


	<p>Anadarko Management System (AMS) Safety and Environmental Management System</p>	
<p>Heat Stress Management Program</p>		

OXY US OFFSHORE

HEAT STRESS MANAGEMENT PROGRAM

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1. PURPOSE

The purpose of this procedure is to protect workers from potential adverse effects of overexposure to heat. Operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for inducing heat stress in employees engaged in such operations. This heat stress program is written to assess, inform, provide awareness, document, and evaluate heat stress in the workplace.

2. APPLICABILITY

The document applies to all operations in the Gulf of Mexico (GoM) under the Anadarko Petroleum Corporation License to Operate.

Potential hazards identified outside the requirements of this Program shall be referred to the local HSE Representative. The Area/Location Supervisor is responsible for securing the work area until the potential hazard can either be eliminated or safely managed.

3. REQUIREMENTS

3.1 CAUSES OF HEAT STRESS

3.1.1 Individual Susceptibility

The environment factors resulting in heat illness include more than ambient air temperature. Radiant heat air movement, conduction, and relative humidity all affect and individuals' response to heat. Age, weight, degree of physical fitness and acclimatization, metabolism, use of alcohol and drugs, and a variety of medical conditions such as hypertension all affect a person's sensitivity to heat. Even the type of clothing worn must be considered. Prior heat injuries predispose an individual to additional injury.

3.1.2 Temperature



The higher the air temperature, the less heat the body can lose by convection, conduction and radiation (see definitions).

3.1.3 Air Humidity

The body's natural cooling system is through evaporative cooling of sweat. As the amount of moisture present in the air increases, the evaporation rate of sweat decreases and the body's cooling system becomes less efficient. At very high humidity levels, evaporative cooling no longer takes place, and the body cannot naturally cool itself by this process.

3.1.4 Wind speed

When the air temperature is less than the body temperature 98.6° F air movement can help personnel stay cooler by increasing both the convective heat exchange (the exchange between the skin surface and the cooler surrounding air) and the rate of evaporation. However, at temperatures above 98.6° F, evaporative

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cooling may be offset by addition of convective heat from the hot air. In conditions of high temperature and high humidity, air movements will in fact make the worker hotter.

3.2 HAZARDS OF EXPOSURE TO HEAT STRESS

3.2.1 Sunburn

Sunburn is often overlooked as a danger when working outdoors in direct sunlight. Besides the discomfort of the burn itself, sunburn can prevent your body from eliminating heat efficiently and can contribute to one of the more dangerous heat disorders.

3.2.2 Heat rash

Heat Rash, also known as prickly heat, is another minor condition that can lower the body's ability to lose heat.

3.2.3 Heat cramps

Heat Cramps are a danger signal since they may occur alone or be combined with one of the other major heat distress orders. These are painful, sometimes severe, cramps of muscles used while working, such as the arms, legs, or stomach. They often do not occur until relaxing after work. These cramps may be connected to heat, dehydration, and poor conditioning, rather than to lack of salt or other mineral imbalances.

3.2.4 Heat Exhaustion

Heat Exhaustion occurs when the body's heat-control mechanism is overactive but has not broken down completely. The signs of heat exhaustion include paleness, dizziness, nausea, vomiting, fainting, and a moderately increased temperature. The victim may also be having heat cramps, and there is a high risk that the victim will continue on to a state of heat stroke. This disorder also causes special risk to older employees or those with coronary artery disease or emphysema. Rest and water may help in mild heat exhaustion, and ice packs and a cool environment may also help.



More severely exhausted people may need IV fluids, especially if vomiting keeps them from drinking enough.

Note: Air conditioning or a cool environment is the number one protective factor against heat exhaustion.

3.2.5 Heat Stroke

Heat Stroke is the most severe form of heat related illnesses and is an emergency requiring immediate medical attention. Outwardly, it may first progress through the symptoms of heat cramps and/or heat exhaustion, with a dramatically sudden onset of heat stroke symptoms followed by rapid deterioration of the victim. It can occur even in people who are not performing physical exertion, if the weather is hot enough. These people have warm, flushed skin, do not sweat, may be delirious, unconscious, or having seizures.

If a person has these symptoms, call for immediate medical attention.

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3.3 HEAT STRESS MONITORING

The environmental factors specifically taken into account for the monitoring of heat stress are dry air temperature and relative humidity. Both parameters are combined on the heat index chart (Attachment 2). The program for controlling heat-related illness requires colored heat stress indicators (i.e. flags, boards or cards) to be displayed at strategic locations throughout the worksite. The indicator denotes the prevailing heat stress condition. Heat stress conditions are monitored throughout the day and the heat stress indicators changed as required. The APC location PIC, person in charge, is responsible for ensuring actual air temperature and humidity data is regularly monitored and reviewed and the heat stress index communicated to employees and contractors via the heat stress indicators. Supervisors will ensure that the appropriate rest levels are followed dependent on the heat stress indicator, and that sufficient shelter and fluids are available (Attachment 3 Offshore Work/Rest Guide). The heat stress campaign is planned between May 1st and September 30th unless local conditions dictate otherwise. The start and the conclusion of the campaign will be announced by the HSE Director and communicated to all APC locations.

3.4 PREVENTION AND CONTROL OF HEAT STRESS

General Ventilation

3.4.1 Ventilation, air cooling, fans, shielding and insulation are the five major types of engineering controls used to reduce heat stress in hot working environments. Outdoor work areas need to have a shaded area accessible to employees. Cool break areas should be constructed to provide overhead protection allowing personnel to safely remove their hardhats during rest periods.

Personal Protective Equipment

3.4.2 Cool neckerchiefs/bandanas, hardhat cool pad inserts, dark safety glasses and sunscreen are recommended to be worn during the heat stress campaign.

Fluid Replacement

3.4.3 Fluid Replacement - Cool (50-59° F) water or any cool liquids (non-alcoholic) shall be made available to workers (at a minimum 1 cup every twenty minutes). Isotonic drinks and electrolyte replacements are not recommended due to the effect of increasing a person's urine output. However if drinking isotonic drinks or electrolyte replacements a ratio of 3 cups of water to 1 cup of replacement fluid is recommended.

Work/Rest Cycles

Heavy and minimal work activities should be alternated. Tasks should be rotated amongst employees (Attachment 3 Offshore Work/Rest Guide).

Heat Stress Audits

Heat Stress Audits (Attachment 1 APC Heat Stress Audit Form) are completed to monitor environmental temperature, humidity levels and the site management of heat stress campaign at APC GoM locations during the heat stress campaign. Audit data for action tracking and analysis shall be stored electronically in a specified central location. The central location shall be communicated to the facilities by

Director. The APC PIC is responsible to ensure a minimum of three heat stress audits are completed at their location weekly during the heat stress campaign. The HSE Representative (Onsite) or Offshore Medic shall be responsible for ensuring audits are signed off by the OIM/APC Representative, loaded into the database and actions tracked to completion.

Heat Stress Monitoring Equipment

Equipment such as a heat/humidity meter shall be made available at all APC work sites for measuring temperature and relevant humidity during heat stress campaign. The heat stress equipment shall be calibrated and maintained by the HSE Representative (Onsite) or Offshore. Medic. The Manger, GOM HSE Ops & Project Safety shall be notified if additional or replacement heat stress equipment is needed.

Incident Reporting

3.4.6 Potential heat stress incidents shall be communicated immediately to the APC HSE Manager and Operations and/or Drilling Superintendents via the Offshore Medic or HSE Representative. Incident reports shall be documented in accordance with APC Incident Reporting & Investigation procedure.

3.5 TREATMENT FOR HEAT STRESS

3.4.7 Heat Cramp

Stop work immediately and move the person to a cool shady resting place. Give patient enough cool drinking water, juice or oral rehydration solution and let patient rest for at least 8 hours.

Heat exhaustion

3.5.1 Move person to a cool shady resting place - do not leave the patient alone. Cool the person rapidly with running water, cold compress or rapid fanning. Remove extra clothing when necessary. Give cool drinking water or oral re-hydration solution. Avoid caffeine or alcohol and let the patient rest for at least 12 hours

Heat stroke



3.5.2 Immediately call for emergency medical assistance/treatment. Place the person in a cool shady area and do not leave them alone. Cool the patient rapidly with running water, cold compresses or rapid fanning Remove the patient's outer clothing. Provide cool drinking water if the patient is alert - Do not give caffeine or alcohol. Continue to cool body temperature until medical assistance arrives and patient can be taken to a medical facility for further cooling and monitoring of body temperature.

3.5.3

Heat Stress Awareness

The following heat stress awareness topics shall be discussed with employees and contractors during the heat stress campaign months and detailed during health campaigns via pre-job toolbox talks, APC safety stand downs, HSE Meetings and Awareness training.

- 3.5.4
- Acclimatization and hydration awareness;
 - Knowledge of the hazards of heat stress;



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- Recognition of predisposing factors, danger signs, symptoms and potential effects of heat stress related illnesses and injuries;
- Awareness of first-aid procedures for treatment of heat stress related illnesses and injuries including heat stroke and heat cramp;
- Employee responsibilities in avoiding heat stress;
- Dangers of using drugs including therapeutic ones, and alcohol in hot work environments;
- Use of protective clothing and equipment;
- Planning of strenuous physical activities and hot operations during cooler periods, wherever possible (e.g. early morning or evening/ night);
- Importance of regular rest breaks, in cool shade or air-conditioned during hot periods;
- Requirement to drink fluids regularly to replace body fluids lost through sweating.

4. RESPONSIBILITIES

4.1 PERSON IN CHARGE (I.E. OIM OR DESIGNATED ALTERNATE)

- Shall ensure that the heat stress procedure is communicated and adhered to whilst employees are working in heat stress conditions.
- Shall ensure the Heat Stress Index (Attachment 2) and Offshore Work/Rest Guide (Attachment 3) are updated, maintained and strategically placed around the facility and communicated to employees and contractors to facilitate their compliance to the program requirements to prevent heat stress related illnesses.
- Shall coordinate heat stress audits for the facility and ensure the minimum required (three) are completed weekly.
- Shall review all heat stress audits and sign off to confirm his recognition of highlighted issues or pending action.
- Provide guidance to APC and contractors site personnel.
- Shall address heat stress concerns of employees, and contractors, and assist in provision of information sessions.
- Shall ensure calibrated heat stress monitors are available on facility during heat stress campaign
- Shall ensure daily atmospheric temperatures are taken at approximately 7:00 am, 11:00 am, 2:00 pm and 5:00 pm. A heat index status (green, yellow, orange or red) shall be communicated to the facility personnel based on the temperature recorded.

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4.2 HSE REPRESENTATIVE (ONSITE) OR OFFSHORE MEDIC

- Shall ensure employee and contractor heat stress awareness through presentation at Stand Downs for Safety, LiveSAFE meetings, HSE meetings or performing Awareness throughout the heat stress campaign.
- Shall in addition distribute leaflets and posters during Heat Stress Awareness Campaigns.
- Shall assist in heat stress audits at worksite locations throughout the heat stress campaign.
- Shall ensure heat stress audits are signed off by the responsible person, loaded in the database and actions tracked to completion.

4.3 HSE DIRECTOR

- Shall announce the commencement and conclusion of the heat stress campaign to all APC facilities.

4.4 APC EMPLOYEES AND CONTRACTORS

- Shall be familiar with heat stress hazards, follow safe working procedures and drink enough fluids to replace those lost through perspiration.
- Employees shall follow recommended schedule of rest breaks, as advised by supervisors, to avoid heat exhaustion and collapse.
- Employees shall report to their supervisor heat stress-related symptoms in themselves or their co-workers and follow recommended rest/ break schedule.

4.5 CONTRACTOR MANAGEMENT

- Contractor personnel performing work on APC facilities shall have the necessary heat stress awareness. They shall follow the guidance provided by APC person in charge and ensure exposure to heat stress is minimized.

4.6 DOCUMENT OWNER



The Document Owner for this Document shall:

- Ensure overall effectiveness of the requirements in this Document.
- Ensure continuous improvement opportunities are identified and shared with the organization.
- Provide personnel, funding, and other resources to support the execution of the requirements in this Document.

4.7 DOCUMENT ADMINISTRATOR

The Document Administrator for this Document shall:

- Coordinate the review/approval of the Document updates.

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- Ensure supporting tools and systems are appropriately implemented (i.e. serving the functions that they are intended to serve).
- Gather, prepare, and present all deviations to the Document Owner for review and approval.
- Gather the improvement opportunities identified by the Continuous Improvement activities and develop recommendations for enhancements/updates. Ensure user education/awareness materials are appropriate.

5. DEFINITIONS

TERM	DEFINITION
Conduction	Transfer of heat through contact. Heat passes from the warmer material to the cooler material. For example, a person skin can transfer heat to a contacting surface if that surface is cooler, and vice versa
Convection	Transfer of heat in a moving fluid. Air flowing past the body can cool the body if the air temperature is cooler. On the other hand, air that exceeds 98.6° F can increase the heat load of the body, especially when humidity is high.
HSE Representative (Onsite)	Anadarko employee or contract employee assigned to rotational position on a facility.
Heat Stress Monitoring Equipment	Equipment such as heat stress monitors used to measure and record ambient air temperature, humidity, air flow, and radiant heat from sources like the sun, or other heat producing equipment. This equipment is designed to provide the data to monitor workplace heat exposures so workers can take action based on their readings.
Offshore Installation Manager (OIM)	Person (or their designated alternate) having overall responsibility for the implementation of the Heat Stress Management Program.
Person In Charge (PIC)	Anadarko employee or designated Anadarko representative directly responsible for the operation or field location.
Radiation	Transfer of heat energy through space. A person whose body temperature is greater than the temperature of the surrounding surfaces radiates heat to these surfaces. A person will also feel radiation heat from the sun when exposed to direct sunlight.

APPENDIX A- HEAT STRESS MANAGEMENT FORM

APC GoM Heat Stress Management Audit

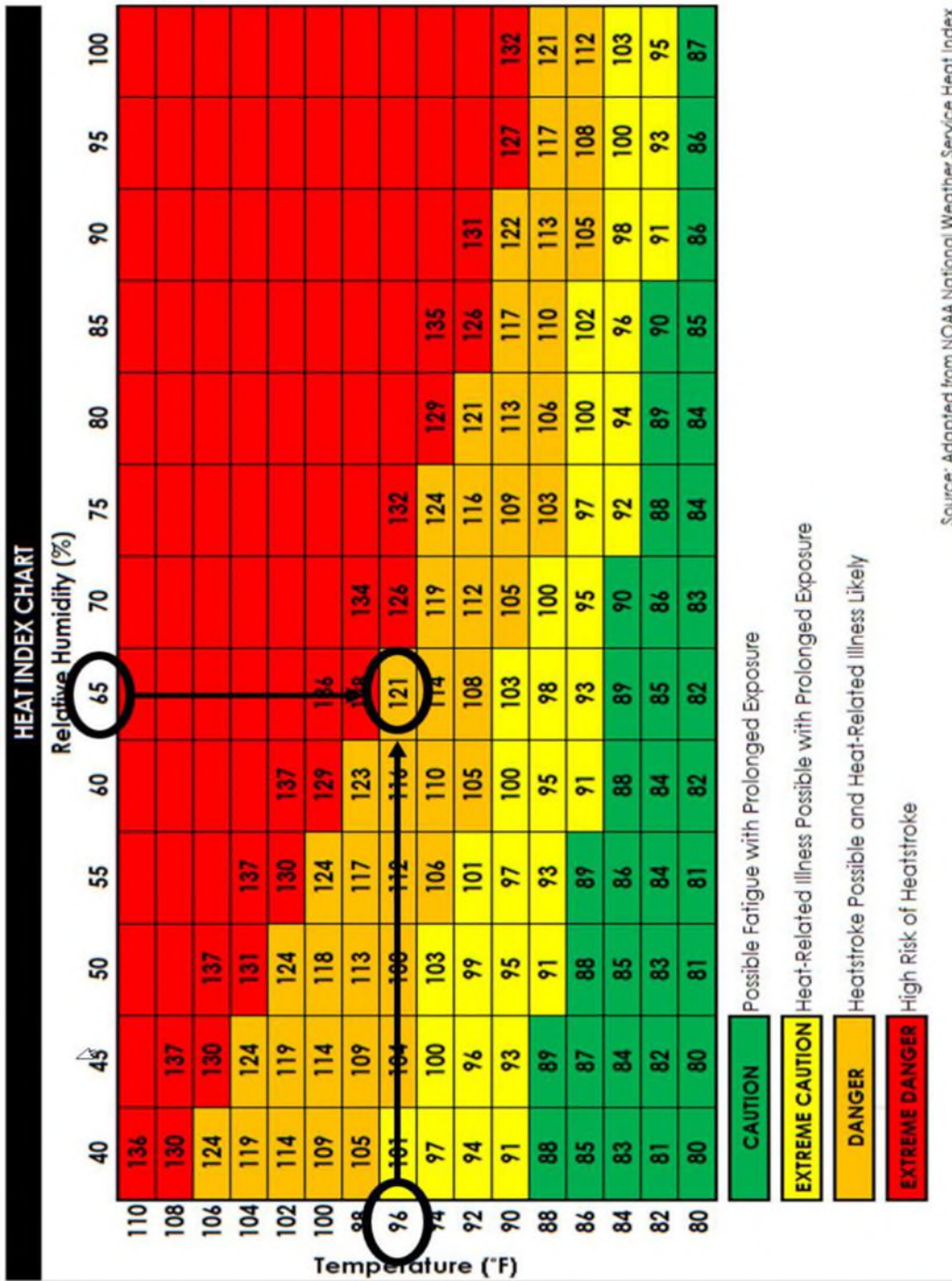


Temperature		Y/N	Comments
Record air temperature, humidity & index rating:			
Any additional heat source that may add to the heat loading?			
Is there a heat source on site that may add to the heat loading?			
Are extra precautions required because of additional heat source?			
Worksite		Y/N	Comments
Is the work site in a shaded area?			
Has shade protection been provided? Is it required?			
Is the work being carried out strenuous? Detail the work activity. Location and WCC# if applicable:			
Light:	i.e. Cleaning	Medium:	i.e. Hammering
		Heavy:	i.e. Manual Handling
Has the heat stress color code been displayed and updated?			
Aware of color code rest period requirements and breaks applied?			
Was work postponed until a cooler part of the day?			
Drinking water available on site or nearby?			
Personnel aware of heat stress precautions and can detail signs?			
Buddy/rotation system in use for activity and monitoring each other?			
Aware of color code water intake requirements?			
Have mechanical aids been provided for manual handling?			
Are personnel using cooling aides?			
Is sun screen being used by personnel?			
First Aid		Y/N	Comments
Trained first aiders available?			
Personnel aware of the nearest medical facility?			
Are urine charts posted in the toilets - are they multi-lingual?			
Sample Checks - Pick an individual and perform a review on the following:			
Individuals body temperature using the non-contact thermometer:		Temp:	
Carry out the pinch test on the back of the hand.			
Check if the person is thirsty and advise.			
Check how much water the individual has consumed that day.		Volume:	
Advise the individual on any finding that may lead to heat stress issue.			

Auditor: _____ Signature _____ Date _____

Site Manager: _____ Signature _____ Date _____

APPENDIX B – HEAT STRESS INDEX EXAMPLE



APPENDIX C – OFFSHORE WORK/REST GUIDE

APC Heat Exposure Work/Rest Guide				
Heat Index	Work : Rest Minutes	Water Requirements	Controls	Flag Color
125 or higher*			Work requirement evaluation.	Red (Extreme Danger)
104-124**	20:10	1 cup every 10 minutes	Work under shade. Elevated and confined space work stopped.	Orange (Danger)
91-103	40:10	1 cup every 20 minutes	No working alone.	Yellow (Extreme Caution)
80-90	50:10	1 cup every 20 minutes	Continuous visual monitoring of workers under direct sun and heavy work.	Green (Caution)
Note* (125+)	Critical activities will be allowed to continue subject to a maximum of 20:20 work/rest periods, an approved risk assessment and additional control measures in place (i.e. air blowers, buddy system). Non-critical activities will be stopped.			
Note** (104-124)	If working in shade is not possible as a heat stress control, tasks shall be individually risk assessed and additional control measures such as increased rest periods implemented.			