

COMMENTS TO BE RETURNED TO:
 COMPANY/PMC

FAX NO.:
 BY DATE:

FAX NO.:
 BY DATE:

Contractor Transmittal No.	T-DH-5578-E4-1587	Recd. Date	29 Oct 2010
Document No.	5578-E4-HSE-HU-00036	Rev. Date	27 Oct 2010
Document Title	Risk Assessment and Management Procedure	Rev	0

COMMENTS:

By: _____ **Signed** _____ **Date** _____

Review Code:

- 1. REJECTED : REVISE AND SUBMIT
- 2. COMMENTS AS NOTED : WORK MAY PROCEED SUBJECT TO COMPLIANCE WITH AND INCORPORATION OF COMMENTS
- 3. NO COMMENTS : WORK MAY PROCEED
- 4. INFORMATION ONLY. : ACCEPTED FOR INFORMATION ONLY

No. of Pages attached to this form :

RISK ASSESSMENT AND MANAGEMENT PROCEDURE

AGREEMENT NO. : 09-5578-E-4

PROJECT NAME : Ruwais Refinery Expansion Project
EPC-4: Tankage & Associated
Interconnecting Piping

COMPANY : Abu Dhabi Oil Refining Company (TAKREER)

PMC : Mott MacDonald Ltd.

CONTRACTOR : Daewoo Engineering & Construction Co., Ltd.



**RUWAIS REFINERY
EXPANSION PROJECT**

**EPC-4 TANKAGE AND ASSOCIATED
INTERCONNECTING PIPING**

AGREEMENT No. 09-5578-E-4

DAEWOO E&C

PROJECT No. 5578

Doc. No. 5578-E4-HSE-HU-00036

Rev. 0

Page 2 / 12

This page is a record of all revisions of this document. All previous issues are hereby superseded and are to be destroyed.

Proprietary Information: This document contains proprietary information and may not be partly or wholly reproduced without prior written permission from TAKREER and/or Daewoo Engineering & Construction Co., Ltd.						DOC. CLASS	T/1
						DIST. CODE	18/19
0	27 Oct 2010	Issued For Construction	D. Bhandari	A. Mesquita	D Y Kim	M Heo	
A	16 August 10	For Review & Comment	S Wardman	D Y Kim	C Wardman	M Heo	
REV	DATE	REASON FOR ISSUE	PREP	CHKD	REVD	APP'D	COMPANY
SIGNED (Initials)							

NOTES:

- (a) Revisions are denoted by a vertical line placed in the right-hand margin against the revised text.
- (b) PREP = Prepared by, CHKD = Checked by, REVD = Reviewed by, APP'D = Approved by.
- (c) In case of conflict between any requirements stipulated in this document with the contractual requirements, the contractual requirements shall prevail.

CONTENTS

1.	INTRODUCTION.....	5
	1.1 Purpose.....	5
2.	DEFINITIONS AND ABBREVIATIONS.....	5
3.	RESPONSIBILITIES.....	7
	3.1 Project Manager.....	7
	3.2 HSE Manager.....	7
	3.3 Section Managers.....	7
	3.4 HSE Supervisor.....	7
4.	PROCEDURE.....	7
	4.1 Identification of Hazards.....	7
	4.2 Evaluation of Risks.....	8
5.	RISK.....	9
6.	RISK MANAGEMENT IN HEALTH AND SAFETY.....	10
7.	RISK ASSESSMENT MATRIX (RAM)	11
8.	RISK REDUCTION MEASURES.....	11
9.	RISK ASSESSMENT FOLLOW UP.....	12
10.	ATTACHMENT.....	12
	1. Sample of Health, Safety and Environment Hazards and Effects Management Process (HEMP) Matrix	
	2. Task Risk Assessment Format – RRE Project	

1. INTRODUCTION

1.1 Purpose

The purpose of this procedure is to establish a formal system for the performance and documentation of risk assessment of Health, Safety and Environmental issues expected on Site of Ruwais Refinery Expansion Project.

The risk assessment will be performed on a variety of activities on the site with the aim of identifying all possible hazards, which may be encountered, and to establish the means by which the hazards can be eliminated/reduced and/or controlled.

The outline stages for performing these assessments, as detailed herein, are;

- The identification of hazards
- An introductory evaluation of the associated risks
- Determination of mitigation measures
- Assessment of control effectiveness, by continuous monitoring

This system shall be based on the project site Hazards and Effects Management Process (HEMP).

A key element in identifying and managing hazards in Ruwais Refinery Expansion Project is a systematic approach to the identification of hazards and the assessment of the associated risk in order to provide information to aid decision-making on the need to introduce risk reduction measures.

Risk reduction measures should follow this hierarchy:

- elimination of the hazard, e.g., adoption of an alternative activity,
- prevention of incidents (i.e. reduction of the probability of occurrence)
- control of incidents (i.e. limit the extent and duration of a hazardous event)
- mitigation of the effects (i.e. reduce the consequences / effects).

Elimination of the hazard should always be first choice, followed by preventative measures, such as using inherently safer design or adopting safe operating procedures. Mitigation of consequences, e.g., by use of appropriate PPE, should always be last choice.

Measures to recover from incidents should be provided based on risk assessment and should be developed taking into account possible failures of the control and mitigation measures. Based on the findings of the evaluation, detailed health, safety and environmental objectives and management programmes should be set at appropriate levels.

2. DEFINITIONS AND ABBREVIATIONS


ALARP

As Low As Reasonably Practicable. To reduce a risk to a level, which is “as low as reasonably practicable” involves balancing reduction in risk against the time, trouble, difficulty and cost of achieving it. ALARP represents the point, objectively assessed, at which the time, trouble, difficulty and cost of further reduction measures becomes unreasonably disproportionate to the additional risk reduction achieved.

BAT

Best Available Techniques. Equivalent to ALARP in Pollution, Prevention

	and Control. BAT minimises the pollution that may be caused to the environment taken as a whole, using best available techniques and having regard to BPEO
BPEO	Best Practicable Environmental Option. Equivalent to ALARP in Pollution Prevention and Control. The outcome of a systematic consultative and decision-making process which emphasises the protection and conservation of the environment across land, air and water. BPEO establishes for a given set of objectives, the option that provides the most benefits or the least damage to the environment, as a whole, at acceptable cost, in the long term as well as in the short term.
CONTRACTOR	Daewoo Engineering & Construction Co., Ltd. or DAEWOO
DEC	Daewoo Engineering and Construction Company Limited
ERA	Environmental Risk Assessment. A method to identify, evaluate and assess significant environmental risks that will form the basis for environmental risk management within the HSE MS.
FAR	Fatal Accident Rate an end point used in safety QRA.
FRA	Fire Risk Assessment. A qualitative method to identify, evaluate and assess significant fire risks that will form the basis for fire risk management within the HSE MS. FRA does not include events with the major accident hazard potential.
Hazard	The potential to harm people and the environment, cause damage or loss of assets, and to adversely impact on TAKREER's reputation.
Health Hazard	The potential to cause harm to health. Health hazards may be biological, chemical, physical, ergonomic or psychological in nature. 'Health hazards' are also known as 'agents hazardous to health' and 'hazardous agents'. These terms are interchangeable.
HRA	Health Risk Assessment. The systematic identification of health hazards in the workplace and subsequent evaluation of health risks. HRA is the primary method for classification of the level of occupational health risk and for setting control implementation priorities.
PLL	Potential Loss of Life an end point used in safety QRA.
PTW	Permit-to-Work
QRA	Quantitative Risk Assessment. A quantitative method to identify, evaluate and assess significant HSE risks that will form the basis for HSE risk management within the HSE MS. QRA shall be used by TAKREER for all events with the major accident hazard potential. QRA is often associated with safety risk assessment but in this guidance a more general description to quantitative HSE risk assessment has been used.
Risk	Combination of the frequency (likelihood) of an event and the severity of the consequences (effects) of that event.
HSE Critical Task	A task with potential to cause major injury or health effects to people, local damage to assets, localized effects to the environment or considerable impact on reputation (see also ADNOC 'Risk Management Guidelines').

 <p>تكرير TAKREER شركة أبوظبي لتكرير النفط We Refine Right</p>	<p>RUWAIS REFINERY EXPANSION PROJECT</p> <p>EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING</p> <p>AGREEMENT No. 09-5578-E-4</p>	<p>DAEWOO E&C</p>	
<p>PROJECT No. 5578</p>	<p>Doc. No. 5578-E4-HSE-HU-00036</p>	<p>Rev. 0</p>	<p>Page 7 / 12</p>
<p>3. RESPONSIBILITIES</p> <p><u>3.1 Project Manager</u></p> <p>Has the final responsibility to ensuring that risk assessment is carried out for critical activity on the project as per this procedure and is done without endangering health and safety in accordance with the local legislation, client’s requirements and stipulations laid down in the HSE management system document</p> <p><u>3.2 HSE Manager</u></p> <p>The HSE Manager shall be responsible for monitoring the application of this procedure by regular HSE Audits.</p> <p>He shall further provide support in the acquisition of suitable training courses and material.</p> <p><u>3.3 Section Managers</u></p> <p>The Section Managers, shall be responsible for the implementation of this procedure and for ensuring that all necessary risk assessment are undertaken by the relevant sections on the project and that all actions arising from the risk assessment are fully implemented.</p> <p>He shall be responsible for ensuring that personnel who are required to undertake risk assessments have received the required training.</p> <p><u>3.4 HSE Supervisor</u></p> <p>He shall ensure that all risk assessments are adequately coordinated, documented, filed, reviewed and followed-up. All of these sub-activities are essential elements of the risk management process.</p> <p>The responsible persons for the relevant sections shall be responsible for establishing a plan and scope for risk assessment to be carried out within the area of responsibility.</p> <p>Shall ensure that all supervisors and HSE personnel at site shall contribute to the risk assessment performance within their area of responsibility and ensure that any follow-up and lessons learned are passed to the workforce via safety meeting and toolbox talks. All supervisory staff will be informed of the findings of any risk assessments which have been carried out on them, their work, equipment they may use and activities they may be involved in. Instructions for any subsequent correction actions shall be advised and implemented.</p> <p>4. PROCEDURE</p> <p>4.1 Identification of Hazards</p> <p>Hazards identification will be performed utilizing the following techniques:-</p> <ol style="list-style-type: none"> 1. Formal inspections using checklists 2. Informal hazard spotting exercises 3. Actions arising from incidents and near miss investigations 4. Management System Audits 			

4.2 Evaluation of Risks

Hazards identified for each task subject to risk assessment will be analyzed to determine the risk value and level which should be controlled accordingly. Definition of the terminology associated with risk assessment is as follows.

Consequence: The outcome of an event especially as relative to an individual, asset, reputation or environment.

TABLE 1 – HARM TO PEOPLE

Consequence Descriptions		
(The highest value in the relevant category will always be used)		
Value	Result of Hazard to People	Description
5	Catastrophic	Multiple fatalities. Total or substantial loss of assets. Massive environmental impact over a large area. Constant high exceedance of statutory limits. International media attention.
4	Severe	Single fatality. Two weeks shutdown. Severe environmental impact. National media attention and public concern.
3	Critical	Long term/irreversible injury/illness, Short term/partial shutdown. Localised environmental impact with no long term consequences. Extensive attention in local media.
2	Marginal	Short term injury/illness (DAFWC) with full recovery. Brief disruption to production. Minor environmental contamination. Limited local concern.
1	Negligible	First aid/medical treatment case. Slight plant damage, no disruption to operation. Environmental damage within site boundary only. No public concern

Probability: A measure of how likely it is that some event will occur; a number expressing the ratio of favorable cases to the whole number of cases possible.

TABLE 2 – PROBABILITY CATEGORIES

Guidance on Probability Categories

Probability	Probability Category	Guidance
Frequent	E	Likely to happen several times per year at the location under consideration (RR,ADR,Office etc)
Probable	D	Has a happened several times in Takreer previously and known to occur elsewhere several times per year throughout ADNOC companies or worldwide.
Occasional	C	Could happen once in the life of the project or operation. Has happened in Takreer before.
Remote	B	Unlikely to occur during the life of the project/operation, although has been know elsewhere in the ADNOC group
Improbable	A	Unlikely event. May have occurred worldwide but not known in Takreer or ADNOC Group Company.

5. Risk

The basic approach to the management of risks in health and safety can be summed up in the following stages:

1. Consider all tasks and situations
2. Identify the hazards that are, or may be, involved
3. Identify those who may be exposed to the hazards
4. Analyze the risks of injury or loss from the hazards
5. Evaluate if the risk is adequately controlled
6. Consider measures that may eliminate or reduce risk further in line with the basic principles of hazard control (ALARP)
7. Implement the risk control measures
8. Monitor the measures
9. Review and feedback any corrective action

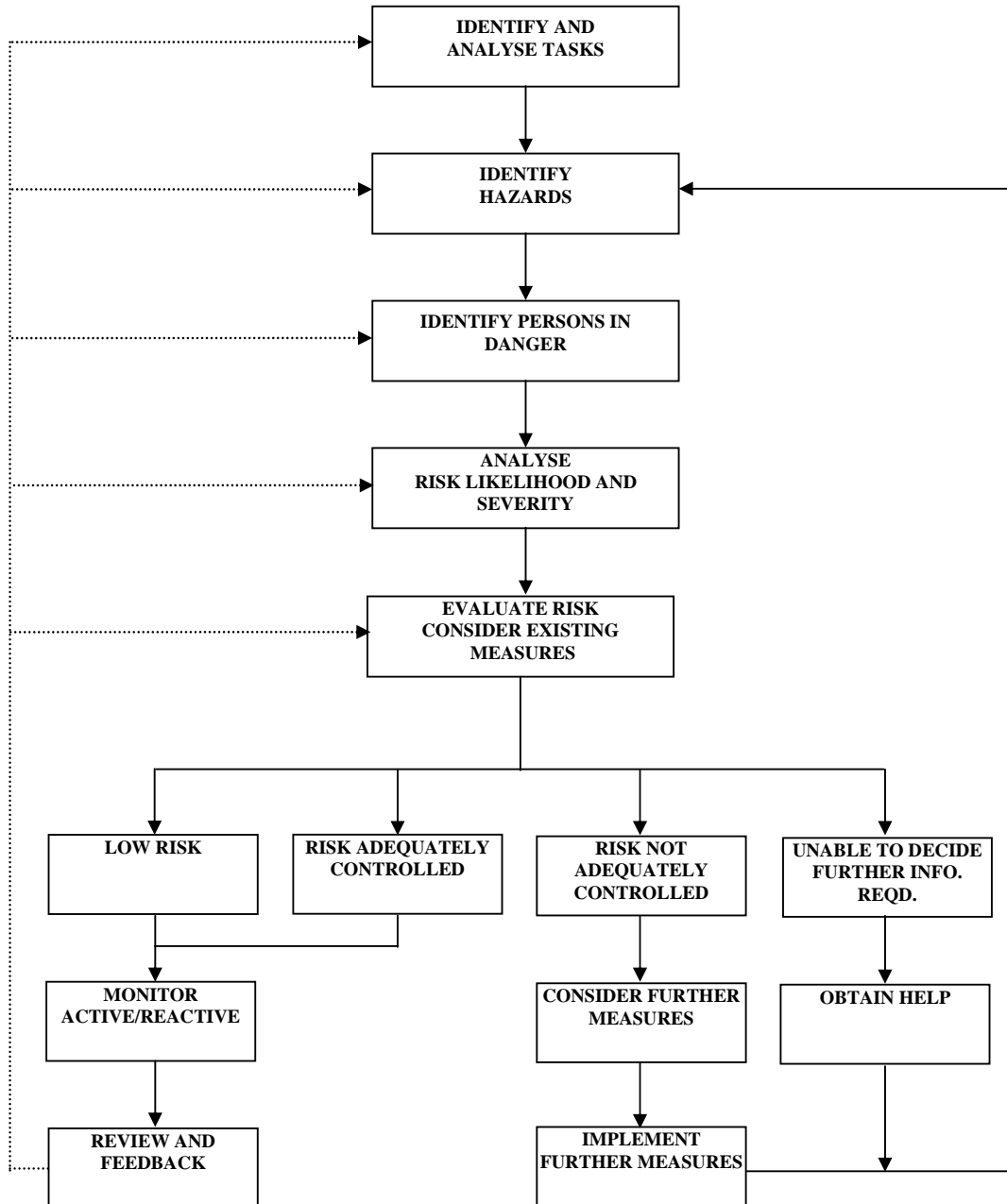
A diagrammatic version of the whole risk management process is shown on next page.

Risk = Probability of the event x the consequences.

Unfortunately as we are not dealing with numbers this too needs judgement. Here are some guidelines:

1. High x High = High
2. High x Medium or Medium x High = High
3. High x Low or Low x High = Medium
4. Medium x Medium = Medium
5. Medium x Low or Low x Medium = Medium
6. Low x Low = Low

6. RISK MANAGEMENT IN HEALTH AND SAFETY



For establishing risk it is represented as:

Risk = Consequence X Probability

For risk assessments, the Consequence categories are applied to both personnel and property/progress. In the cases where a category will be applicable to both people and property (most cases) the one applicable to personnel will, in general, take precedence.

The risk analysis estimated is made of the Consequences and Probability of each hazard identified. The product of these two is defined as the risk value.

7. RISK ASSESSMENT MATRIX (RAM)

Table 3 Risk Assessment Matrix (based on Takreer Guidelines)

SEVERITY	People	Assets	Environment	Reputation	PROBABILITY					
					IMPROBABLE	REMOTE	OCCASIONAL	PROBABLE	FREQUENT	
5 - Catastrophic	Multiple fatalities	Extensive damage	Massive effect	International impact	Has occurred in world-wide industry but not in ADNOC	Has occurred in another ADNOC Group Company	Has occurred in TAKREER	Happens several times each year in TAKREER	Happens several times per year in same location or operation	HIGH
4 - Severe	Single fatality or permanent disability	Major damage	Major effect	National impact						
3 - Critical	Major injury or health effects	Local damage	Localised effect	Considerable impact			MEDIUM (ALARP)			
2 - Marginal	Minor injury or health effects	Minor damage	Minor effect	Minor impact						
1 - Negligible	Slight injury or health effects	Slight damage	Slight effect	Slight impact	LOW					

8. RISK REDUCTION MEASURES

Determination of Risk Reduction Measures

Once the risk has been analyzed, they must then be assessed against agreed acceptability criteria. Below is an indication of the action and time scale for addressing control measures.

Risk Level	Action/Time Scale
High	Immediate:-Before work is started or allowed to continue
Medium	Control to be in place as soon as practicable
Low	Consider the cost benefits of improved controls

Selection of Suitable Risk Reduction Measures

Risk reduction process must address the means of providing a solution in the following order:

- Eliminate the risk by removing the hazard – ‘engineer out’ the problem at source
- Reduce the risk by substitution of a less hazardous process, activity or substance
- Isolate (protect everyone) by effective engineering control such as enclosing the hazard, removing the person from the hazard or reducing the person’s exposure time to hazard.
- Install protective devices
- Enforce special rules and procedures to closely control the hazard(s)
- Provide proper supervision, supported by training, instruction and relevant information

9. RISK ASSESSMENT ACTION FOLLOW UP

The findings of the risk assessments will be passed to all concerned parties (i.e. Construction Manager, Project Manager and HSE Manager). Actions arising from the assessment which cannot be corrected immediately should be recorded on the safety inspection reports and followed up accordingly.

10. ATTACHMENT

Attachment 1: Sample of Health, Safety and Environment Hazards and Effects Management Process (HEMP) Matrix.

Attachment 2: Task Risk Assessment Format – RRE Project

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
Health	H	Diseases							Health Education	Education schedule	Review Procedures	Health statistics from site clinics	Monthly, Site Doctors	
	H1	Mosquitoes	Bites	D4				H	Use of Mosquito repellents on exposed skin at nights	Scheduled. Ongoing Inspections. Regular.	Diagnose illness. Treat on site. Hospitalization. Evacuate if necessary.	Schedule of Issuance of repellents Records of issuance.	Monthly	
	H1	Insect Borne Diseases.	Malaria	D4				H	Vector control, fumigation and fogging. Adequate drainage (TCN & LLC) Prophylactics (Promotion +	Scheduled. Ongoing Inspections. Regular.	Diagnose illness. Treat on site. Hospitalization. Evacuate if necessary.	Schedule of fogging, fumigation Educational material. Records of attendees. Vaccination records.	Monthly	
	H1		Yellow Fever	B3				L	Vector control, fumigation and fogging. Adequate drainage. Vaccination of expats. Monitor incidents.	Scheduled. Ongoing Inspections. Pre-engagement. Weekly.	Diagnose illness. Treat on site. Hospitalisation. Evacuate if necessary.	Schedule of fogging, fumigation Education Records of attendance. Vaccination records.	Monthly	
	H1		Plague	B3				L	Adequate water and sanitary provisions. Refuse collection. Rodent control. Monitor incidents.	Ongoing inspections. Daily. As necessary. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Camps inspection reports. Rodent control measures.	Monthly	
	H2	Readily Infectious Diseases.	Meningitis	B3				L	Vaccination of expats. Monitor incidents.	Pre-engagement. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Education material. Records of attendees. Vaccination records.	Monthly	
	H2		Diphtheria	B3				L	Vaccination of expats. Monitor incidents.	Pre-engagement. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Education material. Records of attendees. Vaccination records.	Monthly	
	H2		Polio	B3				L	Vaccination of expats. Monitor incidents.	Pre-engagement. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Education material. Records of attendees. Vaccination records.	Monthly	
	H2		TB	C3				M	Monitor incidents	Weekly.	Diagnose illness. Hospitalisation. Treat on site Isolate patient. Evacuate if necessary.	Camps inspection reports	Monthly	
	H3	Diseases as a result of poor hygiene & sanitation.	Typhoid	C3				M	Maintain adequate water and sanitary provision in camps and Vaccination of expats.	Ongoing inspections. Pre-engagement.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Camps inspection reports Vaccination records Water quality records.	Monthly	
	H3		Cholera	C3				M	Maintain adequate water and sanitary provision in camps and Monitor incidents.	Ongoing inspections Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Camps inspection reports Water quality records.	Monthly	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
Health	H	Diseases							Health Education	Education schedule	Review Procedures	Health statistics from site clinics	Monthly, Site Doctors	
	H1	Insect Borne Diseases.	Malaria	D4				H	Vector control, fumigation and fogging. Adequate drainage (TCN & LLC) Prophylactics (Promotion + Supply).	Scheduled. Ongoing Inspections. Regular.	Diagnose illness. Treat on site. Hospitalization. Evacuate if necessary.	Schedule of fogging, fumigation Educational material. Records of attendees. Vaccination records.	Monthly	
	H1		Yellow Fever	B3				L	Vector control, fumigation and fogging. Adequate drainage. Vaccination of expats. Monitor incidents.	Scheduled. Ongoing inspections. Pre-engagement. Weekly.	Diagnose illness. Treat on site. Hospitalisation. Evacuate if necessary.	Schedule of fogging, fumigation Education Records of attendance. Vaccination records.	Monthly	
	H1		Plague	B3				L	Adequate water and sanitary provisions. Refuse collection. Rodent control. Monitor incidents.	Ongoing inspections. Daily. As necessary. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Camps inspection reports. Rodent control measures.	Monthly	
	H2	Readily Infectious Diseases.	Meningitis	B3				L	Vaccination of expats. Monitor incidents.	Pre-engagement. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Education material. Records of attendees. Vaccination records.	Monthly	
	H2		Diphtheria	B3				L	Vaccination of expats. Monitor incidents.	Pre-engagement. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Education material. Records of attendees. Vaccination records.	Monthly	
	H2		Polio	B3				L	Vaccination of expats. Monitor incidents.	Pre-engagement. Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Education material. Records of attendees. Vaccination records.	Monthly	
	H2		TB	C3				M	Monitor incidents	Weekly.	Diagnose illness. Hospitalisation. Treat on site Isolate patient. Evacuate if necessary.	Camps inspection reports	Monthly	
	H3	Diseases as a result of poor hygiene & sanitation.	Typhoid	C3				M	Maintain adequate water and sanitary provision in camps and Vaccination of expats.	Ongoing inspections. Pre-engagement.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Camps inspection reports Vaccination records Water quality records.	Monthly	
	H3		Cholera	C3				M	Maintain adequate water and sanitary provision in camps and Monitor incidents.	Ongoing inspections Weekly.	Diagnose illness. Treat on site. Isolate patient. Hospitalisation. Evacuate if necessary.	Camps inspection reports Water quality records.	Monthly	
	H3		Gastroenteritis	D2				M	Adequate screening. Inspection of catering facilities. Food hygiene training. Periodic medical exam. Treated water to LLC / TCN camps. Effective sanitation / sewage system.	Pre-engagement, Medical schedule 6 monthly. Food handlers certificate. Bi-annual camp inspections, monthly water sampling.	Diagnose illness. Treat on site. Hospitalisation Isolate patient. Evacuate if necessary.	Fitness certificates. Catering / health inspection reports. Educational material. Records of attendees. Bacterial investigation and source identification.	Monthly.	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	H4	STD	Hepatitis A & B	B3				L	Adequate water and sanitary provisions. Vaccination of expats. Condom distribution. Monitor incidents.	Ongoing inspections. Pre-engagement. As necessary. Weekly.	Diagnose illness. Treat on provide counseling. Hospitalisation Trace contacts, where possible	Vaccination records Monitoring and trending Tracking records	Monthly.	
	H4		HIV	D4				H	Condom distribution. Warning notice. Health promotion. Monitor incidents.	As required. Regular but frequent. Weekly.	Diagnose illness. Treat and provide counseling. Hospitalisation Trace contacts, where possible	Monitoring and trending. Tracking records.	Monthly	
	H4		Other STD	D2				M	Condom distribution. Warning notice. Monitor incidents.	As required. Regular but frequent. Weekly.	Treatment & counseling. Hospitalisation Trace contacts where possible.	Monitoring and trending. Tracking records. Review of public records	Monthly	
	H5	Pre-Existing Conditions		C2				L	Pre-employment certificate of fitness, sample screening. Medical examinations, and investigations.	Variable	Diagnose illness. Treat site. Evacuate if necessary.	Medical Certificates Medical appointment schedule. Previous Medical History. Monitoring records.	Monthly	
	H6	Infections	Respiratory Infections	D1				L	Adequate screening Dust suppression and monitoring during dry season. Adequate air condition.	Pre-engagement. As required	Treat on site. Hospitalization. Dust suppression.	Pre-employment certificate of fitness. Air-conditioning inspections reports. Air pollution records. No smoking policy.	Monthly	
	H6		Wound Infections	D1				L	Prompt treatment of all wounds.	As necessary	Diagnose illness. Treat on site. Hospitalisation. Isolate patient Evacuate if necessary	Weekly Health Statistics	Monthly	
	H6		Worm Infections	D1				L	Monitor Incidents	Weekly	Diagnose illness Treat on site. Hospitalisation. Evacuate if necessary	Weekly Health Statistics	Monthly	
	H7	Others	Tetanus	B3				L	Debridement of wounds Vaccination.	As required. Pre-engagement	Diagnose illness Treat on site. Evacuate if necessary	Weekly Health Statistics	Monthly	
	H8	Medical Evacuation injury	Unstable condition	D3				M	RA 1 hospital facilities if necessary	As required. No night evacuation By boat	Hospitalization Prior to evacuation	Medical records	Monthly	
	H9	Night Shift Workers	Mosquito/insect bites	C4				M	Free issue of malaria prophylaxis for expats and free issue of insecticide and insect repellent	Free issue for night shift workers (Standard PPE)	Diagnose illness. Treat on site. Hospitalization Evacuate if necessary	Medical records	Weekly	
	S	SAFETY							Daily S.T.A.R.T. Briefings Education & Safety training + PPE compliance. Supervisor Responsibility & Accountability. JSA's	Scheduled, Regular Toolbox talks	Review Procedures	Training schedules, Educational material. Records of attendees. Incident reports	Monthly	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S1	Manual Lifts	Personal injury, back injuries, strains, sprains, crushing, hernia.	D2				M	Ergonomics training. Job Assessments. Provision of lifting aids.	Induction. Regular toolbox talks.	Rescue and treat personnel. Emergency services recovery. Re-educate workforce.		Monthly	
	S2	Routine Maintenance. Work.	Unsafe work methods.	D1	D2	D1		L M L	PTW. Lifting Equipment Certificates and Inspections (SLI's). Routine inspections of power tools	Induction. Regular toolbox talks. Schedule job specific PTW as necessary.	Rescue and treat personnel. Emergency services recovery. Re-educate workforce.	Permits	Monthly	
	S3	Moving machinery	Trapping	C1				L	Warning signs Adequate guards. Adequate lighting. PTW. Lock Out / Tag Out of powered machinery.	Induction. Regular toolbox talks. Schedule job specific PTW as necessary.	Emergency Stop Button Treatment at site clinic. Emergency services recovery. Re-educate workforce.	Safety inspection report.	Monthly	
	S3		Entanglement	C1				L	No loose clothing, tie up hair, no Loose jewelry.	Induction Regular toolbox talks.	Stop activity. Free-up elements. Emergency Stop Button	Safety inspection report.	Monthly	
	S3		Impact	D1				L	Adequate guards Watchman. Reverse alarms. Adequate lighting. Bay markings.	Induction. Regular toolbox talks.	Rescue & treat personnel. emergency services, recovery, repair.	Safety inspection report.	Monthly	
	S4	Mechanical handling	Falling loads	C4	C1			M L	Third Party Crane Inspections Daily Crane checks Competent riggers Inspection of rigging gear equipment. Tagging of equipment. SWL displayed. Test reports, Rigging checks.	Ongoing Inspections.	Treatment at site clinic. Emergency services recovery. Re-educate workforce.	Safety inspection report.	Monthly	
	S4		Overturning machines	C4	C3	C1		M L	SWL displayed. Qualified and certified drivers. Only work on solid ground use of out riggers with adequate support pads.	Ongoing	Treatment at site clinic. Emergency services recovery. Re-educate workforce.	Register of qualified drivers / operators retained by subcontractors.	Monthly	
	S4		Vehicle Accidents	D4	D3	D1		H M L	Effective enforced regulations. (speed limit and checks, drink driving enforcement). Regular car servicing and maintenance. Offender Retaining. Road safety courses, Pedestrian crossing points. Compulsory attendance at DDC. Routine vehicle inspections Vehicle spot checks. DDC refresher training	Ongoing Service schedule	Treatment at site clinic. Emergency services recovery. Re-educate workforce.	Regulations Vehicle service & maintenance records.	Ad-hoc	
	S5	Noise	Hearing damage	C3					Low noise equipment to codes and standards. Noise levels surveillance. Warning signs. Access control. Ear Defenders Controlled Areas and enforcement.	Ongoing	Shutdown equipment. Remove from site. Noise reduction by e.g. Job changes. ENT specialist treatment. PPE.	Noise survey and monitoring records. Testing of suspect equipment.	Ad-hoc	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S6	Excavations	Underground cables and pipes.	D3	D3	D2		M M M	As built documentation. PTW. S/C compliance and supervision of PWT requirements.	As required	Repair	Permits. Safety Inspection reports.	Monthly	
	S6		Collapsing walls	B3	B3			L L	Excavation permits that identify shoring requirements.	As required	Emergency services recovery.	Permits. Incident reports	Monthly	
	S6		Unguarded holes. Access/Egress, falling personnel or machines.	D2	D2			M M	Ladder access Tape barriers. Rigid barriers. Warning signs. Adequate lighting. PTW.	As required	Emergency services recovery.	Permits. Safety Inspection reports.	Monthly	
	S6		Close to Structures	D2	D2			M M	PTW Move or protect temporary structures.	As required	Repair	Permits. Safety Inspection reports.	Monthly	
	S7	Scaffolding	Dangerous Scaffolding	D3	D2			M M	Scaffold system, including Blue Tag requiring 100% Fall Protection for temporary modified scaffolding. Inspections. Dedicated scaffold Supervisor. Scaffold training. Regular board inspection	As required Regular toolbox talks	Dismantled Rebuild	Scafftags. Safety inspection reports.	Monthly	
	S7		Partial collapse	B3	B2			L L	Scafftag system. Inspections. Training in scaffold awareness	As required Regular toolbox talks	Dismantled Rebuild	Scafftags. Safety inspection reports.	Monthly	
	S7		Debris & Tools falling, dropped, Boarding inadequate	E3	E1			H L	Scafftag system. Inspections.	As required Regular toolbox talks	Red tag until rectified	Scafftags. Safety inspection reports.	Monthly	
	S7		Unsafe ladders Metals ladders acting as electric conductors.	E3	E2			H M	Use wooden ladders near to electrical systems. Ladders checked as part of weekly inspection	As required Regular toolbox talks	Remove Destroy if necessary	Scafftags. Safety inspection reports.	Monthly	
	S8	Confined Space Entry	Asphyxiation	B4				M	Must attend CSE course prior to entry into any confined space. PTW. Provide ventilation adequate PPE, Warning signs. Written system of work. Atmosphere tests	Before each entry and minimum 4 hourly thereafter	Emergency services recovery	Permits	Monthly	
	S8		Unauthorized entry. Ingress of toxic material Inert gases	B4				M	Attendant/ Hole watch PTW Provide ventilation, Warning signs Adequate PPE, Positive isolation of system	Before each entry and minimum 4 hourly thereafter	Emergency services recovery	Permits	Monthly	
	S8		Heat	D3				M	Monitor temperatures and humidity in work area PTW Provide ventilation, Warning signs. Adequate PPE Water	As required	Emergency services recovery	Permits	Monthly	
	S8		Personal injury	C2				L	Safe means of access and egress Adequate lighting Approved scaffolding, PPE.	As required	Emergency services recovery	Permits	Monthly	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S8		Fire / Explosion	B4				M	Gas tests, PTW, Isolation of unit, Adequate ventilation, Removal of flammable material	Each entry	Emergency services recovery	Permits	Monthly	
	S8		Electrocution	B4				M	PTW, Lock out / Tag out of all associated electrical equipment. Use of Low voltage, (<50v), or pneumatic tools as per PR	Each entry	Emergency services recovery	Permits	Monthly	
	S8		Access / Egress	E2				M	Use of hole watch Scaffold / ladders or platform	Each entry	Emergency services recovery	Permits	Monthly	
	S9	Rigging	Unqualified person for rigging.	D3	D3			M	Competence checks, registered riggers. List of Competent Persons maintained	On going	N/A	Register of qualified riggers retained by subcontractor.	Monthly	
	S9		Damaged, worn or unusable rigging equipment.	D3	D3			M	Inspections and Colour coding. Dedicated Rigging Supervisor. Quarantine store.	Before use. Quarterly	N/A	Safety inspection reports.	Monthly	
	S9		Falling personnel	C4				M	Supply of harnesses and training for use.	When working at height >2m.	Rescue, treatment.	Monitoring and record of safety inspections.	Monthly	
	S9		Underrated sling / hook / shackles	C3	C4			M	Inspection and colour coding. SWL displayed	Before use. Quarterly	N/A	Register of rigging equipment. Register of qualified riggers retained by subcontractors	Monthly	
	S9		Damage to property		C3			M		Ongoing.	Repair	Register of qualified riggers retained by subcontractors	Monthly	
	S10	Cranes	Sub-standard cranes	C4	C4			M	Third party inspection Certification. checks	Prior to site entry and every 6 months.	Prohibited access to site.	Register of approved equipment retained by subcontractor.	Ad-hoc	
	S10		Unqualified crane drivers	C4	C4			M	Valid certificates for drivers, Competence checks.	Pre-engagements	Remove driver. Provide adequate training.	Register of qualified drivers / operators retained by the subcontractors		
	S10		Excessive lifting weights exceeding capacity of cranes.	C4	C4			M	Load chart available in cab at all times. Displayed of SWL. Radius of working indication. Automatic safe load indicator.	Every lift.	Remove operator.	Safety inspection reports.	Ad-hoc	
	S10		All lifts	E4	E4			H	Lifting study Adequate barriers.	As required.	N/A	Record of lifting studies	All lifts>50 t	
	S10		Working near overhead cables.	B4	B4			M	PTW showing measures taken to indicate.	As required.	N/A	Permits TO/LO locations	Monthly	
	S11	Housekeeping	Debris causing falls	C2				L	Clearance of work site, de-nailing of timbers. Adequate stacking of materials. Regular Inspections and corrective actions.	Daily.	Stop activity. Clear area.	Safety inspection report.	Ad-hoc	
	S11		Material falling from height	E2	E2			M	Regular inspections and corrective action. Toe boards on all platforms Adequate stacking / storage of materials at height. Use of debris nets where appropriate	Daily	Stop activity Clear work area	Safety inspection report	Ad-hoc	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S11		Combustible debris – risk of fire.	C1	C1			L L	Clearance of work site Bins for oily rags. Segregated storage for flammable materials.	Daily.	Stop activity. Clear area. Provision of Fire Fighting Equipment.	Safety inspection reports.	Random	
			Rodent Infestation	D1	D1	D1		L L	Clearance, use of pesticides, bins for food waste.	Daily	Stop activity, clear area	H & S inspection report	Ad-hoc	
	S12	Electrical Equipment	Sub-standard equipment	C3	C2			M L	Distribution panels inspected by TSKJ before being energised. Inspections and Colour coding. Dedicated Electrical Supervisor. Quarantine store.	Ongoing and quarterly.	Tag as unsafe. Remove from site.	Register of approved equipment retained by subcontractor. Inspection records.	Quarterly	
	S12		Unqualified electricians	C3				M	List of Competent people Certified electricians. Training.	Pre-engagement	Provide adequate training. Remove from site.	Register of qualified competent personnel retained by subcontractor.	Monthly.	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S12		High voltage switching	B4	B4			M M	Specific named personnel. PTW	Pre-engagement	N/A	Register of qualified competent personnel.	Monthly.	
	S12		Live equipment	C3	C2			M L	ELCB's. Warning signs. Lock Out / Tag Out	Ongoing	N/A	Safety inspection reports	Monthly	
	S12		Shock and burns	C3				M	ELCB's. Correct voltage use.	Ongoing	Emergency services recovery	Safety inspection reports.	Ad-hoc	
	S12		Fire/explosion	C3	C3			M M	Correct voltage use. ELCBs. Correct storage of flammable materials.	Ongoing	Emergency services recovery	Safety inspection reports	Ad-hoc	
	S13	Testing (Pneumatic, Hydrostatic, Hot-Oil Flushing)	Pressure, Noise, Leaks, Heat.	E2	E2	E1		M M L	Absorbents and booms available when oil flushing. Adequate barricades, Warning signs. PTW. Testing COP / procedure. High pressure tests outside normal work hours.	As required.	Emergency services recovery.	Safety inspection reports	As necessary	
	S13		Unaware of test	C2				L	Subcontractors to advice, giving sufficient notice period – say 48 hours.	As required.	N/A	Notification to others S/C via Site Notice or in Co-ordination meetings.	As necessary	
	S14	MSDS	Chemicals, hazardous to health.	E3		E3		H H	Prevention of exposure. Isolation, dedicated storage areas. MSDS information and training. COSHH style Assessments. PPE Permits and safe conditions. Pre-warning of arrival.	As required	Rescue and treat personnel. Emergency services recovery.	MSDS for each chemical at the store and site of use. Inventory and location of chemicals.	Ad-hoc	
	S15	Aerial Work Platforms, Working at height.	Substandard machine	C3	C2			M L	Third Party Inspections Certification / testing	As required.	Removed from site.	Safety inspection records.	Ad-hoc	
	S15		Tipping over	B4	B3			M L	Use only on solid ground Inspections. Trained and Competent operators, Method Statements* Risk Assessment.	As required.	Rescue and treat personnel. Emergency services response. Investigate	Safety inspection records.	Monthly	
	S15		Personnel falling	B4				M	100% tie off policy Operator proficiency test. Use of PPE, safety nets. Handrails. Clear space underneath working	Ongoing	Emergency services response.	Record of proficiency. Safety inspection records.	Monthly	
	S15		Material, tools falling.	C3	C1			M L	Use of tool bags, safety nets, toe boards. Not overloading walkways, steel work clear of loose material. Close Boarding and safe areas below. Barricade area	As required. Regular toolbox talks.	Rescue and treat personnel. Emergency services response.	Safety inspection records.	Ongoing	
	S16	Mancage Basket	Inadequate mancage	C3				M	Inspections Third party certification	As required and Then 6 monthly	Repair or remove from site.	Register of approved equipment retained by subcontractor. Safety inspection reports.	Regularly.	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S16		Working without permits.	C4	C2			M L	All subcontract issued with site permit requirements.	As required.	Stop activity.	Safety inspection reports.	Monthly	
	S16		Craneage inadequate	B4	B3			M L	Crane to have valid TP certificate of inspection. Permit to include crane details with 50% down rating.	As required.	Stop activity.	Register of approved equipment retained by subcontractor.	Monthly	
	S16		Simultaneous lift of personnel & materials.	B4	B3			M L	Permit only allows tools necessary for job must be include in total weight estimate.	As required.	Stop activity	Safety inspection reports.	Ad-hoc	
	S17	Radiography	Exposure to radiation.	B3				L	Marked exclusion zone Competent personnel Shielding. Follow procedures. Routine monitoring	As required.	Remove from source. Treat personnel.	Register of radiographic equipment as required by regulations, Procedures.	Monthly	
	S18	Welding – Hot work.	Welding flash, substandard equipment.	E2	E2			M M	Shielding of area Inspection, Provision of suitable fire fighting equipment. Provision and use of PPE.	As required.	N/A	Register of approved equipment retained by subcontractor.	Monthly	
	S18		Fire explosion	C4	C3			M M	Provision of fire blanket Provision of fire extinguishers with 6m of work place. Hot work permit Storage and segregation of bottled gas. 6 meters segregation 1 hour firewall.. Segregation of flammable materials. Flashback arrestors	As required.	Rescue and treatment of personnel. Emergency services response.	Safety inspection reports.	Ad-hoc	
	S18		Welding leads (trip hazards) & Earthing.	D2	D2			M M	Housekeeping and prescribed routes. Lead above ground when possible	As required.	N/A	Safety inspection reports.	Monthly	
	S18		Burns	C2				L	PPE.	As required. Regular toolbox talks.	Treat personnel	Issue records of PPE.	Monthly	
	S18		Arc eye	C2				L	Shielding PPE.	As required. Regular toolbox talks.	Treat personnel	Issue records of PPE.	Monthly	
	S18		Shock, 240V outputs protection.	B4				M	Welding units inspected Maintenance and testing. Insulation. ELCB set at appropriate level. Use of 110v equipment.	Every 6 months As required.	Treat personnel	Records of maintenance and testing.	Monthly	
	S19	Storage of Paints, Solvents and Flammable Insulation Production.	Fire explosion	B4	B4	B3		M M L	Dedicated storage areas. Fire fighting equipment allocated Good housekeeping. No smoking notices. Use of AC's when required Earthing of containers during transfer	As required.	Emergency services recovery.	Inventory and location of materials.	Monthly	
	S19		Fumes and Ventilation.	B3				L	Vented sea containers or shaded. Well-ventilated area.	As required.	N/A	Inventory and location of materials.	Upon receipt of materials.	
	S19		Chemical	C3				M	Prevention of exposure. PPE. Pre-warning of arrival & provide information such as MSDS.	As required.	Treatment of personnel	MSDS Inventory and location of materials.	Ad-hoc	
	S19		Gas cylinders, Compressed air.	C4	C3			M M	Inspection and colour coding of gauges Inspection before use. Adequate PPE, Hoses mechanically secured. Adequate storage.	As required	Treatment of personnel	MSDS	Monthly	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S20	Inspection of mechanical equipment.	Dangerous, substandard or unapproved equipment.	D4	D2	D1		H M L	Inspection prior to use on site. Guards/shielding on abrasive wheeled equip. Specific job training and Certificated Abrasive Wheel Changers.	As required.	Remove from site	Register of approved equipment retained by subcontractor. Safety inspection report. Register of competent persons	Monthly	
	S20		Equipment requiring repair.	E2	E1	E1		M L L	Repair carried out by competent person.	As required.	N/A	Register of approved equipment retained by subcontractor. Safety inspection report.	Monthly	
	S20		Hand Tools and cartridge. Operated Fired tools.	E3	E2			H M	Inspection and colour coding Inspection prior to use on site. Guards/shielding on abrasive wheeled equip. Specific job training.	Quarterly Daily Regular toolbox talks.	N/A	Register of approved equipment retained by subcontractor. Safety inspection reports.	Monthly	
	S21	Incomplete structures.	Missing handrails, unsecured grating, structural components missing.	E4				H	Blue tags on scaffolds Permit for grating removal Warning signs. Inspections. Barriers and tape.	As required	Stop activity	Safety inspection report.	Monthly	
	S21		Falling personnel	C4				M	PPE, e.g. harnesses, 100% tie off Hard Barricades Safety nets	When working at height >2m.	Rescue and treatment of personnel. Emergency services response.	Safety inspection report.	Monthly	
	S22	Commissioning and related activities	Unauthorised entry.	C3				M	Taped barriers. Warning signs. PTW. Fenced areas with controlled entry Separated badge requirements – Commissioning Induction	As required	N/A	Ongoing, continual monitoring. Permits	Monthly	
	S22		Smoking	C4	C4			M	The match points No smoking signs. Allocation of smoking rooms.	As required	N/A	Continual monitoring. No smoking policy	Random	
	S22		Equipment access	C3	C3			M M	PTW identifying requirements.	As required	N/A	Permits	Monthly	
	S23	Splicing of electrical cable.	Unapproved or incompetent persons.	D4	D3			H M	Approval and accreditation of personnel. Inspection and Tagging of equipments.	As required	N/A	Register of qualified competent personnel kept by subcontractors.	Monthly	
	S23		Wrong methods	C3	C3			M M	Method statement by subcontractor.	As required	N/A	Method statements, monitoring of work.	At start of work by subcontractor when required.	
	S24	Work on water	Working above water.	E4				H	Adequate PPE. Including tie-off Emergency equipment to be available close to working area. Equipment inspected.	When required	Emergency services recovery.	Safety inspection report.	Monthly	
		Passenger transport on water	Man Overboard	E4				H	Comply with captain's instructions at all times. Wear life jacket when on deck of open boat. Comply with requirements of RTSMP.	All journeys	Recovery by vessel Emergency services recovery.	Safety inspection report.	Random	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
			Boat Sinking	C4	C5			M	Boats smaller than 20 feet length to comply with US Coast Guard floatation requirements. H Routine maintenance of boar Comply with requirements of RTSMP. Risk assessment for type of boat	All journeys	Emergency services recovery.	Audit of RTSMP	6 Monthly	
	S24		Diving operators	B4				M	Only fully trained operators.	As necessary	Emergency services recovery.	Certificates of suitable Inspection and audit report.	Monthly	
	S25	Others	Heat Stroke	C3				M	Identification of location, person. Limit exposure times work rest periods. Drink water liberally. Shielding (e.g. hat)	All year	Observation of long exposures. OH statistics trends.	Medical OH statistics	Ad-hoc	
	S25		Drowning	C4				M	Warning signs. Flotation, buoyancy aids. Specific job awareness training Warning against recreation Swimming from beach	All year	Emergency rescue from water and medical intervention.	Inspection records of relevant sites & records of response teams and first	As necessary	
	S25		RTA	D4				H	Defensive driving. Warning signs, road safety campaigns. Regular Policing with speed traps and Breathalyser. Vehicle checks routine and spot No drink & drive rule.	All the line. Regular toolbox talks	Emergency services recovery. Re-educate workforce.	Incident report	Monthly	
	S25		Burns	C3				M	Appropriate PPE Education – safety at home and work. Identification of potential risk parameters.	Ongoing	Treat personnel	Medical treatment records Records of tool box talks etc.	Ad-hoc	
	S25		Animal bites (type snake).	C3				M	Rodent control by fumigation and baiting. Good housekeeping. Safe refuse disposal methods. Rodent proofing of doors. Education, awareness programs for areas avoidance.	Variable – regular once / twice per week.	Treat personnel Type specific refer to Poison storage center, or National Poison Center.	Schedule of fumigation program and baiting. Inventory of medications. Location records of rodents / snakes etc.	Ad-hoc Monthly	
	S25		Electric shock	C4				M	Electrical connections to regulatory standards. Certified electricians. Warning signs near live equipment. Fuses, circuit breakers, lock-outs. Protective equipment Training Insulation.	Ongoing	Render safe Emergency services recovery.	Electrical installation inspection records.	Ad-hoc	
	S25		Travel by Road, Sea or Air	D5				H	Use recognized air companies. Sea travel on approved craft – with safety equipment in good condition. Road vehicles regularly serviced. Drivers certified.	Variable – monthly to 6 monthly.	N/A	Vehicles service and maintenance records. Driving licenses.	Ad-hoc	
	S25		Intruders	D2				M	Fencing, security guards.	Continuous	Removal of intruder.	Incident report.	Ad-hoc	
	S25		Civil Unrest	C3	C4	C3	C4	M M M M	Fencing, security guards.	As required	Evacuation from site.	Potential dates/times of incidents.	Ad-hoc	
	S26	Transportation of large loads	Falling Load	B4	B4			M M	Load fully secured by competent riggers and checked before moving.	Every load	Recovery of load	Incident reports	Each Incident	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	S26		Road Traffic Accident	B3	B3			L L	Use of escorts to clear road in advance of vehicle.	Every Load	Emergency Services Recovery	Incident reports	Each Incident	
	S26		Damage to Road Furniture, (signs, gates		C1			L	Pre planning of routine using known dimensions of load and vehicle. Removal of obstructing objects in advance.	Every load	Repair and re-instatement.	Incident reports	Each Incident	
	S26		Blocking of Roads						Pre-planning of routine and timing of movement. Movement to be in stages to allow other vehicles to pass.	Every load	Use of flagmen / traffic marshals to guide traffic around load. Vehicles in good working order.	Incident reports	Each Incident	
Environment	E								Education* Stop work	Schedule*	Review Procedures*			
	E1	Spills	Fuel, lubricants			D1		L	Controlled storage – inventory and location. Use of Chemical Store. Bunded storage tanks. Controlled transfer. Spilled Control Procedures and Services.	Before Commissioning	Total clear-up and evacuation of spilled substance. Bioremediation or incineration of contaminated soils. Activate spill response procedure.	Inventory of quantity and location of storage areas. Log of environmental incidents. Recording of all spills. Inspection records. Analyses of soil and/or water samples as determined by site HE Manager.	Each occurrence.	
	E1		Chemicals			C1		L	Controlled storage – inventory and location. Instructions for handling. Provision and use of PPE.	Ongoing	Clear up of contaminated area. Contaminated soil dealt with according to nature of chemical. Handling instructions.	Inventory of quantity and location of storage areas. Log of environmental incidents. Recording of all spills. Inspection records. Analyses of soil and/or water samples as determined by site HE Manager.	Each occurrence. Monthly.	
	E1		Sewage			D1		L	Provision of sewage pumping to treatment plants.	Daily	Clear-up of contaminated area. Minimise environmental impact.	Analyses of sewage plant effluents. Inspection reports. Log of environmental incidents.	Monthly	
	E2	Solid Waste	Chemicals			C1		L	Segregate, treated and disposed in accordance with FME guidelines Possible reprocessing.	When required	Clear-up of contaminated area. Temporary containment and storage on site until removal arranged.	MSDS sheets, storage locations and monthly quantities. Inspection records. Incident logs. Audit of final disposal	Monthly	
	E2		Metal			D1		L	Insignificant impact, store in dedicated area until removal agreed with customs. Segregate and dispose in accordance with HSE premises.	Daily	N/A	Daily records of wastes generated and stored.	Monthly	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced	
	E2		Concrete					D1	L	Insignificant impact, Store in dedicated area until used or disposed. Segregate and dispose in accordance with HSE premises.	Daily	N/A	Daily records of wastes generated and stored. Records of material given to local community for use.	Monthly	
	E2		Sand					D1	L	Insignificant impact, Store in segregated area, treat and dispose in FME approved land fill sites in accordance with HSE premises or make available for local community projects.	Daily	N/A	Daily records of wastes generated and stored. Records of material given to local community for use.	Monthly	
	E2		Timber					D1	L	Segregate and incinerate. Or make available for local community projects.	Daily	N/A	Daily records of wastes generated and stored. Records of material given to local community for use.	Monthly	
	E2		Insulation					D1	L	Segregated, treat and dispose by cement fixation in accordance with HSE premises. SC Responsibility.	Daily	Evacuation from the island	Daily records of wastes generated and stored. Records of material given to local community for use.	Monthly	
	E2		Plastic					D1	L	Segregate, treat and recycle in accordance with HE premises.	Weekly	N/A	Daily records of waste generated and stored and recycle.	Monthly	
	E2		Incinerator ash.					D1	L	Use as soil conditioner, or dispose in FME approved landfill site in accordance with HSE premises.	Monthly	Evacuate from island	Daily records of loads delivered to incinerator. Analyses of ash. Records of offsite disposal	Monthly	
	E2		Domestic Refuse.					D2	M	Collection and incineration or dump to FME / MENR approved landfill site.	Weekly	Temporary storage on site until incineration or landfilling.	Records of waste generated, segregated / treated / incinerated. Inspection records. Log of loads received at dump site.	Monthly	
	E2		Sewage cake					D1	L	None required since used as soil conditioner.	N/A	N/A	N/A	Monthly	
	E3		Oils					D1	L	Collect and dispose off site in accordance with HSE premises.	As required	Use of booms, absorbents to contain spillages.	Routine inspection and sampling of ditches.	Monthly	
	E3		Sewage Effluent					D1	L	To comply with HSE premises. Plant designed to meet requirements for effluent treatment.	Monitor weekly	Clean-up effluent.	Analyses of sewage effluent.	Monthly	
	E3		Hydro test Water					D1	L	Disposed in accordance with HSE premises. Analyses and control rate of discharge.	As required	Stop discharge	Location and equipment requiring hydrotest. Quantity of hydrotest water. Analyses of water prior to disposal. Monitoring of discharge rate.	Monthly	
	E4	Gaseous Waste	Vehicle Exhaust					D1	L	Vehicle regularly serviced, inspected, repaired.	Monthly	Immediate service of engine or engine removed from service.	Regular maintenance records of all engines.	Monthly	
	E4		Temp Incinerator					D1	L	Designed to be in accordance with emission requirements. Comply with HSE policy	Inherent in plant design	Shut-down incinerator	Records of temperature in combustion chambers and O ₂ level in flue gas.	Monthly	
	E5	Fauna	Endangered Species					D1	L	Include in environmental talks on need to preserve all wild-life. Maintain approved width of ROW, re-instate cleared areas in temporarily used locations, and comply with HSE premises.	Scheduled As completed	N/A	Records in environmental talks. GTS inspection records.	Monthly	
	E5		Bush Meat					D1	L	Provision of catering and recreational facilities. Issue warnings about preserving wildlife in environmental talks.	Ongoing	Prohibit sale of bush meat on Company property.	Records in environmental talks.	Monthly	
	E5		Wild animals as pets.					D1	L	Guidelines, warning notices issued. Educating personnel not to buy animals as pets in environmental talks.	Ongoing	Prohibit sale of wild animals on company property.	Records of environmental talks. Notices issued to JV residents.	Monthly	

ATTACHMENT 1 (SAMPLE)

Health, Safety and Environment
Hazards and Effects Management Process (SAMPLE)

Section:
Rev. No:
Date :

HEMP Conducted by :

Category	Item	Subject	Hazard	People	Assets	Environment	Reputation	Level of Risk	Mitigation	Frequency (Of Mitigation)	Emergency/Recovery Measures	Records	Reporting Frequency, Nominee	Procedures to be referenced
	E6	Flora	Endangered Species			D1		L	Include in environmental talks on need to preserve forest plant. Maintain approved width of ROW, re-instate cleared areas in temporarily used locations, and comply with HSE premises.	Scheduled As completed	Prevent further cleaning of bush on Company land – unless construction, related.	Inspection records. Records of environmental talks.	Monthly	
	E6		Bush cleaning			C2	C1	L	Include in environmental talks on need to preserve forest plants. Maintain approved width of ROW, re-instate cleared areas in temporarily used locations, and comply with HSE premises.	Schedule As completed	Prevent further cleaning of bush on company land – unless construction related.	Inspection records. Records in environmental talks.	Monthly	
	E7	Water Courses.	Blockage of Drainage Channels			C1	C1	L	Provide drainage channels, where roads cut across waterways. Comply with EIA recommendation.	As required	Additional channels provided where flooding is evidence as a result of construction activities.	Inspection records. Incident logs	Monthly	
	E7		Damage to Fish			B4	B3	M L	Treatment of all effluent and prudent routing of drainage.	As required	Cease discharge. Rectify. Re-stock if necessary.	Routine analyses of inspection records. Incident logs.	Monthly	
	E7		Contamination of water courses.			B4	B3	M L	Adequate storage of hazardous materials. Fuel in bounded areas.	Ongoing	Containment and recovery of any spills.	Routine analyses of effluents. Inspection records. Incident logs.	Monthly	
	E7		Transport						None. Negligible impact on local environment anticipated.	-	None anticipated.	Occasional monitoring to ensure impact is minimal.	Ad-hoc	
	E8	Socio-Economic	Healthcare	C2				L	Vaccination programs in local community. Education and public enlightenment . Provision of routine healthcare in site clinics for workforce to minimize burden on community services.	Ongoing	Treatment in clinics Referrals to local hospitals/clinic	No. of people vaccinated inventory of treatments, and programs of public enlightments. Records of clinic attendee's for non work related illness.	Monthly	
	E8		Water	B2				L	Provided treated water for work and camp sites.	Ongoing	N/A	Daily checks on portable water quality.	Monthly	
	E8		Power	B2				L	Assist in provision of power generation in Bonny and Finima.	Ongoing	Provide servicing and maintenance of electrical generators.	List of equipment supplied to towns.	Monthly	
	E8		Sanitation	B3				L	Sewage treatment facilities provided for effluents from camps. Pumping to treatment plant.	Ongoing	Diversion of sewage waste to alternative plants or temporary leach fields.	Inspection records. Regular sewage effluent analyses.	Monthly	
	E8		Overloading of existing transport structure.	B2				L	Each contractor / subcontractor to provide adequate transportation to workforce (buses only, no man carriers). Maintenance of roads for construction suitability.	As required	Provide additional transport if required.	Transport studies	Ad-hoc	
	E8		Cost of living	B2				L	Minimise inflation due to spiraling wages by establishing island wage agreements. Renegotiate agreement and fix Expansion Project.	Ongoing	N/A	Surveys of cost of living on Bonny, compared to Port Harcourt.	Annually	
	E8		Noise	B2				L	Construction noise limited by using low noise equipment. Segregate equipment from workforce and screen.	Ongoing	Shut-down noisy plant	Perimeter noise measurements. Workplace noise measurements.	Monthly	

					PROBABILITY				
					IMPROBABLE	REMOTE	OCCASIONAL	PROBABLE	FREQUENT
SEVERITY	People	Assets	Environment	Reputation	Has occurred in world-wide industry but not in ADNOC	Has occurred in another ADNOC Group Company	Has occurred in TAKREER	Happens several times each year in TAKREER	Happens several times per year in same location or operation
5 - Catastrophic	Multiple fatalities	Extensive damage	Massive effect	International impact					HIGH
4 - Severe	Single fatality or permanent disability	Major damage	Major effect	National impact					
3 - Critical	Major injury or health effects	Local damage	Localised effect	Considerable impact			MEDIUM (ALARP)		
2 - Marginal	Minor injury or health effects	Minor damage	Minor effect	Minor impact					
1 - Negligible	Slight injury or health effects	Slight damage	Slight effect	Slight impact	LOW				