

## **Introducing Environmental Management (EM): Need for sustainable development EM tools**

### **ENVIRONMENTAL MANAGEMENT PLAN**

#### **1 Introduction**

The Environmental Management System (EMS) is designed to provide a process to ensure the Project's compliance with the applicable national and international laws and regulations.

This framework Environmental Management Plan ("EMP") will require further development to produce the final EMS for the construction and operation of the Plant. The primary objectives of this EMS are as follows:

To establish minimum standards for an Environmental Management System for the Project  
Provide a framework that can be customized into a site specific EMS following the conclusion of the Project development but prior to commencement of construction  
Provide an EMS framework that will facilitate ISO 14000 certification at the Project site, if necessary

ISO 14001 provide guidelines that provides organizations with guidelines to develop appropriate environmental management practices, and where appropriate seek registration with a relevant certification establishment.

The following outline is based on the general requirements of an environmental management plan for this Project consistent with the requirements under the ISO 14001 standard.

1. Environmental policy
2. Planning
  - Environmental aspects
  - Legal and other requirements
  - Objectives and targets
  - Environmental management program(s)
3. Implementation and operation
  - Structure and responsibility
  - Training, awareness and competence
  - Communication
  - Environment management system documentation
  - Document control
  - Operational control
  - Emergency preparedness and response
4. Checking and corrective action
  - Monitoring and measurement
  - Non-conformance and corrective and preventative action
  - Records
  - Environmental management system audit
5. Management review

## **Key Elements of the EMS**

The key elements of the EMS areas follows:

- Assessing environmental effects (environmental aspects)
- Compliance with laws / regulations (legal and other requirements)
- Setting environmental objectives and targets
- Environmental management program(s)
- Structure and responsibility
- Training, awareness and competence
- Document control
- Emergency preparedness
- Reporting
- Audit and management review.

The EPC Contractor will be primarily responsible for maintaining the EMS during construction whilst the Chief Operating Officer of the Project Company will have primary responsibility for maintaining the EMS during the operations phase.

### **Assessing Environmental Effects (Environmental Aspects)**

This Environmental Impact Assessment comprises the environmental assessments that has been carried out in relation to construction and operation (and future decommissioning) activities at the Project site. The assessment covers:

- Air emissions;
- Water intake and discharge;
- Waste characterization and inventory;
- Aesthetics;
- Noise;
- Consumption of chemicals, energy and other raw materials; and
- Labour and social issues.

### **Compliance with Laws/Regulations**

Approvals / permits / consents / licenses relating to the environment will be in place prior to construction and operational phases. The “permits-to-construct” and the “permits-to-operate” will be displayed at locations easily accessible to personnel operating at the Plant. The approvals / permits / licenses will include the following:

- Land use permits;
- Planning permission;
- Environmental approvals (discharge to air, discharges to water, transport of waste, etc.)
- Water intake permits; and
- Contract with special and approved for transport of hazardous material.

Securing the requisite approvals and permits will be the responsibility of the Project Company. Should any other approvals or permits be required for new activities, these will be obtained prior to the commencement of any such activities.

### **Environmental Compliance Targets and Objectives**

There are a number of specific environmental objectives that relate to the construction and operation of the plant. The primary environmental objectives are as follows:

- Design, construct and operate its facilities in a manner that protects human health and minimizes the impact of its operations on the environment
- Strive for an injury-free work force and minimize environmental impact through implementation of programs in its facilities and the surrounding communities that reduce risks to employees, neighbors, the public at large and the environment
- The Project Company and EPC Construction Contractor will encourage and promote waste minimization, the sustainable use of natural resources, recycling, energy efficiency, resource conservation and resource recovery
- The Project Company will actively participate with the state and national governmental agencies to ensure that the development and implementation of environmental policies, laws, regulations and practices serve the public interest and are based on sound scientific judgment
- All employees are expected to work in a safe manner and comply with the company's Environmental policies and procedures. The Project Company should promote a culture that encourages each employee to be environmentally responsible.

### **Environmental Management Program**

Specific environmental management programs and procedures will be in place prior to the commencement of construction and operation of the Plant. Procedures will include:

- Effluent Monitoring Procedures
- Stack Emission Monitoring Procedures
- Solid Waste Management Program (disposal and reuse procedures)
- Emergency Response Procedures
- Environmental and Security Management.

Detailed provisions will be issued with the EPC Contractor (for the construction phase) prior to the start of construction. Detailed provisions for the operation phase will be issued by the Project Company prior to the completion of commissioning/operation start.

The programs should be reviewed according to the frequency specified in the document control system, or on an as-required basis following any incident, or non-compliance.

The solid waste management program is a key component of the environmental management program and it is presented in the following section as an example of an environmental management program.

### **Hazardous Waste Management**

Hazardous waste materials, such as catalysts, will be handed back to the suppliers for specialist disposal. All hazardous waste shipped from site will be subject to a waste manifest to track generation, transportation through licensed and approved contractors.

### **Non-Hazardous Waste Management**

Non-hazardous industrial solid waste shall be stored in collection containers located within the plant site and will be appropriately identified with markings. These waste materials will be frequently removed in accordance with an agreed schedule by an approved and licensed contractor. A waste handling program should exist for all non-hazardous waste streams in order to avoid waste accumulation.

### **Occupational Health and Safety & Community Health and Safety**

The Project Company will implement all reasonable precautions to protect the health and safety of its workers. Although this will primarily apply during the operations phase, the Project Company will also ensure that all contractors and sub-contractors employed at the Project site during the construction phase will put in place occupational health and safety policies to protect their workers.

The Project has been designed and located to be isolated from the community so the provisions usually required for plants located close to communities would be limited for this Project.

The emphasis should be placed on instituting preventive and protective measures in the following order of priority:

1. Eliminating the hazard such as using less hazardous chemicals wherever possible
2. Controlling the hazard primarily through the use of engineering control measures
3. Minimizing the hazard through the design and use of safe work systems such as training safe work procedures, lock-out and tag-out
4. Providing appropriate personal protective equipment ("PPE").

The environmental movement aspired in sixties after people started to understand relation between inclement environment and un-sustainability. Earth day in 1970's was another milestone that charged awareness of people. Until year 2000 approximately 500 million people from 167 countries participated in the said event. Outcries to save environment echoed demands for open and transparent communication between industry and government. With the growing concern for restoring the environmental health, urge for the restoration of environment was felt through out globe. It was realized that it was humans who degraded environment and who were solely responsible for deterioration of ecological balance. Consequently, these were human beings who were ought to shoulder the responsibility to broach a restorative or compensatory environmental regime for themselves and for their generations to come. Restoring normalcy to an ecosystem requires understanding, awareness and acknowledgement of human role in the deterioration of environment at very first step. Identification of the humans as the sole proprietor of un-sustainability must be maintained upfront. Appropriation of any ecosystem requires us (human beings) to understand the degree of misappropriation that has been inflicted on a system. How, where, what and when we or our actions are playing havoc with our ecosystem needs a clear understanding of the system dynamics. But unfortunately, it is largely invisible or simply not comprehended enough by us that how exercise of liberty (choice) was truncating the freedom of others. The industrial developmental history is replete with such examples where poor understanding of ecosystem and sustainability led the developers to take erroneous decision and execute misconceived

policies. For example, to substantiate industrial process and to overcome dearth of resources, reliance on technology and execution of practices like substitution has invited new generation of environmental problems that is today known as sustainability. There is an increasing consensus among scientists of various fields that society is currently on a long-term unsustainable course. The environment and businesses are getting intrinsically connected to each other, where the future of each one depends on attitude of other. What confronts us at very first step is consensus regarding definition of sustainability and meaning of sustainable development. Sustainable development is a contested term, confusion surrounds meaning of sustainability, this confusion confounds issues like what should be preserved, striking a good balance between the highly concentrated or too diluted definition of sustainability is another challenging issue. Naturally, the poor understanding of sustainability is bound to appear, extend and replicate in our methods and processes that we all drearily employ to afford sustainability. In our research we would try to analyze one of such tools which is mistakenly believed to incorporate sustainability i.e., Environmental Management Systems. We would try to purge this tool of purported misconceptions and would groom it enough to stand for sustainability. To understand 'sustainability, there have been a number of definitions developed by different academic and business intelligentsia. For example, a variation of Brundland's definition, The International institute for Sustainability in 1992, gave a consensual business definition of sustainability as, —Adopting business strategy and activities that meet the needs of the enterprise and It's stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future. This gives a good philosophical ground to stand on but does not guide what strategies should be there, what mechanism should be followed, how things should be sustained etc. Nature and extent of our understanding regarding environmental and social issues is problematic. Until range of social understandings and perceptions are clarified, environmental policy-making is bound to work conceptually in a vacuum. With our inability to comprehend the intricacy and inclusiveness of sustainable development that includes socioeconomic and environmental development it would be impossible to steer organization on path of sustainability. To start with sustainability, leaders, who should be undeniably important, are found to share crude definition of sustainability. Executives that we have in our organizations today don't fully appreciate what sustainability could mean to business success and to society at large. Mostly sustainability is perceived as reporting or merely an intolerable hobby of the chief executive officers in companies. This impression results in less regard for the sustainable environmental agenda at first and consequent disregard for sustainability

afterwards. It is virtually true for all organizations that production departments have overriding powers over environmental departments. This imbalance of power naturally creates hurdle to foster holistic thinking in organization. Environmental considerations are considered to be accompanied only by costs or as counterproductive to economic growth. Similarly, performance of chief executives is mirrored only through the economic performance--the lack of which is most likely to meet a severe blow to his career. To begin with, one must understand that every organization through its management system and its activities is closely connected to society and the ecosphere. Sustainability requires each organization to take responsibility of its activities and ensure that neither of its activities trespass the eco-static balance or wreak havoc with the social activities of the human beings

Very often organizations stay oblivious of their socio-ecological impacts and consequent unsustainability. Sustainability is more than managing environment which forms only one part of sustainability. So, understanding sustainability paraphernalia must form the first step towards sustainable product development. It must be understood that sustainable development coalesces three important areas—environmental, social and economics—into one integrated perspective, where environment is one part not whole of sustainability. As mentioned earlier that environmental management among others global issues is receiving clarion call for change so to respond to growing environmental concerns a number of management tools and methods are emerging. Each of the management tool aims to hunt down the environmental issue in an increasingly distinctive administrative manner. Much to exasperation of environmental managers the constantly increasing number of environmental management tools work in isolation of each other, who can't know by any means that which tool should be used and which should not be. In addition, dearth of a platform where results yielded by different tools could be meaningfully merged is leaving decision makers more confused and more undecided. Today, exceeding amount of industrial resources is allocated to environmental management. To address environmental issue a number of tools emerged during last one decade. Among these tools for environmental management, environmental management systems (EMS) emerged as befitting response to the global sustainability problems. Owing to the growing popularity of these tools there has been strong need to check that how successful or how poor these tools are in delivery in the services for which they are intended for. Hereby, we maintain at first that, EMS implies environmental management system—not sustainability. Sustainability has further socioeconomic dimensions that are not included in environmental management but must be incorporated, in order to reach

sustainability. Environmental management focuses on effective functioning of system whereas sustainability requires far greater emphasis on impacts and indirect effects. These tools (EMSs) while making policies, segregate socio-ecological sustainability from that of environment. Decoupling of social sustainability from environment results in increased burden on organizations i.e., instead of tackling indirect impacts and incorporating social responsibility under one umbrella EMS systems justify the need for running a parallel management system—corporate social responsibility. Worth to be mentioned here is the fact that environmental policies enunciated by these systems are not aiming at sustainability but driven by coercion, statutory requirements or may aim at public relation. Among the big misconception related to tools, it has been found on part of many experts that they mistakenly expect EMS systems to prescribe worldwide environmental performance criteria, set goals for pollution prevention or suggest technology for desirable environmental outcomes. While in actuality they (EMSs) lay out system for management of numerous environmental obligations, without describing what goals an organization must achieve. Environmental management systems don't always supply an impact assessment criterion that does not necessarily form the EMSs. Without an assessment criterion the new developmental activities are not scrutinized by any guiding principles that render EMSs ineffective for the management of the environmental management. With regard to understanding sustainability the conventional form of EMS does not afford the much-anticipated opportunity to foster a shared vision for sustainability—through stakeholder engagement. Policies enunciated by these EMSs are configured to resolve environmental issues contingent upon their occurrence—downstream. Owing to the lack of definition and no vision for sustainability no effort is made to check problems and resolve issues upfront. Instead, the actions are more configured to resolve issue on ad-hoc basis. Similarly, most of the environmental management plans remain devoid of strategic approach, lack flexibility, and are built on the assumption that tomorrow is known that results in loss of flexibility in aftermath of the new needs. Environment management systems are neither strategic nor sustainable. Though they allow for administration along a systematic route towards a robust definition of sustainability for the organization, they don't in themselves provide guidelines for how to arrive at such. This risk leading to that these administration tools try to address the problem as they occur through continuous —improvement in relation to what was done before, but without any idea as regards where the company is heading. In spite of all, EMS can be used as a catalyst for change and could enable organization to embed environmental values in organization. Tools are formatted to point out the need to be strategic and systematic. The whole concert of

different activities that are performed under the EMSs system can be integrated with those of strategic framework for sustainability principles that can move an organization towards sustainability. Provided the administrative framework of EMSs could be laced with principles of sustainability, the tool can be used to facilitate sustainable development. Provided environmental management system is given comprehensive definition of sustainability the tools can be turned to strategic tools that can lead an organization towards sustainability. In the anticipation of gaps found in the environmental management system, this lecture explores opportunities that in what ways sustainability can be integrated in the contemporary EMSs. How and where definition of sustainability should be embedded in the corporate agenda, how definition of sustainability should coalesce socio-ecological and environmental agenda under one head that should lead organization towards integrating sustainability.

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