

Study of gap analysis on HSE management system- consolidated contractors company clean fuel project kuwait

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Abstract

Objectives of Gap Analysis are to study and evaluate the effectiveness of implementation of existing HSE management systems and find the gaps with respect to recommendations of OSHA standards and best international practices in HSE management System, Report the findings in terms of Strength and opportunities for improvement with recommended improvement framework and to Prepare a roadmap through a systematic approach to overcome the gaps as observed in Gap Analysis phase

1. Introduction

The Clean Fuels Project is a major upgrade / expansion of the Mina Al-Ahmadi (MAA) and Mina Abdullah (MAB) refineries to increase capacities and increase conversion of LSFO to higher end products through Bottom of Barrel (BOB) processing utilizing ARDS / Coker / Hydrocracker technologies. The objective is to meet 2020 market demands and specifications for transport fuels, to increase processing capacity to 800 KBBL (currently 736 KBBL), and to integrate operating capability of the MAA / MAB refineries with optimum utilization of existing infrastructure. The report focuses on the implementation of the HSE management system and the improvements that are required. The company mainly following the HSE Guidelines of Kuwait national Petroleum Company Procedures and standards, which is following OSHA standard. It covers almost all the activities concerning the HSE Management system, but after reviewing the documents and system which is followed, improvements can be also made to further increase the standard.

2. Scope of the Study:

- HSE Leadership and Commitment
- Employees Participation
- Facility Design , Construction & Pre-Startup Safety Review
- Process Safety information
- Risk Analysis and Management
- Third Party Services
- Personnel Safety
- Control of Defeat and reliability of critical system and devices

- Work permit system
- Operation & Maintenance System
- Inspection & Maintenance
- Management of Change
- Training
- Incident Investigation and Analysis
- Occupational Health
- Environment Management
- Emergency Planning and Response
- Compliance Audit

3. Standards / Rules adopted:

- OHSAS 18001 Standard
- OSHA guidelines on Process Safety Management
- Good engineering practices followed in Similar Industries

4. Tentative Structure / Chapter Outline of the thesis

The thesis covers the following areas of the HSE management system and identified the gaps in each areas

- 4.1 Fatality Prevention & Risk Management:
- 4.2 Change Management:
- 4.3 Engineering & Construction:
- 4.4 Safe Work Procedures & Permits:
- 4.5 Training & Competence:
- 4.6 Behaviour Optimization:
- 4.7 Contractor Management & Purchasing:
- 4.8 Incident Reporting & Investigation:
- 4.9 Emergency Management:

4.1 Fatality Prevention & Risk Management:

- Maintain effective informal and formal hazard identification procedures, e.g., inspections, worker feedback, task observations, pre-task assessments, etc.

- Develop or adopt a personal & pre-task (PPT) risk assessment tool [Level 1] and require workers who are at-risk in their job duties to utilize the tool before job tasks.
- Develop or adopt systematic job & task (SJT) risk assessment tools [Level 2] for routine and repeatable non-routine work. Develop documentation and train accordingly.
- Apply formal, process & equipment (FPE) risk assessment tools [Level 3] to the mining process, equipment, including development, operations, maintenance and reclamation.
- Define and document the acceptable level of risk through a risk matrix (likelihood & consequences), or adopt the CORE Safety generic risk matrix as a minimum guideline.
- Ensure risks are evaluated by the appropriate level of management, consistent with the significance of the risk. Senior management should be included when assessing major risks and variances.
- Document the company's risk management approach for all high-risk (low likelihood, high consequence) work activities and ensure consistent application of those protocols.
- Establish a management policy that applies the hierarchy of controls to hazard control opportunities and obligations. The policy should include specific criteria for variances.
- Where PPE is permitted to be used in lieu of more comprehensive controls, wearers should be trained on specific uses, proper usage and protection limitations.
- Verify that controls maintain their effectiveness or are modified should circumstances change over time. Include control verification in safety and health audit criteria.
- Document risk management decisions for tracking and verification purposes, and for future reference.
 - o Develop and maintain an up-to-date registry of site-specific high risk activities.
- Assess high risk work activities using risk assessment tools including 'systematic job & task', 'process & equipment' and 'personal'
 - o Develop and/or adopt site-level high risk procedures to maintain risk at as low a level as practicable.
- Verify that all affected employees are educated, trained and competent relative to the high risk procedures.
- Regularly audit high risk procedures to ensure full compliance and effectiveness.
- Ensure internal reporting of all high risk procedure-activity near miss and injury incidents and conduct incident investigation and root cause analysis, as appropriate.

4.2 Change Management:

- Define change requiring management review. Communicate this process to all affected employees, contractors and other stakeholders.

- Develop a change management procedure that defines the ‘who, what, when and how’ for the reviews. Define who is authorized to approve change actions.
- Ensure that the procedure includes provisions to verify that change management actions have been completed and that they do not significantly result in new, negative risk.
- Integrate change management actions into the safety and health communication process to ensure all potentially affected parties are knowledgeable.
- Document change management decisions for tracking and verification purposes, and for future reference.
- Pre-start up safety reviews should be conducted on all new operations, expansions, processing facilities, major mobile and fixed equipment and control systems.
- Ensure that change management is fully integrated with Fatality Prevention & Risk Management

4.3 Engineering & Construction:

- Safety and health management, operations and maintenance expertise are integrated into project planning processes from the inception.
- Where engineering and design codes and standards and/or regulatory compliance are inadequate or absent, management should develop its own with external validation.
- Design and construction for any project with safety and health management considerations should target regulatory as the minimal allowable risk.
- Deviations from standard and accepted design are reviewed and approved by senior management. Variances are documented with adequate justification details.
- The S&H management aspects of construction work conducted on company property should conform to the company’s SHMS standards and expectations.
- Pre-start up safety review should be conducted on all new operations, mines, processing facilities, major mobile and fixed equipment, and control systems. Not doing this, but recognize the need

4.4 Safe Work Procedures & Permits:

- Standard operating procedures (SOPs) are developed for routine and repeated non routine work based on work procedures and outcomes of systematic job and task (SJT) analyses.
- SOPs are used as the basis for on-the-job training and audited against by front line supervisor or managers. Competency verifications are also based on SOPs.
- General and specialized S&H rules should be developed, communicated to all employees and contractors and enforced through a fair and equitable disciplinary policy.

- Risk-specific and/or general work permit program should cover all high risk work (whether routine or non-routine) and include sign-off authority and operational limitations.
- Protocols (more detailed SOPs) should be developed for high-risk tasks that warrant the highest level of control owing to the difficulty in minimizing risk and high consequences.
- Ensure all contractors and vendors are trained on and comply with the work permit and safe work procedure requirements.

4.5 Training & Competence:

- Conduct training needs assessment for all jobs. Training programs should define the skill level to be acquired and demonstrated, frequency, and requirements for competency.
- All new or transferred employees, visitor, contractors and vendors receive sitebased safety and health orientation before being permitted to work onsite.
- Initial, on-going and periodic refresher training is conducted to ensure job and regulatory requirements.
- Combine discretionary training with regulatory training (MSHA, OSHA) whenever possible, e.g., new employee/miner training with company orientation.
- Where on-the-job training is conducted, the instructor should follow standards for knowledge transfer and adhere to standard operating procedure where they exist.
- Ensure contractors, visitors and vendors receive appropriate training to provide adequate worker protection for both the company and their third-party partners.
- Provide train-the-trainer development to those who develop and deliver company S&H management training.

4.6 Behaviour Optimization:

- Educate employees regarding the causes of safe and unsafe behaviour, e.g., the ABC model, how to control their own behaviour and when and how to intervene with co-workers.
- Develop a workplace observation and feedback process. The process should be confidential and voluntary, but collect observation data for analysis
- Apply the ABC model beyond observation and feedback to include an emphasis on general safety and health activators and consequences.
- Ensure adequate focus on the quality of observations and feedback.

4.7 Contractor Management & Purchasing:

- Ensure all company-sponsored project proposals and/or requests for proposals include safety and health management criteria or requirements.
- Pre-screen all operational and project contractors for acceptable S&H management experience and qualifications.
- Ensure contractors notify the company of the introduction of tools, equipment, materials, chemicals or work processes that could be a risk to contractors and/or company personnel.
- Ensure all contractors and third parties are aware of S&H management requirements and expectations including emergency response plans and reporting obligations.

4.8 Incident Reporting & Investigation:

- Ensure all personnel are trained and understand the company's and regulatory authority definition of a recordable/reportable incident and their obligation to comply.
- Investigate all incidents, including near misses, to a level of detail appropriate their maximum likely outcome. All full investigations should reach root cause.
- Ensure that a sufficient percentage of company personnel, representing all company functions, are trained in effective incident investigation and root cause analysis.
- Develop or adopt a root cause analysis procedure that is integrated with the structure of the SHMS, i.e., root causes should relate to the SHMS, as a minimum.
- Capture the lessons learned and ensure they are communicated to all personnel with a need to know.
- Compile root cause data and forward to management for their review of the SHMS.

4.9 Emergency Management:

- Develop and maintain written, site-specific emergency response plans. Plans should be based on a critical assessment of potential emergencies scenarios and their impacts.
- Ensure plans are communicated, trained and drilled against at an appropriate interval. All potentially affected personnel should be aware of the role and responsibilities in an emergency.
- Plans should include an assessment and acquisition of adequate foreseeable emergency resources, e.g., warning devices, first aid supplies, rescue equipment, communication aids.
- Plans should be communicated to external stakeholders as appropriate.
- Emergency response drills should be conducted with sufficient frequency and intent to assure confidence in the event of a real emergency.

- Maintain adequate internal/external first responder capabilities in relation to operations’ size, risk and isolation.

5. Gap Analysis findings and recommendations

Sl. No	Requirement	Findings/ gaps observed	Recommendations
1	Fatality Prevention & Risk Management:	Risk assessment meeting is not attended by all the disciplines of the construction	Risk assessment meeting has to be included the representatives of all the discipline so that the hazards and the control measures can be more effectively identified and control measures can be applied.
		Risk assessment matrix is not referred properly prior to preparation of some Risk assessments	Risk assessment matrix must be used as a major reference document while preparing the values for baseline risk and residual risk and it must be clearly defined to all the workforce.
2	Change Management:	Inadequate communication of Management of change to work force	If any change occurred, it has to be communicated properly and documented evidence has to be produced like changes in Risk assessments, tool box talks and notifications to all the work force.
3	Engineering & Construction:	Inadequate communication between various departments during the execution stage of the work.	Proper communication has to be ensured within all the departments like Construction, Quality Control, HSEetc. to identify any gaps during any changes in the Engineering and construction phases so that the change can be identified easily and arrange the remedial measures accordingly.
4	Safe Work Procedures & Permits:	All the permit executers are not fully aware on the importance of keeping the permits	Proper refresher training to be provided to all permit executers on the proper filling of work permits
5	Training & Competence:	All the work force is not attending the required craft trainings as required.	Ensure that all the workforce are properly trained depending on the nature and type of work they are performed.
6	Occupational Health:	No evidence on premedical examination being conducted in approved medical clinics	Ensure that pre-employment medical and periodic medical are being conducted in approved medical clinics.
7	Behavior Optimization:	Inadequate implementation of Behavior based HSE program involving the work	Behavior based HSE program is implemented, but it has to be communicated and coordinated with the work force and involves the workforce

		force. Only supervisory category of employees is involved in the program.	also in the implementation of Behavior Based HSE program.
8	Contractor Management & Purchasing:	Sub-contractor selection to be focused more on HSE standards	Improve the selection criteria for sub-contractors by following a specific procedure focusing more on HSE.
9	Incident Reporting & Investigation:	Incident reporting time delays to be avoided	Ensure that all the incidents are reported within the prescribed time limit to the client.
10	Emergency Management	Emergency management procedure is not clearly demonstrated to all the work force	Ensure that Emergency roles and responsibilities are communicated to all the work force.

Conclusion

The Gap Analysis study on the HSE management system of Consolidated Contractors Company WLL, Kuwait, on Clean Fuel Project, a project which is undertaken by Kuwait National petroleum Company (KNPC), a Government undertaken organisation in the State of Kuwait is conducted to identify the gaps in the HSE management system and to identify the methods to improve the performance on HSE Management System.

References

- US OSHA 29 CFR (Code of Federal Regulations) Part 1926 – Construction.
- OSHA Regulations (29 CFR 1904 and 1952).
- Local (Kuwaiti) Health Safety and Environmental Laws and Regulations.
- Subcontract for CMEI, EPC of Bldgs & Temp. Fac. Works - Rev.0.
- Company (KNPC) HSSE Documents and guidelines:

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