HEALTH, SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

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.**

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 All previous issues are hereby superseded and are to be destroyed.

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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.

REVISION INDEX DETAILS

Rev	Location of Change	Brief Description of Change

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1. INTRODUCTION

1.1 Project Overview

The Ruwais Refinery Expansion Project (Project) will be executed from December 2009 up to February 2014 (50 months to Provisional Acceptance). The Project is located in the Ruwais Complex in the UAE. The client is Takreer and the scope of Daewoo E&C is the engineering, procurement, construction and commissioning of 76 tanks and associated piping.

The Health and Safety Management system that will be adopted on site during the execution of the Project can be summarized as follows;

1.2 Objectives

To protect the health & well-being of personnel during work site activities and ensure that safety is a prime consideration in the project execution by establishing and maintaining an injury and incident free culture in the workplace. To avoid contaminating the environments and worksite with hazardous substances that may result from construction activities.

1.3 Target

DEC will target to achieve Zero Fatalities, Zero Lost Time Injuries and Major Environmental Incident Cases. In order to complete this project without a lost-time accident and ensure our targets, the HSE Management System as described in this document, will be applied.

1.4 Regulatory requirements

Daewoo Engineering & Construction Co., Ltd ("DEC" hereafter) shall comply with all applicable laws, Company rules, standards and HSE guidelines, and any other requirements specified by the Client during the performance of work. The laws, rules, guidelines and standards from the client should be provided to all lower tier subcontractors and DEC shall be responsible for ensuring such compliance by subcontractors and employees, except in case where such compliance would be contrary to Law.

2. DEFINITIONS

Accident	Within the ADNOC Group it has been agreed that the term accident is synonymous with incident. The term accident has connotations of bad luck in common speech. For this reason the term *incident* is preferred by ADNOC and TAKREER and should be taken to embrace the concept of *accident*. DEC will adopt this philosophy throughout the project.
ALARP	As Low As Reasonably Practicable (ALARP). Refer to section 3.4 for explanation of ALARP.
Aspect	Element of an organisations activities products or services that can interact with the environment
Audit	An independent, systematic and documented process of objectively obtaining and evaluating verifiable evidence to determine that business controls: • Are complete and consistent. • Are (cost) effective and efficient. • Safeguard DEC's resources and promote their effective use. • Provide, and protect the integrity of, required records and information. Allow for compliance with policies, chosen standards, laws and regulations.
Barriers	Elimination and prevention measures that remove or reduce the likelihood of realising a hazards potential for harm. Barriers may be physical (materials, protective devices, segregation, etc.) or non-physical (procedures, inspection, training, drills, etc.)
Continuous improvement	Process of enhancing the (HSE) management system to achieve improvements in overall (HSE) performance in line with the organisations (HSE) policy.
DEC	Daewoo Engineering and Construction Company Limited
Effect	An adverse impact on people, the environment, DEC's assets or reputation.
Hazard	The *potential* to cause harm , including ill health and injury, damage to property, products or the environment; production losses or increased liabilities
HSE Management System (HSE MS).	The company structure, responsibilities, practices, procedures, processes and resources for implementing health, safety and environmental management.
HSE Policy	A public statement of the intentions and principles of action of the company regarding its health, safety and environmental effects, giving rise to its strategic and detailed objectives.
Incident	An event or chain of events which has caused or could have caused fatality, injury, illness and/or damage (loss) to assets, the environment, company reputation or third parties.
Inspection	A scheduled, structured examination of a work site with a specific focus on physical conditions and working practices in addition to normal supervisory duties.
Impact	Any change to the environment whether adverse or beneficial, wholly or partially resulting from DEC's activities.

Near Miss	An event or chain of events which could have caused injury, illness and/or damage (loss) to assets, the environment, company reputation or third parties.
Risk	The product of the measure of the likelihood of an occurrence of an undesired event and the potential adverse effects that this event may have on people, the environment, TAKREER's assets or reputation.
SMART	Objectives and targets shall be SMART (**S**pecific, **M**easurable, **A**chievable, **R**ealistic and **T**ime based).
Top Event	The release of a hazard. The undesired event at the end of the fault tree and at the beginning of the event tree. The centre point in the Bow Tie Diagram.
Task Risk Assessment (TRA)	A process of formal identification, assessment and recording of the risks involved in any particular operation so that appropriate controls can be introduced. TRA is synonymous with job safety analysis (JSA).
Threats	A possible cause that will potentially release a hazard and produce an incident. Examples include damage caused by thermal (high temperature), chemical (corrosion), biological (bacteria), radiation (ultraviolet), kinetic (fatigue), climatic condition (poor visibility), uncertainty (unknowns) or human factors (competence).

3. HSE MANAGEMENT SYSTEM

The DEC HSE management system will cover all aspects of site HSE Management. The HSE management system is the process which turns uncontrolled hazards to controlled risks. The key elements of the program are;

- Leadership and Commitment.
- HSE Policy and Strategic Objectives.
- Organisation, Resources and Competence.
- HSE Risk Evaluation and Management.
- Planning, Procedures and Standards.
- Measuring Performance.
- Audit.
- Management Review.

3.1 Leadership & Commitment

DEC management shall provide strong and visible leadership to promote a culture in which all employees share a commitment to HSE. They shall do this through setting a personal example, demonstrating commitment to implementing the HSE Management System (MS), communicating HSE expectations with employees, discussing and reviewing progress against specific HSE targets and demonstrating personal participation in HSE activities.

DEC management shall be proactive in target setting. They shall do this through developing and discussing improvement targets, ensuring staff have HSE targets in their appraisals, participating in the review of HSE indicators, providing immediate and visible involvement in incidents and in setting targets.

DEC management shall demonstrate informed involvement in HSE issues. They shall do this through reviewing the progress in the development and content of the HSE MS, making resources available to meet HSE targets and undertaking relevant HSE training. In addition, they shall be fully aware of the high priority areas for improving DEC's HSE MS and are personally involved in improvements arising from formal management reviews of the HSE MS.

DEC management seeks to create and sustain a Company culture in which all employees share a commitment to HSE. All employees and sub-contractors shall be involved in creating and maintaining this supportive culture.

3.2 Policy

Daewoo E&C (DEC) is committed to protect Health, Safety and Environment (HSE) throughout all stages of the Project. To create an "Incident Free Environment" for all employees & sub-contractors, continual improvements and preventative measures will be implemented in compliance with the HSE Policy.

DEC shall comply with existing laws, the regulatory framework of the UAE and relevant Company Policies and Procedures. All HSE issued raised by interested parties shall be passed to senior management for thorough consideration.

DEC will establish an HSE Management System based on OHSAS 18001/1999 and ISO 14001/2004.

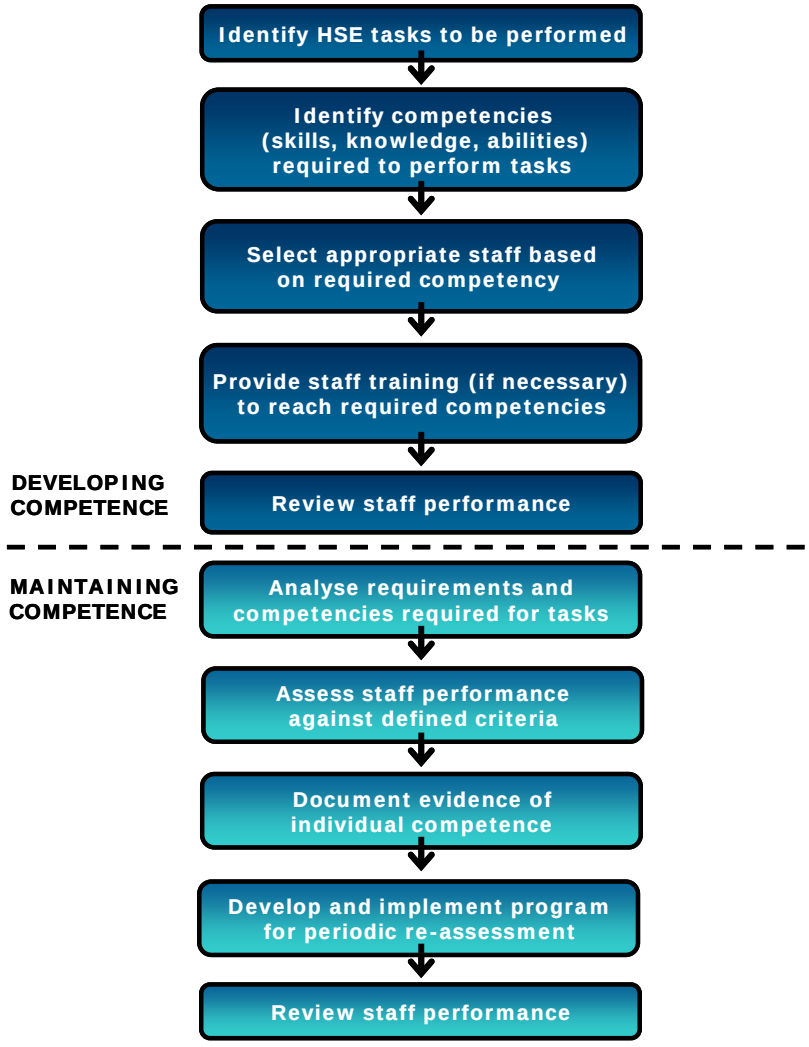
DEC shall comply with the Environmental impact study in addition to identifying potential health and safety hazards. The Project will be subject to a "Zero-accident" campaign to help educate employees and sub-contractors about avoiding injuries, illnesses and property damage at the workplace, and about protecting the environment from contamination.

HSE performance targets shall be set and shall be reviewed annually by DEC's corporate HSE Committee, Site- and Company Management for continual improvement.

The Health, Safety and Environmental Policy shall be communicated to all employees and sub-contractors with the intent that employees are made aware of their individual HSE obligations. Each employee of DEC, including higher management, will participate in the implementation of the HSE Policy.

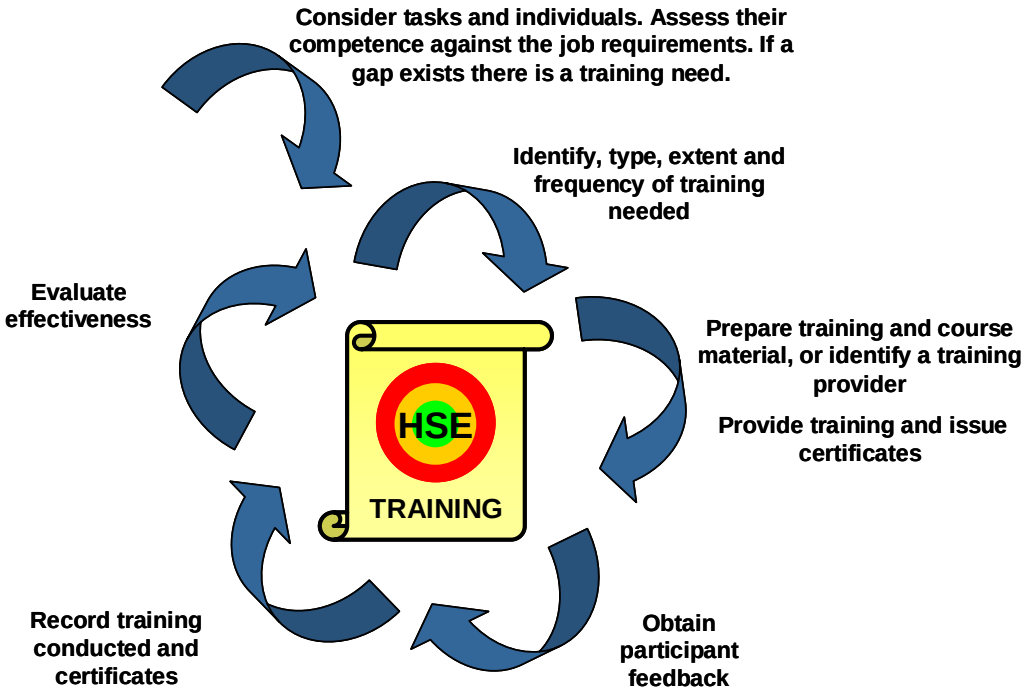
3.3 Organization, resources and competence

The leadership on the project will be actively involved in HSE. Training programs will be in place that all line managers and supervisors have to attend on HSE leadership. The program will clearly outline the roles and responsibilities they have in HSE on the site, and ensure that clear management **control** will be evident on site. It is will also demonstrate that there is specific jobs allocated in specialized fields, and letters of appointment will be given to these persons, signed by the HSE Manager and Project Manager, i.e. Crane Operators, Riggers, Authorized Electrical Persons, Permit Receivers etc. The HSE competence assurance process is depicted in the figure below.



Dedicated weekly HSE Management meetings will be carried out, with management representatives from Company, DEC and all sub-contractors working on site. A monthly HSE committee meeting will also be carried out, as well as a monthly worker committee meeting, that promotes effective **co-operation** and participation of all individuals on site. **Communication** will be very highly focused on and various mediums will be used to disseminate information on site, i.e. Memo's, Safety Alerts, Tool-box talks, meetings, stand-downs etc.

The project personnel are interviewed before employment and clear job specifications are set to ensure **competence** of personnel. Resumes of key personnel will be reviewed before employment. A full training program will be in place that covers all aspects of the work. Personnel will be required to attend training, depending on the scope of their work, before reporting to site, i.e. Working at Height, Defensive Driving, Site Induction, Hydrogen Sulfide etc. The following diagram depicts the evaluation process for training requirements.



3.4 <u>HSE Risk Evaluation and Management</u>

DEC's activities have the potential to cause harm to people, the environment, loss or damage to assets, financial loss and to adversely affect the Company's reputation. DEC's HSE risk evaluation and management process provides a structured and consistent approach to managing hazards and their potential effects, which is based on the Takreer HSE risk evaluation and management process.

The risk evaluation and management process is based on four steps;

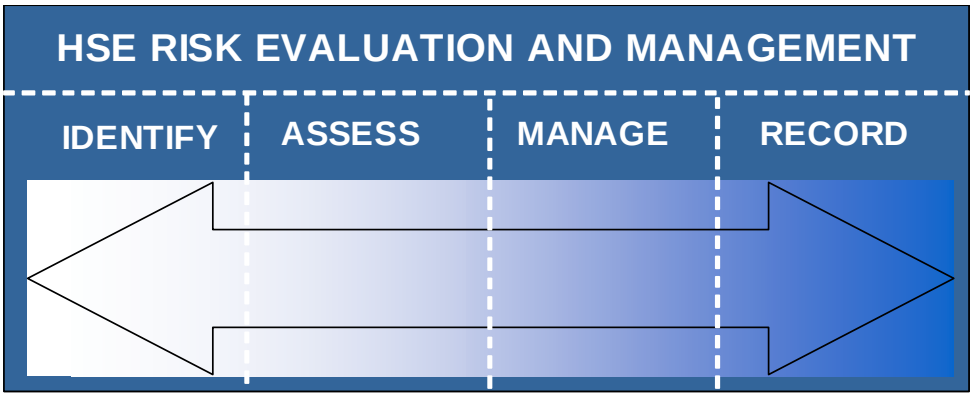
1. **Identification** of hazards and aspects to people, the environment, DEC's assets and reputation.

2. **Evaluation** and **assessment** of the related risks.

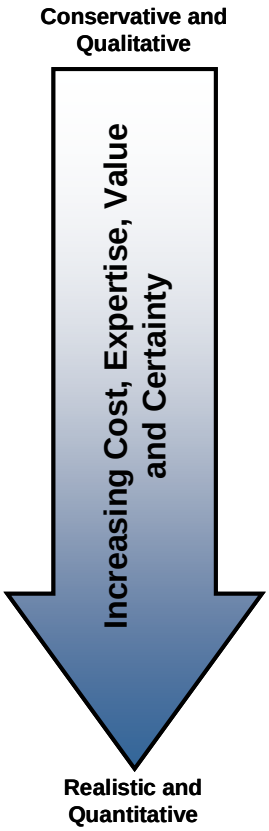
3. Effective **management** of the risks to an acceptable and ALARP level in accordance with risk acceptance criteria and risk management hierarchy.

4. **Recording** of HSE risk assessment studies and their outcomes in terms of the risk management measures utilised to manage HSE risks to an acceptable and ALARP level.

Although the four steps are described sequentially, in practice they overlap and are not always distinct. HSE risk evaluation and management contains feedback loops and is iterative. HSE risk evaluation and management requires review and continual improvement.



The first HSE risk evaluation and management step is to systematically and consistently identify potential hazards and aspects to people, the environment, DEC's assets and reputation. Hazards and aspects shall be identified, tracked and recorded as early as possible and throughout the lifecycle of each DEC's phases of work, i.e. Engineering, Construction, Pre-Commissioning and Commissioning.The second step in the DEC HSE risk evaluation and management process is to evaluate and assess the HSE risks identified and to then prioritize those risks. Assessment of risk in DEC will be according to a tiered process.

TIERED HSE RISK ASSESSMENT METHODOLOGY IN TAKREER		
TIER	**DESCRIPTION**	
1	**Tier 1** risk assessments shall be performed using the qualitative ADNOC Risk Assessment Matrix (RAM) provided in the figure below. A Tier 1 risk assessment is based on conservative assumptions particularly where uncertainties exist. The Tier 1 screening process ensures that ADNOC Codes of Practice requirements are identified and that high and medium risks are passed through to a more detailed Tier 2 risk assessment. All events with a major accident hazard potential should be directly passed to a Tier 2 quantitative risk assessment (QRA). TRA for potentially hazardous activities shall be based on the ADNOC RAM. TRA does not require a Tier 2 risk assessment.	
2	**Tier 2** risk assessments will initially require a semi-quantitative (i.e. numerical scoring, engineering calculations, or simple modelling) based approach in order to evaluate in greater detail and certainty the key HSE risk issues identified in a Tier 1 risk assessment. When uncertainties exist a reasonable level of conservatism should be applied. Screening allows high and medium HSE risks to be passed to a more detailed QRA. The screening process requires expert judgment possibly involving cost benefit decision support. Tier 2 risk assessment also involves the use of QRA techniques that may be applied to Health, Safety or Environmental risks.	

The RAM standardizes Tier 1 HSE risk assessment. The RAM shows risk as the product of probability (or likelihood) and severity (or effect). The RAM shall be used in TAKREER to evaluate and assess Tier 1 HSE risks. Plotting the intersection of probability and severity provides a qualitative assessment of HSE risk.

Use of the RAM:

- Enhance appreciation of HSE risk and achieving ALARP at all levels.
- Assist in setting clear risk based strategic objectives.
- Provide the basis for implementation of a risk based HSE MS.
- Provide consistency in evaluating risk for all DEC activities.
- Ensure compliance and consistency with ADNOC.

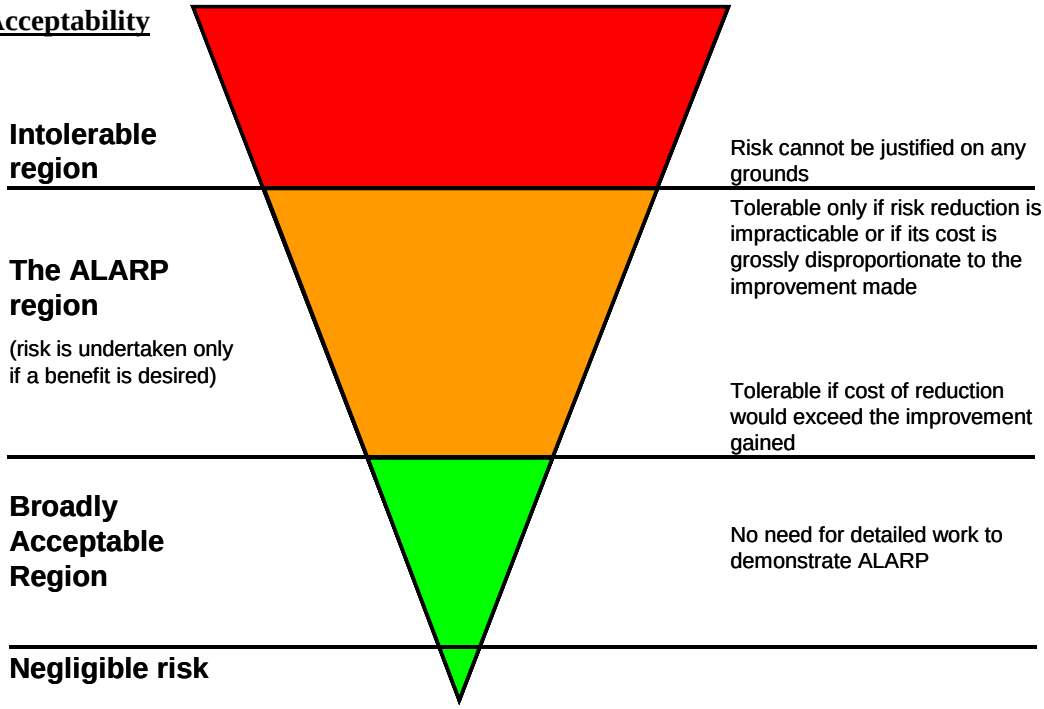
					PROBABILITY				
					IMPROBABLE	REMOTE	OCCASIONAL	PROBABLE	FREQUENT
SEVERITY	**People**	**Assets**	**Environment**	**Reputation**	Has occurred in world-wide industry but not in ADNOC	Has occurred in another ADNOC Group Company	Has occurred in TAKREER	Happens several times each year in TAKREER	Happens 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**				

The third, and perhaps most important step, in the DEC HSE risk evaluation and management process is to make decisions on what management measures will be employed to manage a particular HSE risk. The decision shall be based on two mutually interdependent considerations:

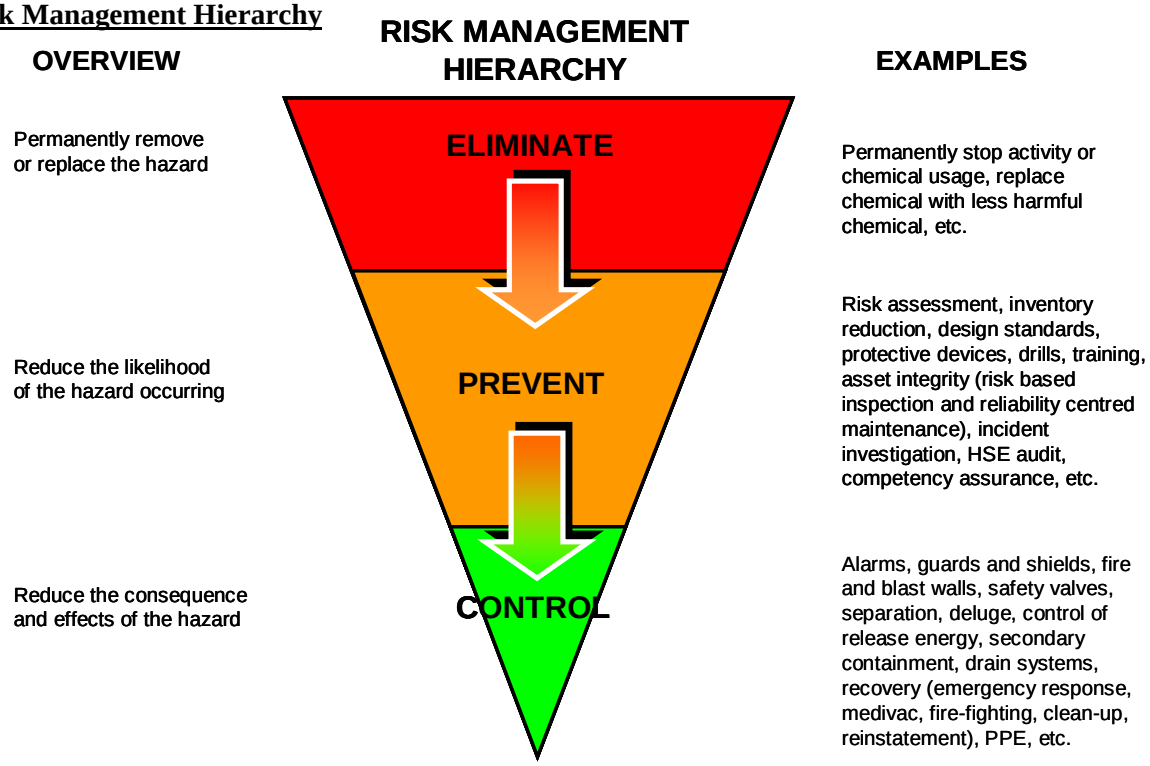
1. **Risk Acceptability** – that the level of HSE risk is managed to an acceptable and ALARP level.
2. **Risk Management Hierarchy** – that HSE risk management decisions are prioritized and appraised according to the eliminate, prevent and control hierarchy.

Risk management options appraisal (including ALARP determination) shall be performed for all Tiers of risk assessment. Risk management options appraisal shall involve a feedback loop to the risk assessment to evaluate the effectiveness of a given risk management measure in reducing the level of HSE risk. The certainty and confidence associated with a risk management decision increases with the risk assessment Tier.

Risk Acceptability



Risk Management Hierarchy



The identification of risk management options shall be made by using the Bow Tie Model (Appendix 1). Risk management measures include the identification and development of HSE critical activities, which are vital to ensure asset integrity, prevent incidents and to control adverse HSE consequences and effects. Even with a comprehensive range of risk management measures in place to eliminate and prevent the release of hazards and their effects things can still go wrong. The last level of risk management is to control escalation of the top event in order to be able to recover from the release of the hazard. Control measures are counter measures aimed at mitigating the consequences of the hazard and aid in the recovery and reinstatement of DEC's activities.

Risk management options appraisal is a particularly useful process for assisting in ALARP determination, which involves the consideration of costs, and benefits in reducing HSE risk. ALARP determination is applicable to all risk assessment Tiers (Appendix 2).

ALARP determination becomes less conservative and more realistic as a risk assessment progresses through the Tiered process. ALARP determinations may also be used to ensure that risk assessment study costs do not outweigh the potential benefits associated with performing a more refined or higher Tier risk assessment. Whilst risk assessment is a technical function, ALARP determination is the responsibility of the Project Manager and Divisional Managers.

3.5 Planning

The site HSE plan will be implemented, and maintained through a HSE Action Plan (Appendix 3), listing out all the key concepts as activities of the site HSE plan. This tool will effectively gauge the up to date status of HSE on site by comparing planned to actual activities, like a schedule.

The site HSE plan has various management arrangements, risk control systems and details of safe work practices. Some of the key programs and initiatives covered in the plan is; Training, Permit to Work (Company), Audits, Incident Investigation, Heat Stress Management Program, Surveys and Welfare incentive programs and Safety Newsletters. The HSE procedures will be revised and updated throughout the project due to the dynamic nature of HSE Management on an EPC contract.
The HSE Action Plan draft has identified 772 planned activities for the year. The activities are listed under the following categories;

- Leadership, Commitment and Communication
- Policy and Strategic Objectives
- Organization, Responsibilities, Resources and Training
- Risk Management
- Planning
- Measuring Performance
- Audit
- Management Review

3.6 Measuring Performance

The DEC HSE department will generate weekly and monthly HSE reports, that will include performance indicators, incident summary and major activities for the month. Performance indicators (KPI's) consist of leading and lagging indicators. The leading indicators focus on proactive and objective implementation

of the HSE Program, whereas lagging indicators measure subjective and reactive elements of the Program. An easy way to interpret these definitions is that leading indicators are before an incident (proactive) and lagging indicators are after an incident (reactive).

The typical leading indicators that will be used on the Project are; Safety leadership training; Job Safety Analysis; Near Miss Reports; Observation Cards; Weekly Management Walkthrough; Training Compliance and Permit to Work compliance. The typical lagging indicators include recordable incidents, incident rates such as lost time incident rate and recordable incident rates as well as lost time incident free man-hours. The leading indicators will also be discussed weekly in the relevant HSE meetings, and trends will be monitored and mitigated as required. HSE performance measurement is a fundamental management principle and a key to the success of the site HSE performance. The format of the reports will be further detailed in the HSE Plan.

3.7 Audit & Review

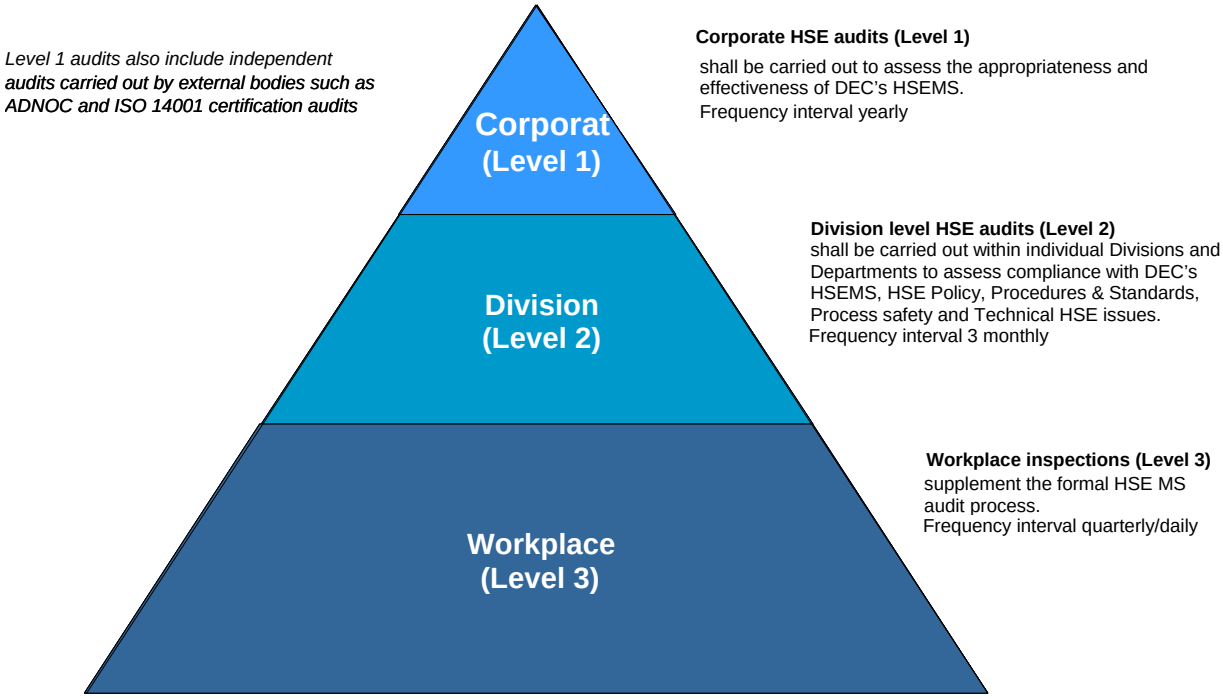
The DEC Audit Committee is a team that will be nominated from Contractor and Subcontractor to carry out periodic audits as defined in the HSE Action Plan. They are charged with assisting the HSE department in overseeing the project's risk management, internal controls and compliance processes by arranging necessary auditing. Technical and other specialized expertise may be obtained internally through Management or externally.

DEC has a three tiered approach to HSE audit applicable to the Project;

Level 1: The objective of a Level 1 audit is to assess at the Corporate level HSE appropriateness and effectiveness, performance and the degree of compliance with DEC's HSE MS. It includes HSE audits performed by the Internal Audit Department or external auditors. Insurance Surveys will also be conducted by external auditors.

Level 2: The objective of a Level 2 audit is to assess at the Divisional level HSE performance and the degree of compliance with DEC's HSE MS, HSE policy, procedures & standards, process safety and technical HSE issues. This includes HSE audits performed or initiated by Divisions and HSE Department as part of Division level assurance process. These HSE audits include technical issue based audits (e.g. offices, permit to work, heavy equipment, lifting equipment, camp, occupational health, environmental controls, etc.). It includes internal and external audits.

Level 3: The objective of a Level 3 audit or inspection is to assess at the Departmental level the physical conditions of the workplace and to physically verify that operations are conducted in accordance with HSE policy, standards and procedures. This includes task verification, workplace and management inspection activities to supplement the formal HSE audit process. This shall include inspection of subcontractor worksites.



3.8 Management Review

In DEC the **annual** management review addresses, but is not necessarily limited to:

- The need to change HSE policies, strategic objectives and targets.
- The provision of adequate resources and competent personnel to achieve HSE strategic objectives and targets.
- The impact of significant organisational, location or activity changes.
- The HSE concerns of employees, contractors and external stakeholders.
- Reviewing the findings of HSE audits, self assessments, inspections, non-compliances and incident investigations.
- Verifying the closure of preventative and corrective actions recommended from HSE audits, self assessments, inspections, non-compliances and incident investigations.
- Technical integrity for those issues with significant HSE risk.
- Emergency preparedness and response plans.
- The findings of HSE monitoring programmes and compliance with legal requirements and ADNOC Codes of Practice.

- Changing circumstances (e.g. changes in ADNOC Codes of Practice).
- Follow up actions from previous management reviews.

DEC shall also perform **quarterly** management reviews which are focused on KPI's and KBP's.

4. REFERENCES

1. ISO: ISO 14001, Environmental management systems – Requirements with guidance for use – 2003.
2. British Standard: OHSAS 18001, Guide to Occupational Health and Safety Management systems, 1996 UK.
3. ADNOC: HSE Management System guidelines, January 2002
4. Takreer HSE Control Procedures
5. DEC: RRE HSE Manual, April 2010
6. DEC: RRE HSE Plan, March 2010

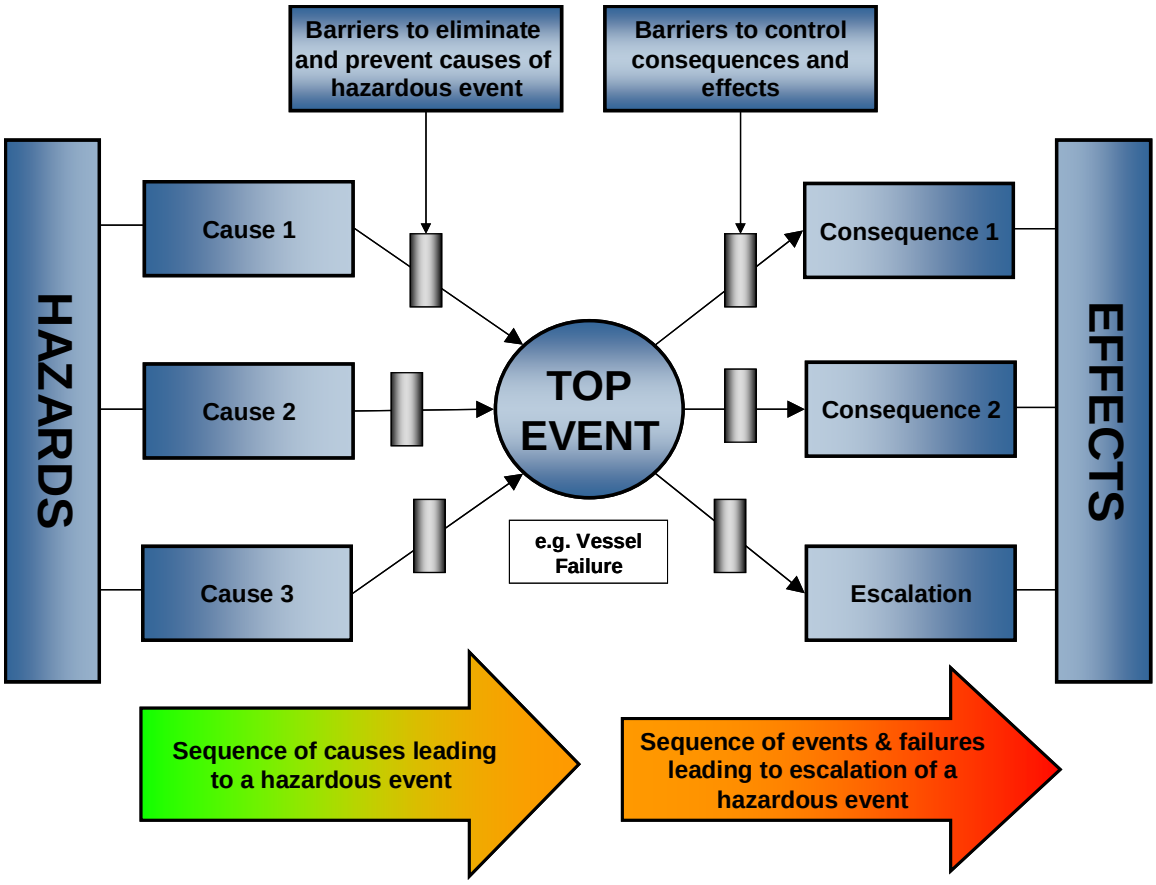
5. ATTACHMENTS

Attachment 1: Bow Tie Model
Attachment 2: ALARP
Attachment 3: HSE Action Plan

BOW TIE MODEL

The Bow Tie Model is a pictorial representation of how a hazard can be hypothetically released and further developed into a number of consequences and effects. The left hand side of the diagram is constructed from fault tree (causal) analysis and involves those threats associated with the hazard, the barriers associated with each threat and any factors that increase likelihood. The right hand side of the diagram is constructed from the hazard event tree (consequence) analysis and involves escalation factors and recovery preparedness control measures.

Bow Tie Model



A fault tree is logic diagram used to identify alternative sequences of hardware faults and human errors that result in system failures or hazardous events. When quantified fault trees allow system failure probability or frequency to be evaluated.

An event tree is logic diagram used to determine alternative potential scenarios arising from a particular hazardous event. It may be used to quantitatively determine the probability or frequency of different consequences and effects arising from the hazardous event.

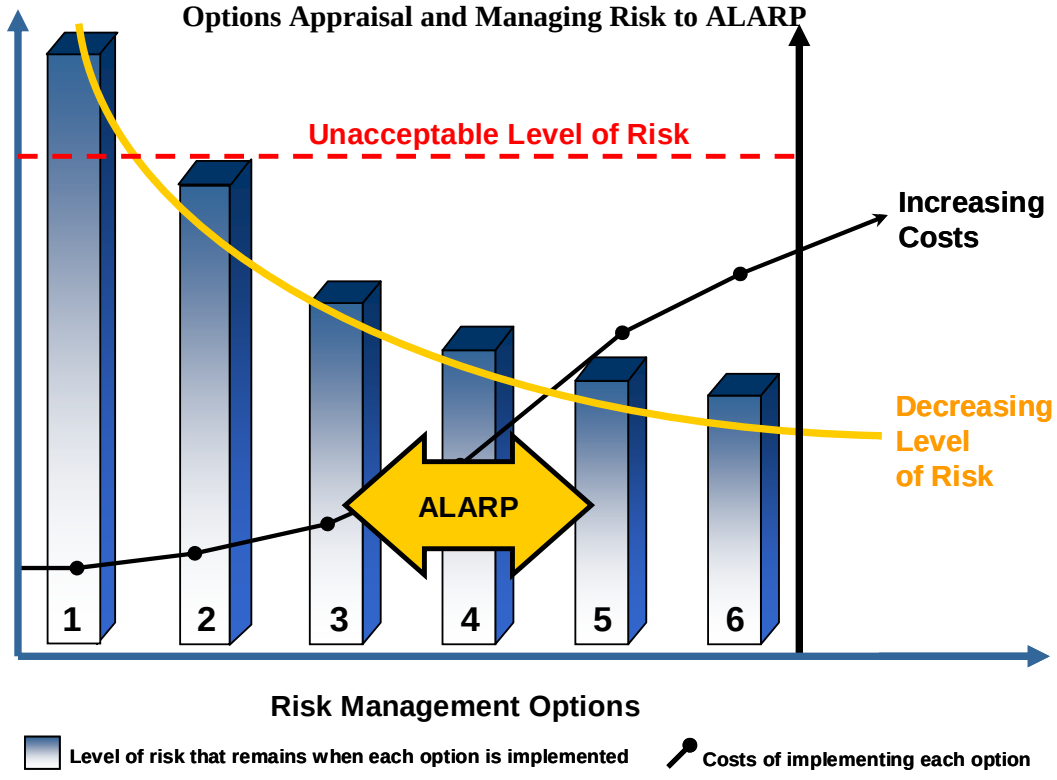
ALARP

ALARP is an abstract concept, which cannot necessarily be expressed, in absolute or quantitative terms. Therefore the following statements are provided as a guide to determining whether a particular risk is being managed to an ALARP level:

- Management decides whether ALARP is achieved, on a case by case basis, for each particular risk.
- For each particular risk ALARP can only be determined by comparing a number of risk management options.
- If risk is not managed in a manner that meets applicable standards (e.g. ADNOC requirements and international best practice), ALARP has not been achieved.
- ALARP has not been achieved if for only a small incremental cost, risk could be appreciably reduced.
- There are many quantitative and qualitative tools that may be used to demonstrate that risks are managed to ALARP, e.g. RAM, QRA, HAZOP, HAZID, HAZAN, SWIFT, best industry practice, etc.

As a guide to deciding whether risk is managed to ALARP, the following statements can be made about the example in the figure below.

1. Options 1 and 2 are not ALARP as the risk is not managed to applicable standards and risk acceptance criteria.
2. Option 3 may be ALARP. However, if for only a small incremental cost, risk could be reduced further as in Option 4, Option 4 would then be ALARP.
3. Options 5 may not be ALARP as reduction in risk may not be justified by the additional risk management costs.
4. Option 6 is not ALARP since the risk management costs outweigh the reduction in risk.



HSES Action Items Schedule 2010 (rev. 21/12/2009)

No	Activities	Frequency	Date & Timing	Action Party	Risk (H - M - L)	Progress %	January				February					March				April					May				June				July					August				September				October					November				December								
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52					
1	**Leadership, Commitment and Communication**																																																												✓	×	▲	♦	TOTAL
1.1	Senior Management Quarterly Meeting	Quarterly		TBA	Medium		♦													♦													♦													♦													0	0	0	4	4
1.3	Monthly HSES Steering Committee	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.4	Sub-Contractor Monthly HSES Meeting	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.5	Camp Safety and Welfare Committee	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.6	Observation Cards Steering Committee Meeting	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.7	Observation Cards Coordinator's Meeting	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.8	Management Walkabout	Weekly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
1.9	Weekly HSES Meeting	Weekly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
1.10	Daily Tool-box Talk Meetings	Daily		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
1.11	HSES Workshop (review incidents lessons and learned, obtain subcontractor feedback).	6-monthly		TBA	Medium															♦																										♦													0	0	0	2	2
1.12	Monthly Safety Raffle	Monthly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
1.13	HSES Poster Campaign (New posters and sharing existing posters)	Monthly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
1.14	HSES Sharing of information (CD) (Alerts, Posters, Signs, Training Material, Lessons Learnt)	Quarterly		TBA	Medium		♦													♦													♦													♦													0	0	0	4	4
1.15	Monthly HSES Team Building	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.16	Monthly HSE News Letter	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
1.17	Milestone Recognition Events	----		TBA	Medium																																																						0	0	0	0	0
1.18	Safety & Welfare Special Events	----		TBA	Medium																																																						0	0	0	0	0
1.19	Update and Issue Management & Supervisor HSES leadership training	----		TBA	Medium																																																						0	0	0	0	0
1.20	Deliver Management & Supervisor leadership training	----		TBA	Medium																																																						0	0	0	0	0
2	**Policy and Strategic Objectives**																																																																
2.1	DEC HSE Policy to be displayed and distributed site wide	----		TBA	Low																																																						0	0	0	0	0
2.2	DEC HSE Policy to be included in HSE Induction Program	----		TBA	Low																																																						0	0	0	0	0
2.3	Review HSE strategice objectives	----		TBA	Medium																																																						0	0	0	0	0
2.4	Develop and Issue Project KPI's for 2010	----		TBA	High																																																						0	0	0	0	0
3	**Organisation, Responsibilities, Resources and Training**																																																																
3.1	Issue Project Organization Chart	----		TBA	Low																																																						0	0	0	0	0
3.2	Update Project HSE Orientation Program	----		TBA	Medium																																																						0	0	0	0	0
3.3	Update Project HSE Training Programs and Matrix	----		TBA	Medium																																																						0	0	0	0	0
3.4	Deliver Project HSE Orientation & Training Programs	----		TBA	Medium																																																						0	0	0	0	0
3.5	Maintain Training Records & Matrix	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
3.6	Update and Issue HSE Organization Chart	----		TBA	Low																																																						0	0	0	0	0
4	**Risk Management**																																																																
4.1	Update and Issue Project Phase Risk Assessment	Quarterly		TBA	High		♦													♦													♦													♦													0	0	0	4	4
4.2	Update and issue project HSES Action Tracking Register	Monthly		TBA	High		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
4.3	Review Contractor & Subcontractors risk assessments, method statements, and JSA's	Daily		TBA	High		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
4.4	Develop and implement emergency / security procedures	----		TBA	High																																																						0	0	0	0	0
4.5	Develop and implement specific scaffolding oversight program	----		TBA	High																																																						0	0	0	0	0
4.6	Test office fire alarm system (10:00 am every Sunday)	Weekly		TBA	High		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
4.7	Carryout office emergency evacuation drill	Yearly		TBA	High		♦																																																				0	0	0	1	1
4.8	Construction Area 1 Emergency Drill	Yearly		TBA	High															♦																																					0	0	0	1	1
4.9	Camp Evacuation Drill	Yearly		TBA	High																												♦																										0	0	0	1	1
4.10	Major Emergency Excericse with Company and 3rd Parties	Yearly		TBA	High																																									♦													0	0	0	1	1
4.11	Maintain Project Incident Command System	----		TBA	Medium																																																						0	0	0	0	0
4.12	Contractor Personnel Expatriate Registration	----		TBA	Medium																																																						0	0	0	0	0
4.13	Hot Tap Risk Assessment (if required)	----		TBA	Medium																																																						0	0	0	0	0
4.14	Ramadam Work Plan Risk Assessment	----		TBA	High																																																						0	0	0	0	0
4.15	Energisation Notification	----		TBA	High																																																						0	0	0	0	0
4.16	Develop and Implement PTW Office, utilizing Company PTW System	----		TBA	High																																																						0	0	0	0	0
4.17	Update and issue PTW register, and PTW magnet boards	Daily		TBA			♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
4.18	Observation Card Implementation	----		TBA	High																																																						0	0	0	0	0
5	**Planning**																																																																
5.1	Revise and Issue DEC HSES Plan (6 months after EDC)	----		TBA	Medium																																																						0	0	0	0	0
5.3	Develop and Implement Environmental Management Schedule	----		TBA	Medium																																																						0	0	0	0	0
5.4	Develop and Implement Security Management Schedule	----		TBA	Medium																																																						0	0	0	0	0
5.5	Develop and Implement Camp Industrial Hygiene Schedule	----		TBA	High																																																						0	0	0	0	0
5.6	Develop and Implement Occupational Health Management Schedule	----		TBA	High																																																						0	0	0	0	0
5.8	Implement Contractor/Subcontractor HSE Training Schedule	----		TBA	High																																																						0	0	0	0	0
5.9	Implement Contractor/Subcontractor Equipment Maintenance & Inspection Schedule	----		TBA	High																																																						0	0	0	0	0
5.10	Test DEC Business Continuity Plan	----		TBA	High																																																						0	0	0	0	0
5.11	Issue DEC Duty Manager Schedule	Quarterly		TBA	High		♦													♦													♦													♦													0	0	0	4	4
5.12	Develop and Issue Pre-Commissioning and Commissioning HSE Plan	----		TBA	Medium																																																						0	0	0	0	0
6	**Implementation and Monitoring**																																																																
6.1	Prepare and issue HSES weekly report	Weekly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
6.2	Prepare and issue HSE monthly report	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
6.3	Develop Occupational Health and Hygiene Performance Report	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
6.4	Develop Environmental Management Performance Report	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
6.5	Develop Project Security Performance Report	Monthly		TBA	Medium		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
6.7	Prepare and Issue Observations Weekly Report	Weekly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
6.8	Prepare and Issue Walkthrough Report	Weekly		TBA	Medium		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	0	0	0	52	52
7	**Audit**																																																																
7.1	Sub-contractor HSE Management System Audit	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.2	Permit to Work	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.3	Working at Height/ Excavation/ Confined Space/ Lifting, rigging and slinging/ Lockout Tagout	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.4	Health Care and Facilities/ Emergency Response/ Fire Precautions	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.5	Tank Dropped Objects	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.6	Camp Welfare, Hygiene and Maintenance/ Camp Diesel Refuelling	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.7	Transport Safety	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.8	Heat Stress	----	As per audit schedule	TBA	High																																																						0	0	0	0	0
7.9	Security Management/ Environmental Management	----	As per audit schedule	TBA	Medium																																																						0	0	0	0	0
8	**Management Review**																																																																
8.1	Review project HSES Action Tracking Register	Quarterly		TBA	High		♦													♦													♦													♦													0	0	0	4	4
8.2	Review project phase risk assessment	Quarterly		TBA	High		♦													♦													♦													♦													0	0	0	4	4
8.3	Review HSE Audit Reports	Monthly		TBA	High		♦				♦					♦				♦					♦				♦				♦					♦				♦				♦					♦				♦				0	0	0	12	12
8.4	Establish Management Review team for significant incidents	----		TBA	High																																																						0	0	0	0	0
8.5	Company Audits	----		TBA	High																																																						0	0	0	0	0
8.6	Head Office Audits	6-monthly		TBA	High															♦																										♦													0	0	0	2	2
																																																												0	0	0	772	772

0%	Actual
100%	Target

0	Complete	0	Delayed / Not	0	Ongoing	772	Planned