Chapter 5. Material and Methods

In order to assess the EHS Culture at Orchid Crown construction project, I prepared a Safety Culture assessment technique which is described as follows. This technique can be referred to as a **triangulation** approach as it includes:

- Questionnaire Based Surveys for attitude measurements
- Direct observations based safety checklist for operations being carried out in construction site.

The relationship between the two methods is that they bring about resulting measures which describe key performance indicators of a safety culture prevailing at the site by simply plotting the results in a graph. An example of this type of recording device is shown in the following table. It should be noted that several complimentary measures can be incorporated in each cell of the matrix – those shown in following table are only examples of what might appear there.

TABLE NO. 4: Safety Culture Matrix

	System Interfaces		
METHODS	Organisation/Environment	Work Group/Systems	Individual Group/ Organisation Systems
Attitude Questionnaires	Management Commitment, Work Environment	Supportive Environment, Involvement	Appreciation of Risk, Personal Priorities
Direct Observation	Safety Systems Compliance	Safe Behaviours	Safe Behaviours

5.1 Questionnaire Based Survey for HSE Culture Assessment:

The questionnaire based surveys have been carried out in two parts i.e. PART 1 & PART 2.

PART 1 consists of 3 activity based questionnaires which help to give an overall picture of the safety culture prevailing in the construction site. Basically what has been done is that, all the employees of the organization were given PART 1 questionnaire which is attached in the Appendix 1 for reference, and the results calculated in relation to the dimension score obtained is plotted in a graph and shown in the result section. The dimension score for the Part 1 questionnaire is shown below:

TABLE NO.5: Activity 1 Score System

Type of Culture	Option Chosen	Mark Awarded
GENERATIVE	Considerative	5
PROACTIVE	Collaborative	4
	Cooperative	4
	Constructive	4
CALCULATIVE	Responsible	3
REACTIVE	Learning	2
PATHOLOGICAL	Compliant	1

Similarly the scoring system for activity 3 is described below:

TABLE NO.6: Activity 3 Score System

Type of Culture	Option chosen	Mark Awarded
GENERATIVE	Something in which I get it right all the time and I share my attitudes with my colleagues and I know we all are genuinely committed	5
PROACTIVE	Something in which I know what is right and I continuously strive to be better and I always care for my colleagues	4
CALCULATIVE	Something in which I know what is right but I do not do it properly all the time.	3
REACTIVE	Something in which I look out for myself and concern for others only after accidents occur.	2
PATHOLOGICAL	Something in which I do not care unless/until I don't get caught and I always focus on myself only.	1

The average value of Activity 1 and Activity 3 obtained is taken and whichever is least is grouped as in Table 7 and is shown in results & discussions.

The main purpose for the Activity 2 of PART 1 Safety questionnaire is to find out the percentage of how many of the employees in the organization see themselves being a part in promoting the EHS Culture at the Orchid Crown project.

PART 2 Safety Questionnaire in general terms helps in measuring safety culture factors which are broadly classified as follows:

- Organisational Context
- Social Environment
- Individual Appreciation
- Work environment
- Shared Values

A brief description of each dimension, listed under the broad area to which it relates, is given below:

- **Organisational Context:**
  - **Management Commitment**: Perception of management over commitment to health & Safety.
  - **Communication**: The nature & efficiency of health & safety communications.
  - **Priority of Safety**: The relative status of health and safety issues within the organization.
  - **Safety rules & procedures**: Views on the efficacy and necessity if rules & procedures.
- **Social Environment:**
  - Supportive Environment: The nature and social environment at work, and the support derived from it.
  - Involvement: The extent to which safety is a focus for everyone and all are involved
- **Individual Appreciation:**
  - Personal Priorities & Need for Safety: The individual's view of their own health & safety management and need to feel safe.
  - Personal Appreciation of Risk: How individuals view the risk associated with work
- **Work Environment:**
  - Physical Work Environment: Perceptions of the nature of the physical environment.
- **Shared Values:**
  - Whether the individuals believe in the principles and objectives as stated in the EHS Policy of the Organization.

In order to analyze the data once the questionnaire is received after completion, the following bullet points provide a step by step guide to evaluate the responses:

- Each item should be scored by giving a value of 5 to the 'strongly agree' category, 4 to the 'agree' response, 3 to the 'neither agree nor disagree' category, 2 to the 'disagree' response, and 1 to the 'strongly disagree' category.

- Some of the items in the questionnaire are negatively worded and care should be taken to reverse the scoring for negative items in the questionnaire when coding the item responses, this is usually achieved by subtracting the item score from 6 to reverse the scoring. For example, a score of 2 on a negatively worded item would be reversed to a score of 4.

- Scores should be averaged for each item, across the whole group (or groups).

- These average item scores can now be used to calculate dimension scores. Dimensions in the current questionnaire have different numbers of items and, therefore, scores need to be standardized before plotting and comparing these dimensions. Converting the scores to a 1 to 100 scale can be achieved by dividing the actual score by the total possible score and then multiplying by 100. Table 5 shows how the dimension scores are calculated from the questionnaire items, for each of the first nine dimensions.

- The last dimension alone has a maximum score of 2 for Always, 1 for sometimes and 0 for No. A Part 2 Safety Questionnaire is attached in Appendix 2 for reference.

TABLE NO.:7 – Calculating Dimension Score

Dimension	Add	Divide by	Multiply by	Score
Management Commitment	Item9+(6-Item 16)+(6-Item 19)+Item 26+Item 33+Item38+Item42	35	100	
Communication	Item1+Item10+(6-Item25)+(6-Item28)+Item31	25	100	
Priority of Safety	Item4+Item5+(6-Item20)+Item40	20	100	
Safety Rules & Procedures	(6-Item17)+(6-Item21)+(6-Item35)	15	100	
Supportive Environment	Item3+Item15+(6-Item22)+Item29+(6-Item32)+Item41	30	100	
Involvement	Item8+Item13+(6-Item39)	15	100	
Personal Priorities & Need for Safety	Item2+Item11+Item12+(6-Item23)+Item36	25	100	
Personal Appreciation of Risk	(6-Item6)+Item18+(6-Item24)+Item34	20	100	
Work Environment Shared Values	(6-Item7)+Item14+(6-Item27)+(6-Item30)+Item37+(6-Item43) 1+2+3	30 6	100 100	

Alternatively, once dimension scores are computed for each respondent, average scores can be computed for the whole group. If the survey sample is small these calculations can be done by hand. However, the larger the sample, the more time consuming data analysis will become. In that case, data from the survey may be best analyzed using a simple spreadsheet computer software package, with the formula for each calculation preset.

5.2 Direction Observations Based Safety Checklist:

Direct observations based safety checklist is used to determine the percentage of safe behaviors observed in the site premises. Even in organizations with extremely good reporting systems, many minor accidents go unreported. The safety checklist comprises a list of safe observations most commonly associated with preventing accidents, incidents & near misses in a particular area. The structure of a sample of direct observation based safety checklist and the scoring system is shown in the following table. Appendix 3 shows the complete observation checklist for reference.

TABLE NO.:8 – Direct Observation Based Safety Checklist

INDICATE EITHER: S = Safe; U = Unsafe; N/A = Not Applicable

EXCAVATION		**SCAFFOLDS**	
Is there a safe access/egress provided to the excavation?		Are all standards provided with proper base plates?	
Are materials, spoil, and plant stored away from edge of excavation to reduce the chance of a collapse?		Are all ledgers, braces and struts in proper position?	
Is there provision for Dewatering facilities?		Is the scaffold secured to the building or structure in enough places to prevent collapse?	
Are there a proper barricade/ fencing and display of Danger sign by way of red tape/light/hand rails?		Are there double guard rails and toe boards or other suitable protection to prevent falling from edge?	
Is the earth being cut from the top and ensuring no undercutting is being done?		Is there a lock pin in place and secure?	
Is there adequate support for the excavation, or has it been sloped or battered back to a safe angle?		Is there proper access in and around the scaffold?	
Are there properly secured stop blocks provided to prevent tipping vehicles falling in?		Is there a safe access and egress to the working platform in the scaffold?	
-		Is Provision for anchoring full body harness – lanyards to be tied to life line?	
Percentage of Safe Observations seen		**Percentage of Safe Observations seen**	

Once getting the average score of the dimension and the average percentage of safe observations take the average of both of them and conclude what type of culture is prevailing in the site. The following table describes type of culture based on the average score of dimensions of EHS Culture and direct observations based safety checklist.

TABLE NO.:9 – Type of HSE Culture

S. No.	Average Score of EHS Culture Dimension score & Percentage of Safe Observations	Type of Culture
1	0 – 30%	Pathological
2	31 – 60%	Reactive
3	61 – 80%	Calculative
4	81 – 90%	Proactive
5	91 – 100%	Generative

From the value , we can ascertain actually what type of HSE Culture is Safety Culture is commonly used term, but can be difficult to define. However, we can recognise an optimal safety culture when experience it. An organisation would certainly consider it had a good safety culture if the following conditions were in place:

Employees:

- Follow HSE rules and procedures because they believe it is in their best interests to do so, and it is the only way to do their job.
- Actively participate in the safety programme.
- Fix hazards themselves, and report hazards they can't fix.
- Assist other employees to work safely, by lending a hand, looking out for inexperienced employees, and watching out for the safety of others.

Supervisors:

- Integrate HSE rules and procedures into training and supervision;
- Ensure that HSE rules and procedures are implemented and pursued with the same level of vigour as productivity and quality objectives.

Managers:

- Lead HSE activity within their department or branch;
- Prompt staff managers and Head Office personnel to provide assistance and resources to reach their HSE goals;
- Maintain continuous improvement within their department or branch without Head Office prompting.

Directors and Senior Management:

- Provide the necessary resources to enable managers to maintain continuous improvement in HSE including.
- Financial resources.
- HSE expertise.
- Training.
- An HSE Management system.

- Recognise and reward HSE achievement at least as well as achievement in other areas of the business.

Achieving an Optimum OHS Culture:

These elements are in place, wholly or in part, in most organisations.

How can an organisation foster an optimum safety culture, assuming that the directors and senior management are already committed to achieving this aim.

HSE attitude surveys – Employees:

A safety attitude survey can be used to determine employee's attitudes and perceptions regarding Occupational Health and Safety and management, supervision, training, their fellow employees, and themselves.

These surveys are conducted using a structured interview with selected groups. The interviews take approximately one hour, and the answers will be recorded as they are given, without comment, and the results then be analysed.

The surveys provide very useful information in determining strategies to improve employee participation in the OH&S programme; and provide a useful baseline for determining progress if the surveys are conducted again after twelve months

HSE attitude survey – Supervisors:

A "pen & paper" safety attitude survey can be conducted amongst all supervisors. The purpose of the survey will be to determine respondents' attitudes and perceptions regarding Occupational Health and Safety.

Management is then provided with an analysis of the results for the group and a comparison by location.

Employee Competitions:

Employee OHS competitions, geared to rewarding participation in the OHS programme, and demonstrating OHS knowledge, provide an excellent way of lifting the profile of the OHS programme amongst the workforce

Special Emphasis Programme:

The concept behind special emphasis programmes draws upon the marketing concept of media saturation. Using a range of media for a short period of time makes maximum impact by reinforcing the message through repetition.

A simple "message" or single issue is selected. This could be a very simple idea such as get help when manual handling, or a single issue such as housekeeping. This message is then promoted with a high degree of intensity, but for a limited period of time.

This will establish cost effective special emphasis programmes that make direct impact on employee HSE awareness and, more importantly, reduce targeted safety exposures.

Identifying safe Behaviors:

Most employees are able to perform their tasks without injuring themselves. They do so because they have their own ways of working safely. These can be identified and distilled into a simple set of rules. The power of these rules is that they come from the employees themselves and are recognised as such by the employees.

Organization can conduct structured interviews and assess the results to develop an effective list of safe behaviours that will have the active support of workforce.

HSE Audit Interview Forms:

Interview Instructions

Introduction

- The interview forms are designed so that a minimal amount of writing is required.
- There are separate forms for worker, supervisor, management, senior management joint health and safety committee, and contractor interview records.

Question No.

- This indicates the section of the evaluation that needs to be answered through interviews.

Question

- This is the basic question that needs to be answered.

Comments

- This column also has space allocated for recording the responses.

Response

- Use this column to indicate whether the interviewee was positive (+), **negative (-),** or **non-committal (N.C.)** in his/her response.

Confidentiality

- Remember, all interview records are completely confidential. Once you are finished with the forms destroy them or keep them in a secure personal file.

Interview Steps:

- Introduce and explain the interview process and purpose to the interviewee.

- Discuss some of the interviewee's background information so that questions can be asked in a Manner that relates to the individual's job.

- Make key work notes in the "Background Information" space.

- Ask the questions on the form. Re-word them if needed. Expand on them if you didn't get enough information. Record key words and comments in the space under the question.

- Place a "tick" in the space under the "Response" column that best reflects the interviewee's response.

- Continue this way for all the interviewees. One set of interview record forms should be all that is needed to record all interview responses.

Score when all interviews are finished, you must determine the overall score to each evaluation question.

- More positives than negatives on any single question would score the points. More negatives than positives would not score points.

- An equal number of positives and negatives will require further examination.

- Extremes of any response may require further examination.

- If a question is asked of 2 or more groups (e.g. 1.4) combine all +, -'and n/c. to determine if points should be awarded.

Senior Management Interview Record Background information:

- What areas are you responsible for?
- How long have you worked here?
- How long have you been in this position?

Senior Section	Question	Comments
1	**Do you have any specific health and safety responsibilities? Could you describe them? (Example: arranging health and safety meetings, reviewing incident reports, inspections, etc.)**	
2	**How do you personally communicate the importance of health and safety to the employees?**	
3	**How often would you tour your areas to look for health or safety concerns?**	

Senior Section	Question	Comments
1	Do you have any specific health and safety responsibilities? Could you describe them? (Example: arranging health and safety meetings, reviewing incident reports, inspections, etc.)	
2	How do you personally communicate the importance of health and safety to the employees?	
3	How often would you tour your areas to look for health or safety concerns?	

ADDITIONAL NOTES:

Senior Management Interview Record Cont'd

Section	Question	Comments
1	Do you review inspection reports?	
2	When a potential health or safety hazard is identified, what is the system/method used to control it? (You may want to use an example that is difficult to deal with such as a health hazard.)	
3	How do you know if a prospective employee is physically capable of doing the job?	
4	What are the emergency response procedures for your areas? (Example: What would you do if.)	
5	Are there ever any emergency drills? When was the last one?	

Senior Management Interview Record Cont'd

Section	Question	Comments
1	What happens to accident/incident investigation reports once they are	
2	How is your safety record this year as compared to previous years? What would you say is your biggest health and safety problem area?	
3	What are your responsibilities for protecting the environment managing waste?	
4	What is done when an environmental issue is brought to your attention?	

Managers Interview Record:

Background information

- What areas are you responsible for?
- How long have you worked here?
- How long have you been a manager?

Section	Question	Comments
1	Do you have any specific health and safety responsibilities? Could you describe them? (Example: arranging health and safety meetings, reviewing incident reports, inspections etc.)	
2	How often would you tour your areas to look for health or safety concerns?	
	When are the safety issues discussed by management with supervisors?	
3	Do you conduct formal health and safety inspections?	
4	**Do** you review inspection reports?	
5	When a potential health or safety hazard is identified, what is the system/method used to control it? (You may want to use an example that is difficult to deal with, such as a health hazard	
6	What are the emergency response procedures for your areas? (Example: What would you do if...)	
7	Are there ever any emergency drills? When was the last one?	
8	What are your responsibilities for protecting the environment managing waste?	
9	What is done when an environmental issue is brought to your attention?	
10	What happens to accident/incident investigation reports once they are completed?	

Supervisor Interview Record:

Background information

- How long have you worked here?
- How long have you been a supervisor?
- What area do you work in?

Section	Question	Comments
1	Do you have any specific health and safety responsibilities? Could you describe them? (Example: inspect, organize tool box meetings, investigate, train, etc.)	
2	How often would you tour your area to look for health or safety concerns?	
3	When a change is implemented in your area, how do you know what hazards may result?	
4	When a worker is transferred or given a new job, are they also given training for that job?	
5	How does a worker know what the hazards of a job are before work begins?	
6	What training have you had for your job as supervisor?	
7	What are your health and safety-related responsibilities?	
8	How are you accountable for health and safety?	
9	How do you communicate Safe HSE practices to your workers on site?	
10	How often do you perform a hazard assessment check of your site?	
11	How do you know if there are any hazards in your area?	
12	Once a hazard is identified, what happens next?	
13	When there is a hazard that can't be controlled completely, who is assigned to do that job?	
14	What are the emergency response procedures for your areas? (What would you do if.)	
15	Is anyone trained in emergency response? (fire control, rescue, first aid)	
16	Are there ever any emergency drills? When was the last one?	
17	If there was an incident (or accident) would supervisors be involved in the investigation? (Example: taking statements, making measurements, taking pictures, writing reports.) If yes, describe a recent situation.	
18	What are your responsibilities for protecting the environment managing waste?	
19	Is there an employee assistance program? How are employees encouraged to use it?	

Worker Interview Record:

Background information

- What do you do?
- What department are you in?
- How long have you been with the company?

Section	Question	Comments
1	Do you have any specific health and safety responsibilities? Could you describe them? (Example: inspection, reporting, attending health and safety meetings, etc.)	
2	Does senior management I your boss / the owner ever tell the employees that health and safety is important? What do they say? How often?	
3	Are you or any other workers ever involved in any hazard assessments? What was the involvement? (May have to explain hazard assessment.)	
4	Does this company have any health and safety orientation for new workers? (May have to explain orientation and give examples.)	
5	Do you know if this company has a health and safety policy ? In your own words, what does it say ? What would you do if you considered a situation too hazardous to work in?	
6	When does a new worker get told about things like evacuation procedures, first aid services, and fire response?	
7	What kind of training about your job's hazards have you had? (Give an example.) Can you describe it?	
8	When did you get an orientation to your job?	
9	When someone is transferred or given a new job, is there additional training provided? (Provide a site-specific example.) Can you describe the training?	
10	Have you attended a crew safety meeting recently? What was discussed?	
11	How do you know what hazards jab has before you start to work?	
12	How do supervisors know whether there are any hazards in the workplace?	
13	Are you or other workers ever involved in health and safety inspections? How often? How are they done?	
14	If you were aware of a health or safety hazard, what would you do? (Give an example relating to his/her job that would be out of their control.)	
15	What happens if someone disobeys a safety rule, or doesn't follow a safe work procedure?	
16	What special precautions do you take when handling a hazardous material? (Give an example that you have observed in the workplace.)	

Worker Interview Record Cont'd:

1. Are you or any other workers ever involved in controlling health or safety hazards? (Example: developing safe work procedures, changing a process, determining proper PPE.) Can you give an example?

2. Do you need to use any personal protective equipment for your job? What kinds? Give examples.) Has anyone ever shown or explained to you how to use and look after it?

3. When there is a hazard that can't be controlled completely, who is assigned to do that job?

4. How does the company check up on your health?

5. What are the emergency procedures for this site? (Example: What would you do if...)

6. Have you been given any emergency response training? (Example: first aid, fire fighting, rescue, etc.) Who else on site would be trained in emergency response?

7. Are there ever any emergency drills? When was the last one?

8. What do you do if you see an incident/accident/near miss?

9. If there was an incident (or accident) would any workers be involved in the investigation? (Example: taking statements, making measurements, taking pictures, writing reports.) If yes, describe a recent situation.

10. What happens after an accident/ incident investigation is over?

	HSE Activities- Pre start up Ops Preparedness Plan			
Sl. No.	**Action**	**Target**	**Progress (as of June 12)**	**On Track?**
1	Review India HSSE Policies, Standards, and Applicable Laws, Develop Renewal Schedule for Licenses	Apr-04	Ready	Yes
2	Develop EMP (Environmental Management Plan)	Jun-04	EIA Received. Time bound EMP being prepared	Yes
3	Develop Case Studies for Overall Terminal (linked to Port)	Jun-04	Draft HSE Case completed. Implement. of 'critical task register' to start.	Yes
4	Develop HLPL Site wide HSE policies and Procedures	Jun-04	Ready	Yes
5	Develop HSE Passport Program for Contractors and Suppliers	Sep-04	Ready. Compulsory Trainings already started for employees. For contractors, at the time of mobilisation.	Yes
6	Develop Emergency procedures including DMP (Emergency Response Plan) and Evacuation Plan/Procedure (e.g. Med Evacuation)	Jul-04	DMP being drafted. Ops phase Emergency scenerios and plans being drafted. Will be merged with current "Hazira Emergency Response Plan"	Yes
7	Conduct Fire and Safety Risk Assessment and Mitigation for Site, Environmental	Jul-04	Detailed Fire, Safety, Health and Environmental Assessments have been done	Yes
8	Ensure that Environmental Requirements are known, Permits filed, Monitoring plan and Schedule for Reporting Compliance are complete (includes off-Loading and Flaring, and Exporting)	Oct-04	Env Monitoring Program as per Permit requirements in place. Being merged with Ops Procedures and Instructions.	Yes
9	Establish Program to Maintain Employee Training records	May-04	Training Manager is maintaining records systems that includes HSE trainings also	Yes
10	Develop / Document HLPL Safety Practices and Procedures from Shell Group (Yellow Book) Policies and Procedures to include:	Jun-04	Draft procedures available as part of HSE manual	Yes
11	HLPL Health & safety systems manual for staff and contractors	Jun-04	Draft procedures available as part of HSE manual. For contractors, HSE Management of contracts procedure drafted as requirements for contractor compliance.	Yes
12	Permit to Work system	Aug-04	Electronic PTW system structured with forms. Training sessions organised to develop skills in use of system. PTW Manual being drafted.	Yes
13	HLPL Safety Rules	Sep-04	HSE Rules are defined in HSE manual and being explained to staff via HSE Communication sessions every week	Yes
14	Toolbox Talks, Conduct Weekly Safety Meetings when staff is on site	Regular	Being Done	Yes

15	Protective clothing & equipment (PPE) program and procure clothing and equipment	Regular	1- For Project phase provided. 2- For Ops phase, list of required PPEs maintenance plan developed.	Yes
16	MSDS procedures and ensure availability to staff	Aug-04	MSDS being prepared by project which include LNG, Diesel, Chemicals, Lubes etc	Yes
17	Hazardous materials handling/storage	Sep-04	Waste site lined up. Waste Mgt Plan being implemented.	Yes
18	Housekeeping	Regular	Being implemented as part of work culture	Yes
19	First Aid	Sep-04	Training for First aiders (All Staff) being arranged. Site Medical facilities will include Nurse, Doctor, Ambulance, Clinic and other appliances. Medical Emergency plan prepared.	Yes
20	Fire Protection and Control	Oct-04	Fire Appliance/ Equipment procurement list received. Ops fire training completed. Security personnel to proceed on Fire training immediately on award of security contract	Yes
21	Identify and procure training facilities & Instructors	Sep-04	HSES + Training Manager are already finalising the faculty, standards, competence assessment etc.	Yes
22	Prepare Safety manuals, handouts, slides, tests, worksheets, etc.	Sep-04	On Track. HSE Templates, Checklists, Forms etc already prepared	Yes
23	Initiate the training programs and testing process	Sep-04	Already started	Yes
24	Implement the Safety Training Management System	Oct-04	Already started	Yes
25	Certify personnel upon completion of training and testing program	Dec-04	Part of HSE competence assessment program	Yes
26	Start Maintenance Site Safety Inspections as areas are Handed Over	Dec-04	Will be part of handover. We have checklist ready.	Yes
27	Start HSE Meeting Program and Safety Walk Arounds	Apr-04	Meeting Structure has been defined. Terminal HSE meetings being held every Monday since August 2003.	Yes
28	Obtain all necessary environmental permits and validate compliance	Oct-04	Permits Obtained. Consents to operate being applied	Yes
29	Develop Security program that Adheres to Shell Policies	Sep-04	Security Plan has been developed by Port Manager. It needs to be fine tuned in include day to day Ops security activities.	Yes
30	Conduct Security Risk Assessment	Dec-04	Last security assessment was conducted in Sept-03 by Shell Security. Recommendations of security review are being implemented as part of security plan	Yes, Subject to budget approvals
31	Develop / Document Security Policy & Procedures	Oct-04	Site Specific security procedures are being developed for Ops Phase.	Yes
32	Develop Interfaces with Local Police and Authorities	Sep-04	In Progress	Yes

What are your responsibilities for protecting the environment managing waste?

Section	Question	Comments
1	During any meeting, if a health or safety concern is brought up, how is it handled?	
2	How are workers recognized for contributing to the health and safety program? (Give an example.)	
3	How are you involved in the health and safety program?	

Contractor Interview Record:

Background information

- How long/often have you been dealing with..?
- What business are you in?

Section	Question	Comments
1	Have you been given any specific health and safety responsibilities?	
2	Could you describe them? (Example: inspect, report, etc.)	
3	Have you been required to inspect areas that you have control over? How often? Are there records?	
4	What are the emergency response procedures for your area? (Example: What would you do	

Audit OIP Response Plan:

Camp HSE Inspection Report		
Contract No.:	**Contractor:**	
Site Supervisor:	**Date :**	
Location:	**Inspected by :**	
Compliance = 1	**Non Compliance = 0**	**Not Applicable = N/A**

General Guidelines

The information in the description section is to assist personnel during the inspection; however, personnel conducting this inspection must be thoroughly familiar with the information relating to camps in the following Company manuals:

- Occupational Health Management Guide
- HSESM Chapters 6 & 12

If there is any doubt as to the interpretation of the requirements, consult with the appropriate staff to clarify the interpretation. Any deficiencies that indicate systemic problems may exist are to be recorded on the Inspection Report Summary (refer to guidelines for additional information).

Section

A	Description	Score	Remarks
	SLEEPING ACCOMMODATIONS		
1	Sound construction which provides protection against pests, and adverse weather conditions.		
2	Min. space provided as 4 m2 per person with 1 m. between beds.		
3	Each occupant is provided with a locker (cupboard).		
4	If clothes are to be hung on the wall, proper hanger hooks or racks are to be used.		
5	Beds are comfortable and staffs are provided with blankets, bed sheets, pillows and pillow cases.		
6	Linen is washed at least once a week.		
7	No evidence of bed bugs.		
8	Proper ventilation is provided (e.g. windows placed opposite sides) is provided.		
9	Air conditioners are provided and working properly.		
10	Lighting is sufficient in all the rooms (e.g. not less than 150 lux intensity).		
11	No evidence of smoking in the rooms.		
12	Electrical plugs are 3 pin or 2 pin plugged in to a fused 3 pin adapter.		
13	Housekeeping is to the required standard.		
	TOTAL		**Total Possible- 13 - _____N/A = _____**

Section

B	Description	Score	Remarks
	KITCHENS		
1	Cooked and uncooked food is segregated and covered when stored.		
2	Kitchen is big enough to cater for the number of the employees served. (e.g. approx. 1 m2 per person served).		
3	The floor is durable, non absorbent, non slip, and no crevices in which dirt/ bacteria can lodge.		
4	Adequate and proper drainage provided.		
5	Walls are smooth, impervious, light in colour and durable from floor to ceiling.		
6	Ceilings are smooth, fire resistant, covered at wall joints and easy to clean.		
7	Adequate lighting (e.g. not less than 500 lux intensity for general working area).		
8	Fly screens fitted and doors are self closing.		
9	Kitchens are air conditioned and hoods are fixed over cooking ranges. Suitable extractor fans are fixed.		
10	Proper dish washing facilities are provided e.g. double units stainless sinks, running hot/cold water, detergents, cleaning solutions.		
11	For drying the dishes/crockery, air drying or paper cloth is used.(Clothes should not be used to wipe and dry dishes/crockery) .		
12	Separate hand washing sink. Liquid soap with a dispenser and plastic nail brush Paper towels or electric hand drier		
13	Sufficient number of refrigerators and chest freezers are provided. Fish is placed either in different freezer or in separate compartment in a combined freezer.		
14	If pork in use, its storage, pots, pans, crockery and cutlery shall be kept separate and marked for easy identification.		
15	Separate area/ surfaces are provided for preparation of cooked and uncooked food.		
16	Colour coded cutting boards made of polypropylene or other non-absorbent synthetic material is provided for fish, meat and vegetables. All purpose wooden chopping for cutting large joints of meat if required. All must be kept clean.		

17	A food thermometer with probes is provided to check and record temperatures of roasted meats Prepared for the day. Recommended above 65deg. C or below 8deg. C		
18	Samples of each prepared food item must be retained for 72 hours in a freezer. These samples must be marked with the date and time of preparation.		
19	A pantry for storing day to day items is available. Shelves and bins are provided for storing dry food items.		
20	A facility for defrosting frozen foods is provided. (E.g. a purpose built "rapid thaw cabinet", a refrigerator or a chill room with a temp. of 1 to 5deg. C /thermometer provided. **NB.** Defrosting of fish, meat and poultry at ambient temperatures --e.g. in a kitchen sink is prohibited. Once the food is thawed, it shall not be refrozen.		
21	On line gas bottles are located outside. A block work separation wall is provided (in cases where the cylinders are closer than 5m from combustible material) and the enclosure is well ventilated. 'No smoking' signs are displayed.		
22	Fire extinguishers and fire blankets are provided.		
23	The cook has attended the fire extinguisher course and understands the necessary actions to be taken during emergencies.		
24	A cleaning schedule for the kitchen and its equipment is available.		
	TOTAL		**Total Possible - 24 - _____ N/A = _____**

Section

C	Description	Score	Remarks
	DINING HALL (MESS)		
1	The mess is large enough to seat 50% of the camp's population and has proper seating facilities.		
2	The mess is air conditioned and well lighted. - All lights are working. - A/C is turned on.		
3	Two small or one large electronic fly killers are installed - e.g. insect-o-cutor.		
4	All doors to the outside shall be self closing. If doors are left open for prolonged periods, fly screens are provided.		
5	Wash hand basins are provided outside the mess halls. Soap is provided.		
6	Cold drinking water in clean water jugs are provided in each of the table.		
	TOTAL		**Total Possible - 6 - _____ N/A = _____**

Section

D	Description	Score	Remarks
	DRY FOOD STORE		
1	Food items are stored in a well lighted and air conditioned room large enough to ensure adequate supply of food is available.		
2	The storage of food is in such a way that allows the "First-in, First-out" practice to be observed.		
3	Dry food is stored on shelves or benches. The area underneath is kept clean. For loose grains, flour etc., metal or plastic bins with tight fitting covers may be used.		
4	Proper shelving for storage is available and food is not stored underneath benches. Shelves have a non-absorbent easy-to-clean finish (cupboards should be avoided).		
5	Cleaning chemicals, detergents, mops and brushes are not kept in the food store.		
6	The store is clean and free of any spillage and pests.		
	COLD STORAGE		
7	Suitable and adequate cold storage and refrigerated equipment are available to keep food staff. Thermometers are in place and temperatures are recorded twice daily. **Requirements:** Frozen food at minus 18deg C$\pm$ 2 deg C Chilled and refrigerated food from minus 3deg C to 1deg C.		
8	Fish and fish products are stored in a separate freezer. Chicken and chicken products are stored in a separate freezer.		
9	If 'walk-in' freezers are used - metal shelves are available, lighting is adequate, safety devices to prevent accidental lock-in are provided, and a thermometer gauge is fixed outside the unit.		
	TOTAL		**Total Possible - 9 - _____ N/A = _____**

Section

E	Description	Score	Remarks
	FOOD HANDLERS AND PERSONAL HYGIENE.		
1	Notices indicating '"Un authorised Persons" are not allowed in the food premises' are displayed.		
2	All food handlers have a valid Ministry of Health certificate. Camp boss has the copies of all the certificates.		
3	Food handlers suffering from diarrhoea, vomiting, high temp, or who have cuts, septic sores in their hands or body have been kept away from food handling works.		
4	Smoking is not allowed in the food handling area. Appropriate signs are displayed.		
5	Food handlers have been provided with minimum of 2 uniforms--aprons, caps, and non-slip footwear appropriate to the hazards.		
6	Food handlers appear clean, neat and tidy. They have clean hands with short finger nails and short hair which is covered during food preparation. Jewellery (rings, necklaces etc.) are not worn while working with food.		
7	Food handlers have been trained on food hygiene.		
	TOTAL		**Total Possible - 7 - _____ N/A = _____**

Section

F	Description	Score	Remarks
	SANITARY FACILITIES		
1	Toilets are provided as per the minimum requirement specified in the HSE-SM Chapter 12. Toilets have WCs, showers, and wash hand basins in good working order and are clean.		
2	Toilets have window openings to the outside air or are provided with adequate artificial ventilation system.		
3	Lighting is adequate/all working.- no dark corners etc.		
4	Supply of running cold and hot water is provided in or adjacent to toilets and washing facilities.		
5	Floor of showers are clean, non-slippery, and in good repair.		
6	Showers cubicles have doors or curtains.		
	TOTAL		**Total Possible - 6 - _____ N/A = _____**

Section

G	Description	Score	Remarks
	WASTE DISPOSAL.		
1	Waste is disposed of in accordance with the WMM.		
2	Sufficient number of covered bins lined with plastic bags are provided in all residential areas, work sites, food premises. Waste is collected from the food premises on daily basis and not less than twice a week from living quarters / working sites within the camp. Garbage is carried in the tied-up bags or in covered bins to the designated collection point at which the Waste Management Contractor collects on daily basis.		
3	The waste collection point is kept tidy.		
4	If applicable, the clinical waste is collected and disposed of in accordance with the procedures (MCH/02/95 obtainable from CSM33/34).		
5	All waste water, including floor washing water is disposed as such that it does not present a hazard to health and environment		
	PEST CONTROL		
6	Proper equipment and pesticides are provided.		
7	All pesticides have SHOC cards available at site.		
8	Trained person handling/applying pesticides are provided with proper PPE - coveralls, rubber gloves, proper pesticide mask/ respirator and goggles.		
9	General cleaning and housekeeping of the camp and the surroundings is maintained properly.		
	TOTAL		**Total Possible - 9 - _____ N/A = _____**

Section

H	Description	Score	Remarks
	WATER		
1	Water for cooking, washing and toilets in camps is provided from the Company's approved sources.		
2	Water supply is sufficient - minimum 250 lt. per day per person.		
3	Water is stored in the above grounds tanks made either in stainless steel, galvanised steel or reinforced fibre glass.		
4	Water supply for domestic use is disinfected by chlorinating to the required standard - ref. Chapter 12 HSE-SM Manual.		
5	If water is trucked, the water tanker / driver / helper have valid health certificates from Reg. Municipalities or Ministry of Health. The water tanker is painted blue and has words "POTABLE WATER" written in white on both sides of the tanker in Arabic and English and is clean and well maintained.		
	TOTAL		**Total Possible - 5 - _____ N/A = _____**

Section

I	Description	Score	Remarks
	GENERAL		
	BARBER SHOP		
1	Muscat or Regional Municipal Regulations for barber shop is available and the shop is in compliance with the regulation. CSM33/34 shall be consulted if further information required.		
	LAUNDRY.		
2	A laundry facility is provided for all personnel accommodated in the camp and maintained in clean and working order.		
3	Detergents and other related chemicals are stored in a ventilated room.		
	RECREATION		
4	Appropriate recreational facilities are provided: recreation room/TV/Video/games		
	EMERGENCY		
5	Fire extinguishers are provided in the camp. (Ref. ERD-88-02) and the fire wardens are appointed.		
6	Audible alarm for evacuation is available in cases of emergencies. Fire exits, alarm points and firefighting equipment are kept clear of obstructions.		
7	Staffs are aware of the emergency procedures.		
	TOTAL		**Total Possible - 7 - _____ N/A = _____**

Section

J	Description	Score	Remarks
	MEDICAL CONDITIONS OF CONTRACTS		
1	Initial and Routine Medical Examinations provided at no cost to employee.		
2	Clinic provided if > 100 employees in camp. Qualified male nurse present.		
3	If more than 10 km from nearest PDO clinic, a suitable vehicle must be provided as an ambulance.		
4	Nurse is competent to perform the tasks allocated to him and has received appropriate training in casualty management, emergency response, resuscitation etc.		
	TOTAL		**Total Possible - 4 - _____ N/A = _____**

Camp Inspection Report:

Camp HSE Inspection Report		
Contract No.:	**Contractor:**	
Site Supervisor:	**Date :**	
Location:	**Inspected by :**	
Compliance = 1	**Non Compliance = 0**	**Not Applicable = N/A**

General Guidelines

The information in the description section is to assist personnel during the inspection; however, personnel conducting this inspection must be thoroughly familiar with the information relating to camps in the following Company manuals:

- Occupational Health Management Guide
- HSESM Chapters 6 & 12

If there is any doubt as to the interpretation of the requirements, consult with the appropriate staff to clarify the interpretation. Any deficiencies that indicate systemic problems may exist are to be recorded on the Inspection Report Summary (refer to guidelines for additional information).

Section

A	Description	Score	Remarks
	SLEEPING ACCOMMODATIONS		
1	Sound construction which provides protection against pests, and adverse weather conditions.		
2	Min. space provided as 4 m2 per person with 1 m. between beds.		
3	Each occupant is provided with a locker (cupboard).		
4	If clothes are to be hung on the wall, proper hanger hooks or racks are to be used.		
5	Beds are comfortable and staffs are provided with blankets, bed sheets, pillows and pillow cases.		
6	Linen is washed at least once a week.		
7	No evidence of bed bugs.		
8	Proper ventilation is provided (e.g. windows placed opposite sides) is provided.		
9	Air conditioners are provided and working properly.		
10	Lighting is sufficient in all the rooms (e.g. not less than 150 lux intensity).		
11	No evidence of smoking in the rooms.		
12	Electrical plugs are 3 pin or 2 pin plugged in to a fused 3 pin adapter.		
13	Housekeeping is to the required standard.		
	TOTAL		**Total Possible- 13 - _____N/A = _____**

Section

B	Description	Score	Remarks
	KITCHENS		
1	Cooked and uncooked food is segregated and covered when stored.		
2	Kitchen is big enough to cater for the number of the employees served. (e.g. approx. 1 m2 per person served).		
3	The floor is durable, non absorbent, non slip, and no crevices in which dirt/ bacteria can lodge.		
4	Adequate and proper drainage provided.		
5	Walls are smooth, impervious, light in colour and durable from floor to ceiling.		
6	Ceilings are smooth, fire resistant, covered at wall joints and easy to clean.		
7	Adequate lighting (e.g. not less than 500 lux intensity for general working area).		
8	Fly screens fitted and doors are self closing.		
9	Kitchens are air conditioned and hoods are fixed over cooking ranges. Suitable extractor fans are fixed.		
10	Proper dish washing facilities are provided e.g. double units stainless sinks, running hot/cold water, detergents, cleaning solutions.		
11	For drying the dishes/crockery, air drying or paper cloth is used. (Clothes should not be used to wipe and dry dishes/crockery).		
12	Separate hand washing sink. Liquid soap with a dispenser and plastic nail brush Paper towels or electric hand drier		

13	Sufficient number of refrigerators and chest freezers are provided. Fish is placed either in different freezer or in separate compartment in a combined freezer.		
14	If pork in use, its storage, pots, pans, crockery and cutlery shall be kept separate and marked for easy identification.		
15	Separate area/ surfaces are provided for preparation of cooked and uncooked food.		
16	Colour coded cutting boards made of polypropylene or other non-absorbent synthetic materials are provided for fish, meat and vegetables. All purpose wooden chopping for cutting large joints of meat if required. All must be kept clean.		
17	A food thermometer with probes is provided to check and record temperatures of roasted meats Prepared for the day. Recommended above 65deg. C or below 8deg. C		
18	Samples of each prepared food item must be retained for 72 hours in a freezer. These samples must be marked with the date and time of preparation.		
19	A pantry for storing day to day items is available. Shelves and bins are provided for storing dry food items.		
20	A facility for defrosting frozen foods is provided. (E.g. a purpose built "rapid thaw cabinet", a refrigerator or a chill room with a temp. of 1 to 5deg. C /thermometer provided. **NB.** Defrosting of fish, meat and poultry at ambient temperatures --e.g. in a kitchen sink is prohibited. Once the food is thawed, it shall not be refrozen.		

21	On line gas bottles are located outside. A block work separation wall is provided (in cases where the cylinders are closer than 5m from combustible material) and the enclosure is well ventilated. 'No smoking' signs are displayed.		
22	Fire extinguishers and fire blankets are provided.		
23	The cook has attended the fire extinguisher course and understands the necessary actions to be taken during emergencies.		
24	A cleaning schedule for the kitchen and its equipment is available.		
	TOTAL		**Total Possible - 24 - _____ N/A = _____**

Section

C	Description	Score	Remarks
	DINING HALL (MESS)		
1	The mess is large enough to seat 50% of the camp's population and has proper seating facilities.		
2	The mess is air conditioned and well lighted. - All lights are working. - A/C is turned on.		
3	Two small or one large electronic fly killers are installed - e.g. insect-o-cutor.		
4	All doors to the outside shall be self-closing. If doors are left open for prolonged periods, fly screens are provided.		
5	Wash hand basins are provided outside the mess halls. Soap is provided.		
6	Cold drinking water in clean water jugs are provided in each of the table.		
	TOTAL		**Total Possible - 6 - _____ N/A = _____**

Section

D	Description	Score	Remarks
	DRY FOOD STORE		
1	Food items are stored in a well lighted and air conditioned room large enough to ensure adequate supply of food is available.		
2	The storage of food is in such a way that allows the "First-in, First-out" practice to be observed.		
3	Dry food is stored on shelves or benches. The area underneath is kept clean. For loose grains, flour etc., metal or plastic bins with tight fitting covers may be used.		
4	Proper shelving for storage is available and food is not stored underneath benches. Shelves have a non-absorbent easy-to-clean finish (cupboards should be avoided).		
5	Cleaning chemicals, detergents, mops and brushes are not kept in the food store.		
6	The store is clean and free of any spillage and pests.		
	COLD STORAGE		
7	Suitable and adequate cold storage and refrigerated equipment are available to keep food staff. Thermometers are in place and temperatures are recorded twice daily. **Requirements:** Frozen food at minus 18deg C+ 2 deg C Chilled and refrigerated food from minus 3deg C to 1deg C.		
8	Fish and fish products are stored in a separate freezer. Chicken and chicken products are stored in a separate freezer.		
9	If 'walk-in' freezers are used - metal shelves are available, lighting is adequate, safety devices to prevent accidental lock-in are provided, and a thermometer gauge is fixed outside the unit.		
	TOTAL		**Total Possible - 9 - _____ N/A = _____**

Section

E	Description	Score	Remarks
	FOOD HANDLERS AND PERSONAL HYGIENE.		
1	Notices indicating '"Unauthorized Persons" are not allowed in the food premises' are displayed.		
2	All food handlers have a valid Ministry of Health certificate. Camp boss has the copies of all the certificates.		
3	Food handlers suffering from diarrhoea, vomiting, high temp, or who have cuts, septic sores in their hands or body have been kept away from food handling works.		
4	Smoking is not allowed in the food handling area. Appropriate signs are displayed.		
5	Food handlers have been provided with minimum of 2 uniforms--aprons, caps, and non-slip footwear appropriate to the hazards.		
6	Food handlers appear clean, neat and tidy. They have clean hands with short finger nails and short hair which is covered during food preparation. Jewellery (rings, necklaces etc.) are not worn while working with food.		
7	Food handlers have been trained on food hygiene.		
	TOTAL		**Total Possible - 7 - _____ N/A = _____**

Section

F	Description	Score	Remarks
	SANITARY FACILITIES		
1	Toilets are provided as per the minimum requirement specified in the HSE-SM Chapter 12. Toilets have WCs, showers, and wash hand basins in good working order and are clean.		
2	Toilets have window openings to the outside air or are provided with adequate artificial ventilation system.		
3	Lighting is adequate/all working.- no dark corners etc.		
4	Supply of running cold and hot water is provided in or adjacent to toilets and washing facilities.		
5	Floor of showers are clean, non-slippery, and in good repair.		
6	Showers cubicles have doors or curtains.		
	TOTAL		**Total Possible - 6 - _____ N/A = _____**

Section

G	Description	Score	Remarks
	WASTE DISPOSAL.		
1	Waste is disposed of in accordance with the WMM.		
2	Sufficient number of covered bins lined with plastic bags are provided in all residential areas, work sites , food premises. Waste is collected from the food premises on daily basis and not less than twice a week from living quarters / working sites within the camp. Garbage is carried in the tied-up bags or in covered bins to the designated collection point at which the Waste Management Contractor collects on daily basis.		
3	The waste collection point is kept tidy.		
4	If applicable, the clinical waste is collected and disposed of in accordance with the procedures (MCH/02/95 obtainable from CSM33/34).		
5	All waste water, including floor washing water is disposed as such that it does not present a hazard to health and environment		
	PEST CONTROL		
6	Proper equipment and pesticides are provided.		
7	All pesticides have SHOC cards available at site.		
8	Trained person handling/applying pesticides are provided with proper PPE - coveralls, rubber gloves, proper pesticide mask/ respirator and goggles.		
9	General cleaning and housekeeping of the camp and the surroundings is maintained properly.		
	TOTAL		**Total Possible - 9 - _____ N/A = _____**

Section

H	Description	Score	Remarks
	WATER		
1	Water for cooking, washing and toilets in camps is provided from the Company's approved sources.		
2	Water supply is sufficient - minimum 250 lt. per day per person.		
3	Water is stored in the above grounds tanks made either in stainless steel, galvanised steel or reinforced fibre glass.		
4	Water supply for domestic use is disinfected by chlorinating to the required standard - ref. Chapter 12 HSE-SM Manual.		
5	If water is trucked, the water tanker / driver / helper have valid health certificates from Reg. Municipalities or Ministry of Health. The water tanker is painted blue and has words "POTABLE WATER" written in white on both sides of the tanker in Arabic and English and is clean and well maintained.		
	TOTAL		**Total Possible - 5 - _____ N/A = _____**

Section

I	Description	Score	Remarks
	GENERAL		
	BARBER SHOP		
1	Muscat or Regional Municipal Regulations for barber shop is available and the shop is in compliance with the regulation. CSM33/34 shall be consulted if further information required.		
	LAUNDRY.		
2	A laundry facility is provided for all personnel accommodated in the camp and maintained in clean and working order.		
3	Detergents and other related chemicals are stored in a ventilated room.		
	RECREATION		
4	Appropriate recreational facilities are provided: recreation room/TV/Video/games		
	EMERGENCY		
5	Fire extinguishers are provided in the camp. (Ref. ERD-88-02) and the fire wardens are appointed.		
6	Audible alarm for evacuation is available in cases of emergencies. Fire exits, alarm points and firefighting equipment are kept clear of obstructions.		
7	Staff is aware of the emergency procedures.		
	TOTAL		**Total Possible - 7 - _____ N/A = _____**

Section

J	Description	Score	Remarks
	MEDICAL CONDITIONS OF CONTRACTS		
1	Initial and Routine Medical Examinations provided at no cost to employee.		
2	Clinic provided if > 100 employees in camp. Qualified male nurse present.		
3	If more than 10 km from nearest PDO clinic, a suitable vehicle must be provided as an ambulance.		
4	Nurse is competent to perform the tasks allocated to him and has received appropriate training in casualty management, emergency response, resuscitation etc.		
	TOTAL		**Total Possible - 4 - _____ N/A = _____**

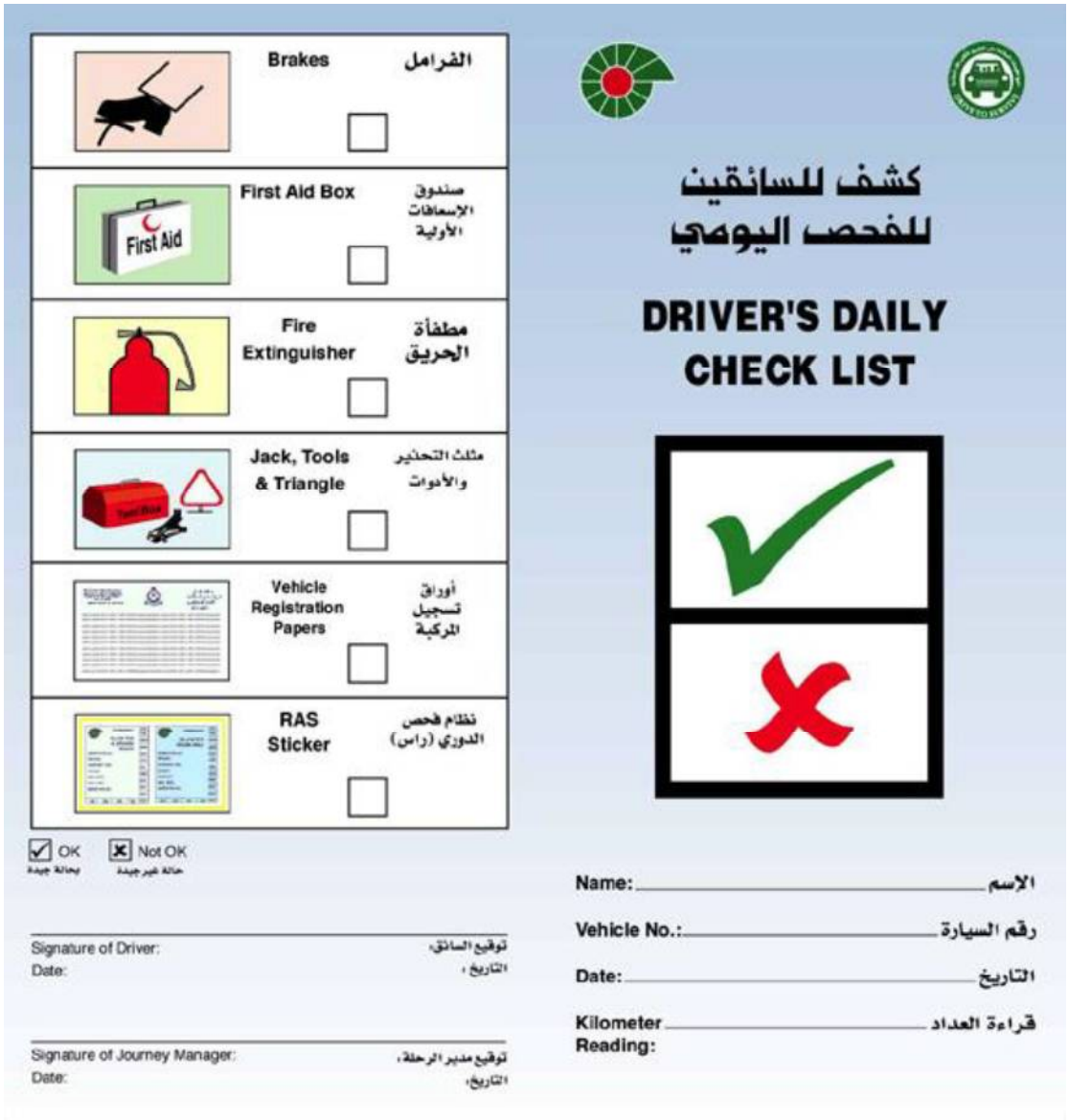
CONTRACT HOLDER's CHECKLIST:

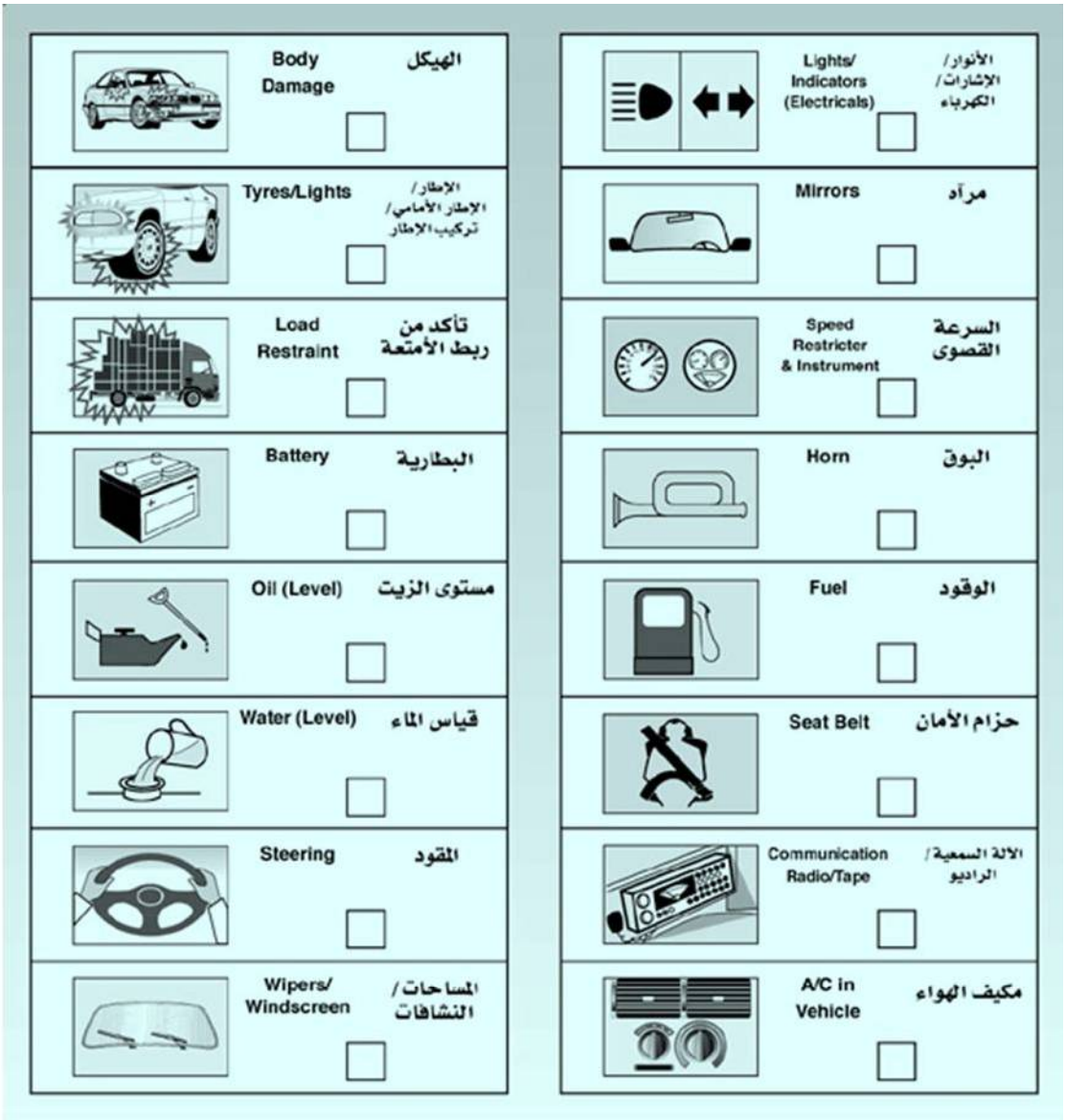
- Have you concluded "Hazard and Effect Management (HEMP)" or "Risk Assessment process" with your contractor prior to mobilization? (HEMP may take few hours of brainstorming)
- Have you prepared contractor HSE plan? Have you checked contractor's HSE policy?
- Have you forwarded the HEMP and Contractor HSE Plan to company HSE Manager for comments and approval?
- Have you ensured competent workers and supervisors for the job? Have you scrutinized their qualifications, experience? How did you ensure that competent people are only doing the job?
- Have you scheduled mandatory HSE trainings such as PTW, First aid, Defensive driving etc for contractor staff before mobilization on the site?
- Have you planned HSE induction, Pre-employment medical exam, Security pass, Gas fence pass etc. for contractor workforce?
- Have you ensured contractor workforce is wearing mandatory personal protective equipment (PPE) of good quality?
- Have you ensured that a competent contractor supervisor must supervise each work?
- Have you checked quality and appropriateness of tools used in the work?
- Have you ensured that contractor has made food, toilet, first aid, and transport, camp arrangements (if applicable) for his workforce?
- Have you ensured that contractor Follows Company approved waste handling and disposal procedures?
- Have you passed all relevant HSE procedures to the contractor? (Supervisor has to organize toolbox with his workers about work procedure before start of job everyday)
- Have you checked that contractor staff knows how to report incidents, near misses, Occupational illness and to whom?
- Have you ensured that contractor complies and understands Company Road safety rules?
  (Such as Driver age, Experience, Driving hours, Defensive Driving, use of Seat belt, Vehicle servicing schedule, First aid, Fire extinguisher, Vehicle checklist, Speed limit, No night driving policy, No Alcohol, Drug, Smoking policy, Precautions while transporting loads etc)
- Have you ensured that contractor understands and report HSE statistics every month on HSE Format (before 4th of following month?)?
- Have you fixed any HSE Inspection/Audit program with contractor?

If the answer is NO to anyone of above, then basic contractual HSE requirements are not met.

Contact Company HSE Manager to help you.

Drivers check list:





Fire and Equipment Check List:

Item	Procured by	Maintained by	Comments/ Action Taken
VHF Radio Phone sets – 2 (25 kames range)	Port		
Satellite Phone –1 (for external contacts)	Port		
Landline Phones-2 (ISD/STD/LOCAL)	Port		
Conference Call Phone-1 (ISD/STD/LOCAL)	Port		
FAX LINE - 1 (Dedicated independent connection)	Port		
PBAX Hot Line (Process & Port control Rooms)	Port		

Current telephone directory– Shell Group, Shell India, GP India, Hazira, Local Surat, Emergency contacts (updated every month by -------)	Port		
Field map of operations area (Overall Aerial plan showing all neighbouring jetties, villages to the scale, Oil spill control map, Port, Terminal and Hazira Mora Pipeline plans displayed on walls) Fire Fighting facility layout (Jetty and Terminal) Overall Security Layout/ positioning of personnel (nice to have)	Port		
Wall clock-1	Port		
White Electronic Board – 1 or White board with 2-3 marker pens Flip stand, charts, Pens	Port		
Board cleaner	Port		
Public announcement system connection (with microphone)	Port		
Emergency Response Plan (Port) – On Board	HSE M		
Emergency response Plan (Terminal & Pipeline) - On Board	HSE M		
Disaster Management Plan (offsite)- On Board	HSE M		
Shell India Crisis management Plan	HSE M		
Emergency Lighting	Port		
3 Dedicated computers with network and independent E-mail connection Dedicated Printer	Port		
Duty manager Roster (pasted on board)	Terminal		
CCTV Screen extension	Port/ Terminal		
Big Table with chairs to accommodate 8 persons	Port		
Refrigerator with 24 hrs food (nice to have)	Port Pantry		
Tea / Coffee kettle	Port Pantry		
Note pads (2) pens (4) provided	Port		
2 sets of cryogenic suite, fire fighters suite, BA set, normal PPEs for use of ERT	HSE C (At		

members	security gate)		
3 sets of controlled keys – 1 with Process, 1 with Port, 1 with Duty manager.	Port		
Dry Powder / CO2 Fire Extinguisher- 9 kg (just outside Emergency control center)	Terminal		

First Aid Box-standard contents:

A Up to 10 persons -

6 small sterilized dressings
3 medium sterilized dressings
3 large sterilized dressings
12 adhesive wound dressings
2 triangular bandages
1" x 5yds zinc oxide plaster
1.5oz sterilized cotton wool
1 sterilized eye pads
1 rubber pressure bandage
1pkt safety pins
Waterproof dressings and plasters
2 Laerdal-type pocket masks*
4 pairs PVC gloves
2 PVC aprons
1 pair eye protection (glasses/goggles)

B 10 to 50 persons -

12 small sterilized dressings
6 medium sterilized dressings
6 large sterilized dressings
24 adhesive wound dressings
4 triangular bandages
1 x 10yds zinc oxide plaster
2.5oz sterilized cotton wool
4 sterilized eye pads
1 rubber pressure bandage
1pkt safety pins
Waterproof dressings and plasters
2 Laerdal-type pocket masks
8 pairs PVC gloves
4 PVC aprons
1 pair eye protection (glasses/goggles)
Pocket mask (for mouth to mouth breathing)
Neck collars (for spine injuries)
Spinal stretcher, Spinal board
Folding stretcher

Incident Report Form

Distribution:

To: Distribution as shown at right

See guidance notes for information On completing this fax or E-mail

All Incidents	**all (**as applicable**)**	Line **- Manager, Dept. Head, Area Co-ord, Section Head, Contract Owner & Holder,** All **Area & Unit HSE Advisers, CFDH, UFDH, CSM & CSM/42,** and "Other Parties" in the table below. **HSS for security incidents only**
Medium Potential	**all the above** plus	**All Managers**
High Potential	**all the above** plus	**All Directors incl. MD (MCC in** all **cases of** death**)**

Other Parties **for all Incidents in:** Fahud, Lekhwair, Yibal, Qarn Alam, Coast	OFH/2/22
Marmul, Bahja, Rima, Nimr	OMH/2/22
DMD, TSD, FD, XD	THR

REPORT ORIGINATED BY: Name:	Reference Ind:
Tel/Fax Number:	Date:
DATE OF INCIDENT:	TIME:
LOCATION OF INCIDENT (INCLUDE AREA / REGION):	
INCIDENT TYPE:	
INCIDENT ACTUAL SEVERITY:	POTENTIAL RISK RATING:
DEPARTMENT(S) INVOLVED:	
CONTRACTOR(S) INVOLVED:	CONTRACT NUMBER:
BRIEF DESCRIPTION OF INCIDENT:	
NUMBER OF PERSONS INJURED:	
BRIEF DESCRIPTION OF DAMAGE:	
NAMES OF INJURED PEOPLE AND DETAILS OF INJURIES:	
PDO FIRST LINE SUPERVISOR:	
The following for Low Potential Incidents Only	
IMMEDIATE CAUSE **:	
UNDERLYING CAUSE **:	
CORRECTIVE ACTION (with target completion dates)**:	

1.Guidance on Health / Safety Incident Notification

DETAILS TO BE PROVIDED ON HEALTH / SAFETY INCIDENT NOTIFICATION **All headings must be completed in the Notification. Use (N/A) against headings not applicable. State (approximate) after any estimated values. Send Notification within 24 hours of the Incident occurring.**	
HEADING	DETAILS REQUIRED
1. Report Originator	**State Name and Reference Indicator of the originator, and the date on which the Notification was generated. Also state the telephone / fax number at which the originator can be reached.**
2. Date of Incident and time	**State date and time of the Incident.**
3. Location of Incident	**State exact location of the Incident. Include the Area / Region in which the Incident occurred.**
4. Broad Incident type	**e.g. Road Traffic, Oil Spill, Equipment Damage, Theft, Non-accidental death, etc. Refer to Appendix 4.5**
5. Incident Actual Severity	**State 0, 1, 2, 3, 4 or 5. If there is a possibility that the category will change, e.g. from 3 to 2, then state 3/2 on the notification message. Specify also if primary harm is to (P)personnel, (A)sset, (E)environment or (R)eputation. (E.g. 3(P) for an LTI case.)**
6. Potential Risk Rating	**Estimate and state the Potential Risk Rating from the information available at the time of sending the Notification using the Risk Matrix. eg. D4(P) Refer to Section 2.2 in the guide-lines.**
7. Department(s) involved	**If PDO personnel or equipment are involved then state the relevant department reference indicators.**
8. Contractor(s) involved	**If a PDO Contractor or sub-contractor is involved, then state the following:** • **Main Contractor (Company Name)** • **Sub Contractor (Company Name)** • **PDO Contract Holder (Ref.Ind.)** **Include the applicable Contract Number.**
9. Brief description of Incident	**Describe the reasons for the work/journey and how the Incident happened.**
10. Number of persons injured / or with adverse health affect	**State the total number of persons injured.**
11. Brief description of damage	**List equipment damaged and any associated minor environmental pollution caused. If major environmental pollution resulted without major injury, complete an Environmental Incident Notification form to trigger legal notification requirements.**
12. Details of injured parties	**Give the following details for each injured party:-** • **Name** • **Reference Indicator or company name of Contractor** • **Company number** • **Injury / illness description** • **Place where injured is being treated**

13. PDO first line supervisor	**State the Name, Reference Indicator and contact telephone number of the PDO First Line Supervisor (write 'same as originator' if applicable).**

For Low Potential Incidents Only:-

14. Immediate Cause	**Give the immediate cause(s) of the Incident as per Appendix 4.6**
15. Underlying Cause	**Give the Underlying Cause as per Appendix 4.7.**
16. Corrective Action	**State the recommended corrective action(s) to prevent re-occurrence of the Incident, Action Party and target completion date.**

ENVIRONMENTAL INCIDENT / LEAK / SPILLAGE NOTIFICATION

To: CSM/2 Fax (67-3145), Distribution at right and:
OTT161M Fax (38-6469) Marmul, Nimr, Rima, **Bahja**
OTT/233 Fax (38-4660) Coast, Qarn Alam, Lekhwair, Fahud, Yibal
OTT/241 Fax (38-2356)

*** See the guidance notes on the back of the form**
**** Delete as appropriate**

Distribution:

All Incidents *	**all (as applicable)**	Line **- Manager, Dept. Head, Area Co-ord, Section Head, Contract Owner & Holder,** all **HSE Advisers, OTS/0, CFDH, UFDH, OTS, CSM/15 and** Other Parties **as given below.**
Medium Potential *	**all above** plus	**All Asset Managers**
High Potential *	**all above** plus	**All Directors incl. MD**

Other parties (distribution list) for all Incidents at:	
Coastal	**OQO, OFH/22****
Fahud	**OFO/4F, OFH/22****
Yibal	**OYO, OFH/22****
Qarn Alam	**OQO, OFH/22****
Lekhwair	**OFO, OFH/22****
Marmul	**OMO, OMH/22****
Rima	**OB0, OMH/22****
Bahja	**OBO, OMH/22****
Nimr	**ONO/4N, OMH/22****

Part 1 - ALL ENVIRONMENTAL INCIDENTS:

*REPORT ORIGINATED BY: Name: Reference Ind.:	Report Date: Tel/Fax Number:
*INCIDENT OCCURRED: Date: TAG NUMBER (or Process pipe number): *LOCATION OF INCIDENT (INCLUDE AREA / REGION):	Time:
*INCIDENT TYPE:	CAUSE TYPE:
*ACTUAL SEVERITY =_____, S=_____, Q=_____, T=_____ *POTENTIAL RISK =_____, S=_____, Q=_____, T=_____	
*DESCRIPTION OF INCIDENT/LEAK FACILITY TYPE:	
*VOLUME OF SPILLAGE: _____ m^3 Oil _____ m^3 Water _____ scm Gas _____ m^3 Other (specify material):	*Volume of oil (exclude sand/water) recovered: _____ m^3 *Area impacted: _____ m^2
*WAS THE INCIDENT REPORTED BY OR INVOLVED THE:	Royal Oman Police: ❑ Yes ❑ No 3rd Party/Local Citizens: Yes No
*ACTION TAKEN TO DATE: Date Site Restoration Completed: Clean-Up Actions:	

Part 2. ADDITIONAL INFORMATION FOR PIPELINE & FLOWLINE LEAKS : TICK (√) APPROPRIATE BOXES ONLY:

LINE DIAMETER (inches):		Defect Orientation (o'clock):	
*WALL THICKNESS (if available):		*Material Grade (if available):	
DISTANCE (chainage):		Distance Reference: Well head	
Station			
*SERVICE:		*No. of clamps already installed on the complete line:	
*LOCATION CHARACTER.	q Road crossing	Expansion loop	qField bend
	q On girth weld	q Downstream of girth weld	q Upstream of girth weld
CONDITION DESCRIPTION:	On sleeper	Off sleepers	Buried
SLEEPER TYPE:	Concrete block: with wood insert	with steel bar	with rebar
	Goal post		
FAILURE MODE:	### External corrosion	(was windblown sand a factor:	###Yes ❑ No)
	q Internal corrosion	qAbrasion	
	Over stressing	❑ Impact	qOther
*DEFECT SIZE:	Pinhole	Major leak	Rupture
EXT. COATING CONDITION:	FBE	PE	Tape wrap
	Other, specify:		None

2. Guidance on Environmental Incident Notification:

GUIDANCE FOR ENVIRONMENTAL INCIDENT NOTIFICATION

Part 1 of this form must be used for reporting of all environmental Incidents, whether caused by human error, mechanical/operational failure, etc. These include, but are not limited to, oil/water leaks from flow lines or pipelines, gas or Halon/Freon releases, sewage treatment plant malfunctions, marine discharges, or any other effluent discharge or Incident (damage/death to property/livestock) that may have a liability or an adverse impact on the environment.

Omani Law requires that all spillages or disposals contrary to the Law must be reported within 48 hours to the Ministry of Regional Municipalities and Environment. It is therefore essential that reports reach CSM/2 as soon as possible. Details to be provided should follow the specified format as shown. All headings must be answered (where applicable). The information in Part 2, the lower panel, is only required for pipeline and flow line leaks. All leaks, discharges, malfunctions, etc., should be reported, regardless of size or volume or area of impact.

HEADING	DETAILS REQUIRED
Part 1	
Report Originated By	**State name and reference indicator of the originator and date on which the notification was generated. Also state telephone/fax numbers at which originator can be contacted.**
Incident Occurred	**State date and time the Incident occurred or was first observed.**
Location of Incident	**State exact location of the Incident, area, facility, field, etc. If the Incident is related to a well, then provide the well number. Give any relevant details of area impacted, e.g. wadi, road, dwellings, flora/fauna, third parties.**
Incident Type	**For example oil/water spill or gas release. If another substance, e.g. chemical, effluent discharge, etc., please specify.**
Cause Type	**Write either Corrosion, Equipment Failure, Mechanical Failure, Operator Error, or Unknown.**
Incident Actual Severity	**State 0,1,2,3,4 or 5. If there is a possibility that the category will change, e.g. from 3 to 2, then state 3/2 on notification.**
Potential Risk Rating	**As estimated from the information available at the time of sending the notification and using the Risk Matrix. e.g. D3 (E)**
Description of Incident/Leak	**For example, new leak, old clamp failure, equipment or mechanical failure etc.**
Facility Type	**Write either Flow line, Pipeline, Drilling/Well Testing, Mainline Booster, or Production Station.**

Volume of Spillage	**Most important to give as accurate an estimate as possible, based on duration, area extent, depth, possible losses (evaporation, seepage). Impacted area also to be recorded. Volume of liquid oil recovered (not oiled sand or water), which is a part of a Corporate Performance Indicator, must also be recorded, if none then say so.**
Incident Reported By/Involved	**If the Incident has been reported by or involved the ROP or 3rd Party or Local Citizens, check the appropriate box.**
Action Taken to Date	**Describe the remedial action already taken, or proposed for site clean-up and measures/locations selected for disposal of oiled sand, waste materials, etc. Give date that site clean-up was completed, which is a part of a Corporate Performance Indicator.**
Part 2	
Wall Thickness and Material Grade	**Complete, if known, from construction records or if written on the pipe surface.**
Number of Clamps Already Installed	**Count the number of clamps over the full line length.**
Service	**Dehydrated crude, wet crude, wet gas or dry gas.**
Location Character	**Tick the appropriate check boxes next to the sentence "Downstream of girth weld" & " Upstream of girth weld" if the defect is within 2 m from the girth weld, otherwise leave the boxes blank.**
Defect Size	**Pinhole defect if the size < 3 mm in diameter** **Major leak if the size > 3 mm, and < (0.6*Diameter) mm in diameter.** **Rupture if the size > (0.6*Diameter) mm in diameter.**

Industrial Area Inspection Report		
Contract No.:	**Contractor:**	**Area:**
Site Supervisor:	**Date :**	**Discipline:**
Location:	**Inspected by :**	
Compliance = 1	**Non Compliance = 0**	**Not Applicable = N/A**

The information in the description section is to assist personnel during the inspection; however, personnel conducting this inspection must be thoroughly familiar with the information relating to industrial facilities in the following Company manuals:

- HSESM
- Waste Management Manual, WMM

If there is any doubt as to the interpretation of the requirements, consult with the appropriate HSE staff to clarify the interpretation. Identified staff includes Company Industrial Hygienists, and Area Company HSE Advisor.

Section

	Description	Score	Remarks
A	**LAYOUT/ BUILDINGS**		
1	**Offices have adequate lighting, workspace, AC**		
2	**Workshop has clearly defined work areas** -hazardous jobs segregated in booths/screens		
3	**Shop lighting adequate** - all fixed lights working		
4	**Ventilation adequate** -exhaust fans working/guarded		
5	**Clearly visible safety signs where required** - signs with pictures or in language of workers		
6	**Adequate storage for materials in workshop** -flammables/chemicals stored separately-shelving secured/not overloaded/safe access		
7	**Electrical outlets** - correctly wired /correct plugs used/no adapters -leads in good condition/no taped joints		
8	**Electrical panel(s) clearly marked/accessible** -panel doors kept closed -"No Wash Water" sign in place		
9	**Battery charging area isolated**		
10	**Adequate toilets/wash facilities/areas clean** -sinks/soap/paper towels or electric drier ref: CH. 12, Appendix I		
11	**Adequate drinking water available**		
12	**Glass doors/full length windows marked with reflective strip**		
	TOTAL		**Total Possible- 12 - _____N/A = _____**

Section

B	Machinery / Equipment /Tools	Score	Remarks
1	**Machines guarded /protected as per Manufacturers 'specifications** -electric leads in good condition -no extension leads on permanent equipment		
2	**Grinding wheels safeguarded** -face shield readily available		
3	**Painting/Grit blasting equipment** -blaster has hood with air supply/ body suit -blast area isolated from other work areas -shop blasters in booth with negative pressure -respirators available for painting		
4	**Pneumatic tools** -hearing/eye protection available if required -fittings correct/using crimp clamps on hose -hoses in good condition/no bulges/damage		
5	**Portable electric tools** -Max 42v or 240v double insulated -extension leads properly rated/good condition -fuse protected/automatic shut-off working		
6	**Hand tools** -fit for purpose/good condition -no home-made tools		
7	**Industrial gases** -cylinders secures in upright position -cylinders tested / inspected/date stamped -bottles color code/gas name stenciled on bottle -gas storage fire resistant/ideally separate building or in stores		
8	**Welding/Cutting area** -no flammable material in booth or nearby -fire extinguishers/fire blankets readily available -cutting equipment regularly inspected -crimp type clamps on hose/fitting connection -proper goggles/clothing/gloves etc. used -electric welding cables in good condition -welding shields in place		

9	**Lifting equipment** -capacity clearly marked on crane/hoist -equipment inspected/certified as required -slings color coded/good condition		
10	**Equipment maintenance** -isolation before cleaning /maintenance -maintenance plan/ regular inspections		
	SCORE		**Total Possible- 10 - _____N/A = _____**

Section

C	Yard/Stores/Laboratory areas	Score	Remarks
	YARD AREA		
1	**Access roads** -free from obstructions/all areas accessible -signs in place/parking areas marked		
2	**Material storage** -pipes /tubing on racks/have L stopper -plate material racked or stacked neatly -waste metal collected in bin/clearly marked		
3	**Work activities** -hazardous work(painting/grit blasting) separated from other yard work/presents no hazard to other workers		

C	STORES AREA		
4	**Lighting/ventilation adequate** - no dark corners		
5	**Walkways/access points** -no slipping/tripping hazards - materials not sores in aisles		
6	**Adequate storage for materials** -shelving secured/not overloaded/safe access -ladders provided for high shelving		
7	**Flammable/chemical storage** -SHOC cards available -well ventilated/lighted -no compressed gasses		
8	**Compressed gas storage** -Fireproof storage if inside/well ventilated -Oxygen stored separately or firewall between other gases -bottles secured in upright position/caps on		
9	**Laboratory facilities** -Free of all waste/rubbish -fume hoods in place if required/AC in place -Decanted Chemicals clearly marked -"Authorized Personnel Only" sign/enforced		
	SCORE		**Total Possible: 9 - _____ N/A = _____**

Section

	GENERAL	Score	Remarks
	EMERGENCY PREPAREDNESS		
1	**First Aid** -kits / first aiders available/identified -eye wash stations available/maintained		
2	**Emergency evacuation** -procedure in place/ routes marked -assembly points clearly identified/exits marked		
3	**Equipment** -fire extinguishers in place/certified/inspected - fire wardens appointed -alarms working/maintained/tested		
	HOUSEKEEPING		
4	**All areas kept clean/free of rubbish/waste** -		
5	**Waste management** -domestic/industrial rubbish segregated -adequate containers/clearly marked		
	SCORE		**Total Possible: 5 - _____ N/A = _____**

***NOTE: The following Non - Compliance items are to be recorded on Inspection Summary Report:**

- **Those that require longer that 24 hours to comply.**
- **Consistent non- compliance in Item/Activity which indicates a management system problem.**

SCORING SUMMARY

A.			**Total Possible**
B.	**Section Total**		**Total Possible**
C	**Section Total**		**Total Possible**
D	**Section Total**		**Total Possible**
	TOTAL SCORE		**Total Score Possible:**
FINAL RATING: Total Score Possible X 100	**TOTAL SCORE**	**=**	**_____ %**

ISSUES WITH MEDICAL

- Shell Yellow Book Guidelines on Incident Reporting
- Company Doctor's report for incident reporting compulsory
- HLPL/HPPL Health Specification
- Pre-employment medical Exam- Employees
- Periodical Exam-40 Yrs + Annual, 40 Yrs - Once in 2 yrs
- Pre-employment medical Exam-Long time, call on contractors
- Daily Ambulance Check
- First Aid box checks
- Fitness certificate (more than 2 days SL)
- Sickness Absenteeism
- Agreements with Hospitals
- Medical Evacuation for employees
- Medical Records (HR will be out of picture)
- Drugs Procurement
- Day to day medical /physical treatment
- Imparting First Aid training
- Participate in drills
- Participation in HSE audits e.g. Catering, Food preparation, Hygienic conditions
- Occupational Health reporting- Work related or non-work related
- Emergency Response-Roles & Responsibility (ERP to be handed over to doctor + Nurse)
- Nurse has to report to process control room in each shift
- Ambulance has to be allowed in Red Fence area-Instruction to security

- New ambulance
- Medical equipment requirement in medical center- strechers, Dummy for training etc.
- Network with Delhi & A'bad
- Communication with HSE people
- Alcohol & Drugs check
- Any other issue

PTW INSPECTION REPORT AS PER NEW PERMIT TO WORK SYSTEM MANUAL		
Contract No.:	**Contractor:**	**Area:**
Site Supervisor :	**Date :**	
Location :	**Inspected by :**	
Compliance = 1	**Non Compliance= 0**	**Non Applicable= N/A**

The information in the description section it to assist personnel during the inspection, however, personnel conducting this inspection mi must be thoroghly familiar with the information relating to following company manuals

Permit to work System Manual Procedure PR-1172 (Audit form ' F)

If there is any doubt as to the inspection of the requirements, consult with the appropriate HSE staff to clarify the interpretation

a) Check the Following	**Score**	**Remarks**
1) Is the permit holder present at the worksite		
2) Is the permit holders licence current		

b) Worksite Examination with Holder		
1) Is the permit displayed on the worksite		
2) Is the permit valid for current work period		
3) Is the location and worksite correct		
4) Is there any other work in or near the work area that could conflict with the permit		
5) If a vehicle is used, is it approved to be on site		
6) Are the copies of certificates as identified on the permit attached.		
7) Are the requirements of any of the certificates not being met.		
8) Is the safety equipment appropriate in good condition and is in use		
9) Are any special precautions being observed		
10) Is the Job Safety Plan attached and is it relevant to the work		

c) Permit Holder

1) Have you been briefed on the requirements of the permit		
2) Have you delivered a tool box talk to the work party identifying the requirements of the permit.		
3) Has the Job Safety Plan been explained to you.		
4) Has the safety equipment been explained to you		
5) How did you explain the Job Safety Plan to the work party		
6) Ask how many class A permits can a permit holder hold		
7) How many Class A permits can run concurrently in the same area		
8) Ask for explanation of a Hazard mentioned on the Job Safety Plan		
Is the explanation realistic		
9) Ask for explanation of a control mentioned on the Job Safety Plan		
Is the explanation realistic		
10) Ask what recovery actions would be taken in the event of worksite conditions changing adversely i.e., (gas, weather, ground conditions etc.)		
Is the Answer realistic for the event, and referenced to the Job Safety Plan		
TOTAL		Total Possible 22____ N/A _____
TOTAL SCORE FINAL RATING: Total Score Possible X 100 = _____%		

SPOT INSPECTION REPORT

Spot Inspection Report		
Contract No.:	**Contractor:**	**Area:**
Site Supervisor:	**Date :**	**Discipline:**
Location:	**Inspected by :**	
Compliance = 1	**Non Compliance = 0**	**Not Applicable = N/A**

The information in the description section is to assist personnel during the inspection; however, personnel conducting this inspection must be thoroughly familiar with the information relating to industrial facilities in the following Company manuals:

- HSESM, 97/02

If there is any doubt as to the interpretation of the requirements, consult with the appropriate HSE staff to clarify the interpretation. Identified staff includes Company Industrial Hygienists, and Area Company HSE Advisor.

Section

A	General	Score	Remarks
1	**Permit and/or written PDO Instructions.** Valid: gas / H2S / Oxygen tests /monitoring - High Risk/Non Routine Activities highlighted		
2	**Job Safety Plan** - Applies to work being done - Specific details on High Risk/Non Routine work		
3	**Tool Box Talk Held** - covers specifics from Job Safety plan - record of items discussed/worker concerns		
4	**Appropriate PPE:** -head/eye/foot/ gloves/body/hearing - respiratory: BA/respirator/dust mask		
5	**Hand tool condition:** - fit for purpose- no major defects		
6	**Power tool condition:** - Electric / pneumatic/ hydraulic		
7	**Safe access to work area:** -walkways/ladders fit for purpose/ secured -Extension ladders have 1.0m stick-up above landing		
8	**Facilities:** -shade / water / toilet / wash –up supplies		
9	**Emergency Response / Communication / First Aid**		
10	**Site organization:** traffic control / dust control Equipment/materials organized/ housekeeping		
	TOTAL		**Total Possible- 10 - _____N/A = _____**

Section

B	Plant/ Equipment	Score	Remarks
1	**Heavy equipment condition:** no oil/fuel leaks Back-up alarm, yellow flasher working		
2	**Banksman in place -** congested areas, reversing, OH lines		
3	**Access to site:** overhead power lines Pipeline crossings etc.		
4	**Warning signs/ barriers:** - Road resurfacing, excavations etc.		
5	**Stationary equipment condition:** -mixers / generators / power plants / bins etc		
	SCORE		**Total Possible- 5 - _____N/A = _____**

Section

C	High Risk or Non Routine Activities (C9/10)	Score	Remarks
1	**Workers in excavations over 1.2 m:** - shoring/sloping (Min 1:1) / steps or combination		
2	**Working at heights over 1.5m:** scaffolding / plat forms in place Fall arrest /safety harness if req.		
3	**Entry into Confined spaces: -** tanks/bunkers etc. - Gas/oxygen testing /ventilation - Safe access / lighting - safety watch / communications/ rescue plan		
4	**Electrical** - isolation and / or lockout in place		
5	**High pressure testing** -20 meter safe distance minimum from all lines/equipment under test - warning signs/barriers at perimeter		
7	**Removal of old flowlines** - lines isolated / mechanical lockout - clearly marked/depressurized/purged - test drill small hole prior to first cold cut/gas test		
8	**Lifting / hoisting** - Critical lift plan required for loads exceeding 50% of crane capacity at required reach - lifting slings to standard -loads secured to prevent slippage or movement during lifting/movement - when lift above shoulder height, load lines to be attached to allow minimum 3m safe distance for riggers handling load. - 5m safe distance to be maintained by all other personnel		
9	**Non-Routine Activity:**		
10	**Non-Routine Activity:**		

	SCORE		**Total Possible: 10 - _____ N/A = _____**

***NOTE: The following Non - Compliance items are to be recorded on Inspection**

Summary Report:

- All High Risk Activities.
- Those in Section A & B that require longer that 24 hours to comply.
- Consistent non- compliance in Item/Activity which indicates a management system problem.

SCORING SUMMARY

A.			**Total Possible**
B.	**Section Total**		**Total Possible**
C	**Section Total**		**Total Possible**
	TOTAL SCORE		**Total Score Possible:**
FINAL RATING:	**TOTAL SCORE** **Total Score Possible X 100 = _____ %**		

ASSESSMENT OF TOOL BOX TALKS	
Contract No.:	**Contractor: Area:**
Site Supervisor :	**Date :**
Location :	**Assessed by :**
Compliance = 1	**Non Compliance= 0 Non Applicable= N/A**

Definition :

Tool Box Talk is defined as the instruction given to the workforce before the actual commencement of work, detailing contents of a specific job, briefing of the week, the sequence of work, the anticipated potential hazards to be encountered and the effective controls to be in place to ensure safe work completion.

Assessment :

To ensure effectiveness Tool Box Talks regular monitoring, auditing, crew size, attitude of the Group Leader, 2-way communication & language play an important role.

Monitoring & Evaluation :

A forum for verbal communication between the supervisor / foreman / crew leader and workforce before starting the activity or any non-routine task.

Why? To ensure the work force understands the hazards and control measures are in place to carry out the task safely.

Who? Supervisor / Foreman / Charge Hand / Permit Holder / Crew-Leader

When? Before starting the activity or prior to non-routine high risk activity.

What?

- Hazard Management
- Dissemination of HSE information
- Motivation for HSE improvement
- Any HSE topic related to the activity

Assessment Questionnaire

Compliance = 1 **Non compliance = 0** **Not Applicable = N/A**

Sr. No.	Description	Score	Remarks
1	When do you hold the Tool Box Talk ?		
2	Who conducts the talk & in which language ? Are the contents translated into Arabic for Omani workforce and in other languages for all personnel to understand? Is language a barrier ?		
3	Is the talk audible and his speech is clear ? Does he effectively conducting the Tool Box Talks ?		
4	Is the Crew / Group leader aware of work procedures, identification including Health & Environmental Hazards & its controls ?		
5	Does the Crew leader invite feedback from the attendees, appreciates suggestions and incorporate them at site and Interact with crew members.		
6	Are the Crew leaders provided with relevant material, such as safety alerts, learning points of incidents during the Tool Box Talks ?		
7	Ascertaining the required PPE, Safety equipment, tools, warning signs, drinking water etc.		
8	Other HSE topic relevant to the work.		
9	Emergency preparedness		
10	Ascertaining physical and mental fitness of crew members.		
	Total Score		**Total Possible = 10 – N/A =**

Final Rating	:	Total Score x 100 = % Total Possible

(**Name of the Assessor-Ref. Ind)** **Signature**

VEHICLE Spot Inspection Report

Contract No:	**Contractor: Area:**
Reg. No:	**Date:**
Fleet No:	**Inspected By:**
VEHICLE TYPE : (TICK OR CIRCLE) LIGHT/MEDIUM/TRUCK/TANKER/BUS/TRAILER/ JCB/FORKLIFT/GRADER/SHOVEL/CRANE/.....	**Compliance = 1 Non-complinace = 0**
	Not Applicable = N/A

"A" Section

(FOR ANY NON-COMPLIANCE, A VEHICLE NOT TO BE USED UNTIL PROBLEM/S RECTIFIED.)

	DESCRIPTION	SCORE	REMARKS
1	**SEAT-BELTS**-FITTED TO ALL SEATS(except for buses). CORRECT TYPE, LOCKING MECHANISM IS FUNCTIONAL AND BELTS ARE IN GOOD CONDITION		
2	**ROLLOVER CAGE**-APPLICABLE TO LIGHT. VEHICLES ONLY.		
3	**TYRES CONDITION**-NOT WORN, TREAD NOT LESS THAN **1MM,** NO DEEP CRACKS OR SIDEWALL DAMAGE, PRESSURE TO BE MARKED ON TOP OF THE WHEEL ARCH.		
4	**SPEED LIMITER**-REQUIRED FOR L.VEHICLES. FUNCTION BETWEEN 80 TO 100KM.		
5	**HEAD / REAR & BRAKE LIGHTS**-ARE ALL WORKING (FULL & BEAM).		
6	**JOURNEY MANAGEMENT**, JOURNEY PLAN IN PLACE AS REQUIRED PER PROCEDURE.		
7	**PDO DRIVING PERMIT**-NOT EXPIRED AND APPROPRIATE TO THE VEHICLE DRIVEN.		
8	**Vehicle Inspection Sticker** -Not Expired And Either From Pdo Or Approved R.A.S. Contractor.		
	TOTAL		**Total Possible- 10 - _____N/A =**

"B" Section

(FOR ANY NON-COMPLIANCE, THE PROBLEM/S TO BE RECTIFIED)

1	**HIGH INTENSITY REAR LIGHTS**- VISIBLE AND IN WORKING CONDITION.		
2	**GENERAL VEHICLE CONTENTS** - I.E. JACK, FIRST AID KIT, WATER, NO STOWAGE OF GOODS OR EQUIPMENT IN PASSENGER COMPARTMENT		
3	**A/C FITTED** - AIR CONDITIONING FITTED AND IN WORKING CONDITION		
4	**SPARE WHEELS**-TWO ON LIGHT VEHICLES, ONE ON TRUCKS AND BUSES.		
5	**WIND SCREEN AND MIRRORS** - TO BE CLEAN, NO SERIOUS CRACKS, VISION OBSTRUCTION .		
6	**SEATS** - DRIVER'S ADJUSTABLE, OTHERS SECURE WITH NO INWARD FACING OR FOLDING SEATS		
	TOTAL		**Total Possible- 8 - _____N/A = _____**

***See note on page 2.**

SCORING SUMMARY

A.			**Total Possible**
B.	**Section Total**		**Total Possible**
	TOTAL SCORE		**Total Score Possible:**
TOTAL SCOREFINAL RATING: Total Score Possible X 100 = _____ %			

***NOTE: The following Non - Compliance items are to be recorded on Inspection Summary Report:**

- **All Section "A" non – compliance items.**
- **Consistent non- compliance in Item/Activity which indicates a management system problem.**

General Guidelines

This check list is designed for use in the interior. Items 2, 4 & 11 do not apply to coastal based vehicles. If in doubt refer to the Transport Standards Manual.

Item	Description	Guidance
1	**SEAT-BELTS**-FITTED TO ALL SEATS (except for buses). CORRECT TYPE, AND LOCKING MECHANISM IS FUNCTIONAL AND BELTS ARE IN GOOD CONDITION CORRECT TYPE -	FRONT SEATS - 3 POINT INERTIA REEL. REAR OUTER SEATS - 3 POINT INERTIA REEL. REAR MIDDLE SEAT - MINIMUM OF A 2 POINT LAP BELT. LOCKING MECHANISM - TEST BY CLICKING IN AND OUT. GOOD CONDITION - BELTS MUST NOT SHOW ANY FRAYING, ALSO ON INERTIA BELTS THE BELT MUST RETRACT WHEN RELEASED. BUSES - DRIVER SEAT - 3 POINT INERTIA REEL EXPOSED SEATS (I.E. WITHOUT ANOTHER SEAT OR PANEL IN FRONT OF THEM) - MINIMUM OF A 2 POINT LAP BELT. OTHER SEATS - NO SEAT BELT IS REQUIRED.
2	**ROLLOVER CAGE**-APPLICABLE TO LIGHT VEHICLES ONLY.	N.B. VEHICLES CLASSIFIED AS LIGHT MEDIUM, SUCH AS THE DYNA OR CANTER DO NOT REQUIRE A ROLLOVER CAGE.
3	**TYRES CONDITION**-NOT WORN, TREAD NOT LESS THAN **1MM,** NO DEEP CRACKS OR SIDEWALL DAMAGE, PRESSURE TO BE MARKED ON TOP OF THE WHEEL ARCH.	CHECK THE TREAD FOR SIGNS OF ABNORMAL WEAR, CUTS, LOAD DEFORMATIONS AND FOREIGN OBJECTS EMBEDDED. CHECK THE SIDEWALLS FOR CUTS, IMPACT DAMAGE AND ABNORMAL DEFORMATIONS. JUDGEMENTS MUST BE MADE AS TO THE SERIOUSNESS OF ANY DAMAGE. PRESSURE NOT BEING MARKED TO BE SEEN AS A BLOCK-B NON-COMPLIANCE.
4	**SPEED LIMITTER**-REQUIRED FOR L.VEHICLES. FUNCTION BETWEEN 80 TO 100KM.	IF THE SPEEDLIMITER IS TESTED THE SPEED ON THE SPEEDOMETER AT WHICH THE VEHICLE CUTS OUT SHOULD BE NOTED. IF THIS IS BETWEEN 80 AND 100 KPH THE SPEEDLIMITER SHOULD BE ACCEPTED.
6	**JOURNEY MANAGEMENT**, JOURNEY PLAN IN PLACE AS REQUIRED PER PROCEDURE.	ALL JOURNEYS REQUIRE A JOURNEY PLAN EXCEPT: •journeys within Muscat Municipality or within other towns, as long as the journey is on blacktop roads, and graded roads or tracks are only used for access to buildings in built-up areas. •journeys within a field or within 20km of a work-site. •journeys between rig site and camp and airstrip • journeys between a seismic camp and the work-area or the airstrip controlled by radio. •journeys under the control by radio or telephone of the Local/Regional/National Emergency Base Controller. • Journeys under the control of a Transport Supervisor as part of a rig-move or other convoy, where the operation complies with Supply Convoy Procedures.

7	**PDO DRIVING PERMIT**-NOT EXPIRED AND APPROPRIATE TO THE VEHICLE DRIVEN.	THE DRIVING PERMIT SHOULD BE ONE OF THE "NEW" VERSIONS AS SHOWN BELOW.  THEY HAVE THE LOGO OF THE ISSUING AUTHORITY IN THE TOP LEFT HAND CORNER. AS OF 5.5.97. THE FOLLOWING MAY ISSUE A PDO DRIVING PERMIT 1. GULF INSTITUTE FOR DEVELOPMENT OF HUMAN RESOURCES 2. WESTERN GEOPHYSICAL 3. REES GEOPHYSICAL 4. SCHLUMBERGER 5. HSE SERVICES (OOISS) 6. NTI 7. OTI 8. CGG AS A GUIDE TO THE APPLICABLE PERMIT LIGHT VEHICLE < 3.5 TONNES HGV >3.5 TONNES
8	**VEHICLE INSPECTION STICKER** -NOT EXPIRED AND EITHER FROM PDO OR APPROVED R.A.S. CONTRACTOR.	ALTHOUGH NO NEW PDO INSPECTION STICKERS ARE NOW BEING ISSUED A NUMBER OF VEHICLES STILL HAVE VALID PDO STICKERS. ALL STICKERS SHOULD BE CHECKED FOR THEIR DATE VALIDITY.
11	**HIGH INTENSITY REAR LIGHTS**-VISIBLE AND IN WORKING CONDITION.	ALTHOUGH THIS IS NOW A REQUIREMENT ON ALL NEW CONTRACTS, THERE ARE STILL A NUMBER OF VEHICLES WITHOUT HIRLS, IT IS ONLY IF IT IS CONTRACTUALLY A REQUIREMENT THAT WE SHOULD DEMAND RECTIFICATION.
13	**A/C FITTED** - AIR CONDITIONING FITTED AND IN WORKING CONDITION	ALTHOUGH A/C IS NOW A REQUIREMENT ON ALL NEW CONTRACTS, THERE ARE STILL A NUMBER OF VEHICLES WITHOUT A/C. IF IT IS A CONTRACT SECIFICATION, THEN RECTIFICATION IS REQUIRED.
15	**WIND SCREEN AND MIRRORS** - TO BE CLEAN, NO SERIOUS CRACK, VISION OBSTRUCTION OR MARKS.	AS A GUIDE CRACKS OR STONE DAMAGE GREATER THAN 2.5CM IN LENGTH / DIAMETER ARE NOT ACCEPTABLE.

Waste Management Inspection Report		
Contract No.:	**Contractor:**	**Area:**
Site Supervisor:	**Date :**	
Location:	**Inspected by :**	
Compliance = 1	**Non Compliance = 0**	**Not Applicable = N/A**

General Guidelines

The information in the description section is to assist personnel during the inspection, however, personnel conducting this inspection must be thoroughly familiar with the information relating to waste management in the following Company manuals:

- **Chemical Management Manual, TSE**
- **Waste Management Manual, WMM**

If there is any doubt as to the interpretation of the requirements, consult with the appropriate HSE staff to clarify the interpretation. identified staff company industrial Hygienists, and Area Company HSE Advisor.

Any deficiencies that indicate systemic problems may exist are to be recorded on the Inspection Report Summary (refer to guidelines for additional information).

Section

A	Description	Score	Remarks
	DOMESTIC WASTE		
1	Camp solid waste including kitchen waste taken to domestic refuse yard		
2	Sewage sent to treatment plant Portable camps have lagoon 100m from camp.		
	INDUSTRIAL WASTE		
3	Wood, cardboard, metal waste		
4	Empty chemical /lubricant drums		
5	Rubber and plastics		
6	Dry batteries		
7	Lead/acid batteries with acid drained		
8	Tyres		
9	Dry paint waste		
10	Asbestos - brake pads gaskets etc.		
	TOTAL		**Total Possible- 10 - _____N/A = _____**

Section

B	Description	Score	Remarks
	OIL COMPATIBLE WASTE		
1	Waste oil/lubricants. - taken to oil saver pit		
2	Oil soaked rags. -taken to sludge farm		
3	Oily sludge from sump pits etc. - taken to sludge farm		
4	Oil contaminated soil. - taken to sludge farm		
5	Oil compatible liquid waste chemicals. - taken to oil saver pit		
6	Pigging waste / non-NORM -taken to sludge farm		
7	Other solid / liquid waste chemicals		
8	NORM waste (previously tested) - radioactive pigging waste etc. - special handling/containment		
9	Other radioactive waste		
10	Documentation-Waste cosignment note		
	TOTAL		**Total Possible- 10 - _____N/A = _____**

***NOTE: The following Non - Compliance items are to be recorded on Inspection**

Summary Report:

- Any non-compliance of items B 8 & B 9 (NORM / Radioactive Waste).
- Those in Section A & B that require longer that 24 hours to comply.
- Consistent non- compliance in Item/Activity which indicates a management system problem.

SCORING SUMMARY

A.			**Total Possible**
B.	**Section Total**		**Total Possible**
	TOTAL SCORE		**Total Score Possible:**
TOTAL SCOR EFINAL RATING: Total Score Possible X 100 = _____ %			

There is a need to develop an appropriate Safety culture to build Safety thinking into the DNA of employees. This can be done through Policies, Standards, Procedures and importantly by encouraging employee involvement in various Safety activities/initiatives.

Standards are developed by organizations for this purpose. Standard provides information to help industry and manufacturing site operational management implement procedures to control the hazards associated with manufacturing Operations to protect personnel from injury and prevent significant environmental harm, property damage, and business losses. The task of safety management implementation is complex because it crosses over many functional areas of a business's organization, including research/development (R&D), engineering, manufacturing, construction, maintenance, training, purchasing and contracts and sourcing.

An integrated, systematic approach to implementing safety elements across these business functions with due cognizance to culture of the organization is important to sustain strong safety related performance. Effective Safety management relies on the individual and collective efforts of everyone involved in managing process safety. Recognizing that employees are uniquely knowledgeable about the process and are "key managers" of process safety, it is important that industry / management provide for and encourage a broad spectrum of employee involvement in the design, implementation, and ongoing operation of the safety management programs. Some examples involving employees include the following:

- Membership on safety management committees or subcommittees
- Participation in Process Hazard Analysis (PHA) teams
- Participation in incident investigation teams
- Participation in pre-start-up reviews
- Conducting equipment tests and inspections
- Writing and/or reviewing operating and maintenance procedures
- Participation in development of training procedures and programs
- Participation in process safety audits

Within each element of Safety management, employee participation should be solicited, on an ongoing basis, regarding ideas for improving and strengthening Safety management programs and systems.

5.3 Process Hazard Analysis:

PHAs are used to identify, evaluate, and develop methods to control significant hazards associated with hazardous processes and operations. These hazards generally represent the potential for fires, explosions, and/or the release of toxic materials. PHAs use an organized, methodical study approach; seek to achieve a multi-disciplined consensus on hazard control; and document results for future use in follow-up, emergency planning, and training of personnel involved in operating and maintaining the process. PHAs include the activities of hazard identification, hazards evaluation, human factors evaluation, facility siting evaluation, inherently safer process evaluation, Quantitative Risk Analysis (wherever required) and development of recommendations.

A PHA is generally divided into six parts, as listed below. The activities should normally be performed in the order listed.

1. Planning and preparing to conduct a PHA
2. Hazards identification activities
3. Consequence analysis activities
4. Hazard evaluation activities
5. Developing and managing recommendations
    - Evaluating the risk of identified hazards
    - Qualitative risk assessment protocol
    - Quantitative risk assessment , if required
6. Documentation requirements

Planning and preparing to conduct a PHA:

The leadership must charter the PHA study team, select the team leader , provide any resources required by the team as well as the necessary training, and adjust the team leader's and members' priorities according to the aims of the study.
PHA Team leader must have adequate hands-on operating experience. The selection of the team members must be based on the skills needed for the planned studies.
The PHA study team must be multi-disciplined.

Adequate training of the PHA study Team leader and the team must be done to ensure a high quality analysis of process hazards. Training is most effective when provided shortly before the beginning of the study.

The leadership must prepare and issue a charter that defines the study team's responsibilities, tasks, and objectives. The charter should include study timing requirements, process boundaries, expectations, and any special objectives. The PHA team leader will review the

team charter with the team, so that all members clearly understand the expectations from the team. This discussion should include the boundaries of the study (i.e., the systems that are included and those that are not), the required timing for completion, special work included in the charter, whether the PHA team is responsible for communicating the results of the study to all affected parties and how this is to be done, what resources are available to the team, where to go for help, how to resolve priority conflicts, and so on. The PHA team shall develop a plan for conducting the study, including team member assignments, and set an overall timeline for completing the plan.

The leadership must maintain an up-to-date process technology package, which must be correct before the process hazards analysis review is begun.

The process technology package essentially consists of documentation on the:

- Hazards of materials
- Process design basis,
- Equipment design basis

Other documents and information that should be collected for review and use in the PHA include, but are not limited to, the following:

1. Operating procedures
2. Standard operating conditions (safe operating limits)
3. Management of change documents (since prior PHA)
4. Serious incident reports (since prior PHA)
5. Prior PHAs (within the same boundaries)
6. PHAs from similar processes, if applicable

The PHA team should review the process technology information for the process or system to be studied to be satisfied that the information is sufficiently accurate for conducting the review. The team should correct minor errors as they are found. The team should also review the quality and adequacy of the prior PHAs, noting the status of recommendations and determining whether or not all corrective actions are still in place.

Hazards Identification:

Process hazards must be identified and listed in the initial stages of the process hazards analysis. These hazards are inherent and unique to the specific chemicals and process conditions under review. They are generally hazards having the potential for explosion, fire, large toxic release, or irreversible human health effects.

Listed below are techniques that may be helpful in identifying and ranking process hazards.

1. Review of serious process incident reports for the process under review and for similar facilities
2. Review of management of change documents

3. Review of previous PHA reports for the process under review and for similar facilities
4. General hazards identification checklist
5. Chemical interaction matrix.

The PHA team must conduct a field tour of the facilities being studied to ensure the team has a clear picture of the process and the layout of the area being studied. A second purpose is for the team to look for hazards and begin to develop the list of hazards.

Consequence Analysis:

Consequence analysis consists of evaluating the direct, undesirable impact of potentially hazardous events, such as fires, explosions, and toxic releases, resulting from loss of engineering and administrative controls for the process. This evaluation includes estimating release amounts and conditions, evaluating consequences and affected areas, and determining the resulting safety and health effects. The purpose of consequence analysis is to help the PHA team understand the type, severity, and number of potential injuries, possible property damage, and significant environmental effects, at both on-site and off-site locations. Qualitative review of these hazards is acceptable, though more quantitative analysis may be useful and must be done when off-site impact is possible. A consequence analysis is normally conducted as part of every PHA, although it may also be desirable to conduct a consequence analysis for a large process as a separate review to help develop an overall understanding of possible consequences.

It is useful to conduct an initial consequence analysis in the early stages of the PHA. This helps the PHA team obtain an overall understanding of possible injuries, property damage, and significant environmental effects before evaluating the process with a detailed hazards evaluation methodology. The consequence analysis may be revisited many times during the review to study new results in these areas or to determine if additional events have been identified using the hazards evaluation methodology.

The PHA team should consider scenarios involving hazardous events, as total loss of all engineering and administration controls, that can lead to toxic releases, explosions, fires, spills, and similar hazards. Generally, a wide range of hazardous events should be considered, from small holes in pipes to larger, worst case events, to help bracket the range of possible consequences. The PHA team can then evaluate what locations could be affected by the release, the possible health effects related and the resulting type, severity, and number of injuries. Similarly, the PHA team would also consider events that could lead to larger releases, such as large holes in pipes or vessel failure, and evaluate the possible consequences.

Qualitative description of the consequences of hazardous event scenarios is acceptable, provided the consequences are well understood by the PHA team. Conservative, simplifying assumptions may be used to qualitatively estimate potential release quantities, affected areas, and possible consequences. Qualitative estimates based on past process incidents or simple calculations, for example, may be sufficient to help the PHA team understand possible consequences for many hazardous events. Many models are available to calculate the areas impacted by fires, explosions, toxic releases, etc. for events such as spills, holes in pipes, and

stack releases. Typically, these models require inputs on physical properties, release conditions, meteorology, and levels of concern for various consequence thresholds. The primary result from modeling is the area impacted by the release for the defined input conditions and levels of concern. This model result is then interpreted by the PHA team to evaluate the type, severity, and number of injuries, for example, in order to understand the consequences of the event.

This requires the PHA team to also consider how many people may be exposed to the release, how long they may be exposed, the warning properties of the material, ventilation, exits, and the effects the material may have on different people. For toxic materials, for example, it is necessary to consider the acute toxicity of the material, how it enters the body, and whether or not it affects a person's ability to evacuate. Consequence modeling can also be used to consider possible secondary effects resulting from the event, such as broken lines or damaged vessels in other parts of the facility, that can lead to additional injuries or property damage. Due to the complexity of modeling many different types of releases and the ease with which poor modeling results can be obtained with improper input, it is generally recommended that specialized resources be provided for completing consequence modeling activities.

Hazards Evaluation:

The PHA team conducts a systematic and comprehensive study of the process to:

1. Identify all of the ways that each hazardous event can occur and their consequences.
2. Identify significant existing lines of defense against these events.
3. Characterize the integrity of each significant line of defense.

In general, checklist is the basic method for most portions of a process hazards analysis. However, more structured approaches, such as the Hazard Analysis and Operability study (HAZOP) or the Failure Mode and Effect Analysis (FMEA) method should be used to study those segments, components, or unit operations in high hazard processes where failure of the automatic process control system will lead to rapid initiation or escalation of a hazardous event. Fault tree analysis is a useful tool to quantify the probability of the top event (occurring by multiple failures) identified by the other structured approaches such as What-if/check list, HAZOP, HAZOP, FMEA , FTA, and Bow-Tie Analysis may also be used in other cases, to complement or in lieu of the what if checklist method, at the discretion of the PHA team.

The what if checklist method combines two basic hazards evaluation methods: the ªwhat ifº review and the checklist review. The most important aspect of the checklist method is the order in which the two basic methods are conducted. The ªwhat ifº method should be applied first, without reference to any checklists, to help ensure the spontaneity and creativity of the questions. The checklist method should be used after the question period is completed.

Failure Mode and Effect Analysis (FMEA):

The FMEA method is a structured study of individual component failures and their effects on the whole system. The results of this study can be used to identify common mode and single component failures that lead to the same hazardous event. FMEA also helps identify lines of defense, as well as provide a method for beginning the study of probability and risk.

Hazards Analysis and Operability Study (HAZOP):

The HAZOP method is a structured study of specific deviations from system design intents and their effects on the rest of the system. The results of this study can be used to identify all the deviations from standard operating conditions that could cause specific hazardous events. HAZOP also helps identify lines of defense.

Fault Tree Analysis (FTA):

Fault tree analysis uses a logic diagram to describe all failure paths leading to a specified top event. The analyst begins with a pre-defined accident, then works backwards through the potentially multiple series of sub-events (or branches) needed to produce the top event, until each branch of the tree is driven to a small number of basic, initiating and enabling failures. Logical mathematical operators (e.g., AND, OR, etc.) are used to connect events and branches. By applying known or estimated failure probabilities to each initiating and enabling event, the probability of the top event can be quantitatively estimated. This is the key advantage of the FTA. It also provides qualitative insight as to how multiple failures can combine to lead to an accident.

Its disadvantages, however, are that:

- It is difficult to execute properly without detailed training.
- It is focused on a specific event, to the exclusion of all others.

Bow-Tie Analysis:

This is structured Hazard analysis methodology relating the hazards to the top event indicating the mechanism of the hazard being realized to result into event and the consequences through mitigation measures. It graphically conveys the relationship between major hazards, barriers (control methods) & consequences. The bow-tie diagram method is a combination of fault tree on the preventive side and the event tree on the recovery side, to utilize advantage of both the tools for comprehensive process hazard analysis. The method is very simple and it is a structured approach in which causes and hazards are linked directly to the possible outcomes. It is a good tool for management appraisal.

Final process hazards recommendations cannot be made without a full understanding of the integrity of existing, significant lines of defense. The identification activity is already incorporated in the HAZOP and FMEA methodologies. Identification of lines of defense should also be done when applying the checklist method.

An analysis of human factors includes all aspects of how humans interact with their work environment, in both routine and emergency situations. Within the context of process hazards analysis, human factors primarily concern the interactions between people and the equipment, systems, and information in their work environment. The PHA deals with the physical aspects of these interactions (human size and strength relative to the workplace and equipment design and layout), as well as the cognitive aspects (human intellectual capabilities for gathering, processing, and acting on information). The focus in the PHA is to identify and avoid situations where human error is likely, both in the process and in the maintenance of the equipment and systems associated with the process.

Such human error-likely situations may involve one or more of the following:

1. Deficient procedures or procedural violations
2. Inadequate, inoperative, or misleading instrumentation
3. Poor layout or design of controls
4. Poor task design
5. Poor communications
6. Conflicting priorities

The PHA is not the time, however, for a complete human factors analysis some of the more significant areas are listed below:

Ergonomics:

In this context, the term ergonomics does not refer to the likelihood of strain or cumulative-trauma injury. Instead, a key consideration is the accessibility of emergency controls and equipment. Physical issues (traditional ergonomics) can come into play if emergency controls require great strength, dexterity, or size to access and operate successfully.

The man-machine interface:

Another important human factors issue is the clarity of the design of panel boards and video display terminals. Are emergency controls clearly marked? Is emergency activation straightforward or complex?
Can emergency or important controls be confused with others in close proximity? Keep in mind that both familiarity (boredom) and extreme anxiety (panic) vastly increase the chance of errors being made. Design of controls should take these factors into consideration.

Distractions:

Consider what the work environment is like under routine conditions and what it might be like in an emergency. Are there many nuisance alarms or other chronic distractions? Are trivial or nuisance alarms in close proximity to critical ones, so they are likely to be ignored? In an emergency, can information overload take place? Consider the number of required tasks, the work schedule, and likely response time.

Training, skill, and performance:

The PHA team should consider the effectiveness of personnel training to deal with unusual and emergency situations. How effective is the program, and what actions are taken to remediate sub-par performance? If critical emergency procedures exist, are there drills to gauge how well they work in practice?

Developing and Managing Recommendations:

PHA teams must consider the risk of the hazardous events identified by the team. The relative degree of risk ultimately determines if recommendations need to be made.
Risk is the product of the seriousness of an event (consequence) times its likelihood of occurrence (probability). Hazardous events that have lesser consequences, but are much more likely to occur, may pose a higher risk.

To evaluate risk, the team should look at all the identified hazardous events and the impact of these events as developed in the consequence analysis. Next, the team should apply probability analysis (experiential or historical data) to determine the relative likelihood of the remaining serious events. This application can be either qualitative or quantitative, using the tools listed below.

Qualitative Risk Assessment:

The team develops a qualitative sense of the probability of occurrence for each event by applying standard hazard evaluation methodologies (e.g., ªwhat ifº/checklist, HAZOP, FMEA) through the stages of hazards identification, hazardous event definition, and analysis of lines of defense. This information, in combination with the results of the consequence analysis, permits the team to make a qualitative assessment of the risk associated with each event.
An event may be uncovered where the team is unsure if the risk is acceptable or not. An example is multiple routes to the accidental event.

A small fault tree, specific for the hazardous event in question (even a qualitative one without a formal probability analysis), may be helpful for the team to visualize the probability of occurrence as high or low.

Another approach is the use of the qualitative risk assessment protocol In this approach, a matrix is set up with one axis as a consequence ranking and the other axis as a probability ranking. The product of consequence and probability gives an overall ranking that is used to determine if a recommendation should be made.

Quantitative Risk Analysis:

In some cases, particularly very high consequence events, the PHA team may feel the need to conduct a formal quantitative risk analysis. Usually, a fault tree analysis is required to develop the necessary frequency data. The results of the analysis provide the interval between incidents (IBI) in years. For events limited to on-site consequences, the IBI can be used to generate measures of risk, such as an Individual Hazard Index (IHI), which is the number of fatal injuries per 100MM exposure hours, or a Process Hazards index (PHI), which is the number of years per fatal injury.

Typically, fault tree analysis and an quantitative risk analysis are time consuming and subject to error if not done carefully. In general, quantitative risk analysis should be reserved for only the most severe situations and when expert assistance is recommended.

After risk has been evaluated, hazards requiring additional safeguards must be addressed. Recommendations must be made to provide additional safeguards where appropriate.

Documenting Recommendations:

In documenting recommendations, the PHA team shall address or reference specific findings in the hazard evaluation i.e., HAZOP work sheet, 'what if'/checklist, etc.

For multi-part recommendations that would be done by different persons or groups, the recommendation should be broken into its parts, creating multiple recommendations that can be assigned individually. The goal is to have a single person, not a group of people, responsible for each recommendation.

Occupational Health Hazards and Effects Register:

The Hazards and Effects Register is a quality record which demonstrates that all the hazards and effects have been identified, are understood, and are being properly controlled. The purpose of the Hazards and Effects Register is to present in a clear and concise form, the results of the analysis made of each hazard or effect present in, or resulting from, Asab-0 Facility operations.

The Hazards and Effects Register will be carried forward and updated where appropriate as part of the Implementation and Roll-Out of the HSEIA.

The controlled electronic copy of this Hazards and Effects Register is provided in THESIS in Annexure 1.

The Hazards and Effects Register for Occupational Health is broken into the following sections:

- Biological Aspects
- Chemical Aspects
- Ergonomics
- Physical Aspects
- Psychological Aspects