# *Chapter 10*

# *Environmental Management Plan*

## 10.1 Administrative Aspects for EMP

### 10.1.1 Operational Philosophy

The basis of the operational philosophy of Cairn operations in India is that the activities proposed in oil and gas processing (upstream and mid stream) shall be operated in complete compliance with all applicable Laws, Regulations, Standards and Permits, the Production Sharing Contract (PSC), CEIL corporate policies, procedures, specifications, rules, standards and guidelines.

In order to achieve this, CEIL will establish a resource base for the management of health, safety, environmental and social issues during construction and operation of crude oil terminals and pipeline project. Technically qualified and experienced staff will be deployed. Detailed procedures and plans will be developed for each activity prior to operations start up. All persons on this project work will be experienced crew with valid qualifications.

The HSE Management System Process which will be developed for use as part of the implementation of the operations philosophy will be followed, together with the commitments contained within the Cairn Energy corporate Health, Safety and Environment (HSE) Policy. Cairn India is committed to being accredited with ISO 14001 standards. The System also contains adequate security measures that are designed to protect people and property. The HSE objectives for the project are

simply stated as: no accidents, no harm to people and no damage to the environment.

### 10.1.2 HSE Management during Design, Construction and Operations

During the design phase, office occupational health and safety will be monitored by a series of HSE and social audits conducted by the project team and co-coordinated by HSE Manager, together with representatives of the Detailed Design contractor.

All construction contractors will work in accordance with the requirements set out in project Contractors' Safety Requirements. This document requires contractors to implement HSE management systems that meet the requirements of international standards and to follow a risk based approach to identify and manage hazards. The Contractors' Safety Requirements would be consistent with the Cairn Gated Process (CGP) developed to guide the project team in setting out the appropriate safety programs and procedures to manage the construction hazards. The contents of this guideline should be regarded as the minimum acceptable Safety requirements for the Midstream Facilities Development project. This covers areas like:

- Appraising project safety status
- Identifying resource
- Managing project safety issues
- Measuring project safety performance
- Improving communication
- Capturing, incorporating, and sharing lessons learned

In addition to specifying the HSE requirements for the construction sites and fabrication facilities, the "Contractors' Safety Requirements" shall include the requirements to ensure the occupational health and safety of the workforce is protected, including their fitness to work and general welfare.

Following the pressurization or energisation of systems, a "Permit To Work" system will be implemented with appropriate levels of authorization required prior to work commencing.

All project personnel will receive HSE training appropriate for their needs, as identified through formal competency assessments and by their departmental heads in consultation with Project HSE Manager.

The selection of materials during both construction and operations will be based on those that are safe to use and cause the minimum environmental impact. Handling will be in accordance with the manufacturer's instructions. Proper personal protective equipment and training in the potential hazards will be provided.

### 10.1.3 Contractors HSE Plan

Reputed Pipeline Contractor(s) will be engaged for the construction of pipeline and associated facilities based on competitive bidding basis. The competency of the contractor HSE systems will be one of the main considerations for selection criteria. The Construction shall be managed by a dedicated construction team interacting with the Contractors' construction personnel and ensuring all QHSE aspects of the project. During construction phase of pipeline project, the HSE management systems developed by the construction contactor aimed at managing the environmental and social management plans will be implemented.

Each contractor shall develop procedures for waste management including handling and management of chemicals, hazardous wastes, spill control measures, used oil, emission control, waste water treatment, etc. Contractors shall comply with all applicable government regulations governing storage, disposal and transportation of wastes.

All waste streams shall be identified and appropriate waste storage and removal procedures shall be in place. Measures shall be taken to prevent the pollution of soil and ground water. Personnel shall be trained and instructed for proper handling and spill prevention. The waste shall be storage in proper containers and located at pre-defined and protected locations. Waste quantities shall be properly reordered and documented. The waste transport and disposal vendors engaged by contractor shall be reviewed and approved by CEIL.

## 10.2 Health Safety and Environment

### 10.2.1 Health

Systems, equipment and plant layout should be designed to ergonomic principles to help facilitate both operation and maintenance of the plant and equipment. Health and Safety of all personnel will be a consideration in design to ensure that the risks to those personnel are minimised. This should include a human

factor study of the design which will address issues such as exposure to noise, heat, cold, stress, lighting, control room design, control desk VDU layout, field accommodation and recreation facilities, transportation etc.

A pre-mobilisation, company approved minimum level of medical fitness including all applicable regional vaccinations will be required for all persons working in the field and along the pipeline. This will apply to all company and contract employees and will continue throughout the life of the project and into the operations phase.

Due to the remote location of the field, high quality medical facilities and staff are required and will be in place for first aid and initial life survival capabilities with an efficient response network capable of transferring sick or injured persons to medical facilities outside the field. The area near to the Mangala terminal will have an adjacent helipad for use in medical emergencies. Such medical facilities should also be provided at Viramgam and Salaya terminals. An approved exposure monitoring and health surveillance programme will be in place throughout the construction, commissioning and operations phases.

### 10.2.2 Safety

#### 10.2.2.1 Emergency Response

There will be emergency response teams shall be provided in the Mangala, Viragam and Salaya terminals. These teams will be made up from operations personnel, who can be called upon 24 hours a day, supported by an Incident Management Centre (IMC) manned by operations senior management field personnel as and when required. The Mangala, Viramgam and Salaya terminals will also have a dedicated fire and emergency team to carry out with the routine operations personnel. The fire and emergency response teams will receive specific training for their roles and exercised on a regular basis, as described in the Site Emergency Response Plan.

#### 10.2.2.2 Safety Case (COMAH)

Cairn India will adopt COMAH (Control of Major Accidents Hazards) principles for the basis of safety management and reporting. The Safety Report will be a document prepared by Cairn India and will provide information that will demonstrate that all measures necessary for the prevention and mitigation of major accidents have been taken.

Hazard management will identify hazard and consequences, assess and optimize risks and provide tools for managing each risk. There will be hazard reviews including Hazard and Environmental Identification ("HAZID" and "ENVID"), Project Safety Reviews (PSR's), Hazard and Operability ("HAZOP"), PHSER (Project Health Safety Environmental Review) and other project safety and environmental processes during the proposed project stages.

All personnel working at sites will be expected to fully conform at all times to the appropriate Cairn India requirements for PPE (Personal Protective Equipment) for the area in which they work

Safety rules will be developed and adhered to by all employees and contractors whilst involved in cairn India activities. Key areas such as Permit to Work (PTW), energy isolation and hazard identification / risk assessment shall be fundamental to the development of these rules. These rules shall also be in compliance with relevant laws, company policy and established international practices.

Different phases of the project will be monitored through the methods of raising, recording and reviewing Safety Actions, and the implementation of the resulting actions. A procedure for the management of Safety Actions will form part of the Project Management System.

Various reviews, studies and audits shall be used to ensure the technical safety of the design. These include:

- Environment Impact Assessment (EIA)
- Project Health, Safety and Environment Reviews (PHSER)
- Hazard Identification (HAZID)
- Layout Review
- Design Review
- Hazard and Operability Studies (HAZOP)
- Fire Protection Review
- Quantitative Risk Analysis (QRA)
- Safety Audits and inspections
- COMAH Documentation

### 10.2.3 Environment

The Environmental and Corporate Social Responsibility management issues of the proposed pipeline development project has been widely recognized within Cairn India as a key challenge that need to be managed appropriately and effectively to obtain and maintain the 'Social License to Operate'. The environmental control measures being put in place will be aligned with ISO 14001.

The Environmental Impact Assessment (EIA) and Risk Assessment (RA) will provide guidance on what particular areas should be monitored; these will typically include flaring, chemical consumption, emissions to air, liquid discharges and waste disposal. The waste management will be designed into the facilities to allow and encourage safe and efficient waste reduction, recycling, segregation and disposal. The operation will be designed to first minimise waste and then effectively deal with that waste which is generated.

## 10.3 Security

Cairn's Security Policy commits the Company to provide security to everybody involved with our activities, the people who come into contact with our operations and the physical and natural environments in which we work. To achieve this, Cairn seeks to provide a secure working environment and adopt appropriate international standards to protect employees and contractors, physical assets and operations against risks of injury, loss, damage or impairment from criminal, hostile or malicious acts (ref. Security Policy posted on the Cairn intranet site).

To achieve this, a strong security presence / surveillance is required along the export pipeline and all intermediate stations on the pipeline in order to manage the security concerns of the facility and infrastructure. Each of the pumping / heating / pigging stations will have security guards, supervisors and patrol crew for 24-hours a day, 365 days a year.

It is envisaged that the security personnel will be working a two-shift work schedule. In addition there will be security personnel for patrolling and working as supervisors / area in-charge.

## 10.4 Corporate Social Responsibility (CSR)

Proactive management of our interface with society and the local communities impacted by our activities is one of the key issues to be managed in the Midstream Facilities Development project.

In accordance with Cairn's Corporate Social Responsibility (CSR) Policy, a Community Development Plan / Strategy shall be prepared for implementation.

## 10.5 Environmental Organization

To facilitate the implementation of the Environmental Management systems, one of the most important aspects related to are, the organization and personnel.

CEIL has a well defined Organization for Environment Management System. Both the oil and gas operating assets in Andhra Pradesh and Gujarat are certified with ISO 14001 (2004) system and maintains the international standards in respect to safety and environment. The Director (Midstream) of the project oversees the total environmental activity on a day-to-day basis. All individual departments are accountable for the environment in and around them and individual departments take prompt action in dealing with environmental issues.

The HSE department is the nodal agency to coordinate and provide necessary services on environmental issues during construction and operation of the project. The department consists of officers from various disciplines to co-ordinate the activities concerned with the management and implementation of the environmental control measures.

Basically, this department will supervise the monitoring of environmental pollution levels viz. ambient air quality, water and effluent quality, noise level either departmentally or by appointing external agencies wherever necessary.

In case the monitored results of environmental pollution found to exceed the allowable limits, the Environmental Management Cell will suggest remedial action and get these suggestions implemented through the concerned authorities.

## 10.6 Staff Requirement for Environmental Management

The Environment Cell at the Crude Oil terminals / pipeline route should be headed by a senior executive who reports to the environment engineer at site. The Environment cell consists of environment professionals with experience in various aspects of environment management ranging from 5 years to 20 years. This cell will be set up during the construction of the terminals itself and will have adequate expertise and competency in handling and implementing the environment management systems and practices. The Environment Cell monitors and measures the environmental performance of the terminals and pipeline. There will be a

laboratory set up for monitoring of environmental parameters as per CPCB guidelines and norms. This cell is qualified and experienced chemists, environmental scientists who support the head of environmental cell at site.

Third party Environmental Audits are also coordinated by the cell on a regular basis. Members of the Environment Cell also participate in National Task Forces under CREP (Charter for Corporate Responsibility for Environmental Protection) and in commitees for reviewing National Standards for the petroleum industry. The environmental cell at Mangala, Viramgam and Salaya terminals are also supported by Corporate Environmental Group at head office.

A dedicated HSE set-up exists in the corporate level to oversee the environmental management and pollution control aspects and headed by Director (Business Services) and constitutes Deputy General Manager, Environmental manager, Environmental Safety Engineers, Health Officer, etc. This environmental group is responsible for implementation of environmental management plan at asset level, interaction with the environmental regulatory agencies, reviewing draft policy and planning, etc. This department interacts with MoEF, Central Pollution Control Board (CPCB) and other environment regulatory agencies. The department shall also interact with operational and local people to understand their problems and to formulate appropriate plans. The Organization Chart of the Environment Cell of CEIL pipeline project is presented in **Fig. 10.1**:

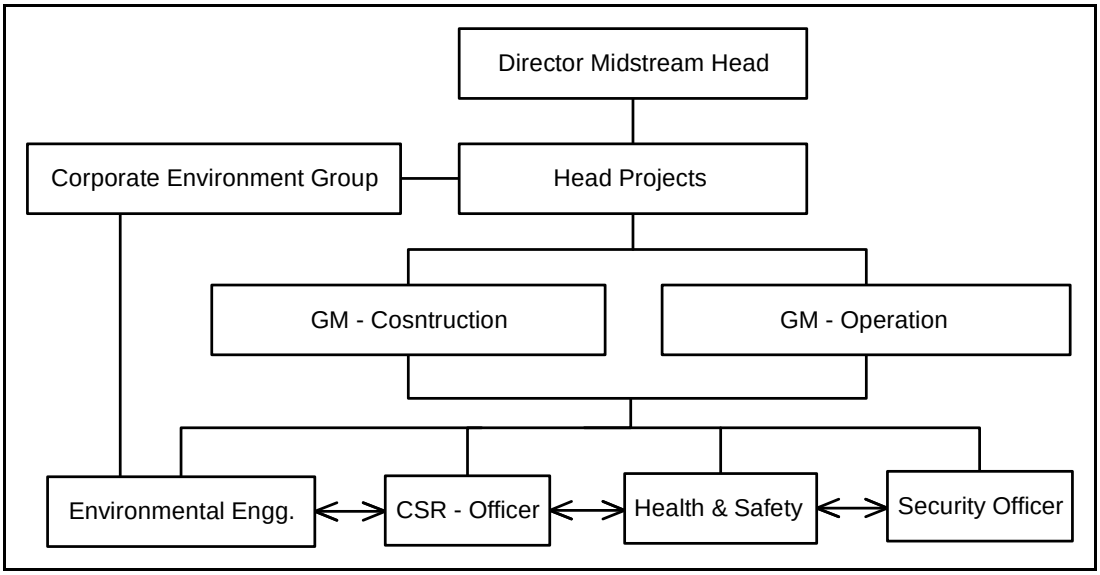


**Fig. 10.1: Organization Chart of Environmental Cell of CEIL Pipeline Project**