

# Background Document

## Environmental Practices in Offshore Oil and Gas Activities

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2<sup>nd</sup> International Expert Meeting

**Stavanger, Norway**  
**29-30 June 2000**



INTERNATIONAL EXPERT MEETING  
environmental practices in  
offshore oil & gas activities



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## General introduction

Norway, in close co-operation with the United Nations Environment Programme (UNEP), the Netherlands, the International Association of Oil and Gas Producers (OGP, formerly E&P Forum) and World Wide Fund for Nature (WWF), have agreed to organise a 2<sup>nd</sup> International Expert Meeting on Environmental Practices in Offshore Oil and Gas Activities in Stavanger, Norway, on 29 – 30 June 2000. This will be a follow-up to the 1<sup>st</sup> Expert Meeting held in Noordwijk, the Netherlands, in 1997 (see Appendix II for the conclusions of that meeting).

The 2<sup>nd</sup> Expert Meeting has been scheduled to immediately follow the 5<sup>th</sup> International Conference on Health, Safety and Environment (HSE) in offshore oil and gas activities, organised by the Society of Petroleum Engineers (SPE). This conference will be held in Stavanger, Norway, 26 – 28 June 2000 and will be attended by 1400 experts from around the world. This will enable the 2<sup>nd</sup> Expert Meeting to draw upon the conclusions and outcome of the SPE conference.

## Background

The need for an exchange of information on environmental aspects of offshore oil and gas activities at the national and regional level has been emphasised at many international meetings over the last few years. The 1<sup>st</sup> International Expert meeting on Environmental Practices in Offshore Oil and Gas Activities was organised by Brazil and the Netherlands and held in Noordwijk, the Netherlands in November 1997.

The Second London Oceans Workshop in December 1998 highlighted the need for new initiatives to follow-up on the success of the Noordwijk meeting. It also emphasised the need for these to focus on guidelines for satisfactory environmental management systems and on the regional environmental goals that such systems should aim to achieve.

The United Nations Commission on Sustainable Development (CSD), at its 7<sup>th</sup> session held in 1999 (Decision 7/1 on Oceans and Seas), recommended that:

- The environmental aspects of offshore oil and gas operations need to continue to be addressed at the national, sub-regional and regional levels;
- In support of such action, there is a need for the exchange of information related to the development and application of satisfactory environmental management systems aimed at achieving national, sub-regional and regional environmental goals;
- In order to promote this exchange of information, to raise awareness and to provide early warning of off-shore oil and gas activities and projects posing potential threats to the marine environment, further initiatives should be undertaken, involving governments, international organisations, operators and major groups (stakeholders).

At its 9<sup>th</sup> session in April 2001, the Commission on Sustainable Development will focus its discussion on issues crucial to achieving sustainable energy development (e.g., production, distribution and use of energy), including offshore oil and gas activities. The 2<sup>nd</sup> Expert Meeting in Stavanger will provide useful input for this session.

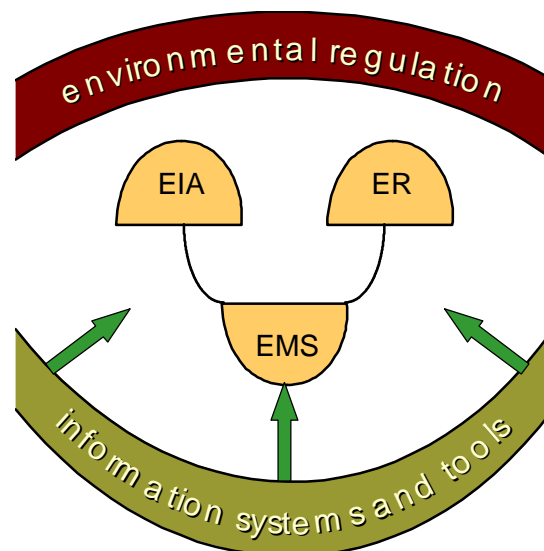
## Purpose

The purpose of the 2<sup>nd</sup> Expert Meeting is to:

- Encourage improvements in environmental practices in offshore oil and gas activities around the world, particularly in developing regions;
- Contribute to the development of a communication system to promote and facilitate the sharing of information and exchange of knowledge ;
- Provide input to the 9<sup>th</sup> session of the Commission on Sustainable Development to be held in New York in April 2001.

## Scope

The 2<sup>nd</sup> Expert meeting will address several of the topics discussed during the 1<sup>st</sup> Expert Meeting, based on new developments. However, since the 2<sup>nd</sup> Expert Meeting will draw upon presentations and discussions of the SPE conference, its scope will be narrowed to include only the issues of highest priority related to the relationship between governments, industry and other stakeholders on the management of oil and gas activities and their possible impacts on the environment (see Figure 1).



*Figure 1 Schematic representation of the tools to be used in environmental care management supporting an industrial self-regulatory approach in environmental care in perspective of the governmental environmental regulation*

(EIA: Environmental Impact Assessment; ER: Environmental Reporting;  
EMS: Environmental Management Systems)

The focus of the meeting will be on recent developments in environmental management of offshore oil and gas operations as related to governmental environmental regulation of this sector. The main topics at the 2<sup>nd</sup> Expert Meeting will, therefore, be:

- **Environmental management systems:** EMS are being developed in order to facilitate the self-regulatory approach of the industry, which has assumed responsibility for achieving agreed environmental goals. EMS assists companies in meeting their environmental goals by incorporating them into the overall business management strategy.

1. Environmental Management Systems

- **Environmental impact assessments:** EIA forms an important basis for decisions on major developments. It is a tool to communicate information on environmental care during the planning of activities and the evaluation of operational procedures. At the Expert Meeting emphasis will be placed on the socio-economic context of impact assessment.
- **Environmental reporting:** This is another tool used to communicate information on environmental care during the planning of activities and the evaluation of operational procedures. At the Expert Meeting emphasis will be placed on key performance indicators in environmental reporting.
- **Information systems and tools:** There is the need to improve the environmental management of world-wide operations within the offshore industry, by improving the exchange of information and experiences via information systems and tools. Special attention will be given to "The Offshore Oil & Gas Environment Forum" web-site ([www.natural-resources.org/offshore](http://www.natural-resources.org/offshore)), which was established in a co-operative effort between the UNEP Division for Technology, Industry and Economics (UNEP TIE), the Netherlands, Norway, OGP and WWF.

The 4 topics mentioned above will be discussed in 4 separate working group sessions. In addition to introductory presentations on these subjects, there will be a presentation on regional co-operation prior to discussions in working groups.

The 2<sup>nd</sup> Expert Meeting will not re-address the actual state of the art in environmental technologies regarding emissions and chemical/waste management. This is due to the fact that these topics were discussed during the 1<sup>st</sup> Expert Meeting and that these topics will be addressed at the HSE Conference. An updated review of the best available technologies, including air emissions, may, however, be included in future Expert Meetings. A comparison of the topics addressed in the 1<sup>st</sup> meeting and those to be addressed in the second is given in Figure 2.

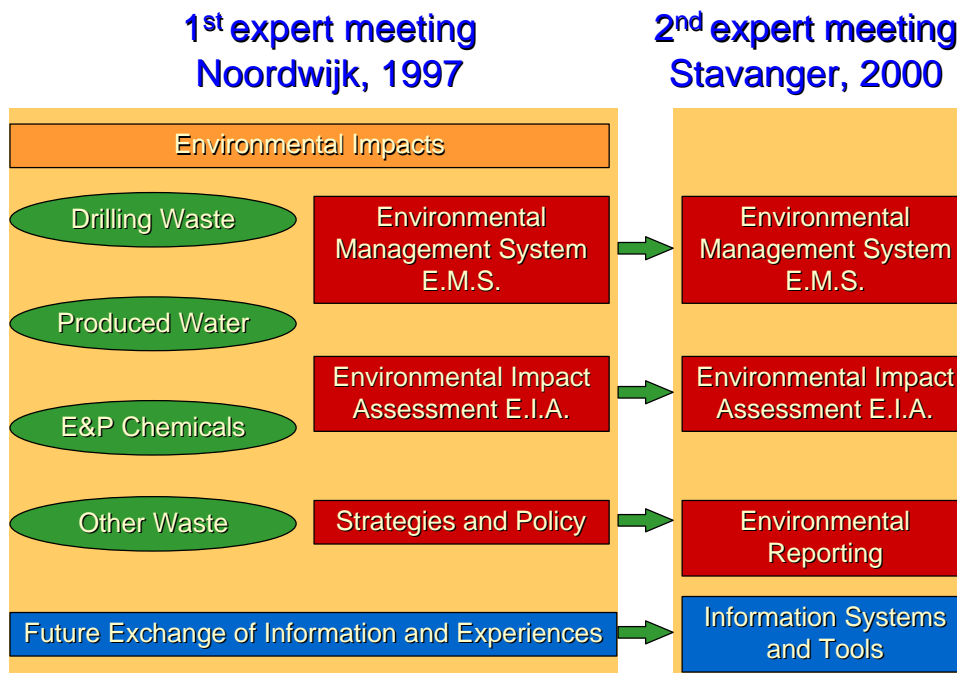


Figure 2 Schematic comparison of the general scope of the 2<sup>nd</sup> Expert Meeting and the 1<sup>st</sup> Expert Meeting.

## Structure and status of this Background Document

Each chapter addresses one working session of the Expert Meeting and includes

- The **Scope** of the working session, as defined by the Steering Committee;
- **Background Information** compiled from various sources;
- A **Working Session Outline**, which includes information on the introductory presentations and the topics for discussion.

This Background Document is intended to assist participants in preparing for the Expert Meeting. All participants are requested to review the information presented in this background document prior to the meeting. Following the meeting, a Meeting Report will be produced (the report of the Expert Meeting) based on this background document, comments and working session discussions.

The Meeting Report will also include the chairmen's reports from the working sessions, which will provide a summary of the working sessions discussions and the conclusions (i.e., comments on the questions raised in the topics for discussion). Finally, the overall conclusion of the Expert Meeting, drafted by the Norwegian chair, will be included in the Meeting Report.

Appendix II serves only as preparatory information for the 2<sup>nd</sup> Expert Meeting, and will not be included in the Meeting Report.

## 1. Environmental Management Systems

### Scope

In many areas, regulatory regimes have been supplemented by voluntary initiatives and codes to improve the industrial practices that need to be regulated. This has led to a growing interest in Environmental Management Systems (EMS). EMS provides a framework for systematic and company-wide implementation and awareness of environmental policies. EMS also contributes to communication between stakeholders through environmental reporting and performance indicators. Generic systems (ISO, EMAS) have been applied within the E&P sector. The ISO 14001 standard has now been introduced in many areas. The status of this introduction will be presented and discussed in addition to the status of other standards, positive experiences with EMS and opportunities for improvement.

### Background information

Like other major industries, the offshore oil and gas industry is faced with a range of environmental issues at both local and global levels, such as marine habitat and biodiversity protection air emissions and marine discharges.

Primary sources of *atmospheric* emissions from oil and gas operations arise from:

- flaring, venting and purging gases;
- combustion processes such as diesel engines and gas turbines;
- fugitive gases from loading operations and tankage and losses from process equipment;
- airborne particulates from soil disturbance during construction and from vehicle traffic; and particulates from other burning sources, such as well testing.

The principal emission gases include carbon dioxide, carbon monoxide, methane, volatile organic carbons and nitrogen oxides.

Primary sources of *aquatic* discharges from oil and gas operations arise from:

- produced water;
- drilling fluids, cuttings and well treatment chemicals;
- displacement water, wash and drainage water;
- sewerage, sanitary and domestic wastes;
- spills and leakage; and
- cooling water.

Components of these waste streams of particular environmental concern include components from the reservoir like hydrocarbons (aliphatic and aromatic), chemicals, heavy metals and radioactive materials (NORMS), and chemical additives.

Traditionally, government authorities have regulated E&P activities through prescriptive measures. While the 'Command and Control' approach is still widely used, this is gradually being complemented by performance based approaches. Examples include goal setting, negotiated agreements and economic measures to achieve better results at lower costs for both authorities and companies than those of prescriptive measures

alone. Historically, the response of industry to the 'command and control' approach was limited to simply achieving compliance. The shift towards performance based measures has provided industry with the opportunity to find innovative ways of meeting the goals or targets set by government. This has increased the use of voluntary measures by industry, the so called 'co-regulatory' approach. Several proactive relationships with regulators have been established to solve common problems, to develop voluntary guidelines and codes to educate members, to encourage and fund research programmes to improve daily operations and to incorporate performance measures into their reporting. A list of voluntary environmental reporting guidelines and initiatives was published in the Oil Sector Report (SustainAbility/UNEP, 1999). For measures to be taken, the costs and benefits of alternative measures must be compared. In the cost/benefit analysis the following should be considered: environmental impact, the costs of investments and legal and other regulatory considerations. The pro's and con's of measures can be evaluated through multi-criteria analysis. Methods for the environmental weighting of factors can be derived from various sources. There is at the moment no one single globally accepted system for weighting factors.

Audits and verifications require a standard as a reference. Several standards exist (see Section 'Implementation'). Specific targets for environmental performance are not incorporated into these standards. These targets are generally derived from permits, regulations and corporate long and short term policy. Continual improvement actions, therefore, will also be derived from these goals and targets.

In this context, attention has been given to environmental protection systems *within* companies, principally through the development of Environmental Management Systems (EMS) and through the development of integrated health, safety and environment management systems (HSE-MS). EMS has been implemented within many companies and interest in its use is still growing. As EMS becomes increasingly utilised, many issues are being raised in an attempt to optimise its use and benefits. These issues need to be addressed by all parties involved.

The evolution of the EMS concept has been rapid and has its origins in the Quality System principles of ISO 9000-standard series. The concept was given a boost by the report from the Cullen Inquiry into the 1988 Piper Alpha disaster, published in 1990, which recommended the application of the Safety Management System (SMS) concept. Since then, EMS, SMS and, increasingly, integrated HSE-MS have been promoted by a number of industrial organisations and trade associations. Most of the major oil and gas companies have started to adopt detailed EMS and/or HSE-MS in addition to internal environmental operating guidelines. An important driving force for the implementation of an EMS is the recognition that good environmental practices and economic progress go hand-in-hand and all environmental risk should be controlled.

## Purpose

An EMS is a voluntary, self-regulatory instrument used by companies in order to ensure that their environmental objectives are reached by integrating them into the overall management system. This integration ensures that environmental concerns are taken into account when business decisions are made. An EMS also provides a structured framework for the continual improvement of environmental performance, the rate and extent of which is determined by the company in light of economic, regulatory and other

considerations. In this way, an EMS can lead to a practical and feasible environmental protection strategy.

An EMS not only sets out procedural rules for internal use by the company concerned; it also contributes to communication with stakeholders through environmental reporting and performance indicators. More specifically, EMS is used by industry to shape their environmental management policies and monitor the results, while allowing government and other stakeholders (including employees, shareholders, financial institutions, business partners, customers, regulators, environmental groups and the general public) to evaluate and/or control the environmental performance of companies.

EMS requirements are often more applied by companies and their suppliers and partners than by governments. EMS is an important factor in corporate relationships and marketing within the industry.

At the 1<sup>st</sup> Expert Meeting it was stated that the overall aim of operators in managing offshore oil and gas activities with potential environmental impacts should be threefold:

- to meet the requirements imposed by the regulatory system(s) under which they operate;
- to achieve control of all environmental risk through the application of due diligence;
- to improve continually their environmental performance.

## Elements of an EMS

The essential premise of an EMS/HSE-MS is that leadership from all levels of management and commitment of all employees is needed. This means that environmental protection is based on the involvement, motivation, competence and education of all employees within a company.

EMS is intended as an integral part of the overall Business Management System. The aim is to integrate environment into the whole management life cycle, as described by Deming (plan-do-check-act), in the same way as financial, personnel and other management aspects are integrated. In addition to integration into the overall business management systems, the critical elements needed to ensure the maximum effectiveness and benefit of such management systems are:

- effective communication internally and externally;
- implementation;
- links to contractors.

Overall, an EMS should include the objectives of the operator regarding, for example, energy savings and reduction of emissions, noise, odour, dust and physical impacts; and global issues (ozone depletion, global warming, sea level rise, ocean dumping, pollution of international waters, transport of hazardous wastes, biodiversity, etc.). An EMS should also include information on how those objectives are to be met, performance standards to be met, and plans for monitoring these. The emphasis, in other words, is on performance. The principle is that the company should maintain procedures for monitoring relevant aspects of HSE performance and for establishing and maintaining records of the results.

Sustainable development is an important issue, both within the EU (Directive Guidelines Enterprise and Environment) and globally (The International Chamber of Commerce (ICC) Business Charter for Sustainable Development). The Environmental Policy of a

company EMS should therefore be in compliance with these principles. The benchmark survey of 100 international companies showed however little evidence of reporting on progress toward sustainability or use of sustainability indicators (SustainAbility/UNEP, 1999).

## Guidelines for Designing an EMS/HSE-MS

Health, safety and environmental protection have been integrated into one management system, because of similarity in objectives and methods. There have also been a number of guidelines written to assist in the development of a EMS/HSE-MS. Two of the guidelines of direct relevance to offshore E&P operations are the Minerals Management Service (MMS)/American Petroleum Institute (API) *Safety and Environmental Management Program (SEMP)*, and the OGP *Guidelines for the Development and Application of Health, Safety and Environmental Management Systems*. These are described in detail below. The Eco Management and Audit Scheme (EMAS) is also described, since it is an important European regulation for environmental management.

The IMO's International Safety Management Code, which is applicable to vessel operations, also addresses health and safety management and environmental protection in a single management structure.

### SEMP

The MMS/API SEMF initiative resulted in the 1993 publication of API RP 75 – *Recommended Practice for Development of a Safety and Environmental Management Program for Outer Continental Shelf (OCS) Operation and Facilities*. It is important to emphasise that SEMF is not a regulatory regime. Rather it is a management programme designed to promote a mentality that recognises safety and environmental issues rather than a compliance mentality. Its intent is to assist in the development of a management programme designed to promote safety and environmental protection during oil, gas and sulphur operations on the outer continental shelf. As such, it addresses the identification and management of safety and environmental hazards in planning, design, construction, start-up, operation, inspection and maintenance of new, existing, or modified drilling and production facilities.

### OGP Guidelines

The OGP's HSE-MS (Health, Safety and Environmental-Management System) guidelines, published in 1994, deserve special attention. They represent an attempt to provide companies and contractors with a template for designing a HSE-MS management cycle (see figure below). The key elements of this model and the issues it addresses are as follows:

- **Leadership and commitment:** top-down commitment and company culture.
- **Policy and strategic objectives:** corporate intentions, principles of actions and aspirations, compliance with legislation (including goal-setting with authorities).
- **Organisation, resources and documentation:** organisation of people, resources and sound documentation.
- **Evaluation and risk management:** identification of the HSE risks associated with activities, products and services, and development of risk reduction measures. EIA (see Chapter 2) is an adequate tool for this evaluation.

1. Environmental Management Systems

- **Planning:** planning of environmental practices; changes in processes, activities, products, services; and emergency response.
- **Implementation and monitoring:** monitoring of the performance and evaluation of the effectiveness of corrective measures.
- **Auditing and reviewing:** periodic assessment of EMS performance and effectiveness by external and internal audits, including senior management review of fundamental suitability (policy and strategy) and governmental inspection.



In addition to the 1994 HSE-MS guidelines, OGP has published a review of EMS with UNEP (1997). The OGP/UNEP guidelines aim to assist companies in fully integrating environmental protection into the regulatory and business processes that control the exploration and production of oil and gas. To this end, the document provides an overview of the environmental issues and the technical and management approaches to achieving high environmental protection performance in E&P activities.

E&P activities are not limited to single operations. The supply chain, contractors and joint ventures take also part in the activities and should thus be properly selected and integrated in the company EMS. In 1999, OGP published a report entitled "Guidelines for working together in a contract environment". The overall objective of these guidelines is to improve the company and contractor HSE performance regarding exploration and production. It provides guidance to link operators and contractors within the HSE Management Systems.

## EMAS

Eco Management and Audit Scheme (EMAS) is a European Union (EU) regulation published in 1993. The purpose of EMAS is to promote continual improvement in the environmental performance of industrial activities by:

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1. Environmental Management Systems

- development and implementation of EMS;
- evaluation of environmental performance by auditing;
- provision of information to the public (environmental statement).

Participation with EMAS is voluntary for companies in the industrial sector. Member States of the EU are obliged to set up a national implementation system. Although the implementation is at a national level, the registration of EMAS is site oriented. Therefore effective communication is needed, in order to prevent conflict or opposition between national authorities and industries.

### Recent Guideline Developments

- Because of the growing importance of social issues in the strategic planning and management of oil and gas operations, the Environmental Quality Committee of the OGP is planning to produce a practitioners guide on the subject to supplement the report on principles issued in 1997.
- OGP guidelines on venting and flaring and produced water injection were published in 2000.
- In 1999 the Contracting Parties to the Convention for the Protection of the Marine Environment of the North-east Atlantic adopted the OSPAR Strategy on Environmental Goals and Management Mechanisms for Offshore Activities (OSPAR Reference number 1999-12).
- Within the EU, companies that produce or store certain amounts of dangerous substances are required to have a safety management system and to report to the authorities regarding their safety organisation (safety report). This is stated in the Seveso II Guidelines (EU Directive 96/082/EEC), which came into force in 1999. This Directive is aimed at the prevention of major accidents involving dangerous substances, and the limitation of their consequences for man and the environment, with a view to ensuring high levels of protection throughout the Community in a consistent and effective manner.

### Implementation

#### ISO 14000

EMS certification is becoming an accepted requirement in most business sectors. A growing number of European, Asian and Latin American companies and countries are taking the lead with regard to ISO 14001 certification. In the Far East, countries such as Indonesia, Japan, Korea, Malaysia, Singapore and Taiwan are implementing national EMS based on ISO 14001. Similarly, China regards the new ISO standards as an opportunity to improve the environmental performance of its companies. In Latin America, interest in EMS standards is increasing, the most active countries being Mexico, Brazil, Argentina, Chile, Colombia and Venezuela, all of which have national delegations participating in ISO's Technical Committee (TC) 207. The most important factor driving ISO 14000 in Asia and Latin America is the fact that companies are coming under increasing pressure to comply with strict international environmental standards in order to sell their goods and services abroad. A key driving force in the

Far East is a fear that the lack of EMSs may become a barrier to trade with the European market.

The 1<sup>st</sup> Expert Meeting successfully encouraged the international Standards Organisation to explore ways of assuring trust in ISO 14000 certificates. Determining whether or not an operator's EMS is acceptable is an important question for regulators. The ISO 14000 series offers a useful approach for an operator in developing an acceptable EMS, but regulators cannot, at least for the time being, regard certification as being sufficient proof that such a level of acceptability has been achieved (conclusions of the 1<sup>st</sup> Expert Meeting).

#### EMS Training Resource Kit

The EMS Training Resource Kit (UNEP/ICC/FIDIC, 1997) provides a generic approach (with examples and suggestions) to developing and implementing an EMS. It is based on the approach of standards such as British Standards 7750, EMAS, and ISO 14000-series. The Training Resource Kit can be used in the following ways:

- To introduce the concepts of environmental management systems to the user's country or region;
- To train enterprise managers in the basic concepts of environmental management systems and to enable them to introduce an environmental management system in their enterprise;
- To design and introduce an environmental management system in a particular enterprise.

### Target-setting

Besides the obligation to comply with regulations, targets within an EMS can be fairly freely chosen. Regulations do not fully describe all aspects of possible environmental impacts. The public has been critical of the fact that an EMS itself does not include fixed targets, rather these are set by later policy. The continuous improvement cycle, without some idea of timetable and targets, seems too vague to be effective in really dealing with urgent issues.

At the 1<sup>st</sup> Expert Meeting, it was stated that a regional approach is needed within a company's EMS. Therefore, a link has to be made between this regional approach and the contents of a company's EMS, in which stakeholders play an important role. Figure 3 shows the different regulatory approaches for a company EMS and the role of stakeholders.

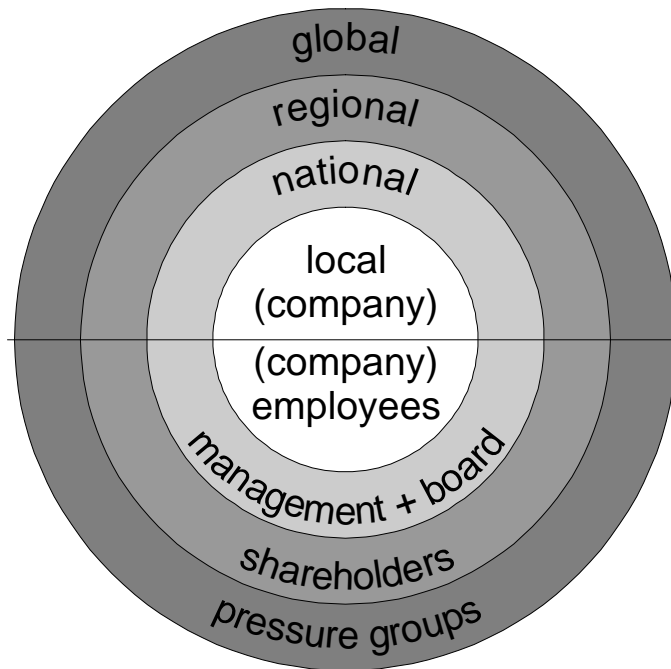


Figure 3 Authority and stakeholder involvement in a company's EMS

Since national regulations, generally, do not fully specify the environmental targets of offshore E&P activities, additional targets have to be set and implemented within the company's EMS, in order to ensure compliance with the global or regional concepts of 'sustainable development'. Two important aspects of target-setting within EMS are to implement targets in a company EMS in a structured way and to involve stakeholders in this process. It is also important to ensure that companies are not exploiting their EMS only to show compliance with regulations. All groups as shown in the figure above should be considered in a company EMS.

At the 1<sup>st</sup> Expert Meeting conclusions regarding the role of target-setting and assessing performance against targets were as follows:

*The effectiveness of EMS will depend crucially on establishing a clear set of links between policies, objectives, targets and indicators, so that the translation of the one into the other can be followed and checked. In this chain, targets for improving environmental performance over and above the minimum regulatory standards are the most important. These targets can be set in a number of ways: in terms of the ambient environment (very difficult in view of the other significant influences on the ambient environment), of environmental performance, of emissions, discharges, losses and wastes, of the effort expended, the inputs made or the activities undertaken, or of the levels of compliance achieved.*

As with the EMS itself, the setting of targets needs to involve all sections and all levels of the company, the regulators, relevant stakeholders and sectors of the general public. Again, the OGP's Guidelines could usefully provide guidance for this. Different time frames should be considered as appropriate when setting targets since, for example,

what is a sensible target for the medium term (5-10 years) is unlikely to be feasible for the short term.

To reassure the public that the offshore oil and gas industry is applying environmentally responsible practices, it is essential that there be an evaluation of the implementation of EMS - in particular, performance against targets. In the first instance, this is a task for the industry itself as part of its effort to demonstrate that it is delivering its part of the "contract". An important means for industry to demonstrate the sustainability of their activities is through environmental reporting. Within the EU, oil and gas producing companies are obligated to report on safety performance regarding man and the environment (Seveso II).

While companies are increasingly reporting on their individual environmental performances, there is a need to develop a mechanism for reporting on the collective impact of companies within a region.

Four tasks are involved in assessing performance against targets, both for individual operators and collectively for all operators active in a region:

- a) identification of the indicators that can be used for this purpose, and establishing mechanisms for consistent data collection (the existing work of the OGP in collecting data on safety indicators could be a useful model for this process); indicators could also include information on factors, such as, levels of training, response speed following environmental audit comments, and number of compliance failures where poor performance is likely to lead to unacceptable environmental performance ("leading indicators");
- b) development of regional reporting formats for companies; this should be done, as much as possible, in consultation with the existing regional seas organisations;
- c) assessment and reporting of the information collected on targets and corresponding indicators;
- d) setting targets that go beyond the minimum standard required; such targets must be set in relation to the performance measured by the indicators mentioned in point (a), thus completing the cycle.

The sequence in which these four tasks are addressed may vary from case to case. Governments and operators need to determine how the tasks are to be carried out, how responsibility for them should be divided (Task c, for example, would be appropriately done by the regulator), and how other stakeholders should be involved.

Target-setting within EMS could be part of the company's Environmental Policy. There are various inputs in development of this Policy: results of initial environmental review; values and beliefs of the organisation; business strategy and the strategic plan; any existing statements on environmental aspects of operation; other policies (H, S, Q); stakeholder views; legislation and regulations; standards; statements of environmental principles by external groups; codes to which the organisation subscribes; examples of policy statements from similar organisations (UNEP/ICC/FIDIC EMS Training Recourse Kit, 1997).

1. Environmental Management Systems

ISO 14001 requirements on Environmental Policy includes a framework for objectives and targets.

<b>Working Session Outline: <i>Environmental Management Systems</i></b>
<b>Chaired by Joakim Lystad (Norwegian Pollution Control Authority) Rapporteur: Sebastian Winkler (IUCN)</b>
<b>Keynote Presentation</b>
Jan Hartog (Shell International) <i>title</i>
<b>Introductory Presentations</b>
<ul style="list-style-type: none"><li>• Simon Cripps &amp; Samantha Smith (WWF) <i>EMS as a tool for limiting biodiversity damage by exploration and production operations.</i></li><li>• Edward J. Pinceratto (APPEA, BHP Petroleum, Australia) <i>title</i></li><li>• Leopoldo R. Henriquez (State Supervision of Mines, The Netherlands) <i>title</i></li><li>• Shelley de Souza Carneiro (National Council for Environment, Brazil) <i>title</i></li></ul>
<b>Topics for Discussions</b>
<ul style="list-style-type: none"><li>• Are there suitable guidelines available for EMS development in offshore oil and gas industry; can the joint OGP/UNEP review from 1994 still serve as a reference document in this respect? Is there a need for an update? Can generic systems (ISO, EMAS, etc.) be applied by this sector or do we need separate application guidelines (ISO 14001) for oil and gas?</li><li>• What are the experiences and expectations with regard to verification and certification of a companies' EMS? How can a company guarantee and demonstrate that its general business management system and operation procedures include a fully endorsed, functioning EMS (or integrated HSE-management system)? How can it be ensured that subcontractors and suppliers are compliant in EMS practices and implications. Is an EMS also practicable for small companies? Is the reference to continuous improvement a hindrance for establishing ambitious environmental goals and how can verification and certification thus be organised? How to establish the appropriate scope of an EMS in relation to compliance and the role of stakeholders in this process?</li></ul>

## 2. Environmental Reporting

### Scope

Reporting on environmental performance is an important means by which an industry can demonstrate the sustainability of its activities. Environmental Reporting (ER) could, therefore, play an important role in internal and external communication. Integration of Environmental Reporting into the environmental management systems is possible through ISO 14031, for example. Status and priorities in establishing global or regional environmental performance indicators will be presented and discussed.

### Background Information

In 1997, the Third International Benchmark Survey (produced by the long-standing research partnership of SustainAbility and UNEP) called *Engaging Stakeholders*, was conducted on Company Environmental Reporting (CER). The survey was restricted to companies that produce stand-alone, printed environmental reports (disclosures in annual reports or other documents were not included) and limited to 100 companies. The criteria covered five main areas of reporting: Management Policies and Systems; Input and Output Inventory; Finance; Stakeholder Relations and Partnerships; and Sustainable Development. The oil sector was in the top five main sectors in reporting practise (other sectors being the automobile; chemical; pharmaceutical; and retail sector). Highlights of the *Oil Sector Report* (SustainAbility/UNEP, 1999) are presented below.

#### Current State (SustainAbility/UNEP, 1999)

Quantitative data in current environmental reporting primarily relates to inputs and outputs, significant incidents, expenditure concerning environmental aspects, compliance, and management policies and systems. Notably absent from most reports are measures related to actual impacts, performance targets, disturbances to land, biodiversity, products, legacy impacts, or progress toward sustainability.

A summary view of how the surveyed companies are reporting on inputs and outputs is provided by the 'Results Matrix'. These results are based on a list of selected aspects representing the commonly reported areas. The selected aspects are exclusively operational performance indicators that describe a company's direct environmental footprint. At present, this category is limited to a company's use of inputs (resources used) and direct outputs into the environment (e.g., air emissions, water releases, wastes). The list of selected aspects is presented below:

2. Environmental Reporting

<b>Inputs:</b>	Total use of energy Energy efficiency Freshwater consumption Chemical use
<b>Outputs:</b>	Special releases (multi-media) Oil spills (multi-media)
<b>Air emissions:</b>	Total emissions Special releases Hydrocarbon emissions VOCs Flaring Venting Total GHG emissions CO <sub>2</sub> , CH <sub>4</sub> , SO <sub>2</sub> , NO <sub>2</sub> , NO <sub>x</sub> , CO, CFCs, Halons, Particulates
<b>Releases to water:</b>	Total releases Special releases Hydrocarbon releases Oil discharged to water Oil in muds and cuttings Oil spills, accidents BOD, COD Phenols, Particulates, Ammonia, Sulphides, Phosphorus, Nitrogen, Metals Produced water; Oil content of produced water; Chemical content of produced water
<b>Releases to land:</b>	Total Special Spills, accidents Underground injections
<b>Wastes:</b>	Total Special Other Chemical Drillings & cuttings

Suggestions for other important aspects that could be included in the list are: synthetic base oil to water; hydrogen sulphide releases; catalysts released in waste; lead emissions; toluene emissions; benzene emissions; and hydrogen fluoride.

Most E&P survey respondents report only on a small fraction of the full list. The most commonly disclosed aspects for E&P operations are shown in Table 1. The extent to which global operations are covered, is not always clear from environmental reports. To indicate the completeness of a company's reporting efforts, the survey included an estimation of the proportion of global coverage for each indicator used. The results are also presented in Table 1. Although usually less than 50% of all global operations are covered, full geographic coverage could be seen as the ultimate goal of any best practise reporter. 'Oil spills (multi-media)' is the aspect for which most respondents (75%) report data for full geographic coverage.

*Table 1 Commonly disclosed aspects of E&P Operations (SustainAbility/UNEP, 1999)*

Aspect	% of respondents disclosing data	% of respondents, estimates of geographic coverage of global operations			
		no indication	less than half	more than half	full coverage
SO <sub>2</sub> (air)	50	27	13	13	47
NO <sub>x</sub> (air)	50	33	13	13	40
CO <sub>2</sub> (air)	50	27	13	20	40
CH <sub>4</sub> (air)	47	14	14	21	50
Oil spills accidents (water)	43	15	15	31	38
VOCs (air)	40	33	17	8	42
Special waste	40	17	33	0	50
Oil spills (multi-media)	40	8	0	17	75
Total use of energy	37	9	27	18	45
Oil discharge to water	37	18	0	27	55
Total waste	37	9	27	18	45

Reporting on outputs, which tend to be regulated, greatly outweighs reporting on inputs (such as: water use; use of chemicals; energy use; and energy efficiency measures), which tend not to be. European companies tend to report inputs with greater frequency than non-European companies.

Environmental Reports are generally retrospective. Companies could improve reporting by also showing what it is doing to improve the environmental performance. This could be done, in part, through disclosure of quantitative targets for improvement, and the company's progress (or lack thereof) in meeting these targets. While a number of companies commit to long term policy objectives, such as zero incidents and zero pollution, few explicitly link current performance data to quantifiable objectives and targets. With respect to environmental sustainability, for example, one might expect oil company CERs to address the following sorts of issues:

- strategies for achieving goals of zero discharges, emissions or waste;
- plans to expand through lower impact activities;
- movement away from oil and towards natural gas;
- investment in gas-to-liquid technologies;
- plans to produce alternative fuels for the next generation of vehicles (such as those powered by fuel cells); and
- plans to divest into renewable energy options.

Companies are expected to cover their total business interests - or sphere of influence - in environmental reports. The need for clarity on the boundaries of accountability is particularly relevant in the oil industry, in which companies are often involved in numerous joint ventures and project-based consortia. Currently, many companies do not report anything from non-operated ventures, and not all include jointly operated ventures.

Companies are split over the benefits of third-party report verification, which aims to raise the level of trust readers have in voluntarily produced corporate environmental reports. Two major obstacles seriously detract from the value of current environmental

reporting in the oil and gas industry: the lack of clarity within individual reports about what the data covers, and the lack of comparability between reports.

Another important issue in Environmental Reporting is that companies often treat the CER primarily as a public relations vehicle - for reassurance and 'feel-good' image-building - whereas stakeholders are increasingly using CERs as a means of comparing and differentiating between companies on the basis of hard performance data.

### Pressures

A lot of effort is needed in order to prepare a CER. To include everything that any potential reader may want to know seems an impossible task. Understanding the expectations is important in order to decide what and how to report and to keep the whole exercise manageable. Existing and emerging pressures on companies to provide environmental reports are:

- satisfy the community's and individual's 'right-to-know' about impacts that directly affect their health, safety and local environment;
- improve actual company performance in the social and environmental arena through the process of measuring and publicly reporting on progress in these areas;
- demonstrate corporate accountability for the social and environmental impacts of their operations by publicly reporting these impacts;
- enable aggregation of emissions levels and resource use across companies, particularly post-Kyoto in the area of greenhouse gas emissions;
- add to shareholder value through the demonstration of a superior ability to manage environmental and social impacts and to communicate this competitive edge to financial analysts;
- report contributions towards sustainability by measuring and reporting 'triple bottom line' impacts and value added.

The basic principle underlying the 'right-to-know' (RTK) movement is that people deserve access to information about company actions that directly affect their welfare. Traditionally, the focus has been on environmental health issues - but the RTK concept is expanding to encompass a company's social and economic effects as well, such as employment or land-use decisions. Most of the survey companies undertake some form of systematic social disclosure, but approaches vary widely in both form and content. With limited agreement as to the nature of social indicators or how to measure social performance, there is a pressing need for greater convergence and coherence in the area of social reporting.

### Best practise

With respect to the content of a 'best practise' reporting in the sector, current reports provide little to help the reader understand the basis of the data disclosed or to make genuine assessments, let alone comparisons, of a company's true environmental performance. SustainAbility/UNEP (1999) recommends the parallel development of a full set of aspects and indicators (to set the standard for best practise reporting) and a smaller, but expanding core subset that is harmonised for true inter-company comparability. The full set of indicators would seek to reveal a company's commitment to, and delivery of, a progressive shift toward more sustainable products and operations. It has been suggested that much of the groundwork for the framework is already in place, through the efforts of the GRI (Global Reporting Initiative, see section

on “Guidelines”), industry association indicator projects, inter-company benchmarking groups, and a host of resources on best practise environmental reporting.

Goals for the development of an environmental reporting framework, are to increase the number of reporting companies, and to improve the quality, comprehensiveness and comparability of the data disclosed. Although each of these goals are important individually, when considered together, some conflicts arise:

– **Quantity - Quality**

Getting more companies to report will require current non-reporters to perceive greater benefit, and reduced costs, will result from doing so. This suggests that reporting needs to be made a simpler, cheaper affair. However, more comprehensive coverage requires that companies measure and report more, not fewer, aspects.

– **Comprehensiveness- Comparability**

Improving comparability in reporting data between companies will require precise specification of each indicator (clear definitions, measurement and estimation protocols, and included/excluded activities). The more indicators there are to harmonise, the longer the effort is likely to take.

These issues are likely to be short-term. Heading towards a ‘best practise’ framework, it is best to address this short-term incompatibility, while still progressing the long-term goals (SustainAbility/UNEP, 1999). A two-pronged approach is recommended: a ‘top-down’ perspective, to define the end-goals, or the standard by which companies should judge their reporting efforts; and a ‘bottom-up’ approach to develop and disseminate a core set of truly comparable performance indicators. In developing the framework, the ties between reporting indicators and performance indicators should be stronger. Also, there is a need for greater innovation in selection of indicators, particularly to appropriately reflect aspects with primarily local or regional impacts.

The key principle in developing the framework is that the ultimate goal is performance improvement rather than better reporting for its own sake.

The framework should aim to be compatible with the GRI Guidelines - and, where possible, with the WBCSD indicator framework (see section Guidelines below), industry benchmarking initiatives, government reporting requirements, and major macro-tracking schemes, such as national greenhouse gas inventories.

## Guidelines

### *Sustainability Reporting Guidelines*

The Global Reporting Initiative (GRI) was established in late 1997 with the mission of designing globally applicable guidelines for preparing enterprise-level sustainability reports. The GRI is convened by CERES (Coalition for Environmentally Responsible Economies) and incorporates the active participation of corporations, non-governmental organisations (NGOs), consultants, accountancy organisations, business associations, universities and other stakeholders from around the world. The GRI seeks to establish a common framework for enterprise-level reporting on the linked aspects of sustainability: the environmental, the economic and the social. These Guidelines were open for public comment and testing through the end of 1999. In 2000 the Guidelines will be revised. The full GRI Sustainability Reporting Guidelines can be downloaded from [www.globalreporting.org](http://www.globalreporting.org).

*WBCSD indicator framework*

The WBCSD (World Business Council for Sustainable Development) working group intends to give guidance for the selection of sector- or company-specific indicators (SustainAbility/UNEP, 1999). The working group recommends the use of the following ratio as a way to measure and report eco-efficiency: unit of value provided per unit of environmental burden. The following cross-comparable indicators have been considered:

Environmental Indicators	Value Indicators
Total amount of energy used	Mass or number of products
Total amount of material used	Number of employees
Greenhouse gas emissions	Sales/turnover
Ozone depleting substances	Gross margin
SO <sub>2</sub> and NO <sub>x</sub> emissions	Value added

*ISO 14031 Guidelines*

There has been a number of attempts to develop generic categories of environmental performance indicators. The ISO 14031 guidance document on environmental performance evaluation is likely to become the standard framework in future. The central feature of ISO 14031 is a definition and detailed discussion of three basic types of indicators that can be used in environmental management. It, firstly, distinguishes between ‘environmental condition indicators’ (ECIs) and ‘environmental performance indicators’ (EPIs), and then subdivides the latter into operational performance indicators (OPIs) and management performance indicators (MPIs), resulting in three broad categories, as follows.

- Environmental condition indicators (ECIs), defined as a specific expression that provides information about the local, regional, national or global condition of the environment.
- Operational performance indicators (OPIs), defined as EPIs that provide information on the environmental performance of an organisation’s operations. There are five OPI sub-categories: input of materials, energy and services; the supply of inputs; the design, installation, operation and maintenance of the physical facilities and equipment; outputs of products, services, wastes and emissions; and the delivery of outputs.
- Management performance indicators (MPIs), defined as EPI that provides information on management’s efforts to influence an organisation’s environmental performance. This can include policies, people, planning activities, practises and procedures at all levels of the organisation, as well as the decisions and actions associated with the organisation’s environmental aspects. ISO 14031 distinguishes four main sub-categories of MPI: implementation of policies and programmes; conformance; financial performance; and community relations.

The three categories of ECIs, OPIs and MPIs (see Figure 4) can be seen as a pressure-state-response model of a business’s impacts on the environment. **Pressures** on the environment are created by the operations of the business, which affect its **state** or condition, leading (hopefully) to a **response** through action by management to

2. Environmental Reporting

address the problem. By including indicators in all three of these categories, the ISO 14031 framework can be seen as ensuring a good balance of coverage.



Figure 4 Categories of environmental performance indicators

The range of indicators in use at oil companies, classified by ISO 14031 terminology, is illustrated in Table 2.

Table 2 Environmental indicators in use (SustainAbility/UNEP, 1999)

<b>Operational Performance Indicators (OPI)</b>	
Materials indicators	Average weight of chemicals used per well
Energy indicators	Fuel oil equivalent barrels per barrel of crude run to stills Energy consumption per unit produced Energy used by fuel type
Facilities and equipment indicators	Number of double-bottom and/or double hull vessels Number of wells and platforms
Product indicators	Size of 'green range' of fuel products Emissions released during the life cycle of reformulated Futura gasoline and Futura City diesel Sulphur content of fuel oil for heating and diesel oils
Emissions indicators	Hydrocarbons emissions to air per barrel of refined product Greenhouse gas emissions in CO <sub>2</sub> equivalents kilotonnes Biological oxygen demand of effluents, chemical oxygen demand of effluents
Waste indicators	Quantity of waste per throughput.
<b>Management environmental performance indicators (MPI)</b>	
Implementation indicators	Number of hours of environmental training and attendance at courses
Conformity indicators	Legal compliance with regulations Number of audits completed by type Fines and penalties
Community relations / stakeholder indicators	Number of community advisory panels Number of sites with environmental reports Perceptions about reliability of information on environmental issues and impacts
Financial indicators	Capital investment on pollution abatement, environmental expenditures Environmental expenditure index - litre per tonnes of oil equivalent Reserve for future environmental remediation costs
<b>Environmental condition indicators (ECI)</b>	
Reception indicators	Concentration of a specific contaminant in ambient air at selected locations E&P disturbance measures (number of wells drilled, total hole length)

Working Session Outline: <i>Environmental Reporting</i>
<b>Chaired by Carolita Kallaur (US Offshore Mineral Management Services)</b> <b>Rapporteur: Hanne-Grete Nilsen (Norwegian Ministry of Environment)</b>
Keynote Presentation
<b>Shelly Fennel (SustainAbility)</b> <i>Title</i>
Introductory Presentations
<ul style="list-style-type: none"><li>• Amy Rosenfeld (Conservation International) <i>Title</i></li><li>• Emmanuel Garland (TotalFinaElf) <i>From operational performance indicators to global environmental reporting: a challenge for the industry</i></li><li>• ? (Angola) <i>Title</i></li><li>• Odd Raustein (Miljosok, Norway) <i>Title</i></li></ul>
Topics for Discussion
<ul style="list-style-type: none"><li>• What is the appropriate scope of Environmental Reporting of offshore oil and gas activities: key performance indicators, relevant parameters, information detail, and report format?</li><li>• Is the Oil Sector Report published in 1999 a suitable guideline for Environmental Reporting of offshore oil and gas activities? Is there a need for the development of more practical guidelines? Can generic guidelines (e.g., UNEP, etc.) be applied in this sector?</li><li>• How should the performance of suppliers and contractors be included in the Environmental Reporting?</li></ul>

### 3. Environmental Impact Assessment

#### Scope

Environmental impact assessment (EIA) is widely accepted as a tool to ensure that all environmental and social concerns are addressed early in the planning process of offshore developments. As already indicated by the 1<sup>st</sup> Expert Meeting, public perception and social acceptance are very important factors in meeting environmental targets. An EIA is required by law in many countries and is also required in projects supported by, for example, the World Bank. The scope of EIA in a socio-economic context will be presented and discussed.

#### Background information

The ultimate objective of an EIA is to identify and predict (for the public stakeholders) any potential environmental, socio-economic, or human health effects which may result from the planned activity before they occur, and to identify or develop suitable preventative or mitigative measures to eliminate or reduce the undesirable effects. In many jurisdictions, EIA or similar studies have become an important tool for integrating environmental and social considerations into the planning and authorisation of new development projects. Within the E&P industry, an EIA is also integrated with hazard & risk assessment. Minimising environmental impacts is an iterative process taking into consideration various project design and operation alternatives.

It has become widely accepted that an EIA can:

- help ensure that all environmental and social concerns are identified and addressed early on in the planning process, decreasing, in a cost effective way, the chance that expensive plan modifications will be needed at a later stage;
- improve decision making and planning;
- improve future assessments and practises;
- improve the public understanding and appreciation of the operation by developing confidence and partnership among the various stakeholders and interested parties;
- improve company credibility;
- help align expectations and reduce conflict.

In addition, environmental protection (and sustainable development) is increasingly becoming an essential criterion for decisions concerning funding for international development projects (e.g., World Bank and Asian Development Bank funded projects). To this end, EIA provides a means of systematically addressing environmental and socio-economic concerns. Since addressing socio-economic concerns within EIA is currently receiving a lot of attention and many questions are being raised, this chapter includes a separate section on socio-economic issues within the E&P Industry (see Section 'Socio-economic context').

In the context of offshore E&P operations, EIA is increasingly used by authorities to help ensure that operations comply with national environmental policies and standards. Operators use the EIA in an iterative process of designing planned activities, while taking into account the necessary environmental and major hazard requirements.

The EIA process can be applied at many levels in the development of an offshore field. A distinction can be made between operational and strategic EIA. Operational EIA is applied by operators at the project level, when considering individual projects. This is the most common application. Since the operational EIA is applied at the project level, the actions and decisions made at earlier stages of the development process fall outside the scope of the EIA, see Figure 5.

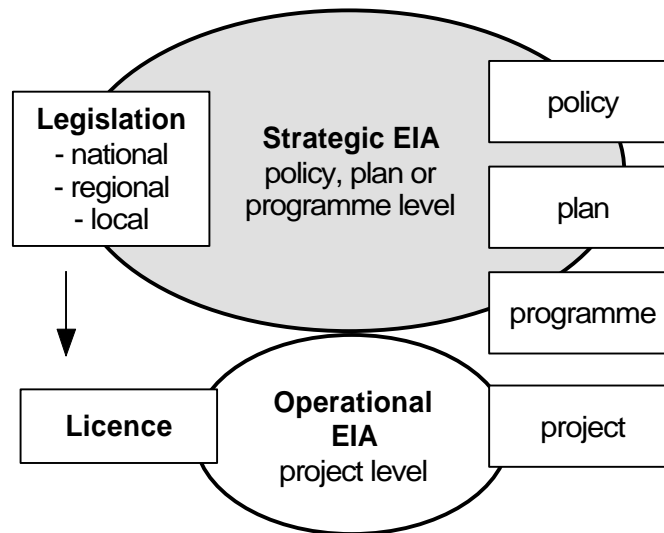


Figure 5 Strategic versus Operational EIA

In order to address the limitations of Project EIAs, some countries (e.g., USA, the Netherlands and Norway) and the World Bank now require Strategic EIAs, also called Strategic Environmental Assessment (SEA). SEA is applied by authorities at the policy, plan, or programme levels. In contrast to EIA applied only at the project level, it is possible for SEA to:

- encourage the consideration of environmental protection objectives during policy, plan and programme-making activities;
- facilitate consultation between authorities on, and enhance public involvement in, the evaluation of environmental aspects of policy, plan and programme formulation;
- allow formulation of standard or generic mitigation measures for later projects;
- encourage consideration of alternatives to the development (during the planning stage);
- direct development away from environmentally sensitive areas (during the planning stage);
- consider the cumulative effects of several projects.

Within the European Union, EIA has been developed over the last twenty years, resulting in the EIA Directive, which is implemented in the Member States. Many countries have developed screening criteria for projects for which EIA is obliged, which has to be applied before drawing up an EIA (National screening lists). At international level these are still in development.

Aspects of both types of EIA are presented below:

<b>Project EIA</b>	<b>Strategic EIA</b>
Covers projects, which need a license for operation from national, regional and/or local authorities.	Covers plans and programs based on laws or other legislation, which are developed by national, regional and/or local authorities.
Criteria for screening projects against legislation: - capacity of production, infrastructure, etc. - nature of production, infrastructure, etc. - environmental impact	Criteria for screening plans and programs against legislation: - condition for projects - integration of environmental impact - relevance of environmental impact - protected areas - nature, cumulative risk and international effects

In December 1998, the UNEP carried out a review of EIA practices for industrial projects to assess how effectively it was being used. The review noted a number of important deficiencies in current practice, including, in particular, a tendency to view EIA as a regulatory requirement rather than as a way of optimising the operational performance over the life of the project. It was also noted that EIA is often insufficiently linked to EMS and the application of environmental management tools. Finally it was noted that the understanding by industry managers of how the EIA process works (and how they should manage the process) was often inadequate. In addition, it was pointed out that managing the EIA process is not commonly part of the training of industry managers in tertiary education institutions or courses.

EIA should form the basis of the EMS for the facility concerned, if permission for its construction is granted. It should also play a central role in the tendering process for design and building contracts. During the project development, companies should be aware that:

- authorities need be notified on time, in order to allow for the issues that may result from the EIA procedure (e.g., for example time, procedure, influence on licence application procedure);
- during the design of the process, environmental and socio-economic issues brought to light by the EIA procedure should be taken into account (e.g., mitigating measures, alternatives, sustainable processes and energy supply);
- sub-contractors should also operate in a manner consistent with the results of the EIA (sub-)contractors (e.g., for design, engineering, constructing, maintenance),

Companies will note in their EMS, that all demands resulting from the EIA procedure will be implemented and translated to operational activities. If the EIA is part of the ISO 14000 system, correct implementation will be ensured through auditing.

### The socio-economic context

Increasingly, social impacts (e.g., impacts on population, economic conditions, employment, cultural values, quality of life, social structures and resources) are being assessed in EIA. Since the oil industry is increasingly facing conflicts with local communities, NGO's, and effective campaign groups, these social impacts are

becoming an increasingly important part of an EIA. Addressing these issues in an EIA requires consultation in order to identify interested parties and their issues, concerns, needs, ideas and values as well as mutual interests in and potential conflicts with the objectives of the company. In some cases this leads to an additional social sustainable development management plan. An important criterion for a viable social strategy to manage environmental impacts is that it be self-supporting and, therefore, sustainable by local communities when external priorities shift or when external budgets are otherwise constrained. Also, a viable social strategy must fit the social organisation and institutional structure of local communities.

However, social analysis in EIA is not expected to be a complete sociological study nor a social cost/benefit analysis of the project. It is primarily concerned with social impacts, relating to environmental resources and the informed participation of affected groups. An EIA should identify the social changes, evaluate the social costs of long-term continuation of the project, and formulate strategies to achieve the desired objectives. In areas where a close relationship exists between the way of life of a group of people and the resources they exploit, social assessment is of particular importance. This could be the case for projects involving indigenous people or people dependent on fragile ecosystems.

From a survey on environmental reporting within the oil sector (see Chapter 4) the social disclosure in the oil industry has been reviewed. It was stated that, given the fact that there is limited agreement on how to measure and monitor social performance, there is a pressing need for greater coherence and convergence in the area of social accountability (SustainAbility/UNEP, 1999).

### Stakeholder concerns

Many guidelines are available for assessing impacts due to emissions resulting from E&P activities. For assessing socio-economic impacts however, no specific guidelines are available. General guidance is provided by the World Bank Guidelines, assessing social aspects of development investments. Currently, addressing socio-economic issues within the E&P industry takes place through the stakeholder consultation process.

Since much of the world's known oil reserves are located in the developing world, the level of economic power and influence that oil companies have, and how that power and influence is used, are of special concern to stakeholders.

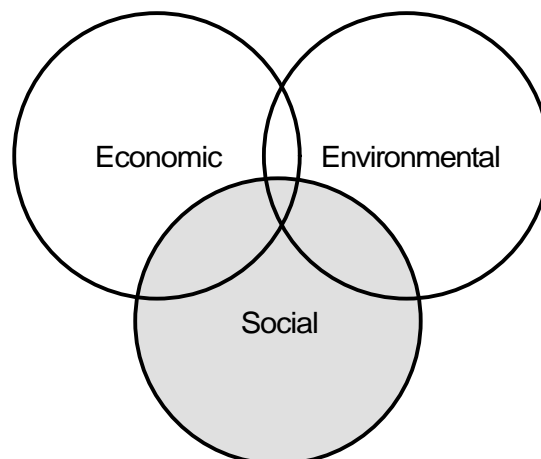


Figure 6 Stakeholder concerns (SustainAbility/UNEP, 1999).

Examples of stakeholder concerns are:

Economic/social examples: competition in the use of natural/environmental resources; jobs created; local economy impacts; social investment; distributional equity; bribery and corruption; philanthropy; stakeholder compensation; training support to raise the skills base.

Social examples: security arrangements; labour standards; indigenous communities; respect for diversity; human rights; conflict prevention; stakeholder consultation.

Social/environmental examples: health and safety; global warming; local environment; eco-justice; conflicts in competition for environmental space/resources; nature compensation; habitat enhancement and creation.

### Core concern in social-economic assessment of E&P activities

#### 1. Indigenous people

Social assessment within EIA focuses on how groups of various people affected by a project allocate, regulate and defend access to the environmental resources upon which their livelihood depends. Special action is required when affecting local communities are composed partly or entirely of indigenous, tribal, low caste, or ethnic minority groups. Because of their powerlessness such groups are vulnerable to dislocation and impoverishment in conditions of rapid socio-economic change. This can lead, in turn, to the adoption of inappropriate production systems with negative environmental impacts. To lower the risk of impoverishment and environmental degradation, special development plans tailored to the social, cultural and ecological conditions of these groups are required. Important issues are:

- the significant social changes for human populations whose livelihood and cultures are depended on development areas; especially in ecologically sensitive areas, like coastal marine areas (fragile). Human communities traditionally exploit these areas and are extremely dependent upon them;
- the heightened vulnerability of indigenous due to their social status may inhibit their capacity to assert or defend their interest;
- changes within communities with regard to resource management and decision-making (ethnic/tribal groups, occupational groups, age and gender);
- variation within production system (fishery, agriculture, nomadic);
- involuntary resettlement;
- use of social information in EIA
  - verify existing assumptions
  - predict likely response of local groups to a project
  - formulate social strategies for addressing environmental impacts (sustainable by local people).

#### 2. Ecologically sensitive areas

Development investment in areas of unique biological diversity or ecologically fragile ecosystems, such as coastal and marine zones, may result in significant social changes for human populations whose livelihoods and cultures are dependent upon them. Social changes in communities dependent upon ecologically sensitive areas may lead, in turn, to unacceptable environmental risks. The EIA should identify potential changes which may result in environmental impacts and formulate strategies to prevent or mitigate undesirable impacts and enhance positive impacts

in ecologically sensitive areas.

Coastal marine areas (e.g., beaches, sand dunes, estuaries, mangroves, swamps, marshes and coral reefs) are fragile because the complex food chains and life cycles of all species are easily damaged when a few species are affected by environmental changes. Thus, affecting a relatively small area by E&P activities, may cause an impact throughout the rest of the ecosystem. The abundance of marine resources in certain seasons is marked by scarcity in other seasons, leading to “boom and bust” cycle characteristic of fishing communities. For this reason, human communities in coastal marine zones traditionally exploit not only the sea, but also the beach and inland areas through agriculture, hunting and gathering. As much as half of diet and income may be derived from beach and inland areas of the zone. Social changes associated with development investment in coastal marine areas include restricted access to one or more of the sub-zones of the area, over-exploitation of selected species to meet demands of new markets, population displacement, and attraction of new settlements. Adjustment in response to these social changes often leads to additional environmental impacts elsewhere in the coastal marine zone.

## Regulatory Framework

At an international level, a regulatory framework for EIA and environmental monitoring is provided by the United Nations Convention on the Law of the Sea (UNCLOS). Specifically, Article 206 requires that when States have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial changes to the marine environment, they shall assess the potential effects of such activities on the marine environment. Article 204 calls for States to monitor the risks or effects of pollution of the marine environment.

At a regional level, more specific provisions are contained within various agreements. In certain areas of the world (e.g., the Mediterranean and the Persian Gulf) regional conventions and their implementing protocols (e.g., *the Mediterranean Seabed “Barcelona” Protocol 1994* and the *Kuwait Protocol 1989*) call for contracting parties to implement EIA requirements pertaining to offshore production activities. In addition, the EC has issued a new directive 97/11/EC (an amendment of 85/337/EC) concerning the requirements of an EIA for proposed projects including production of oil and gas. Finally, the Espoo Convention 1991, although this instrument is not yet in force, calls for the EIA to be conducted only by specialised scientists with substantial experience in issues concerning environmental protection and management.

Many E&P companies have internal rules requiring EIA, linked to investment approval.

At a national level, provisions concerning EIA are typically an integral component of environmental legislation and it is not uncommon for an EIA to be mandatory prior to commencing production activities. In some jurisdictions, an EIA may also be required prior to commencing exploration drilling with baseline environmental surveys being conducted prior to prospecting activities (e.g., seismic surveys). Commonly, the competent authorities publish EIA guidelines. In some countries, (such as the Netherlands, Pakistan, India, France, USA and Canada), specific guidelines have been developed for the assessment of the impact of E&P operations. These procedures are designed to obtain an objective and independent judgement of the EIA and to ensure

stakeholders influence (public consultation). In countries where such provisions are lacking, it is advisable to:

- strengthen the institutional provisions
- set up public consultation procedures (inhabitants and NGOs)
- arranging agreements between national authorities and industry to appoint experts who advise to both parties about the Terms Of Reference (TOR), the EIA and the implementation of the EIA (expert panel).

Even in countries where EIA is not a statutory requirements, operators commonly carry out such studies prior to commencing E&P activities. In the absence of national EIA guidelines, reference can be made to guidelines published by non-governmental organisations (e.g., OGP, IUCN, ARPEL) and funding organisations (e.g., World Bank and Asian Development Bank (ADB)) or European Union.

Since government regulators and planning officers often lack the resources and skills needed to ensure that an EIA (and the linked EMS) is effectively implemented, there is a need for E&P companies to take responsibility for the whole EIA/EMS process. Hence, the E&P industry has the knowledge (for example present and future activities/technologies) and should share this knowledge with the global community in order to enhance and extend the available EIA provisions.

The ADB and the World Bank, in their role as major funding organisations, are faced with enormous challenges regarding the environmental and social impacts of the projects that they fund. The ADB has developed the “Environmental Guidelines for Selected Industrial and Power Development Projects,” which are technical in nature. The funding organisations, therefore, decided that EIA should be conducted for industrial and power development projects. As a result, in 1998, the World Bank developed the “World Bank Operational Directive on Environmental Assessment”. A wide range of subjects are addressed in this document, which has led to the so-called: ‘Environmental Assessment Source Book’. In these guidelines, environmental important items are listed for any particular operation. They are meant as guidelines for World Bank staff for conducting EIA of proposed projects. The Source book focuses on operations with potential negative environmental impacts which can be easily found. It contains environmental guidelines, as well as socio-economic guidelines.

## Scope of an EIA

In order for an EIA to be comprehensive and effective in providing information for the decision making process it must:

- be made early on in the planning process;
- provide a description of the operation;
- make use of all relevant data available;
- identify and assess the potential harmful effects to the environment and socio-economic impacts (including external safety) for each step of the operation;
- describe likely effect measures, monitor methodology and provide alternatives which are relevant to the activity, in an iterative manner;
- provide opportunities for public consultation and encourage communication between the public and the operator;
- be part of the tendering process, so bidders allow for the requirements stemming from the EIA.

It is important that an EIA contains an integral environmental and socio-economic review of all E&P activities (seismic, exploratory drilling, production drilling, construction, production, maintenance and decommissioning), including issues on sustainable development such as climate change. This helps to define an optimum level of oil and gas production at a certain field considering the environmental objectives and the conditions acceptable to the other stakeholders. Extensive public consultation should be part of the EIA process. A full EIA should also include formal plans to promote occupational health and safety (see, for example, the World Bank Guidelines).

An EIA can be an integral part of the Environmental Management System (EMS). Also, EMS can be implemented within EIA. According to the World Bank Guidelines for example, a full EIA should include an assessment of the existence, role, and capability of environmental units on-site, or at the agency and ministry level. Based on these findings, recommendations should be made concerning the establishment and/or expansion of such units, and the training of the staff, to the point that EIA recommendations can be implemented.

Figure 7 represents a schematic view of the scope of an EIA. E&P activities could lead to direct ecological and/or socio-economic effects. The ecological effects could indirectly lead to socio-economic effects, for example decreasing fish abundance causing problems for fisheries. The E&P activities may also lead to direct socio-economic effects, like immigration of people in remote areas, which in turn may result in ecological impacts (change in land-use / disturbance of sensitive areas).

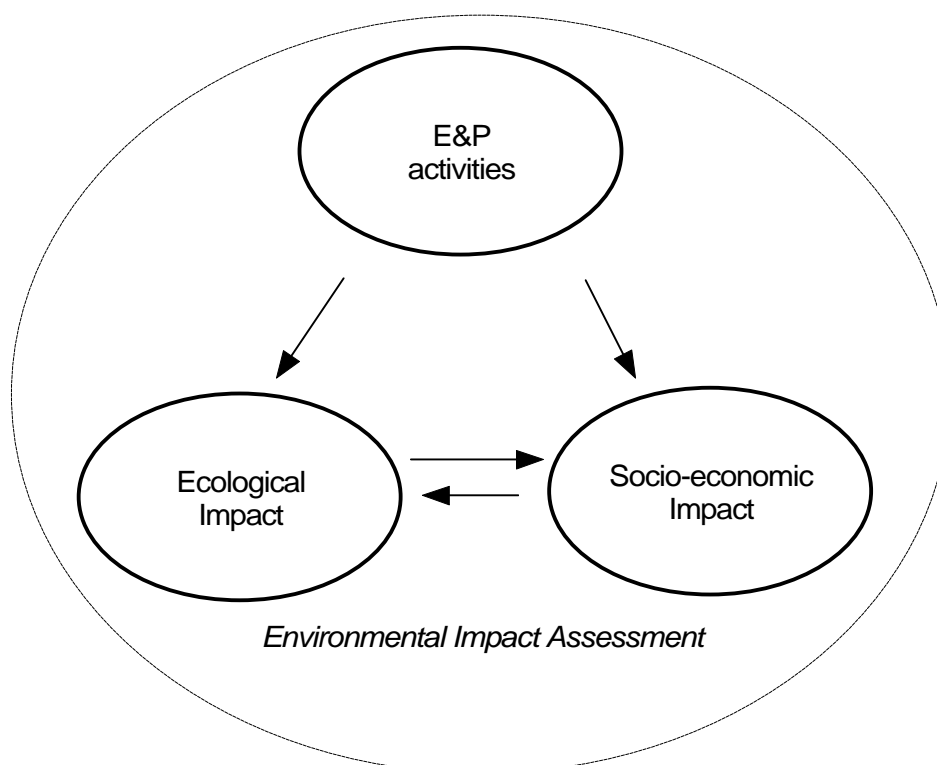


Figure 7 Scope of an EIA

Policy of the World Bank and ADB is that, within an EIA, special attention is given of social-cultural and economical factors, in describing effects like:

- local housing of present and future communities
- employability local community (occupation to be potentially affected by offshore activities could be fishery for example)
- land use
- cultural aspects
- recreation/tourism

The 1<sup>st</sup> Expert Meeting concluded that EIA should be applied to all developmental stages of Exploration and Production. However, the size and scope of an EIA depend on elements such as the receiving environment, anticipated impacts, experience and familiarity with operations in the environment. EIA should aim to meaningfully protect against negative socio-economic and environmental impacts and take cumulative effects on the receiving environment, both onshore and offshore, into consideration. Furthermore, it was stated that there are various ways to involve stakeholders and incorporate local expertise. It is also acknowledged that working within the social and cultural context will enhance the transparency of the EIA process. Conclusions of the 1<sup>st</sup> Expert Meeting regarding the benefits of integrated social and environmental assessment included:

- protection of the environment and communities;
- identification and enhancement of potential project benefits;
- improved decision making and planning;
- identification of design options over remedial solutions;
- expectations alignment and conflict avoidance;
- balancing environmental and social expectations;
- establishing baseline situation and documenting impacts;
- improving future assessments and practice;
- contributing to building or strengthening local capability (capacity building);
- actively search for positive outcomes in environmental, social and safety areas.

The geographical area considered in an EIA may vary according to the nature of the proposed project. For example, a distinction may be made between a specific project EIA (e.g., well operation) as opposed to a regional project EIA (e.g., offshore oil and gas field development activities, regional assessment of a marine area, etc.). Examples of local and regional social impacts that could be considered for inclusion in the EIA are listed below.

- The development of new petroleum fields may lead to changes in the local coastal areas. These changes may lead to coastline urbanisation, which often replaces traditional economic activities (e.g., fisheries and herding), on the other hand these changes may create opportunities for new economic activities, which are important for local development.
- The establishment of production infrastructure (e.g., terminals, installations, pipelines and access ports) may have an impact on the adjacent onshore area. Associated impacts might include, for example, localised deforestation and the ingress of people into previously uninhabited/inaccessible areas or inhabited by indigenous people, via communication links established as part of the proposed project.
- Offshore activities can, in this respect, also compete with and/or contribute to tourist resort development along the coastlines.

3. Environmental Impact Assessment

- There is an inevitable decline in economic activities when adjacent oil or gas fields are depleted. This decline will have an effect on the local community.
- People attracted to the development may come from geographically removed locations. This could lead to conflicts with local populations. The construction phase can be particularly severe in this respect.
- Hazards to which local people will become exposed to from hydrocarbon fires, explosions and vapours.

### Finding the balance

The EIA process can assist in addressing both ecological- and socio-economic impacts. The following social-economic issues are important in finding the balance, within EIA, between ecological-, and socio-economic issues:

- Significant social changes for human populations whose livelihood and cultures are depended on them with (positive or) negative effects; especially in ecologically sensitive areas, like coastal marine areas (fragile). Human communities traditionally exploit these areas and are extremely dependent.
- Indigenous people are especially vulnerable, since their social status inhibits their capacity to assert or defend their interest.
- Involuntary resettlement.

The World Bank Guidelines suggests that the first step should be to disaggregate the human population found in and around the area, dividing them into categories. Three groups of people which may inhabit an area are as follows.

- Social groups that have lived in the area for generations have been able to evolve stable, low-energy, sustained-yield production systems. An EIA can be strengthened by including local knowledge of the environment that may be affected by the activities. Assuming that most natural resource use practises, where stable systems of this kind are found, are environmentally appropriate will help avoid harmful impacts.
- Recent settlers, which usually have relatively little knowledge of environmental constraints or sustainable resource practises of the area and may colonise areas unsuitable for the production systems they operate.
- Non-resident populations, which extract or utilise resources (e.g., tourists, harbour activities).

The Guidelines of the World Bank present the following socio-economic factors to be considered in an EIA:

Nearby communities: Location, access, population (number, demographic and social characteristics); economy (employment rate, income distribution, tax base); services (types, capacity, adequacy) and housing; the ability to (a) provide workforce, (b) service new development and (c) absorb and adjust to growth.

Land use: Intensive and casual, full time and occasional, actual and projected, specially designated areas (marine sanctuaries, coral reefs, recreational beaches or seashores, parks, refuges, reservations, wilderness), man-made features.

Cultural: Historic sites, archaeological sites, native religious or harvest sites, ship wrecks.

Short- and long-term effects should be addressed in the EIA. For example, during production, the sites of offshore and onshore activities will no longer be accessible to

local communities, which could cause temporary (socio-economic) effects. The use of coastal and offshore locations should, therefore, be described in the EIA. Immigration of labours could cause economical/social/cultural conflicts. These conflicts could lead to long-term effects. Describing the current situation of in terms of: community structure; public health; crime; education; hunting; fishing; food and firewood gathering; tourism industry; and port facilities, which could be affected long-term, should be part of the EIA.

<b>Working Session Outline: <i>Environmental Impact Assessment</i></b>
<b>Chaired by Avinash Chandra (Directorate General Hydrocarbons, India) Rapporteur: Kit Armstrong (Chevron)</b>
<b>Keynote Presentation</b>
Siân Pullen (WWF) <i>Strategic environmental assessment and the offshore industry</i>
<b>Introductory Presentations</b>
<ul style="list-style-type: none"><li>• Paul V. Horsman (Greenpeace) <i>Title</i></li><li>• Liz Rogers (BP Amoco) <i>Consideration of sustainability in the context of an offshore hydrocarbon development</i></li><li>• Eleodoro Mayorga Alba (World Bank) <i>EIAs and the Mitigation of the social impact of Oil and Gas Operations</i></li><li>• Kalsom Abdul Ghani (Malaysian Ministry of Science, Technology &amp; The Environment) <i>Title</i></li></ul>
<b>Topics for Discussion</b>
<ul style="list-style-type: none"><li>• What is the appropriate scope (or “level of ambition”) of EIA for offshore oil and gas activities related to local conditions, regional/global impacts, socio-economic context? How should EIA be related/integrated (theoretically and practically) in a companies EMS?</li><li>• What type of strategic EIA should be developed in addition to project based EIA’s, and how can these be interconnected?</li><li>• Are there suitable EIA guidelines available specifically for the offshore oil and gas industry? Is there a need for the development of such specific guidelines? Can generic guidelines (World Bank, etc.) be applied by this sector?</li><li>• What should be the aim of (baseline, impact or compliance) monitoring, and what is the appropriate scope of monitoring?</li></ul>

## 4. Information Exchange Systems and Tools

### Scope

The exchange of information within a global network is a key factor in ensuring the development of good environmental practices within regional approaches to achieve sustainable development. Recent developments show an increase in the abundance of information and of ways to exchange information. Details on central web pages, conferences and fora for such information exchange will be presented and discussed.

### Background Information

The development and operation of offshore installations is now influenced by many factors beyond the simple engineering feasibility of a project. Stakeholders include unions, fishing operators, NGOs, and even the public consumers of oil products. Even the industry itself consists of a variety of sub-sectors with different interests, including contractors, operators, suppliers, owners, insurers and so on.

Some stakeholders and industry sectors generate environmental information upon which they base decisions. This information is often also used by others who interpret it, in their own way, in order to establish a particular position, as partner or protagonist. Governments respond to the concerns of these stakeholders by imposing safety and environmental regulation on the oil and gas industry. One common complaint by the industry and the public alike is that decisions are often based on inadequate or unsound information.

At the 1<sup>st</sup> Expert Meeting, it was concluded that, "A large body of information already exists. This takes the form of not only legislation, guidelines, reports and performance data, but also conference proceedings and workshops, and research results. However, this is not organised in ways which make it easy for those concerned to access the relevant information, or even to be aware of its existence" (Conclusions of the International Expert meeting, Noordwijk-NL- 1997). This describes the information dilemma facing offshore oil and gas stakeholders. The information exists, but it is not easily available to all interested parties. Sources of environmental data are widely dispersed and finding information to make decisions based on reliable, accurate facts is not always easy.

One way in which information is currently exchanged between companies world-wide is through publication of documents and guidelines. Appendix II shows a list of the basic documents and guidelines concerning environmental practices in offshore oil and gas activities. Furthermore, information is exchanged through (inter)national discussions between governments, industries and stakeholders.

During the 1<sup>st</sup> Expert Meeting, possible methods of enhancing the exchange of information and experiences were discussed. The main objective was to ensure a flow of information: from industry to governmental agencies and vice versa; from industry and government to stakeholders (i.e., environmental groups and the public); and from

4. Information Exchange Systems and Tools

countries with extensive experience in offshore oil and gas production to countries with developing offshore oil and gas production industries (see

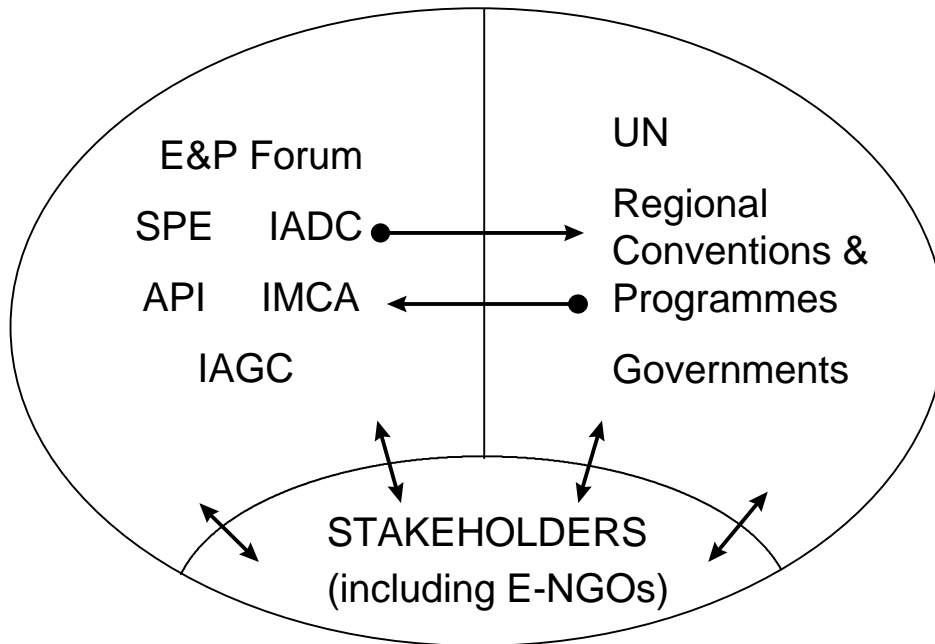


Figure 8: Sharing Experience Diagram drafted during the 1<sup>st</sup> Expert Meeting

Information exchange consists of suppliers and users. In Table 3 users of information at the company level are listed, regarding the primary use of information.

Table 3 Primary use of company based information (SustainAbility/UNEP, 1999).

Primary Use of Information	Primary Audience(s)
To understand how a company's actions directly affect an individual's welfare	Individuals directly affected by the company's activities (e.g., local communities, employees)
To spur or enable performance improvement	Environmental and social professionals within company in charge of benchmarking
To gauge whether companies are upholding their obligations to society	Opinion-forming groups (NGOs, media, ethical investment community)
To include company's activities in tracking of total impact on source or sink	Administrators of macro-tracking schemes (e.g., government, academics)
To evaluate a company's financial prospects	Company management (internal); financial analysts, shareholders (external)
To assess a company's contribution to sustainability	Governments, ethical investors, NGOs

The supply of information should be organised and funded. Considering the different uses of the information supplied, it is difficult to determine who should be responsible for organising and funding the information exchange.

## Introduction to Post-Noordwijk Initiatives:

### OEF-Website

At the 1<sup>st</sup> Expert Meeting on Environmental Practices in Offshore Oil and Gas Activities the 'Offshore Oil and Gas Environment Forum' (OEF) web site was initiated ([www.natural-resources.org/offshore](http://www.natural-resources.org/offshore)). It was developed by UNEP in co-operative effort with the Netherlands, Norway, OGP and WWF, and is operated by the UNEP Division for Technology, Industry and Economics (UNEP TIE). The web site provides both a place where users can obtain information and an interactive forum to which they can contribute. The web site does not attempt to store all of the information available; that would require a mega-database. Instead, the site provides a map to guide the user to existing information sources. Access is world-wide and use is free of charge. The open structure of the OEF allows any information provider to register his/her data bank. Anyone can be a user, and anyone can be a provider of information (and of course, many providers will also be users). The only condition is that information must be relevant to **offshore oil and gas** and to **environment**.

In its current developmental phase, the OEF site contains bulletin boards (e.g., news, events, related sites), regional forums and links to a wide variety of information on topics such as:

- sources of emissions (e.g., produced water, gas release, decommissioning);
- environmental news on operations, trends, studies, regulation, accidents;
- environmental events such as conferences, meetings, debates, training;
- environmental trends, impacts and studies;
- regulations and codes on environment;
- clean technologies, treatment technologies;
- environmental management systems and tools, such as EIA;
- education and training sources.

#### *The value of the OEF website*

Of course some of the information referred to above is already available elsewhere, for example from the information sources own publications or website. The OEF website does not seek to duplicate information, instead it adds value to it by telling the rest of the world that the information exists, and where to find it. The value of the OEF website is that it cuts out the need for prolonged searches by individual users and, more importantly, it indicates to uninformed users that something interesting or useful is available. The OEF website is designed to encourage Internet users to consult information that other providers make available. It is this proactive stimulating role, combined with its neutrality and global relevance, that make the OEF website unique.

The interactive nature of the OEF website allows all users, whether they be governments, NGOs, companies or institutes, to reach a wider audience for their announcements, to display their presence, and to contribute to dialogue. This possibility for global outreach has been slow to be appreciated by organisations that

already have their own websites. The OEF website has a global reach, is neutral, and is more likely to be found by search engines than a private site.

#### *Who are the users?*

Although the universal user concept is fundamental to OEF design, certain types of users stand out because of their importance in the information generation process, and/or their importance as decision-makers.

**Scientific institutes** and marine surveys are important generators of baseline environmental quality data used by operators and regulators. Such bodies also need to compare data between regions, and regularly seek or advertise environmental conferences. These users should register the data they hold, and indicate how it can be accessed.

**Regulators** often want access to baseline data, and to environmental performance data from permit holders. More generally, they need information on overall environmental trends, environmental profiles of companies, descriptions of regulations in other places, technology options and addresses of environmental organisations and consultants. They may also wish to make announcements, release statistics, advertise leases or seek tenders on environmental projects. For the OEF, regulators are potentially both users and providers of environmental information.

**Companies** are often keen to publish their environmental performance through public reports, and may canvass for public input. They require baseline information, access to environmental technologies and expertise, and background on public issues and public groups. Like regulators, they are both users and providers of information for the OEF.

**Public groups** and other interest groups often look for baseline environmental information and want to exchange data on environmental impacts and compliance data. Public policy groups are concerned with global issues and global trends within the industry. They are big users and modest providers on the OEF.

**Co-ordination bodies** such as OSPAR, Regional Seas programmes, and industry associations seek information about other environmental stakeholders, trends and events, technology and management options. They are able to provide information about their own programmes and members, and environmental overviews they themselves prepare. For the OEF, they are both users and providers.

**News groups, discussion groups**, more specialised groups have varying needs, either as users (situation reports, environmental trends) or as providers, when they wish to announce events or concerns.

In addition to simply using or announcing factual information for others, all the above users can use the OEF to engage in dialogue or debate on selected issues such as decommissioning, environmental reporting, or anything else agreed upon (this dialogue function is not yet operational in Phase 1). Such discussion groups can, for example be useful prior to a major conference.

#### *Future development*

The 2<sup>nd</sup> Expert Meeting will explore how this information tool can be enhanced and further developed in order to serve as an information system on environmental aspects

of offshore oil and gas activities. The main focus will be on regional co-operation and, in particular, on methods of strengthening co-operation between the developed and developing regions. In order to achieve this, a close co-operation will also be established with the UNEP Regional Seas Programme.

Participants of the Expert Meeting will be requested to give their opinions on the attractiveness, accessibility and informativeness of the present web-site, and to make suggestions for improvements.

### Course in Offshore Environmental Practices

The environment has become a major consideration for company decision-making. The traditional way of dealing with environmental issues (i.e., by waiting until they become problems and then reacting) is proving to be both inadequate and highly inefficient. A training course on environmental practices in offshore oil and gas E&P is planned for 4-29 September 2000 in Delft, The Netherlands. The course is organised by the International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE) in co-operation with TNO. The development of the training course was one of the follow-up actions of the 1<sup>st</sup> Expert Meeting.

Course objectives include:

- Raising awareness of the protection of the environment from oil and gas operations;
- Sharing knowledge and experiences on environmental issues in the oil and gas exploration and production sector; and
- Establishing mutual understanding between stakeholders in the private and public sector.

The environment should not be treated as “add-on” training for just a few specialists. There is growing recognition that environmental issues are associated with almost all the activities of an organisation. Therefore, environmental understanding should be included in all undergraduate engineering and business courses to improve the level of environmental understanding and literacy of mainstream industry personnel.

The course will enable participants to fully grasp the impacts of oil and gas activities on the environment, to examine the best practical solutions and to take, or advise on, decisions for activities in the field of (offshore) oil and gas mining. Further information on the training course can be found at: <http://www.ihe.nl>

### Expert meetings linked to SPE-HSE conference

The International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production held in Stavanger at 26-28 June 2000, is the fifth in a series of biennial conferences organised by the Society of Petroleum Engineers (SPE).

At the fourth Conference in Caracas in 1998 it was discussed and recommended that future International Expert Meetings on Environmental Practices in Offshore Oil and Gas Activities (with the aim to exchange information and experiences) be organised in conjunction with the SPE-HSE Conference at which the state-of-the-art knowledge and views are presented.

The 2<sup>nd</sup> Expert Meeting to be held in 2000 is the first attempt of such a conjunction. This should be evaluated in order to decide whether this concept can also be applied when the 6<sup>th</sup> SPE-HSE Conference is organised for 2002 in Malaysia.

#### Examples of information exchange systems and tools.

Several industry associations are now attempting to expand beyond their traditional role of lobbying on behalf of their members, to developing their members' capacity to implement environmental protection measures. The mechanisms established to facilitate more effective dialogue between government and industry emphasise transparency, problem solving and the inclusion of various stakeholder interests. The following are examples of how information exchange and consultative mechanisms are being used to support self-regulatory approaches.

##### *Consultative Forums*

MILJØSOK is the alliance between the Norwegian industry and government to create an open dialogue between the stakeholders on measures to better meet environmental challenges. An important outcome has been a programme to reduce total produced water discharges. Similar forums are active in the Netherlands (working groups of industry and government) and within OSPAR (e.g. CHARM Implementation Network, (CIN).

##### *Negotiated Agreement between the Australian Environment Department and Industry Association*

A feature in the Australian profile is the strengthening relationship between the national environment agency and the leading industry association. Under an industry - government agreement, there has been a commitment to establish a joint work plan. Reviewed annually this plan will identify opportunities for co-operative programmes. It will also find solutions to the question of competing resource interests and sustainable multiple use.

##### *Regional Networks*

The Atlantic Frontier Environmental Network (AFEN) is a co-ordinated and strategic approach to environmental management by 21 oil operators in the UK Atlantic margin. The companies work with government and regulatory authorities, academic research community and interested parties. The AFEN leads a range of regional activities and studies to understand the environment better. They believe that a joint approach can generate much better data and use resources more efficiently.

##### *Industry-Initiated Environmental Codes and Guidelines*

Codes and guidelines are widely used to assist operators in understanding and acting upon their environmental responsibilities. The International Association of Oil and Gas Producers (OGP) and other national associations, such as API and UKOOA, have produced guidelines and best practices on environmental management systems (see Appendix I).

<b>Working Session Outline: <i>Information Exchange Systems and Tools</i></b>
<b>Chaired by Lyn Arscott (OGP)</b> <b>Rapporteur: Jean-René Marabelle (UNEP-TIE)</b>
<b>Keynote Presentation</b>
Fritz Balkau (UNEP-TIE) <i>Title</i>
<b>Introductory Presentations</b>
<ul style="list-style-type: none"><li>• Vassily Spiridonov (WWF) <i>Title</i></li><li>• Terry L. Thoem (SPE) <i>Title</i></li><li>• ? <i>Title</i></li><li>• Klaus Tilmens (World Bank) <i>Title</i></li></ul>
<b>Topics for Discussion</b>
<ul style="list-style-type: none"><li>• How can we ensure a sufficient exchange of information and experiences in global and regional networks involving all relevant stakeholders? That is to say, how can we facilitate the transfer of information from industrial specialists to governmental authorities and public NGO; and how can we facilitate the transfer of experiences from countries with developed offshore oil and gas industry to those with developing offshore industries? Who are the providers and the receivers of the information? What information is needed? Who should contribute to the development and maintenance of information systems?</li><li>• How can we improve the implementation of the existing initiatives: OEF web site; IHE course; Follow-up Expert Meetings in conjunction to the biennial SPE-HSE conferences?</li><li>• Is there a need for more specific, practical or updated guidelines regarding environmental technologies, environmental management, environmental reporting and environmental impact assessment for application in environmental care in offshore oil and gas activities? How can we improve the implementation of existing guidelines?</li></ul>

## Steering Committee

The Technical Meeting Document is issued by the Steering Committee of the Expert Meeting on Environmental Practices in Offshore Oil and Gas Activities. The Steering Committee defined the scope and topics for discussion for each of the working sessions.

The Steering Committee consists of:

Per W. Schive (Chairman)	Ministry of the Environment, Norway
Gunnar Andresen	Norwegian Petroleum Directorate, Norway
Lyn Arscott	International Association of Oil & Gas Producers, United Kingdom
Stig Bergseth	Statoil, Norway
Ingebret Gausland	Statoil, Norway
Jean-René Marabelle	UNEP-IE, France
Lindis Nerbø	Ministry of the Environment, Norway
Hanne-Grete Nilsen	Ministry of the Environment, Norway
Siân Pullen	World Wide Fund for Nature (WWF), United Kingdom
Tone Sjørgård	Norwegian Petroleum Control Authority, Norway
Aart Tacoma	Ministry of Transport, Public Works and Water Management, North Sea Directorate, The Netherlands
Koos Visser	Health, Safety and Environmental Management Consultant, The Netherlands
Anne Kjersti Frøholm	Ministry of Foreign Affairs, Norway
Øystein Aardnevik	Ministry of Petroleum and Energy, Norway

Steinar Nesse (DNV, Norway) served the Steering Committee as rapporteur and secretary.

Martin C.Th. Scholten (TNO, the Netherlands) advised the Steering Committee on technical issues, and was responsible for the compilation of this background document.

Appendices

Appendices

APPENDIX I            Basic Documents and Guidelines Concerning Environmental Practices in Offshore Oil and Gas Activities

APPENDIX II          Conclusions of the 1<sup>st</sup> Expert Meeting, Noordwijk (The Netherlands, 17-20 November 1997)

## APPENDIX I: Basic Documents and Guidelines Concerning Environmental Practices in Offshore Oil and Gas Activities

Organisation	Document	Topic			
		Env. Impact Assessment	Env. Management	Env. Technologies	Env. Reporting
OGP/UNEP	Environmental Management in Oil and Gas Exploration and Production (1997)	X	X	X	X
IUCN/OGP	Oil and Gas Exploration and Production in Mangrove Areas (1993).		X	X	
ARPEL	A Guideline for the Disposal and Treatment of Produced Water			X	
ARPEL	A Guideline for the Treatment and Disposal of Exploration and Production Drilling Wastes			X	
ARPEL	Guidelines for an Environmental Impact Assessment (EIA) Process			X	
AEPS (Arctic Council)	Arctic Offshore Oil & Gas Guidelines (1997)		X	X	
OGP	Exploration and Production Waste Management Guidelines (1993).			X	
OGP	Guidelines for the Development and Application of Health, Safety and Environmental Management Systems (1994).		X		
OGP	OGP Guidelines for the Planning of Downhole Injection Programmes for Oil-Based Muds Wastes and Associated Cuttings from Offshore Wells (1993)			X	
OGP	Quantitative Risk Assessment Data Directory (1996)			X	
OGP	The Physiological Effects of Processed Oily Drill Cuttings (1996).			X	
OGP	Technologies for Handling Produced Water in the Offshore Environment (1996)			X	
OGP	Production Water: Current and Emerging Technologies (1994)			X	
OGP	North Sea Produced Water: Fate and Effects in the Marine Environment (1994)	X		X	
Petroconsultants	Operational Discharges from Offshore Oil and Gas Exploration and Exploitation Activities: Regulatory Requirements and Enforcement Practices (1997)		X	X	
World Bank	Environmental Guidelines (1988, 1995).	X	X	X	
World Bank	Offshore Hydrocarbon Resource Drilling Operations –Effluent Guidelines (1983)			X	
API	Chemical Treatments and Usage in Offshore Oil and Gas Production Systems, Offshore Effluent Guidelines (1989)			X	
API	Safety and Environmental Management Programme (Semp) (1993)		X		
IAGC	Environmental Guidelines for World-wide Geophysical Operations (1992)	X	X	X	
The Joint Links Oil and Gas Consortium	Polluting the Offshore Environment (1996)	X		X	
WWF	The Application of Strategic Environmental Assessment in Relation to Offshore Oil & Gas Resource Exploration (1998)	X		X	
WWF	The Application of EIA in Relation to Offshore Oil and Gas Exploitation (1998)	X		X	

APPEA	Environmental Implications of Offshore Oil and Gas Development in Australia- The Findings an Independent Scientific Review (1994)	X	X	X	
OGP	View of environmental impact assessment	X	X		
WWF	Environmental Best Practice and the Move Toward Zero Discharge in the Offshore Oil and Gas Industry			X	
OGP	Implementation of HSE Management Systems Workshop Proceedings (1999)		X		
OGP	HSE Management - Guidelines for working together in a contract environment (1999)		X		
SustainAbility/UNEP	Engaging Stakeholders 1998:The Non -Reporting Report (1998)				X
SustainAbility/UNEP	The Oil Sector Report (1999)				X
Bennet & James (editors)	Sustainable Measures. Evaluation and Reporting of Environmental and Social Performance. Greenleaf Publishing Limited. (1999)				X
OGP	Guidelines on venting and flaring and produced water injection			x	
UNEP/ICC/FIDC	Environmental Management System Training Resource Kit, Version 1.0		x		

## Appendix II: 1<sup>st</sup> EXPERT MEETING, NOORDWIJK (THE NETHERLANDS), 17-20 NOVEMBER 1997

### CONCLUSIONS OF THE JOINT CHAIR

There were two main products from the meeting, namely:

1. The Technical Meeting Document - consisting of an update of the Technical Background Document and the Working Session Reports.
2. The Conclusions of the Joint Chair - based on conclusions from each Working Session Report.

The conclusions of the Joint Chair will be forwarded to the United Nations Commission for Sustainable Development (UN-CSD) by the joint organisers (Brazil and the Netherlands). The Steering Committee will publish the Technical Meeting Document in December 1997.

### CONCLUSIONS OF THE JOINT CHAIR

The offshore oil and gas industry operates in the context of a multitude of social, economic, physical and environmental factors, according to the principles of Sustainable Development and the Precautionary Approach, as articulated in Agenda 21 and the Rio Declaration on Environment and Development. The balance between these varies from region to region; companies and joint-ventures operate on a global-scale in strong world market competition, as well as in the context of global and regional conventions.

The main objective of Environmental Management Principles at company, national and regional level is to minimise environmental impacts and to identify negative impacts on the total environment including socio-economic issues.

A regulatory framework concerning offshore operations should not be based only on environmental regulations concerning critical requirements, but should encourage the industry to assume its responsibility to achieve agreed goals with respect to their environmental practices under local and regional conditions. Sharing of experience and expertise is important and effective in identifying sound Environmental Practices under these local conditions.

It has to be taken into account that development of state of the art technologies and better understanding of environmental sensitivities requires a flexible approach to the development of regulatory controls, allowing for a case-by-case determination of environmental standards and targets which accommodate a self-regulatory approach.

The concept of "Sustainable Development" can be made operational in the form of a joint development of environmental best practice guidelines in offshore oil and gas activities, obtained through open discussion between industries, governmental organisations and other interested parties within the framework of regional or local environmental and socio-economic conditions.

Although it is primarily the responsibility of governments to organise and maintain the discussion, it is a shared responsibility of governments, industry, and other interested partners to define the outcome and to review the implementation.

Companies should have, and behave according to, an integrated vision on production, safety, health and environment, regardless of where in the world they are active.

**A Offshore E&P activities have local impacts on the marine environment, the extent and nature of which depend on the local environmental the operational practices.**

- The degree of the potential impact of offshore oil and gas activities on the marine environment is considered to be largely local, but varies between ecosystems. The significance of the potential cumulative environmental impact of offshore activities can be related to the density of operations in perspective of the sensitivity of the local ecosystem.
- Prior assessment is important and baseline assessments/studies valuable to predict impacts.
- The verification of impacts by monitoring ,for which a number of methodologies are available, is important. In some areas, however, this is hampered by lack of monitoring or inadequate monitoring techniques.

**B The industry has developed methods and technologies for the management of drilling and production activities, E&P chemicals and wastes, in order to minimise environmental impacts.**

**Drilling management**

The objective of environmental management of drilling operations is to minimise potential environmental impacts.

- There are now drilling technologies that offer opportunities for minimising environmental impacts, but not all are applicable in every drilling operation.
- Opportunities to use these technologies are among the elements to consider in preparing the drilling plan.
- It is important to facilitate research and development to improve drilling technologies and achieve the overall objective as stated above.

**Produced Water Management**

The objective of environmental management of produced water is to reduce the quantity and to improve the quality of discharged produced water.

- There is to date no universal solution for the treatment of produced water. There is a need for further experience and information exchange on the use of different technologies associated with produced water.
- Integrated produced water management should be based on the following prioritised strategies:
  - 1) Prevent the production or inject produced water for reservoir pressure maintenance.
  - 2) Inject produced water for disposal, if energy requirements do not cause more environmental trade-offs.
  - 3) Minimise waste production.
  - 4) Treat and dispose remaining production water.
- Integrated produced water management would also require the minimisation of hazardous chemicals used in the treatment process.

- Integrated produced water management should take into account specific local conditions and engineering limitations.
- The industry should continuously seek to develop new technologies, but also implement the optimal utilisation of existing technology and resources including continuous training of personnel.

### **E&P Chemical Management**

The objective of environmental management of E&P chemicals is to minimise or optimise the use of chemicals or substitute less toxic chemicals, taking into account the effect this may have on production capability, health and safety.

- E&P Chemical management is an integral part of the environmental management system as a whole.
- There is a need for expert judgement and the development of control systems based on both hazard and risk assessment. Methods for the environmental hazard and risk evaluation of E&P chemicals are presently available.
- A critical factor for assessment of chemicals, whichever management process is adopted, is the proper consideration of local and regional environmental conditions. Due account must be taken to lists of prohibited or approved chemicals (e.g., annexes to the London Convention). Further development of such lists need clear criteria for selection of substances. In this respect the persistence of substances, or of their metabolites, is identified as an important factor.
- Transparency and reporting of information is important in the communication with relevant stakeholders.

### **Other Waste Management**

The objective of waste management for offshore activities is to minimise the environmental impact of discharges and disposal of trash, solid and hazardous waste.

- It is important to implement the following waste management hierarchy:
  - 5) Minimise
  - 6) Reduce, Recycle and Recover
  - 7) Treatment
  - 8) Disposal or Discharge
- A lack of adequate infrastructure is likely to present a challenge to the processing of wastes. Industry is responsible for E&P waste management. National authorities should have a regulatory role to facilitate the establishment of appropriate onshore infrastructure.

**C Strategies and Policies aimed at integrating sound environmental practices into the total management of offshore operations depend on the implementation of Environmental Management Systems (EMS), at company level, in compliance with environmental management at national, regional and global level (legislation, conventions respectively sustainable development). Environmental Impact Assessment (EIA) is an adequate tool to ensure that protection of the marine environment is considered in the planning of offshore oil and gas activities.**

### **Strategies and Policies**

- Incentives should be given to the industry to take responsibility in achieving agreed environmental goals. A goal-based approach requires the identification of environmental impacts of E&P activities, agreement on environmental objectives for a specific area or region, and the establishment of plans as to how the objectives should be reached. This approach provides industry with more flexibility, responsibility and accountability. Some complementary prescriptive measures are still required in order to address some specific issues. Measures in one country may not necessarily be appropriate in other areas or countries.
- A consultative process involving governmental, petroleum and environmental agencies, the petroleum industry and other stakeholders, on a local and national level, would be an appropriate approach in establishing environmental objectives.
- It is the governmental responsibility to ensure that agreements at regional level should embody standards and environmental objectives in accordance with the consultative process at local or national level.
- Industry guidelines can play an important role in meeting the commitments under a goal-based regime. The guidelines should be developed in a consultative process with governments and other interested parties such as NGOs, when applicable.
- Areas vulnerable to the impacts of offshore oil and gas activities, and environmentally sensitive areas should be assessed and protected accordingly. Such areas need to be determined on a local, national or regional level, as appropriate.

### **Environmental Management Systems, EMS**

- The overall aim of operators in managing the environmental impact of their offshore oil and gas activities should be three-fold:
  - 9) to meet the requirements imposed by the regulatory system(s) under which they operate
  - 10) to achieve control of all known environmental risks through the application of due diligence
  - 11) to continuously improve their environmental performance.
- EMS should be part of an integrated overall management system.
- Operators should aim to develop EMSs which can be accepted by the competent regulatory agencies (“the regulators”) as being well designed, properly resourced and organised and effectively implemented for the purpose of promoting good environmental performance. The emphasis on regulation can move from prescriptive measures towards setting the standards and leaving the choice of means to the operators.
- Transparency is required for the establishment of the standards which must be achieved, the levels of performance to which the operators are committed and the evaluation of whether those standards and performance levels have been achieved.
- The ISO 14000 series can offer a useful approach for an operator in developing an acceptable Environmental Management System. The Guidelines for the Development and Application of Health, Safety and Environmental Management Systems, produced by the E & P Forum in 1994, is a valuable guidance in further developing guidelines in consultation with stakeholders.
- The effectiveness of Environmental Management Systems will depend crucially on establishing a clear set of links between policies, objectives, targets and indicators, so that the translation of one into the other can be followed and checked.
- To reassure the public that the offshore oil and gas industry is applying sound environmental practices, it is essential that there is an evaluation of the implementation

of Environmental Management Systems, in particular, performance against targets. While companies are reporting on their individual environmental performances, there is a need to develop means for reporting on the collective impact of companies in a region.

### **Environmental Impact Assessment, EIA**

- The scope of EIA in the management of E&P activities, from seismic exploration to decommissioning, is:
  1. To apply EIA to all development steps;
  2. To aim at meaningfully protecting socio-economic structures and the environment;
  3. To consider cumulative effects on the receiving environment.
- When an EIA is applied, it should be considered in the implementation of the EMS.
- It is necessary to include an assessment of the socio-economic impacts of onshore developments related to offshore activities at all stages of exploration and production.

**D     Sharing of information (including experience and expertise) in a global network is a key factor in ensuring the development of good environmental practices within regional approaches to achieve "sustainable development", and in perspective of the global context of multinational operations, world market competition and enforcement of global conventions.**

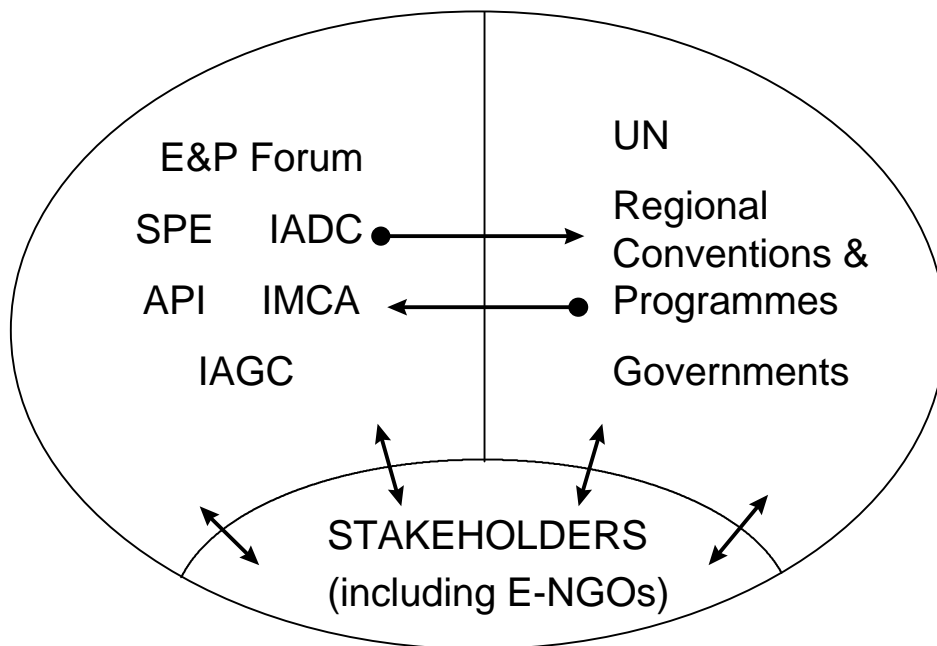
### **Future Exchange of information and experiences**

- Regulatory agencies in many developing countries have limited economic resources to carry out sufficient control and enforcement. There is, therefore, a recognised need for instruments to improve the supervisory and regulatory role of such agencies. Companies operating in these areas should be proactive and operate in an environmental sound manner, even if national legislation proves to be inadequate.
- Information exchange and sharing of experience is a key point for further development of measures related to offshore industry. This work has to be built on experience and lessons learned in different countries. The information exchange between developed and developing countries is of particular importance.
- Offshore operators, non-governmental organisations and the general public share an interest in promoting good environmental practice. The development of such good environmental practice depends crucially on the availability of the relevant information, practical experience and scientific and technical expertise.
- This International Expert Meeting has brought together a wide range of people who between them possess a wealth of information, experience and expertise. The quality of the resulting discussion demonstrates the benefits of access to such a resource.
- Information, experience and expertise is needed to set environmental goals and develop environmental management systems. It is important that regulators, operators, non-governmental organisations and the interested sectors of the public have access to this.
- A large body of information already exists. This takes the form of, not only legislation, guidelines, reports and performance data, but also conference proceedings and

workshops and research results. However, this is not organised in a manner which make it easy for those concerned to access the relevant information, or even to be aware of its existence.

- The development of good environmental practice in the offshore oil and gas industry will be facilitated by the creation of a voluntary arrangement from which all concerned parties can benefit and which will provide a prompt and effective way of making relevant new material generally available. In this context initiatives of the Expert Meeting are welcomed.
- It was proposed to establish a group consisting of representatives of the Netherlands, as organisers of this International Expert Meeting, the UN Environment Programme, as one of the main international agencies involved, the E & P Forum, on behalf of the offshore operators, and a relevant non-governmental organisation to develop an initiative in this field. It was welcomed that SPE is willing to share its experiences in technological information exchange. However, it is advisable to include a small number of additional representatives of other organisations and bodies which are ready to support the initiative. They should aim to develop a clear, simple plan for such an arrangement by the time of CSD VI, together with a solution to the question of how it can be resourced within existing constraints.
- Future exchange of information should be based on the “Sharing Experience Diagram” (see below) by making use of existing fora, rather than creating new ones. Information exchange can be facilitated through the use of tools such as a clearinghouse under the auspices of the United Nations.

### *Sharing Experience Diagram*



- The success of the International Expert Meeting in creating a forum for the free exchange of information, experience and ideas between regulators, the offshore

petroleum sector, inter-governmental and non-governmental organisations, suggests that efforts should be made to ensure that similar meetings take place on a periodic basis in the future. Exchange of information, experience and expertise can be promoted by face-to-face contact, which is not possible on paper or by electronic means. Discussion of differing points of view and examination of the justifications for them enable real progress to be made. It is advisable that regional meetings serve as a complement to the existing information structure on a global level to ensure regional participation.