temperature readings are communicated to personnel under their supervision and that appropriate controls are implemented. b. Be familiar with heat and cold stress limits when planning tasks under their supervision. The thermal stress evaluation process flow is illustrated in the flow diagram. c. Ensure unacclimated workers are protected as described in this chapter. d. Ensure acclimation principles are applied to individual workers by categorizing them appropriately, based on number of days spent away from the work environment (i.e., is worker acclimated or unacclimated?). e. Communicate to personnel under their supervision if environmental conditions are 81° or higher, or 40° and below. f. Implement routine and additional controls when the RealFeel® temperature exceeds 81° or falls below 40°. g. Work with site safety specialist in choosing appropriate controls when the specialist establishes an awareness condition. h. Ensure annual heat stress awareness training is held.
Site Safety Specialist	<ol style="list-style-type: none"> a. Be responsible for RealFeel® temperature data collection and communicate this data to line supervisors, if designated. (Site Director will designate someone as a backup.) This includes retrieving RealFeel® temperature values at required times. b. Manage the site thermal stress program and coordinate industrial hygiene support when necessary. c. Establish a thermal stress awareness condition when necessary. d. Assist line supervisors in determining appropriate controls. e. Ensure the annual heat stress awareness safety meeting is provided. f. If necessary, assist the industrial hygienist in performing heat strain monitoring.
Employees	<ol style="list-style-type: none"> a. Drink plenty of fluids during the day. b. Let supervisor know if not feeling well. c. Take rests as required depending on weather conditions.

17.4. FIGURES: ENVIRONMENTAL FACTORS

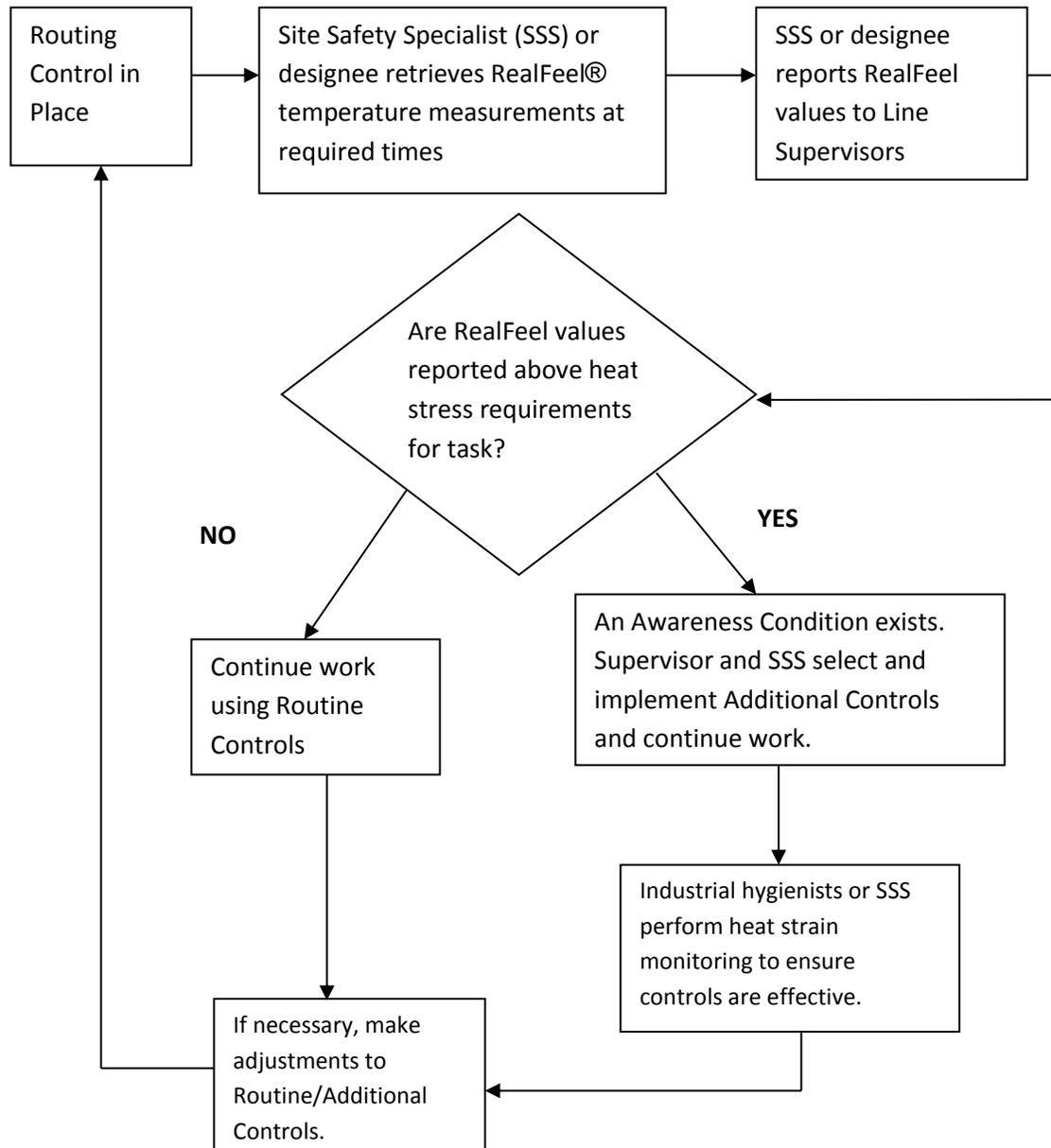


Figure 17-1 Thermal Stress Controls.