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Importance of Environmental Management Systems in Ensuring Continual Environmental Protection in Offshore Upstream Oil and Gas Industry

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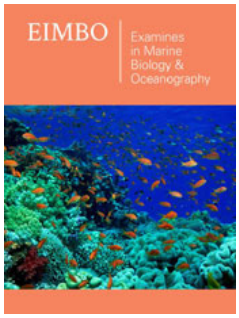

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Abstract

The present work highlights the importance and benefits of establishing and implementing Environmental Management Systems (EMS) in offshore upstream oil and gas industry. It focuses on the priorities in pollution prevention and summarizes the pollution prevention model together with its associated selection process. It also delineates the environmental management system main elements and steps in view of ISO 14001 and how they can be used to achieve continual environmental protection in offshore upstream oil and gas industry.

Keywords: Environmental management system; Offshore oil and gas industry; ISO 14001; Upstream oil and gas industry

Introduction

The future health and well-being of the environment depends on what people do today. Unless people make drastic changes to the way they live, environment on which they depend will continue to deteriorate. Industry has long been considered the primary target of efforts to slow environmental degradation. For this reason, companies are voluntarily encouraged to have ISO 14001 to establish and maintain Environmental Management Systems (EMS). EMS standards, guidelines and operating procedures have been developed by organizations such as ISO, European Union and petroleum industry associations. The ISO, being an amalgamation of "standard bodies" from about 140 countries, has wider acceptability and it is well respected. For example, the international association of Oil and Gas Procedures (OGP), firmly supports the internationalization of standards, promotes the publication, development and use of ISO standards without modification [1]. Hence, ISO 14001 EMS is a widely recognized standard for environmental management in the petroleum and gas industry. The best practices that may ensure environmental protection in terms of environmental management procedures and practices are:

A. Environmental Impact Assessment (EIA)/Socioeconomic Impact Assessment (SIA)/ Health, Safety, and Environmental Impact Assessment (HSEIA).

B. Environmental Management Systems (EMS).

C. Environmental Performance Evaluation (EPE).

D. Environmental Monitoring and Auditing, and

E. Environmental reporting [2]. EMS aims at achieving sustainable development which meets the needs of present without compromising ability of future generations to meet their own needs. Companies focuses on environmental management to:

   a) Comply with the applicable legislation.

   b) Avoid stakeholder pressure.

   c) Keep on image and reputation.

   d) Raise competitiveness.

   e) Achieve financial benefits.

ISO 14001 is the part of the overall company management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving and maintaining the environmental policy, the main aims of a company EMS can be summarized as:

A. Identification and control of aspects, impacts, and risks.

B. Establishing and achieving an environmental policy, objectives, and targets including compliance with legislations.

C. Identifying environmental opportunities.

D. Monitoring and continual improvement of environmental performance [3]. Company environmental performance can be defined as the measurable results of the EMS, related to its control of its environmental aspects, based on its environmental policy, objectives and targets. The company environmental performance continual improvement is the process of enhancing the EMS to achieve improvements in overall environmental performance in line with the company environmental policy [3].

Objectives

The present work main objective is to evaluate EMS as a potential means of ensuring continual environmental protection from offshore upstream oil and gas industry. It also demonstrates the EMS main elements and steps in view of ISO 14001 and how EMS when adequately implemented, it should help reduce negative environmental impacts and help in achieving sustainable development in the offshore oil and gas highly important economic sector.

Methodology

This work is prepared using descriptive approach in addition to the authors knowledge and experience in the area of marine pollution and its control.

Results and Discussion

Elements of ISO 14001 according to Deming are:

Plan

Environmental policy, environmental aspects, legal requirements, objectives and targets, and environmental management program.

Do

Structure and responsibilities, training, communication, environmental management documentation, document control, operational control, and emergency preparedness.

Check/correct

Monitoring measurement, non-conformance/corrective/preventive actions.

Records and EMS audits, management review

The main components of the ISO 14001 Environmental management system are [3]:

A. Policy.

B. Planning.

C. Implementation and operation.

D. Checking and corrective actions, and

E. Management review.

Environmental policy has to be defined by top management: Appropriate for the nature, scale, impacts of the activities, products, and services. It also has to reflect commitment for continual improvement and prevention of pollution, express commitment to comply with environmental legislation, regulations, and other requirements, highlight a framework for objectives and targets. It must be documented, implemented, maintained, communicated to all employees, suppliers and contractors in addition to its availability to the public. Planning includes preparation of:

A. Initial review reflecting environmental aspects and impacts together with legal and other associated issues.

B. Environmental policy.

C. Objectives and targets, and

D. Environmental management.

Implementation and operation implies on structure and responsibility, training, awareness and competence, communication, internal and external, document control, operational control for procedures, criteria, suppliers and contractors, and-emergency preparedness and response. Checking and corrective actions includes:

A. Monitoring and measurement.

B. Non-conformance and corrective actions, records, and EMS audit. Management review aims at checking suitability, adequacy and effectiveness of the EMS in view of the documentation findings and considering changes in environmental policy, objectives and targets in the light of changing circumstances and in view of performance continual improvement.

The company functions which may be affected by the development and implementation of the EMS are:

A. Research and development.

B. Manufacturing.

C. Finance.

D. Planning and development.

E. Marketing, and management and distribution (retail and wholesale). Continual improvement in the company environmental

performance can be ensured through the adequate implementation of the Deming model (Plan-Do-Check-Improve).

EMS preparation steps in view of ISO 14001 are: initial environmental review, environmental policy, environmental action plan, environmental responsibilities, environmental procedures, training, environmental auditing and management, and internal and external communication. The initial environmental review should cover laws, standards, and regulations, potential environmental issues and concerns, facility and operations description, management and operational practices, and previous environmental accidents, incidents and penalties.

The initial environmental review gives baseline for environmental management, current and future regulatory requirements, prioritization of areas of significant risk, advance identification of potential problems, and base for effective on-going appraisal of environmental performance. Environmental policy is a statement by the company of its intentions and principles in relation to its overall environmental performance. Environmental action plan is a process of narrowing down from broad, long-term goals through objectives and targets to a plan of action [3]. The plan of action meets environmental performance goals containing clear, measurable objectives and targets based on the environmental policy, identified priorities, and environmental aspects of operations.

The company can use the EMS as a dynamic tool to achieve continual environmental performance improvement through: providing resources needed, carrying out procedures and work tasks, initiating actions to prevent non-compliance with legal or policy requirements, recommending solutions to problems and verify implementation, control activities until required changes are carried out, and act in emergencies. An effective EMS must clearly define who does what in terms or structure, responsibilities, role and position of the environment, and management function.

Environmental training is needed to:

A. Get the environmental message across the company, and

B. Reinforce documentary and other communication initiatives of the environmental program. Types of environmental training include awareness of environmental issues, company environmental policy and program, environmental skills enhancement, environmental compliance and environmental management.

EMS environmental audit definition is a systematic documented verification process of objectively obtaining and evaluating evidence to determine whether an organization EMS, conforms with EMS audit criteria, and communicating the results of this process to the client [4]. The audit report usually includes executive summary, general information, audit findings, audit conclusion, and recommendations [4]. Problems that may hamper the implementation of an effective EMS can be summarized as follows:

A. Incomplete identification of areas of potential environmental impact.

B. Poor or ineffective consultation on draft procedures.

C. Insufficient consideration of human factor.

D. Instructions are poorly written or implemented.

E. Insufficient or ineffective training.

F. Out of date with organizational and operational changes.

G. No monitoring or review.

H. Ineffective incorporation of legal requirements, and

I. Continuous improvement not included. Effective procedures are conversions of policy into a series of Coordinated activities and tasks which set out what people need to do, assist in identifying competencies which individuals require, and form the basis for measuring performance of the individual, group, and the company. The steps of setting and maintaining procedures are hazard identification, risk assessment, identifying risk control, preparing and implementing control and ongoing audits.

Coastal and marine environment protection aims at reducing harm to sea water, air, sediments and living organisms. The priorities and hierarchy to achieve pollution prevention in offshore areas start with:

A. Prevent pollutants and wastes discharge followed by

B. Eliminate and reduce waste generation.

Recycle, reuse and recover and finally treatment and waste disposal [5,6]. The conceptual design of the pollution prevention model starts with the materials procurement followed by materials utilization associated with the production and reuse and recycle practices followed by waste accumulation and on-site and off-site waste management and disposal [7].

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