DEEPWATER HORIZON
HOUMA COMMAND CENTER
June 8, 2010

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Deepwater Horizon
Off-shore Clean-up Task Force
Heat Stress Management Plan
DATE: June 8, 2010

Unified Command Approvals:

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SOSC		**Date:** 8 June 10
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DEEPWATER HORIZON RESPONSE
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Deepwater Horizon
Off-Shore Clean-up Task Force
Heat Stress Management Plan

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1.0 Introduction

1.1 Purpose

This plan is designed to reduce the risk of heat related disorders for the employees working On-Shore and Near-Shore clean-up operations in Louisiana.

1.2 Acronyms and Definitions

PPE - Personal Protective Equipment

HSM – Heat Stress Manager

2.0 Heat Stress Management Plan

2.1 Rest Areas

Shaded rest areas will be made available to accommodate the number of workers planned to be on their rest cycle at any one time.

2.2 Personal Protective Equipment

Refer to the PPE matrix in Appendix B based on the type of work you are doing..

2.3 Work/Rest Cycle

The work/rest cycle is a method of decreasing heat stress. The work rest plan for this action was developed in conjunction with Dr. Robert M. Bourgeois who is Board Certified in Occupational Medicine. This plan was designed to provide simple rules that can be easily implemented. The work rest cycles have been set based on a worst case scenario.

The work schedule will be based on 20 minute intervals. The Boat Captain will use an air horn or other effective means to notify workers of the beginning and end of each interval.

Table 1 Heat Stress Management Plan Work Schedules	
Work Schedule for Employees "not" using Protective[1] Coveralls or Respiratory Protection	
40/20	Employees can work 40 minutes of every hour with 20 minutes spent at rest in the shade.
Work Schedule for Employees who are using Protective[1] Coveralls or Respiratory Protection	
20/40	Employees can work 20 minutes of every hour with 40 minutes spent at rest in the shade.

* If at any time during the course of work, an employee feels signs or symptoms of heat disorder, they should immediately be moved to shaded area and consume liquids.

[1] Can apply to Dupont Pro-Shield 1 or similar; Tychem QC or SL or

2.4 Acclimatization

- A gradual physiological adaptation that improves one's ability to tolerate heat stress – evaporation of sweat
- Exposure guidelines assume workers are: healthy; un-medicated; heat acclimatized; and adequately hydrated.
- Acclimatization is a gradual process where the body adjusts to more stressors and heat levels. The body benefits from a smaller increase in body temperature, heart rate and increased sweat production while working in heat.
- Workers new to working in a hot environment, workers returning after 3 weeks of cooler weather, or returning after being sick will acclimatize by working 10 minutes per hour on days 1 and 2. On days 3 and 4, the work time can be increased to 15 minutes per hour. (with Dupont ProShield or TyChem)
- Workers new to working in a hot environment, workers returning after 3 weeks of cooler weather, or returning after being sick will acclimatize by working 20 minutes per hour on days 1 and 2. On days 3 and 4, the work time can be increased to 25 minutes per hour. (without Dupont ProShield or TyChem)

2.5 Training and Capability

Individuals performing off-shore clean-up will be (verbally) trained by each of the captain's/safety officer prior to work in the:

- Hazards of heat stress
- Signs and symptoms
- Factors that may put them at risk (e.g. age, obesity, drug-use, alcohol)
- Responsibilities
- Use of protective clothing and equipment
- First-aid procedures

2.6 Fluid Replacement

The water needed to replace body fluids varies among individuals, but generally workers should drink at **least** a liter of water for each hour of their shift. Water is the preferred liquid for preventing heat stress but from time to time it is necessary to replace electrolytes. When providing sports drinks it is imperative that the liquids other than water be low sugar options, such as Gatorade G2.

Workers should be encouraged to drink water prior to work, and avoid drinks with caffeine, alcohol, or large amounts of sugar, like soft drinks.

Lighter foods are recommended over heavy meals. Eat smaller meals at more frequent eating intervals.

2.7 Worker Protection

At a minimum the following worker protection should be used:

- Sun screen with SPF 50 should be applied to face, ears, neck, lips and any exposed skin. It should be reapplied at least every two hours.
- Hats that are broad-brimmed are preferable to baseball caps.

- Clothing should be light-colored, loose, and made of natural fabrics (e.g. cotton)
- Specific PPE where required (e.g. Glove, Boots and Dupont ProShield or TyChems)

3.0 Heat Related Disorders

There are several heat-related disorders and of them heat stroke is the most serious and can result in death. However it is important to be able to recognize the symptoms of all heat-related disorders, so information on the symptoms and immediate treatment for each heat-related disorder is provided for you in Appendix B.

4.0 Roles and Responsibilities

4.1 Heat Stress Manager (HSM)

- The HSM will oversee the Heat Stress Program for the vessel operations. He will provide information and support to the captain and act as the liaison for Safety Officer at Houma Unified Command.

4.2 Vessel Captain

- Advise task force members based on the requirements of this management program.
- Prior to assigning tasks, the **vessel captain/safety officer** must:
  - Describe tasks and job demands that may include, but are not limited to;
    - Working in hot weather with PPE (e.g. Dupont ProShield or TyChem suit, gloves, boots)
    - Walking and bending to pick up light objects
    - Heavy labor during vessel decon and other water related activities.
    - Heavy lifting and pulling (e.g. stringing sweep boom)
    - Lifting weights up to 40lbs
  - Advise the individuals that they should be in good health and able to perform the general labor skills described
  - Before boarding and starting work for the day, the vessel captain will advise the crew what their tasks are for that day and ask the crew if they will be able to complete their expected tasks.
    - If a member of the crew indicates that they cannot perform their assignment (or is otherwise **clearly** unable to perform the job), the vessel captain will find another crew member.
  - Guide task force on work/rest schedules as per Section 2.4
  - Ensure sufficient water and/or low sugar electrolyte replacement (such as Gatorade G2) is available as per Section 2.7.
  - Monitor the task force for signs and symptoms of heat stress as per Appendix A
  - Where necessary acclimatize workers according to Section 2.5
  - Provide worker training as per Section 2.8

4.3 Crew Members

- Inform vessel captain/safety officer of potential work limitations
- Be alert for heat illness signs in themselves and others
- Drink water before, during and after work
- Report heat stress signs/symptoms immediately

5.0 First Aid and Medical Attention

Heat-related disorder symptoms and first aid information is provided in Appendix A. Report heat stress related illnesses in accordance with the standard incident reporting protocols. The Medical Plan (IAP Form 206) provides phone numbers and addresses for local emergency services and hospitals.

APPENDIX A

Heat Stroke

Heat stroke is the most serious heat-related disorder. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 degrees Fahrenheit or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given.

Symptoms

Symptoms of heat stroke include:

- Hot, dry skin (no sweating)
- Hallucinations
- Chills
- Throbbing headache
- High body temperature
- Confusion/dizziness
- Slurred speech

First Aid

Take the following steps to treat a worker with heat stroke:

- Call 911, notify their supervisor and make arrangement for transportation to medical facility identified in the Medical Plan (IAP Form 206).
- Move the sick worker to a cool shaded area.
- Cool the worker using methods such as:
  - Soaking their clothes with water.
  - Spraying, sponging, or showering them with water.
  - Fanning their body.

Heat Exhaustion

Heat exhaustion is the body's response to an excessive loss of the water and salt, usually through excessive sweating. Workers most prone to heat exhaustion are those that are elderly, have high blood pressure, and those working in a hot environment.

Symptoms

Symptoms of heat exhaustion include:

- Heavy sweating
- Extreme weakness or fatigue
- Dizziness, confusion
- Nausea
- Clammy, moist skin
- Pale or flushed complexion
- Muscle cramps
- Slightly elevated body temperature
- Fast and shallow breathing

First Aid

Treat a worker suffering from heat exhaustion with the following:

- Have them rest in a cool, shaded or air-conditioned area.
- Have them drink plenty of water or other cool, nonalcoholic beverages.
- Have them take a cool shower, bath, or sponge bath.

Heat Syncope

Heat syncope is a fainting (syncope) episode or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position. Factors that may contribute to heat syncope include dehydration and lack of acclimatization.

Symptoms

Symptoms of heat syncope include:

- Light-headedness
- Dizziness
- Fainting

First Aid

Workers with heat syncope should:

- Sit or lie down in a cool place when they begin to feel symptoms.
- Slowly drink water, clear juice, or a sports beverage.
- If they have or are fainting, then Call 911, notify their supervisor and make arrangement for transportation to medical facility identified in the Medical Plan (IAP Form 206).

Heat Cramps

Heat cramps usually affect workers who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion.

Symptoms

Muscle pain or spasms usually in the abdomen, arms, or legs

First Aid

Workers with heat cramps should:

- Stop all activity, and sit in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention if any of the following apply:
  - The worker has heart problems.
  - The worker is on a low-sodium diet.
  - The cramps do not subside within one hour.

Heat Rash

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather.

Symptoms

Symptoms of heat rash include:

Heat rash looks like a red cluster of pimples or small blisters.

It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.

First Aid

Workers experiencing heat rash should:

- Try to work in a cooler, less humid environment when possible.
- Keep the affected area dry.
- Dusting powder may be used to increase comfort.

Spill Response PPE Matrix

Spill Response PPE Matrix

APPENDIX B

Task Number	Cleanup Technique	Description & Requirements	Hard Hat	Safety Glasses	Rubber Boots	Nitrile 26-40 mil Heavy Use	Nitrile 11-26 mil Light Use	Steel-Toe Leather	Snake Boots	DuPont ProShield 1 or similar	Tychem QC or SL or similar	Slicker Suits (rain)	PFD	Hearing Protection	Leather Gloves	Face Shield	Safety Goggles	Kevlar Sleeves	Respirator w/ VOC and P100 Filters	FRC DuPont Limitedwear Nomex Disposable	Chest Waders/Hip Boots	Life Vest or life Jacket (USCG approved)	Boat or deck shoes with traction	Wet suit or shirt and long pants or overalls
#1	Manual Scraping (Beach Clean Up)	Oil is scraped from substrate manually using hand tools. Foot or light vehicular access.	(1)	X	X	NA	X (inner)	NA	NA	X	NA	NA	(2)	NA	(4) (outer)	NA	NA	NA	NA	NA	NA	NA	NA	NA
#2	Sump and pump/ vacuum	Oil collects in sump as it moves down the beach and is removed by pump or vacuum truck. Requires recovery equipment.	X	X	X	NA	X	X	NA	NA	X	NA	(2)	X	(4)	(4)	(4)	NA	NA	NA	NA	NA	NA	NA
#3	Manual removal of oiled materials	Oiled sediments and debris are removed by hand, shovels, rakes, wheelbarrows, etc. Foot or light vehicular traffic.	(1)	X	X	X	NA	NA	NA	NA	X	(3)	(2)	NA	(4)	NA	NA	NA	NA	NA	NA	NA	NA	NA
#4	Low pressure flushing (Decon Operations)	Low pressure water spray flushes oil from substrate, it is channeled to recovery points. Light vehicular traffic, recovery equipment.	X	X	X	NA	X	NA	NA	NA	X	(3)	(2)	X	(4)	X	(4)	NA	NA	NA	NA	NA	NA	NA
#5	Manual sorbent application (Beach Clean Up)	Sorbents are applied manually to contaminated areas to soak up oil. Disposal containers for sorbents, foot or boat access.	(1)	X	X	NA	X	NA	NA	NA	X	NA	(2)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
#6	Manual cutting	Oiled vegetation is cut by hand, collected and stuffed into bags or containers for disposal. Deploy plywood sheets for foot traffic.	(1)	(4)	(5)	X	NA	(5)	NA	NA	X	NA	(2)	NA	X	NA	(4)	X	NA	NA	(4)	NA	NA	NA
#7	In-Situ Burning	Upwind end of contaminated area is ignited to burn to down-wind end. Light vehicular or boat access, fire control equipment.	(1)	X	(5)	NA	NA	(5)	NA	NA	NA	NA	(2)	NA	NA	NA	NA	NA	NA	X	NA	NA	NA	NA
#8	Vacuum trucks, vacuum pumps or portable skimmers	Oil collects in sumps behind booms or natural depressions and is removed by vacuum trucks, vacuum pumps or portable skimmers.	X	X	X	(4)	X (inner)	NA	NA	NA	X	NA	(2)	X	(4)	(4)	(4)	NA	NA	NA	NA	NA	NA	NA

Spill Response PPE Matrix

#9	Oil Mop	Various size units used onshore or with shallow draft Jon boats in water with little or no current. Boat or light vehicle access.	(1)	X	(5)	NA	X	NA	NA	NA	X	NA	(2)	NA	(4)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
#10	Recovery of oil from ground water groundwater	Contaminated oil is pumped out. Heavy equipment access	X	X	X	NA	X	NA	NA	NA	X	NA	NA	NA	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
#11	Marsh / Non-Shore Clean-up Operations	SCAT-Pollution Investigation. Workers board small boats and patrol marshes and bayous to search for oil impact. Workers will not be physically cleaning	X	X	(4)	(4)	(4)	X	(4)	NA	NA	NA	(2)	(4)	(4)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
#12	Skimming Operations (water)	Use of on water skimming resources to remove oil from the water. Both USCG and Contract Skimming vessels will be used.	(1)	X	X (or steel toe leather with covers)	X	NA	X (w/ covers or steel shanked rubber boots)	NA	NA	X	NA	X	X	NA	NA	(4)	NA	X (only if req'd basd off air monitorning)	NA	NA	NA	NA	NA	NA
#13	High Pressure Cleaning (Decon Operations)	High pressure (>3000 psi) water spray flushes oil from substrate. It is channeled to recovery points. Light vehicular traffic, recovery equipment.	X	NA	X	X	NA	NA	NA	NA	(4)	X	(2)	X	NA	X	X	NA	X (only if req'd basd off air monitorning)	NA	NA	NA	NA	NA	NA
#14	Manual Removal of solid tar balls (if no other oil dispersant is present)	Solid Tar Balls or tar pattys are removed using shovels, rakes and buckets, ect. Foot or light vehicle traffic	(1)	X	X	NA	(4)	NA	NA	NA	NA	NA	NA	NA	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
#15	On Shore Support (shallow water jetski opertaions)	Pre-task setup and pre-op checks and launching. Handling of taglines, pulling boom and tendering.	X	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	X	NA	(4)	NA	NA	NA	NA	X	X	X	
#16	A Float Support Shallow waters Jetski operations- (NOT FOR ANCHOR DEPLOYMENT)	Handling of Taglines, pulling boom and boom tendering	Hard Impact kayak helemt	X (secured)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	NA	(4)	NA	NA	NA	NA	high visibility/ high Impact	Ridged bottom Swim or tennis shoes, dive boots	X	

Equivalent PPE can be substituted as long as it meets or exceeds the original specified product.
(1) Required only when overhead hazards are present.
(2) Portable floating device (PFD) is required when working on water,

docks, barges, boats, piers.

[3] Optional if it's raining or liquid saturation is likely.
[4] Based on risk.

[5] Steel-toed boots required based on worksite conditions
NA - Not Applicable