

**ENVIRONMENTAL MANAGEMENT SYSTEMS AND  
INTERNATIONAL ENVIRONMENTAL STANDARDS  
IN THE OFFSHORE OIL AND GAS INDUSTRY**

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Herndon, VA 20170- 4817**

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**Prepared By:**

**Environmental and Safety Solutions, Inc.  
445 Spoonbill Lane  
Melbourne Beach, FL 32951  
321-722-1740**

**Robert R. Sands CHMM, REPA  
Principal**

**Douglas B. Weinfield Esq.  
Associate**

**Susan Rost MBA, MPH  
Environmental Management Strategies**

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This report reflects the research and opinions of Environmental and Safety Solutions, Inc and the authors individually or jointly, and not the views of any other organization.

MMS, NEW ORLEANS DISTRICT OFFICE

MMS, NEW ORLEANS OFFICE OF SAFETY MANAGEMENT

BP / AMOCO

CHEVRON U.S.A. PRODUCTION COMPANY

DEVON ENERGY CORPORATION

EXXONMOBIL PRODUCTION COMPANY

HALLIBURTON COMPANY

SCHLUMBERGER OIL FIELD SERVICES

SHELL EXPLORATION AND PRODUCTION COMPANY

## INTRODUCTION

The Department of the Interior, Minerals Management Service (MMS) contracted with the firm of Environmental and Safety Solutions Inc. to collect, analyze and report information on Environmental Management Systems (EMS) and international environmental standards used by the offshore oil and gas industry. The purpose of the report is to:

- Improve MMS understanding of EMS and their applicability to the offshore oil and gas industry.
- Educate MMS personnel on the potential value of environmental management systems based on international standards, particularly ISO 14001.
- Support MMS in better defining the relationship between international environmental standards and environmental management systems.
- Support MMS in determining how international environmental standards and environmental management systems will be used in the regulation of offshore oil and gas activities.
- Provide a vehicle to strengthen the understanding of ISO 14001 and EMS among companies conducting offshore oil and gas activities

Although a number of EMS standards and principles have been proposed domestically and internationally, the ISO 14001 Standard for EMS has achieved worldwide acceptance and adoption. Therefore, the research involved with this project focused primarily on the applicability of ISO 14001 to the offshore oil and gas industry.

Section 1.0, Aspects of ISO 14001, describes the relevant aspects of the ISO 14001 system including: (1) standard development (2) operational structure and certification trends, (3) U.S. ISO 14001 activities compared with those in Western Europe and the rest of the world, (4) comparability with ISO 9000, (5) application to the offshore oil and gas industry and (6) a comparison between ISO 14001-compliant EMS and MMS regulations. This information was developed from research in existing literature and the industry experience of the project team.

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The information provided in Section 2.0, Impact of ISO 14001 on the Offshore Oil and Gas Industry, was developed as a result of meetings, interviews and discussions with representatives of the Minerals Management Service New Orleans District Office, industry representatives, visits to offshore platforms, literature research, and the Environmental and Safety Solutions, Inc team's relevant knowledge of the oil and gas industry.

The recommendations offered in Section 3.0 of the report are for the consideration of MMS; they do not represent any position on the part of MMS.

# **EXECUTIVE SUMMARY**

## **ENVIRONMENTAL MANAGEMENT SYSTEMS AND INTERNATIONAL ENVIRONMENTAL STANDARDS IN THE OFFSHORE OIL AND GAS INDUSTRY**

### **Background**

The purpose of this report is to provide information and insight into the role of environmental management systems (EMSs), particularly EMSs that conform to the ISO 14001 international EMS standard (ISO 14001), in the offshore oil and gas (OO&G) industry. ISO 14001, developed by the International Organization for Standardization (ISO), has its roots in the 1980s, when a number of nations established EMS requirements to promote responsible environmental management, in response to divergent and often inadequate environmental management practices resulting in inadequate control of industrial externalities. The initial version of ISO 14001 was published in 1996.

ISO 14001 registrations in the United States have increased by 170%, 270%, and 125% over the past three years for which data is available. Many firms have implemented an EMS that conforms to part or the entire ISO 14001 EMS standard; some have chosen to have their conformance certified by an accredited third-party registrar. This certification is not an ISO 14001 requirement; an organization may demonstrate conformity with ISO 14001 via either a self-declaration to the standard, or audit and certification/registration of its EMS by third-party organization. In the U.S., governmental agencies generally are evaluating ISO 14000, with some pilot projects underway.

The attitude of the oil and gas companies with respect to third-party registrars and auditors parallels that of industry in general. While recognizing the value and credibility of an independent review of their EMS, some companies interviewed during this project preferred to use internal resources to audit their processes while others are pursuing third - party certification. This is the result of the belief that external registrars and auditors do not understand the business and are not qualified to evaluate their systems, as well as the cost of the audit. However, if a company's customer or a

country where a company does business requires registration (or certification), the companies are pursuing third-party registration for the specific location and operation.

Although it is widely believed that conformance with ISO 14001 can translate into financial and marketing benefits, as well as improved environmental performance, this has yet to be effectively quantified. However, because of the value of an EMS as a management tool, ISO 14001 is becoming a globally accepted business standard. Thus, an ISO 14001 *conformant* EMS may, over time, become a defacto requirement for doing business in much of the world—even if third-party *certification* does not. Until such time as the benefits to certification can be demonstrated and quantified, many companies interested in ISO14001 will choose to generally conform to the ISO 14001 requirements, but not formally register their EMSs.

### **Why Companies Go Beyond Compliance**

There are numerous drivers for companies or facilities to engage in environmental management activities that go beyond compliance. OO&G E&P companies cited the following drivers, among others:

- Improved relations with regulators.
- Customers requirements
- Company experiences with a series of incidents or observation of incidents such as the Bhopal disasters or the Exxon Valdez spill.
- Access to some areas of the world where specialized environmental programs are preferred.
- Integration of environmental activities into other management programs, especially occupational health and safety.

### **ISO 14001 and OO&G Activities**

Although there is some correlation between the ISO 14001 standards and the MMS regulations governing offshore oil and gas production, the differences in development and purpose between the ISO 14001 standard and the MMS regulations make direct correlation between the two difficult. However, some sections of ISO 14001 do correlate.

A number of petroleum extraction and production companies and related companies have adopted or are developing a Health, Safety and Environmental (HSE) MS which includes elements of SEMP/RP-75, E&P Forum HSE MS guidelines, and ISO 14001. An important difference between the ISO 14001 model and other tools such as SEMP or HSE Case Management is that the former uses hazard-based rather than risk-based criteria in determining the significance of an environmental issue, and hence takes into account a wider range of possibilities.

Literature research, and interviews with oil and gas companies and oil and gas contracting companies, suggests that the regulations MMS is charged with enforcing have little or no impact on the adoption of ISO 14001. While many of these regulations are compatible with ISO 14001, the regulations themselves do little to support or inhibit a company's decision to adopt an ISO 14001 or any other EMS. However, the regulations have the potential to be revised to encourage companies to adopt an ISO 14001 EMS.

Certain broad trends are visible. Larger offshore operators are moving towards establishing unified health, safety and environmental management systems. The systems of the large companies interviewed for this report are generally more robust than those of the mid-size and small companies interviewed. The management systems of the mid-sized companies primarily focus on SEMP. Smaller companies typically direct their resources towards compliance with regulations and not the development of environmental or safety management systems (SMS). Currently, some of the large companies interviewed indicated a preference for contractors with robust EMS and HSMS because these management systems can lower the company's risk for injury to personnel and/or environmental liability.

If MMS finds it beneficial to encourage and support the development and implementation of the EMS / ISO 14001 approach in the OO&G industry, it may wish to explore several options including: regulatory revisions, expanding SEMP to strengthen its environmental components, developing incentives for companies that implement EMSs and demonstrate beyond compliance performance, support of mentoring and information sharing across companies, and allowing electronic record-keeping and reporting.

## METHODOLOGY

The information provided in the report was developed from a variety of sources, including literature research, Internet research, numerous telephone and in-person interviews, multiple site visits, conversations with industry and Minerals Management Service (MMS) personnel, and the 40+ years of combined experience of the project team. The project team worked over a period of eight months to prepare this report, using in-person meetings, platform visits, telephone conference calls, and e-mail to ensure the accuracy and completeness of the final report.

Section 1.0, Aspects of ISO 14001, is primarily based upon off-site research, drawing upon:

- Existing books and publications,
- Annual reports from oil and gas companies operating offshore facilities,
- Internet documents,
- MMS regulations,
- In-house expertise and research files, and
- Previous publications and other writings by the project team.

In addition, information was acquired from ISO registrar organizations and the oil and gas industry associations.

Section 2.0, Impact of ISO 14001 on the Offshore Oil and Gas Industry, is based, in addition to the sources listed above, on information gained from:

- Interviews and discussions with representatives of the MMS Gulf of Mexico OCS Region, New Orleans District Office,
- Interview with representatives of the Minerals Management Service, Office of Safety Management,

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- Interviews with seven offshore oil and gas company representatives including:
  - 4 large E&P companies
  - 2 service companies
  - 1 medium and
  - 1 small company
- Visits to 3 offshore platforms, including interviews of on-site personnel,
- Conversations and correspondence with industry representatives, including numerous medium and small companies, and
- Literature research and the team's relevant knowledge of the oil and gas industry.

The interview notes were forwarded to the participating OO&G company representatives for review and comment to ensure the accuracy of the information acquired during the interviews. In addition, a draft version of the report was transmitted to OO& G industry participants to solicit their comments. After review of these comments by the project team, a small number of edits were made to the final report to clarify some points and to ensure technical accuracy.

Final review and comment on the draft report was conducted by the Minerals Management Service, Herndon, Virginia.

**ACRONYMS**

<b>ANSI</b>	American National Standards Institute
<b>ANSI-RAB NAP</b>	American National Standards Institute - Registrar Accreditation Board National Accreditation Program
<b>API</b>	American Petroleum Institute
<b>BS7750</b>	British Standards Institute Environmental Management Systems Standard
<b>CFR</b>	Code of Federal Regulations
<b>E&amp;P</b>	Exploration and Production
<b>EAR</b>	Environmental Auditing Roundtable
<b>EHS</b>	Environmental, Health and Safety
<b>EMAR</b>	Eco-Management and Audit Regulation
<b>EMAS</b>	Eco-Management and Audit Scheme
<b>EMP</b>	Environmental Management Program
<b>EMS</b>	Environmental Management System
<b>EPA</b>	US Environmental Protection Agency
<b>EPE</b>	Environmental Performance Evaluation
<b>EU</b>	European Union
<b>EVABAT</b>	Economically Viable Application of Best Available Technology
<b>GM</b>	General Motors Corporation
<b>HSE</b>	Health, Safety and Environmental
<b>HSE MS</b>	Health, Safety and Environmental Management System
<b>HSMS</b>	Health and Safety Management System
<b>INC</b>	Incident of Non-Compliance
<b>ISO</b>	International Organization for Standardization
<b>LWDI</b>	Lost Work Day Incident
<b>MBO</b>	Management by Objective
<b>MITI</b>	Ministry of Trade and Industry (Japan)
<b>MMS</b>	Minerals Management Service, US Department of Interior
<b>MS</b>	Management System

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<b>NAP</b>	National Accreditation Program
<b>NGO</b>	Non-Governmental Organization
<b>NPDES</b>	National Pollution Discharge Elimination System
<b>OGP</b>	International Association of Oil and Gas Producers
<b>OIMS</b>	Operations Integrity Management System
<b>OO&amp;G</b>	Offshore Oil and Gas
<b>OSFR</b>	Oil Spill Financial Responsibility
<b>OSHA</b>	Occupational Safety and Health Administration
<b>QMS</b>	Quality Management Systems
<b>RAB</b>	Registrar Accreditation Board
<b>SAGE</b>	Strategic Advisory Group on the Environment
<b>SDO</b>	Standards Developing Organization
<b>SEMP</b>	Safety and Environmental Management Program
<b>SMS</b>	Safety Management System
<b>TAG</b>	Technical Advisory Group
<b>TC</b>	Technical Committee

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# **ENVIRONMENTAL MANAGEMENT SYSTEMS AND INTERNATIONAL ENVIRONMENTAL STANDARDS IN THE OFFSHORE OIL AND GAS INDUSTRY**

## **1.0 ASPECTS OF ISO 14000**

### **1.1 DEVELOPMENT AND COMPARISON TO OTHER STANDARDS**

#### **1.1.1 Development of the ISO 14000 Standards**

The International Organization for Standardization (ISO) is a non-government organization, headquartered in Geneva, Switzerland, that develops and promotes international business standards through a consensus process of its member countries. The origins of ISO can be traced to 1946, when 100 member countries established the organization in Geneva. ISO's purpose is to harmonize international standards for goods and services, thereby lowering barriers to international trade. Perhaps the most familiar ISO standard applies to film speeds, such as ISO 200 and ISO 400. Each ISO member country is represented by its domestic national standards body.

The development of a set of ISO standards begins with the selection of an issue by the ISO Technical Management Board. Following the selection of an issue, a Technical Committee (TC) is formed to gather data, exchange ideas, and develop the initial position papers. Further development generally occurs in various TC subcommittees, which work to develop technical or other (i.e., management system) standards. Technical Advisory Groups (TAGs) are established in participating nations by the standards development organizations in those nations.<sup>1</sup> In the United States, the American National Standards Institute (ANSI) serves as the U.S. representative to ISO and administers the U.S. delegation's TAGs to ISO. Membership on the U.S. TAG is open to individuals, industry, and groups.<sup>2</sup>

**The ISO 14000 set of standards specifies the methods to manage environmental issues and impacts.**

<sup>1</sup> In the case of the ISO 14000 series of standards, the TCs included groups to develop standards for the EMS itself, product claims, audits, and other environmental issues. Each TC subcommittee addresses one standard.

<sup>2</sup> Weinfield, D., ISO 14000: An Overview, Legal Analysis & Regulations (MAPI, April 1995).

ISO 14000 is a set of standards some issued and some under development -dealing with environmental issues. While the standards are individually numbered 14001, 14004, 14012, and so forth, the set is generically referred to as "ISO 14000." The ISO 14000 standards do not establish a specific level of environmental performance, as do the familiar U.S. EPA emission standards. Rather, they specify methods to manage environmental issues and impacts. The ISO 14000 standards address issues involved in

- environmental management systems (ISO 14001-4),
- environmental auditing (ISO 14010-15),
- environmental performance evaluation (ISO 14030-31)
- environmental claims made on product labels (ISO 14020-24), and
- life cycle assessment (ISO 14040-43),

as well as other areas.

**ISO 14001 has its roots in the management of uncontrolled environmental externalities, cross-border pollution, and the proliferation of EMS standards.**

The origins of the ISO 14001 standard can be traced to the 1980s, when in response to divergent and often inadequate environmental management practices resulting in inadequate control of industrial externalities, a number of nations established environmental management system (EMS) requirements to promote responsible environmental management. Fundamentally, an EMS uses a management by objective (MBO) approach to integrate environmental management into the organization's operations, rather than have it be strictly a compliance-based responsibility of a corporate manager.

Some nations, including the Netherlands, Sweden and the United Kingdom, had ensured that companies operating in their nations controlled their environmental impacts through the implementation of environmental management system regulations. Due to the migratory nature of much pollution, these nations still faced environmental impacts from countries that did not have the same environmental values and pollution control requirements. EMSs were developed in European countries as a method to encourage environmental responsibility by companies operating in nations with relatively few or ineffective environmental rules and regulations, and to improve environmental performance

in all companies. In essence, preferential treatment would be given to suppliers that conformed to the customer's EMS model. Through use of EMSs, it was thought that the trans-national environmental impacts of these industries could be minimized.<sup>3</sup>

It was theorized that an EMS could be used in a manner that extended beyond national boundaries, to encourage international suppliers of products and services to implement these systems. Slowly, different EMS standards evolved, with one of the more popular being the British Standards Institute Environmental Management Standard BS 7750. Over time a number of different national EMS standards evolved, some of them from countries with a history of restricting imports, including France, Germany, and Japan.

Multinational companies saw the development of the growing number of EMS standards as a non-tariff trade barrier, resulting in a call for ISO to develop environmental management standards.<sup>4</sup> At the same time, following several environmental disasters, (i.e., Exxon Valdez and the Union Carbide catastrophe in Bhopal, India), environmental groups were calling for some demonstrable means of environmental control. These groups asserted that multinational companies were applying a lower level of environmental diligence when they operated outside of their home countries' national boundaries.

In 1991, ISO, as an organization created to develop international standards, established a Strategic Advisory Group on the Environment (SAGE) to study divergent national environmental standards and programs and their potential impact on trade. In 1992, the Rio Conference<sup>5</sup> called for increased social and corporate management environmental responsibility as the result of a number recent environmental disasters. The Rio Conference developed the "Charter for Sustainable Development."

In 1993, ISO formed Technical Committee (TC) 207 to develop environmental management standards and tools. These international EMS standards would utilize the

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<sup>3</sup> Weinfield, D., Rost, S., Companies Find Range of Reasons to Take Various Standards on ISO 14000, Legal Analysis & Regulations (MAPI, Sept. 1998).

<sup>4</sup> Thirty billion dollars of U.S. exports are lost annually due to various types of technical standards that cause trade barriers, and every billion dollars of exports lost translates to the loss of 20,000 jobs. Sergio Maza, President, American National Standards Institute (ANSI), "ISO 14000 Update Seminar," April 1996. Prevention or elimination of trade barriers and veiled trade barriers (such as national environmental management system standards or eco-labeling criteria) was the principle driver for the U.S. position during the development of the ISO 14000 environmental management standards.

<sup>5</sup> The Rio Conference, formally "The United Nations Conference on Environment and Development, was widely viewed as a key point in developing support for EMSs. Frankel, C., In Earth's Company, 45 (New Society, 1998).

ISO 14000 numbering system. In 1996 the initial version of the International Standard for Environmental Management Systems (ISO 14001) was published.<sup>6</sup>

As with other ISO standards, the ISO 14000 family of standards was developed through a consensus process. Through participation on the Technical Committee (TC 207), and the Technical Advisory Groups (TAGs), large industry, including the petroleum industry, heavily influenced the development of the standards. Although environmental groups and other non-governmental organizations (NGOs) were interested, generally they did not have the resources to attend all of the meetings nor were they organized to present a coherent position on issues.

Since the issuance of the 14001 International Standard in the fall of 1996, many firms have implemented part or most of the ISO 14001 EMS standard and some firms have chosen to have their sites certified by an official third-party registrar.

Globally, some of the nations with the most sites that are certified to ISO 14001, as of December 31, 1999, in various regions are: Japan, 3015; United Kingdom, 1492; Germany, 962; Sweden, 851; Australia, 708; USA, 636; Spain, 573; Switzerland, 543; Finland, 470; France, 462; Republic of Korea, 309; Brazil, 165. The industry segments with the most sites certified include Electronics; Transportation; Defense; Metal Products; Energy - Petrochemical; Automotive Parts; Paper-Forestry products and Packaging; Retail, and Chemical.<sup>7</sup> Additional statistics are provided in Section 1.3 and at Tab 1.

### **1.1.2 Comparison to EMAR/EMAS and BS 7750**

A number of nations, including France, Ireland, and the United Kingdom, have developed EMS regulations. However, the most powerful force driving the internationalization of EMS legislation was the Eco-Management Audit Regulation/Scheme (EMAR/EMAS), the European Union (EU)<sup>8</sup> environmental management standard.<sup>9</sup>

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<sup>6</sup> Weinfield, D., Rost, S., Companies Find Range of Reasons to Take Various Standards on ISO 14000, Legal Analysis & Regulations (MAPI, Sept. 1998).

<sup>7</sup> ISO Survey of ISO 9000 and ISO 14000 Certificates: Ninth Cycle – 1999; International Organization for Standardization (ISO), 7-10, 15, [www.iso.ch](http://www.iso.ch) (available 26 July 2000).

<sup>8</sup> The EU block of nations has a combined population over 350 million and a gross domestic product exceeding \$8 trillion. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom are EU member States. Facts and Figures on the European Union and the United States, [www.eurunion.org/profile/facts.htm](http://www.eurunion.org/profile/facts.htm) (available Jan. 5, 2001). Hungary and Poland have formally applied for membership. In addition to this market force Russia, and the EU signed a pact, "Partnership and Cooperation Agreement," (PCA) in 1994 to strengthen their economic ties.

The European Union's Eco-Management and Audit Scheme has been codified in the EU as the Eco-Management and Audit Regulation (EMAR). At this time, EMAR is a voluntary regulation for organizations in Europe, providing requirements for an EMS and environmental auditing program. EMAR is expected to increase compliance to European environmental regulations through public disclosure of performance objectives and the achievement of environmental protection objectives.

**An ISO 14001 conformant EMS can generally fulfill the requirements of EMAR/EMAS.**

Both EMAS and ISO 14001 are voluntary. However, the latter constitutes a globally applicable standard, while EMAS requires the existence of a "competent body," established by EU members, which is responsible for the registration of new companies and the coordination and enforcement of EMAS regulations. Competent bodies exist only in the EU, so EMAS can be brought to bear only within the Union, where a suitable institutional framework exists. Also, the target groups are significantly different. The ISO standard is more flexible since it is designed to apply to any organizational unit (even those representing non-production sectors such as services, administration, etc.), while EMAS is initially oriented towards manufacturing industries.<sup>10</sup>

EMAR/EMAS is a legislated environmental management standard that is a powerful influence when doing business with European countries. EMAR/EMAS stresses the importance of environmental management when evaluating suppliers, contractors, and vendors. At this time EMAR/EMAS is voluntary, but if businesses in electronics, aerospace, retail and other 'pollution generating' industries do not comply, the EU may make compliance with EMAR/EMAS mandatory.

The European Union has finalized a "bridge" document that will allow sites certified under ISO 14001 to qualify for EMAR/EMAS. Fifteen of the EU member nations signed a memorandum of understanding providing mutual recognition of each nation's ISO 14001 and EMAR/EMAS certification. Under the so-called "bridging document" issued by the European Committee for Standardization (CEN), the EU has agreed to utilize ISO 14001

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<sup>9</sup> While the EU's governance is similar to the United States federal model, key differences include the absence of a head of state and a constitution, and the differences in common defense arrangements. The EU possesses the power to create and enforce legislation without further review by individual nations. Member states relinquish a portion of sovereignty.

<sup>10</sup> What is EMAS? , [http://europa.eu.int/comm/environment/emas/intro\\_en.htm](http://europa.eu.int/comm/environment/emas/intro_en.htm) (available Dec. 10, 2000).

standards whenever feasible. Thus, an ISO 14001 conformant EMS can generally fulfill the EMS requirements of EMAR/EMAS.

While EMAR/EMAS and ISO 14001 both advocate a systematic integrated approach to environmental management intended to minimize an organization's negative environmental impacts, they do differ. The most often mentioned differences are:

- EMAS requires companies to produce a public statement, verified by a third party, that identifies its environmental emissions.
- EMAS can be somewhat more performance-oriented.
- EMAS is site-related.

Hence, EMAR EMAS is potentially stricter than ISO 14001, which focuses mainly on EMS development and improvement. In particular, the requirement for a public statement is unattractive to U.S. companies, due to the relatively high risk of litigation in the U.S.

These differences largely are the result of the following:

- The European Union is less litigious than the U.S., so the requirement for disclosure in EMAR/EMAS engenders less concern about litigation. U.S.-based companies worked to block such requirements from ISO 14001, due to fears of litigation.
- The U.S. has very strict environmental legislation and regulations in place, so U.S.-based companies saw less of a need for the ISO 14001 requirements. Also, the U.S. requirements are generally national in nature, versus the diversity of requirements among the members of the European Union.
- ISO 14001 included in its development provisions that are designed for organizations from less affluent and less developed nations.
- Representatives from industry on the U.S. Technical Advisory Group (TAG)<sup>11</sup> were active in shaping ISO 14000.
- EPA played a role in the development of ISO 14000 as a member of the US TAG.

Overall, EMAS is more prescriptive and public than ISO 14001. (See Table 1, "ISO 14001 vs. EMAS Comparison.")

BS 7750 was a work in progress in 1991 when SAGE was discussing the issues associated with an international environmental management standard. In fact, BS 7750 was used as the model for ISO 14001 by SAGE and greatly influenced the standard.

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<sup>11</sup> A TAG is a consensus committee within a specific country responsible for developing a position for that country on a specific ISO 14000 standard.

However, unlike ISO 14001, BS 7750 was designed to be a standard that includes the regulatory requirements, rather than supplement the regulations.

With the release and adoption of EMAR / EMAS and the release of the ISO 14000 standards, adoption of the BS 7750 EMS standard decreased to the point where it has been supplanted by EMAR /EMAS and ISO 14001.

**TABLE 1**  
**ISO 14001 versus EMAR/EMAS**

<b>Requirement</b>	<b>ISO 14001</b>	<b>EMAS</b>
Initial Review		X
Periodic Public Environmental Statement verified by an accredited third party on environmental: policies, programs, objectives, management system, performance and significant issues including a summary on: Pollution emissions Generation of waste Consumption of: Raw materials Energy Water Generation of noise, odor, etc.		X
Emphasis on Economically Viable Application of Best Available Technology (EVABAT)		X
Allows for registration of more than one site under certification	X	
Commitment to continual improvement of environmental performance		X
Commitment to continual improvement of environmental management system	X	
Emphasis on supplier and vendor environmental performance		More strongly emphasized
Requirement of third-party certification		X
Commitment to "Prevention of Pollution"	More strongly emphasized	

## **1.2 OPERATIONAL STRUCTURE OF ISO 14001 AND CERTIFICATION TRENDS**

### **1.2.1 Structure of ISO 14001**

In today's business environment, most major corporations that impact the environment have an EMS in place to achieve their environmental goals. The trend is for EMSs to rely on a "management by objective" (MBO) philosophy, as opposed to the "command and control" approach which many companies earlier implemented in response to federal, state and local environmental regulations. The focused approach provided by an

EMS offers opportunities to mainstream environmental management into the culture of the company through the setting of objectives and targets, and by reviewing performance. This can result in an increased return on environmental expenditures, reduced risk, and improved efficiency.

Just as ISO 9000 establishes requirements for a company's management of quality, ISO 14001, the key standard in the ISO 14000 series, establishes the specific requirements for the management of environmental activities with an EMS that will comply with the ISO 14000 standards.

The specific requirements for an ISO 14001 EMS are provided below.

### **ISO 14001 4.2 - Environmental Policy Development**

“Top management shall define the organization's environmental policy and ensure that it:

- a) is appropriate to the nature, scale and environmental impacts of its activities, products or services;
- b) includes a commitment to continual improvement and prevention of pollution;
- c) includes a commitment to comply with relevant environmental legislation and regulations, and with other requirements to which the organization subscribes;
- d) provides the framework for setting and reviewing environmental Objectives and Targets;
- e) is documented, implemented and maintained and communicated to all employees;
- f) is available to the public.”

The Environmental Policy establishes the cornerstone for all of the other elements of an organization's EMS. The policy establishes broadly defined goals for environmental performance against which the effectiveness of the management system will be evaluated, provides a unifying vision for the organization, and considers all significant products/services and activities in its development. Because the policy statement can have a significant impact on the organization's image, it should be clear, verifiable, documented, effectively communicated and address three essential areas: compliance with laws and regulations; prevention of pollution; and continual improvement.

### **ISO 14001 4.3.1 - Environmental Aspects**

“The organization shall establish and maintain (a) procedure(s) to identify the environmental aspects of its activities, products, or services that it can control and over

which it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment. The organization shall ensure that the aspects related to these significant impacts are considered in setting its environmental objectives.

The organization shall keep this information up-to-date. The determination of the environmental aspects of an organization's operations, and the evaluation and identification of those that are significant, is the foundation on which the rest of the EMS rests.

**Aspects are those activities that may have an effect on the environment.  
Impacts are the actual changes or consequence of any aspect.**

Environmental **aspects** are those elements of an organization's activities, products, services or physical resources which may have potentially beneficial or harmful effects on the environment. Possible aspects include discharges and emissions (including aqueous emissions containing petroleum), raw materials and energy use, waste recycling, noise, dust, and visual pollution. Aspects can be produced by activities such as manufacturing processes, storage, transfer, transportation, utilities, and product related issues.

An environmental **impact** is the actual change due to the occurrence of any aspect. An impact is the consequence of the pollution that would result if an environmental aspect were not properly managed or controlled. Impacts include the **results** of emissions to air or water, hazardous waste, energy use, material use, as well as cosmetic and nuisance concerns, such as bio -accumulation and/or mortality in mammals, fish and invertebrates. Aspects are the causes and impacts are the results.

Some environmental aspects may not be governed by regulatory requirements. As an example, solid waste production and energy consumption, although not regulated by set governmental limits, are still aspects.<sup>12</sup> Once the environmental aspects have been identified, they are evaluated for their significance. A guideline or process is developed to identify those aspects that are "significant" and those that are not. Significant environmental aspects shall be considered when developing ISO 14001 objectives and targets. Identification of aspects is a continuous process of review, improvement and refinement.

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<sup>12</sup> There are two kinds of aspects: those that are a direct result of operations, and those that are indirect results of operations. Aspects are not necessarily negative and can also have a positive impact on the environment.

Once an organization's environmental aspects have been determined, and those that are significant have been identified, then the objectives and targets can be developed.

#### **14001 4.3.2 - Legal and Other Requirements**

"The organization shall establish and maintain a procedure to identify and have access to legal and other requirements to which the organization subscribes, that are applicable to the environmental aspects of its activities, products or services."

A procedure to identify legal requirements applicable to an organization should be established and maintained. This includes all laws and other requirements, including **self-imposed** requirements, such as industry standards, to which the organization adheres. An organization needs a process to identify, track and access the legal and other requirements applicable to its operations, and it needs to identify the process it uses to inform employees and others, such as subcontractors and suppliers, of any changes in legal requirements.

These requirements can include operating permits, federal, state, regional or local regulations, industry codes, customer requirements, or internal policies, procedures or guidance.

#### **ISO 14001 4.3.3 - Objectives and Targets**

"The organization shall establish and maintain documented environmental objectives and targets, at each relevant function and level within the organization. When establishing and reviewing its objectives, an organization shall consider the legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements, and the views of interested parties. The objectives and targets shall be consistent with the environmental policy, including the commitment to prevention of pollution."

Objectives and targets are established to meet the goals of the organization's Environmental Policy, and are based on the results of the environmental aspects development. The objectives and targets should aim at fulfilling the three commitments required by ISO 14001<sup>13</sup> and consider the financial, operational and business limitations of the organization. They must be developed within the scope of the environmental policy, and should quantify the organization's commitment to improving the environmental

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<sup>13</sup> These three commitments are continual EMS improvement, prevention of pollution, and compliance with legislative, regulatory and self-subscribed requirements.

performance of their operations. Typically, environmental **objectives** are broad in scope, are not themselves quantifiable, and consider issues such as the development of employee education and training, improved communication with other interested parties, and EMS development and registration. Environmental **targets** are more specific in intent such as the reduction of solvent use by X% in a year, or the reduction in waste volume of Y% over 4 years. To effectively determine performance, environmental targets should be set with specific time constraints and measurable performance parameters.

Objectives and targets support the development of measurable environmental performance indicators to be used by management to track the progress and performance of the ISO 14001 EMS. When coupled with audit reports, and changing circumstances (which can include economic changes), this provides the basis for a “Management Review” under ISO 14001 Section 4.5.6.

#### **ISO 14001 4.3.4 - Environmental Management Program(s) (EMP)**

“The organization shall establish and maintain (a) programme(s) for achieving its objectives and targets. It shall include

- a) The designation of responsibility for achieving objectives and targets at each relevant function and level of the organization:
- b) The means and time frame by which they are to be achieved. If a project relates to new developments and new or modified activities, products or services, programme(s) shall be amended where relevant to ensure that environmental management applies to such projects.”

The EMP is an action plan that defines how an organization will meet its objectives and targets. It identifies responsibilities, methods, and time frames for completion; incorporates environmental issues into the greater business management arena: and is communicated and tracked internally. The EMP develops specific, prioritized actions dealing with processes, products, services, projects, and facilities relevant to the identified environmentally significant aspects, objectives and targets.

The EMP ensures that the EMS objectives and targets are reached. An EMP should be integrated into the existing environmental management practices of the organization wherever possible, and tied into the strategic plan of the organization. Issues such as scheduling, resource allocation, and responsibilities should be included in the EMP to allow for the successful achievement of the objectives and targets. These issues must be

included in the program documentation so that the critical operational practices and responsibilities are reviewed and revised regularly.

### **ISO 14001 4.4.1 - Structure and Responsibility**

“Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective environmental management.

Management shall provide resources essential to the implementation and control of the environmental management system. Resources shall include human resources and specialized skills, technology and financial resources. The organization’s top management shall appoint (a) specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for

- a) ensuring that environmental management system requirements are established, implemented and maintained in accordance with this international standard;
- b) reporting on the performance of the environmental management system to top management for review as a basis for improvement of the environmental management system.”

In an effective EMS, individuals’ roles and responsibilities are clearly defined both in relation to objectives and targets and to the EMS as a whole. Top management must (1) provide adequate financial, staff and technical resources to ensure that the EMS can meet its established objectives and targets, and (2) appoint a management representative to oversee the operation of the EMS.

The management representative is an essential element of a successful program. He or she should have overall responsibility for meeting the requirements of the EMS, and should be charged with ensuring that changes in regulations and the firm’s environmental aspects/impacts are monitored and the system modified to address those changes.

The management representative’s role does not absolve line management from compliance responsibilities for regulations and operational requirements of the EMS. For example, line managers may be delegated the responsibility to develop detailed operating procedures which operations staff must follow. As the standard mentions in several places, EMS structure and responsibility should be designed to involve all relevant functions and levels throughout the organization.

### **ISO 14001 4.4.2 - Training, Awareness and Competence**

“The organization shall identify training needs. It shall require that all personnel, whose work may create a significant impact on the environment, have received appropriate training. It shall establish and maintain procedures to make its employees or members at each relevant function and level aware of

- a) the importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- b) the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;
- c) their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements;
- d) the potential consequences of departure from specific operating procedures.

Personnel performing the tasks which can cause significant environmental impacts shall be competent on the basis of appropriate education, training and/or experience.”

All employees (not only management) are to be trained in the specific environmental responsibilities that are directly related to the significant aspects, impacts, objectives and targets associated with their operations and activities and on the operation’s EMS. All employees and relevant contractors should receive awareness training on EMS content and purpose. New hires and re-assigned management are to be given appropriate training on the specific requirements of their new position, the equipment they will be expected to operate, its impacts on the environment and expected methods of operation.

### **ISO 14001 4.4.3 - Communication**

“With regard to its environmental aspects and environmental management system, the organization shall establish and maintain procedures for:

- a) internal communication between the various levels and functions of the organization;
- b) receiving, documenting and responding to relevant communication from external interested parties. The organization shall consider processes for external communication on its significant environmental aspects and record its decision.”

This section refers only to communication that is related to an operations’ environmental aspects and its EMS. To fulfill this element of the standard, both internal and external communication must be addressed. Internal communication is that communication within the organization or facility directly related to the environmental

aspects or the EMS. The standard requires communication at all relevant levels and functions within the organization. External communication is communication between the organization and interested parties outside the facility (e.g., EPA, clients, environmental organizations, NGO's, adjacent facilities or residents). To fulfill this element, the organization must have the following in place:

1. Procedure for internal communication on environmental matters
2. Procedure for external communication on environmental matters

Communication in an EMS includes the communication of internal and external environmental information to management, and the communication from management to others of its intentions regarding environmental impacts. An effective communication program can:

- Demonstrate management's commitment to the environment;
- Make others aware of the organization's environmental policy and commitment to environmental responsibility;
- Address external parties' concerns about the organization's environmental activities;
- Announce the organization's strategic environmental management approach; and
- Establish a line of communication that clearly defines emergency responsibilities.

Also, because employee suggestions are often effective in improving procedures and products, effective communication requires bottom-to-top as well as top-to-bottom flow of information. Effective communications can help an organization motivate staff, identify action to be taken regarding the environment, verify roles, responsibilities and procedures, monitor environmental performance, and identify potential areas for improvement.

Communication with external parties is also important for comprehensive management of an organization's environmental aspects. Often, through good external communications, problems with regulatory agencies and non-governmental organizations (NGOs) can be avoided. Further, communication from these sources may help in identifying relevant aspects, objectives and targets.

Facility top management, the management representative or the facility's public relations officer should be responsible for the release of information to third parties about environmental matters.

#### **ISO 14001 4.4.4 - Environmental Management System Documentation**

"The organization shall establish and maintain information, in paper or electronic form, to

- a) Describe the core elements of the management system and their interaction;
- b) Provide direction to related documentation."

The EMS does not need to be contained in one document. A "road map" to other documents will meet the requirements of the ISO 14001 standard. The EMS should be integrated into other business planning wherever opportunities present themselves and appear to be economically or strategically beneficial to the organization. However, to ensure conformance with the requirements of ISO 14001, all components of the EMS should be clearly and concisely documented.

The organization can choose to document its EMS in as simple or complex a manner as the organization wishes. EMS documents can be integrated with other management documents, such as health and safety manuals and quality manuals. Existing procedures may also contain related information.

#### **ISO 14001 4.4.5 - Document Control**

"The organization shall establish and maintain procedures for controlling all documents required by this international standard to ensure that

- a) They can be located,
- b) They are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel,
- c) The current versions of relevant documents are available at all locations where operations essential to the effective functioning of the environmental management system are performed,
- d) Obsolete documents are promptly removed from all points of issue and points of use, or otherwise assured against unintended use,
- e) Any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Documentation shall be legible, dated (with dates of revision) and readily identifiable, maintained in an orderly manner and retained for a specified period. Procedures and

responsibilities shall be established and maintained concerning the creation and modification of the various types of document.”

The organization can choose to establish an EMS document control system or utilize an existing control system.

Operational processes and procedures should be defined, documented and updated, especially those that establish control over significant environmental aspects. The single-manual approach may not work for EMS documentation. Rather, the EMS manual can be a road map to other associated documents. The EMS Manual should describe the structure of the EMS, where other related documents are located, and where records of performance can be found. It should be a “one-stop“ outline of all other sources of EMS documentation.

For the purposes of EMS registration, a firm must have documented proof of its activities as they relate to EMS practices.

#### **ISO 14001 4.4.6 - Operational Control**

“The organization shall identify those operations and activities associated with the identified significant environmental aspects in line with its policy, objectives and targets. The organization shall plan these activities, including maintenance, in order to ensure that they are carried out under specified conditions by

- a) establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the Objectives and Targets;
- b) stipulating operating criteria in the procedures;
- c) establishing and maintaining procedures related to the identifiable significant environmental aspects of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and contractors.”

To ensure operational control over activities associated with significant environmental aspects and impacts, operating methods and procedures should be documented. This provides consistency when staff changes occur, and clearly identifies job responsibilities. Specific, documented instructions should be developed for those activities where the absence of instructions might result in a non-conformance or a high risk of significant environmental impact. In those cases, written instructions can clearly and succinctly provide operating procedures, performance verification criteria and any

corrective actions required in the event of a non-conformance. Master lists should be developed to control the existence, location and ownership of each procedure.

#### **ISO 14001 4.4.7 - Emergency Preparedness and Response**

“The organization shall establish and maintain procedures to identify potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them.

The organization shall review and revise, where necessary, its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations.

The organization shall also periodically test such procedures where practicable.”

Detailed emergency preparation and procedures should be established to respond to unplanned events. Procedures should define control mechanisms, operational requirements and other controls during these events, and are to be integrated with response plans required by law or regulation. Emergencies include uncontrolled releases to the environment of all types, natural disasters that might lead to releases, and process hazards that might become emergencies.

#### **ISO 14001 4.5.1 - Monitoring and Measurement**

“The organization shall establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of its operations and activities that can have a significant impact on the environment. This shall include the recording of information to track performance, relevant operational controls and conformance with the organization’s environmental objectives and targets.

Monitoring equipment shall be calibrated and maintained and records of this process shall be retained according to the organization’s procedures.

The organization shall establish and maintain a documented procedure for periodically evaluating compliance with relevant environmental legislation and regulations.”

This section of the EMS establishes the expectation that measurements are quantified and collated into a useable form for management review.

Monitoring and measurement ensures the management of significant aspects and that the organizations’ EMS objectives and targets are reached. The EMS establishes operational control performance criteria that must be verified and therefore, should include procedures for measuring and monitoring. The results of this self-critical analysis should

be reviewed and used as indicators of the system's success and reliability, as well as identifying those areas in need of corrective action or improvement.

Some individuals argue that an EMS need not be in total compliance with laws and regulations in order for it to be in conformance with ISO 14001. However, a non-compliance would indicate one or more errors in the structure and/or operation of the EMS, which often indicate that the EMS does not conform with ISO 14001.

### **ISO 14001 4.5.2 - Nonconformance and Corrective and Preventive Action**

“The organization shall establish and maintain procedures for defining responsibility and authority for handling and investigating nonconformance, taking corrective action to mitigate any impacts caused and for initiating and completing corrective and preventive action.

Any corrective or preventive action taken to eliminate the causes of actual and potential non-conformances shall be appropriate to the magnitude of problems and commensurate with the environmental impact encountered.

The organization shall implement and record any changes in the documented procedures resulting from corrective and preventive action.”

The results of monitoring and measurements, audit findings and other systematic reviews should be documented, reviewed, and lead to any necessary corrective actions. Procedures should be in place so that the organization can ensure that corrective actions have occurred, and that they have been effective in resolving the problem. Patterns and trends should be noted and analyzed and the root cause of any systemic failure should be determined.

By recording the events of a non-conformance and its corrective action, patterns of success and failure of the EMS can be reviewed and the system, the equipment, or the personnel adjusted accordingly. This process is essential to continuous improvement of environmental performance.

Procedures are to be established for defining responsibility and authority, investigating non-conformances with the EMS and taking action to correct impacts when requirements are not met.

It is important to distinguish between corrective actions and preventative actions. Preventative actions may include analysis of environmental performance indicators to

determine probabilities of non-conformance. A corrective action will be the process or procedural change that is initiated when the preventative actions identify a problem.

### **ISO 14001 4.5.3 - Records**

“The organization shall establish and maintain procedures for the identification, maintenance and disposition of environmental records. These records shall include training records and the results of audits and reviews. Environmental records shall be legible, identifiable and traceable to the activity, product or service involved. Environmental records shall be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times shall be established and recorded.

Records shall be maintained, as appropriate to the system and to the organization, to demonstrate conformance to the requirements of this International Standard.”

Records are essential to demonstrate conformance with an organization's EMS. Environmental records are collected and maintained within the framework of the EMS document control system. Procedures must be established to maintain, identify, collect, index, and store the records necessary to validate the EMS.

Record management under an ISO 14001 EMS enables the organization to demonstrate that operating procedures and processes are properly documented and current. Records must be legible and identify the activity, product, or service involved. Records may include details of non-conformance and corrective actions, regulatory violations and corrective actions, incident reports and follow-ups, complaints and responses, supplier and contractor information, inspection and maintenance logs, and monitoring data.

### **ISO 14001 4.5.4 - Environmental Management System Audit**

“The organization shall establish and maintain (a) programme(s) and procedures for periodic environmental management systems audits to be carried out, in order to:

- a) determine whether or not the environmental management system
  1. conforms to planned arrangements for environmental management including the requirements of this International Standard; and
  2. has been properly implemented and maintained; and
- b) provide information on the results of audits to management.

The organization's audit programme, including any schedule, shall be based on the environmental importance of the activity concerned and the results of previous audits. In

order to be comprehensive, the audit procedures shall cover the audit scope, frequency and methodologies, as well as the responsibilities and requirements for conducting audits and reporting results.”

An EMS must include a routine systems audit. This audit should determine compliance with the ISO 14001 standard, and may be combined with regulatory compliance audits, quality audits, energy audits and other forms of management inquiry if so desired.

Whether internal or third -party auditors are used, they should possess the qualifications outlined in ISO 14012:

- Expertise in environmental science and technology.
- Expertise in the technical and environmental aspects of the facilities and operations being audited.
- Expertise in environmental law, regulations.
- Expertise in EMS.
- Expertise in EMS auditing techniques.

#### **ISO 14001 4.6 - Management Review**

“The organization’s top management shall, at intervals that it determines, review the environmental management system to ensure its continuing suitability, adequacy and effectiveness. The management review process shall ensure that the necessary information is collected to allow management to carry out this evaluation. This review shall be documented.

The management review shall address the possible need for changes to policy, objectives, and other elements of the environmental management system, in the light of environmental management system audit results, changing circumstances and the commitment to continual improvement.”

A management review of the EMS must assess the extent of compliance or non-conformance to ISO 14001. It may include a review of instances of nonconformance, corrective actions, continuous improvements associated with the EMS, progress against objectives and targets, results of compliance and EMS audits, complaints, results of any prevention of pollution programs, waste minimization programs, and a summation of measurement and monitoring results. The result of a management review should also suggest corrective measures to solve problems identified in EMS design, intent, or scope.

The results of the review should be used to determine modifications to the EMS necessary for achieving continuous improvement and follow-up to verify that the EMS modifications were effective.

### 1.2.2 Certification and Registration Definitions

**ISO 14001 EMS registration can encompass a particular business operation or the entire corporation.**

ISO 14001 EMS registration may encompass the entire EMS of a particular business operation or can include a specific site or facility, several sites or facilities, or the entire corporation or enterprise. For example, one ISO 14001 certificate might register a business unit that encompasses six different sites in six different states.

A certificate of registration is usually valid for three years, though this can vary depending on the certification body. Some registrars (companies providing ISO 14001 certification) provide indefinite certificates, pending continuing successful surveillance audits. In most cases, certification bodies require surveillance audits on a six-month schedule. When a certificate expires, the registrar conducts either a complete reassessment or an assessment that is between a surveillance audit and a complete reassessment in level of detail.

The following distinctions among the terms “Accreditation”, “Certification”, and “Registration” are derived from the ISO:

- **Certification** is a procedure by which a third party gives written assurance that a product, process, or service conforms to the specified requirements. Certification to ISO 14001 stipulates that a company is in compliance with an EMS that meets all requirements of ISO 14001. For example, a registrar **certifies** that a facility is ISO 14001 conformant.
- **Accreditation** is a procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks. With regard to ISO 14001, accreditation means that a body is authorized to grant certification to a company that it has successfully assessed as meeting ISO 14001 EMS requirements and as having the processes in place to maintain that system. For example, the Registrar Accreditation Board (RAB) **accredits** the individual auditors and the organizations that grant certification.

- **Registration** is a procedure by which a body indicates relevant characteristics of a product, process, or service and then includes or registers the product, process, or service in a publicly available list. For example, RAB **registers** a facility's certification.

In the United States the term "registration" is used interchangeably with "certification" in the context of management system standard conformance. In Europe, EMS certification is the proper term, rather than EMS registration, which is the U.S. terminology.

### 1.2.3 Demonstrating Conformance with ISO 14001

An organization may demonstrate conformity with ISO 14001 via either a self-declaration to the standard, or certification/registration of its EMS by an external organization. Self-declaration (and self-certification) refers to a business's decision to audit its own EMS and certify its own conformance to ISO 14001. Some companies are exploring self-certification to ISO 14001, anticipating that this will be more cost-effective than using third-party registrars.<sup>14</sup> Many firms exploring this option are considering also performing third-party audits by consultants or by a government agency (but less frequently than every six months), to strengthen the credibility of their EMS.

A third-party registrar audits a facility to ensure that the EMS is in conformance with the ISO 14001 standard and that it is actually being implemented. Depending upon the complexity of the site, the results of the certification audit, and the number and type of non-conformities, a site either is certified as conforming to ISO 14001, with a specific schedule for periodic re-auditing, or it is not so certified. The discovery of a major non-conformity with the ISO 14001 standards plays a determinative role in deciding whether or not certification is given.<sup>15</sup> According to the ANSI - RAB criteria document for registrars, a major nonconformity exists when:

- “a) one or more numbered requirements of ISO 14001 have not been addressed; or

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<sup>14</sup> Hewlett Packard and Motorola have achieved a significant degree of success with self-certification of their ISO 9000 programs. Weinfield, D., ISO 14000: An Overview, Legal Analysis & Regulations (MAPI, April 1995).

<sup>15</sup> Weinfield, D., Companies Find Range of Reasons to Take Various Standards on ISO 14000, Legal Analysis & Regulations (MAPI, Sept. 1998).

- b) one or more numbered requirements of ISO 14001 have not been implemented; or
- c) several non-conformities exist that, taken together lead a reasonable auditor to conclude that one or more numbered requirements of ISO 14001 have not been addressed or implemented.”

A primary factor in choosing a means to demonstrate conformity is customer demand. For facilities that market primarily to retail customers, who may not consider environmental issues in their purchasing decisions, third-party certification might not provide added benefits and would be a significant cost. In contrast, a manufacturer supplying goods to the European Union, or to an industry such as the automotive or electronics industries, might find third-party registration to be necessary to compete in the market or as a condition of a bid to provide goods or services.

ISO 14001 allows for flexibility in allowing an entire corporation to self-certify to ISO 14001 while allowing third-party registration for specific divisions or facilities, based upon their own business requirements or market demands. The Environmental Auditing Roundtable (EAR) estimates that for every dollar spent on an outside audit, a company will spend an additional \$1.20 of its own on internal activities and processes. Therefore a \$10,000 surveillance audit, which a facility might incur every six months, could actually cost the site \$22,000.

Surveillance audits are conducted during the certification period to ensure continuing conformance with the standard. The duration between surveillance audits is directly related to how robust the EMS is and a site's complexity. The ISO 14001 EMS auditing cycle generally is every six months with some sites on an annual cycle. Some senior Environmental, Health and Safety (EHS) executives believe this rate is too high, particularly in comparison with the typical, third-party, 1 to 2 year compliance audit cycle.

### **1.3 CERTIFICATION IN THE U.S. AND GLOBALLY**

The first of the ISO 14000 family of standards for environmental management were published in September 1996. In comparison with the ISO 9000 family of standards, the ISO 14000 family is being implemented at a much slower pace.<sup>16</sup>

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<sup>16</sup> ISO Report issued August 2000, on data as of December 31, 1999. ISO Survey of ISO 9000 and ISO 14000 Certificates: Ninth Cycle – 1999; International Organization for Standardization (ISO), [www.iso.ch](http://www.iso.ch) (available 26 July 2000).

The total number of certificates awarded worldwide at the end of 1999 was 14,106, compared to 7,887 at the end of December 1998, showing a rise of 6,219, or 78%. The total number of certificates awarded worldwide at the end of 1998 was 7,887, compared to 4,433 at the end of December 1997, showing a rise of 3,454, i.e., also a 78% increase. See Figure 1.

Europe and the Far East experienced very significant growth in 1998, showing a total of 11,715 certificates, compared to the other regions where the adoption of ISO 14000 appears to be slower. See Figure 2 and Table 2.

### **1.3.1 United States**

In the United States, governmental agencies are still evaluating the applicability and usefulness of ISO 14000. In light of trends to reduce governmental inefficiency, such as "reinventing government," agencies are considering alternate regulatory schemes that are voluntary and do not solely rely on command and control.

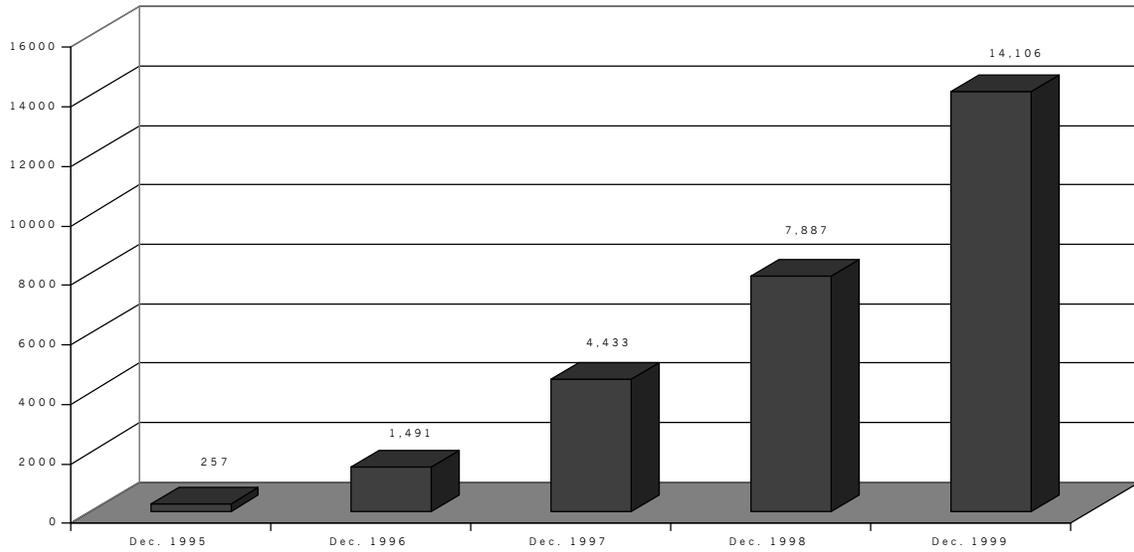
There is sporadic growth of governmental (EPA and state) environmental agency programs utilizing "ISO 14001-plus"—blending the full set of ISO 14001 or other EMS requirements with additional requirements, often involving emission or discharge limits. Examples of these programs include EPA New England's Star Track program, state EMS pilot programs in New Hampshire (such as the Performance Partnership Agreement Between the New Hampshire Department of Environmental Services and EPA Region I - New England), Vermont, Massachusetts, and Rhode Island.<sup>17</sup> Most of these programs are in their developmental stages and do not always have the full cooperation of other agency offices or other departments. Most companies are approaching these government-sponsored programs with caution. Generally, these programs are yet not seen as important reasons for an organization to pursue ISO 14001 certification.

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<sup>17</sup> Partners for the Environment, U.S. EPA, 7-89 (Spring, 1998).

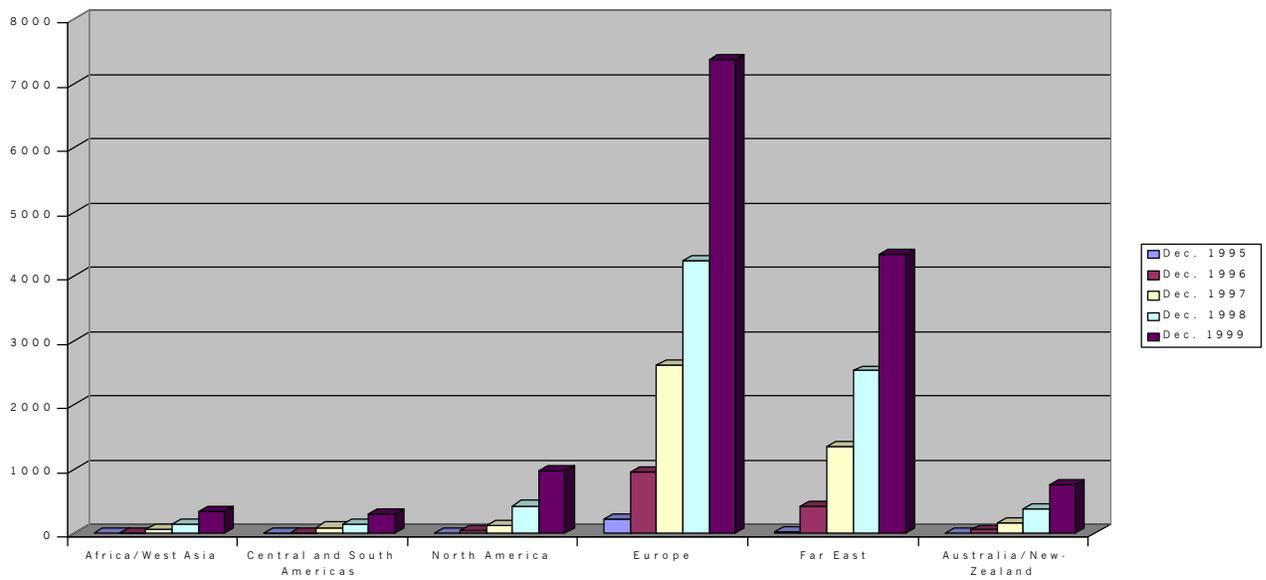
**FIGURE 1**

**Annual ISO 14001 Registrations Worldwide**



**FIGURE 2**

**ISO Certifications By Region and Year**



**TABLE 2****ISO 14000 Certifications Worldwide from 1995 to End of 1999**

Countries	Dec. 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
<b>Africa/West Asia</b>	1	10	73	138	337
Share in percent	0.39	0.67	1.65	1.75	2.39
No. of countries	1	6	10	15	21
<b>Central and South Americas</b>	3	15	98	144	309
Share in percent	1.17	1.01	2.21	1.83	2.19
No. of countries	2	4	5	12	14
<b>North America</b>	1	43	117	434	975
Share in percent	0.39	2.88	2.64	5.50	6.91
No. of countries	1	3	3	3	3
<b>Europe</b>	226	948	2626	4254	7365
Share in percent	87.94	63.58	59.24	53.94	52.21
No. of countries	11	20	25	29	32
<b>Far East</b>	25	419	1356	2532	4350
Share in percent	9.73	28.10	30.59	32.10	30.84
No. of countries	3	10	10	11	12
<b>Australia/New-Zealand</b>	1	56	163	385	770
Share in percent	0.39	3.76	3.68	4.88	5.46
No. of countries	1	2	2	2	2
World total	257	1,491	4,433	7,887	14,106
World growth		1,234	2,942	3,454	6,219
Number of countries	19	45	55	72	84

Additionally, a dual-track approach is being considered that would impose command and control where it appears to be required along with a separate voluntary track for companies that have rigorous EMSs.<sup>18</sup> There is recognition in some government agencies and programs that there needs to be some quid pro quo in terms of regulatory relief, such as fewer audits and inspections for ISO 14001-compliant companies. This may lead to legislation to institute such an approach at some point in the future. There is concern, however, regarding the reaction of environmentalists and the general public, and their degree of comfort with such an approach.

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<sup>18</sup> Ibid.

**Generally, U.S. industry is adopting elements of ISO 14001, and proceeding cautiously in obtaining third-party certification.**

U.S. industry currently is evaluating the extent to which the ISO 14001 standards will provide any tangible benefits, particularly in the areas of regulation and trade. The approach at this time is cautious. There is interest, but also reluctance on the part of many companies to make an investment in the process until customers start to demand participation or companies see a direct commercial advantage. This is beginning to change as the standards are being accepted internationally, and some companies are moving ahead to position themselves for ISO14001 registration.

Domestically, several trends are occurring with respect to ISO 14001 implementation and certification:

1. Firms are phasing elements of ISO 14001 into their current EMS.
2. Firms are delaying on obtaining third-party certification to ISO 14001 because:
  - they have not had any customer requests for ISO 14001 certification,
  - they are reducing their EHS expenses and maximizing the return on investment for their EHS expenditures. The current ISO 14001 certification process and audit cycle (ISO 14001 audits occur on a six month or annual cycle in contrast to business and third-party compliance audits usually occur every two to three years) are viewed as not economical, and/or
  - they did not find that certification to ISO 9000, the standard for quality management systems, to have added much intrinsic value to their current operations.
3. Many companies are integrating their EMSs with their health and safety management systems, utilizing ISO 14001, the OSHA Voluntary Protection Program, the OSHA cooperative compliance program and other international programs as frameworks. This integration of environmental and safety systems allows companies to maintain a high level of performance, standardize audits and reduce liabilities, therefore increasing the return on their EHS management investment.

ISO 14001 activity in the United States has increased by 170%, 270%, and 125% over the past three years, respectively.<sup>19</sup> While some U.S.-based companies have been developing an ISO 14001-conformant EMS for efficiency or stakeholder relation purposes, most have done so for other reasons. Some U.S. operations are owned by European or

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<sup>19</sup> ISO Survey of ISO 9000 and ISO 14000 Certificates: Ninth Cycle – 1999; International Organization for Standardization (ISO), [www.iso.ch](http://www.iso.ch) (available 26 July 2000).

Japanese companies, and ISO 14001 has achieved a greater penetration in Europe and Japan, as shown in Table 2, page 26. In order to achieve worldwide management consistency, as well as respond to concerns over domestic stakeholder relations, these companies have required their U.S. subsidiaries to become ISO 14001 compliant.

One example is Toyota. On August 3, 2000, Toyota released a set of green guidelines for its approximately 500 suppliers of parts, materials, and components, to be implemented by 2004. Suppliers will be required to either obtain ISO 14001 certification through a third-party auditor, demonstrate conformance with a Toyota-developed chemical ban list, and/or demonstrate conformance with a hazardous materials transportation management system.<sup>20</sup>

Large (i.e., Fortune 500) U.S.-owned companies, which operate globally, may find themselves exposed to pressures in their non-U.S. operations similar to those impacting European- and Japanese-owned companies, and adopting ISO 14001-compliant EMS for similar reasons. Additionally, these very large companies are usually perceived as resource-rich, which allows them to invest in investigating and implementing ISO 14001.

On September 15, 1999, Ford announced that it will require all production and non-production suppliers with manufacturing facilities to certify a minimum of one manufacturing site to the ISO 14001 standard by December 31, 2001. Ford will also require all suppliers manufacturing sites to be certified to the ISO 14001 standard by July 1, 2003.<sup>21</sup> On September 21, 1999, General Motors Corporation (GM) announced a requirement that suppliers certify the implementation of an EMS in their operations, in conformance with ISO 14001, by the end of 2002. GM will accept documentation of third-party certification to ISO 14001 or registration to the European Union Eco-Audit and Management Scheme (EMAS) as a demonstration of EMS implementation. While third-party confirmation is strongly preferred, GM also will accept a written declaration by a responsible executive that a site is operating under an EMS that is in conformance with ISO 14001.<sup>22</sup>

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<sup>20</sup> Toyota Presses Suppliers to Go Green, from [www.greenbiz.com](http://www.greenbiz.com) (available 17 September 2000).

<sup>21</sup> Memorandum, Ford Motor Company Group Vice President, Purchasing (September 15, 1999).

<sup>22</sup> "General Motors Sets New Level Of Environmental Performance For Suppliers," Press release, (September 21, 1999).

### **1.3.2 Western Europe**

In Europe, a complex situation has arisen due to a perceived conflict between ISO 14001 and the Eco-Management and Audit Scheme (EMAS), the European Union regulation that went into effect in July 1993. The program is voluntary, but companies are concerned that it may become mandatory. Hundreds of companies in Europe, particularly in Germany, are certified under EMAS. Some feel that EMAS is more comprehensive than ISO 14001, and that ISO 14001 could undermine EMAS's objectives.

In spite of these concerns, the German government and industry regard ISO 14001 as a useful tool to protect the environment and manage environmental issues. Both the government and industry, however, are concerned that accreditation procedures be equal for registering entities and in different countries, so that there would be harmonization on an international level. Although in Germany there are still many more companies that have EMAS registration than ISO 14001 registration, the trend is towards ISO 14001 in Europe as a whole. The number of companies that have obtained third-party registration for ISO 14001 has now surpassed the number that have EMAS registration.

Given that EMAS is an EU standard, it is not surprising that EU-based companies adopting EMAS tend to cite external communications as a reason for adoption; while companies adopting ISO 14001 cite cost-savings.

### **1.3.3 Other Countries**

Some developing countries have little in place in the way of environmental legislation and regulations. These countries generally are the least familiar with ISO 14001 and have had minimal involvement in the development of the standards, which may lead to concerns regarding their applicability.<sup>23</sup> Over the past two years, however, awareness of ISO 14001 has increased, as has interest in obtaining third-party registration to ISO 14001.

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<sup>23</sup> This lack of involvement is shown in the most recent ISO 14001 survey, cited above.

## Pacific Rim

**Japan has been quick to realize that ISO 14000 may provide an advantage in worldwide markets.**

Pacific Rim countries generally appear to have a broad range of involvement in the ISO 14000 process. The Japanese government in particular supports the process and the Ministry of Trade and Industry (MITI) is very proactive in incorporating ISO 14001 as part of the Japanese industrial standards and establishing a scheme of assessment and registration. However, there is concern about how to measure the effectiveness of an EMS. Industry in Japan recognizes the importance of the international standardization provided by the ISO 14000 series and has been quick to realize that ISO 14000 may well provide an advantage in worldwide markets. Industry foresees that the standards can result in a decrease in environmental risks and costs but there is concern that some companies will superficially address the standards.<sup>24</sup>

There are a number of influences that are uniquely Japanese. One of these is the Japanese experience with ISO 9000, the quality management standard. Because of their confidence in their own quality control systems, Japanese companies were slow to adopt ISO 9000. As a result, they were caught short when European and North American clients began to insist that their suppliers be certified to ISO 9000.

Japanese firms don't want to repeat their ISO 9000 experience with ISO 14000. In fact, Japan was one of the first countries to embrace the standards. According to one estimate, by the time the final version of ISO 14001 was published in September 1996, about two-thirds of the country's electrical equipment industry had been certified to ISO 14001.

Observers also point to Japanese concern over the environment. During the country's rapid growth in the 1950s and 60s, several high-profile incidents, including over 80 deaths due to mercury poisoning, led to widespread concern about pollution. More recently, events such as the United Nations' 1997 Kyoto Conference on global warming and new environmental legislation have prompted Japanese organizations to review their environmental practices.

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<sup>24</sup> "ISO 14000 In Japan, "Consensus., Canada's Newsmagazine of Standardization, 14-16,(Sept./Oct. 1999).

Japan is concerned about the environment because, as a small island nation with limited natural resources, it has to import most of the raw materials and energy it uses. Japan is also densely populated. As a result, pollution, resource conservation and land use are serious concerns.

Strong endorsement from government and from the country's leading industries may also have contributed to ISO 14001's success in Japan. The national government, for example, has supported the implementation of EMS since 1993, when its Basic Environmental Plan recommended establishing an EMS as an effective tool for managing environmental issues. Besides pursuing their own registrations, governments at the national, prefecture and local levels offer grants and loans to organizations establishing or registering an EMS. Tokyo's metropolitan government, for example, will cover half the cost of registration, to a maximum of 1.3 million yen (about \$11,000).

### **Latin America**

In Latin America the interest in ISO 14000 is rising, with Colombia, Mexico, Brazil, Venezuela and Argentina all having companies that are certified to the ISO 14001 standard. The governments in Argentina and Mexico are following in the footsteps of those in Canada and China, and have integrated ISO 14001 requirements into their regulatory schemes.<sup>25</sup>

Detailed information on ISO 14001 certifications worldwide is provided at Tab 1.

## **1.4 COMPARISON OF ISO 14001 WITH ISO 9000**

The original focus of ISO (from the Greek word meaning equal) was to establish technical and scientifically based product and safety standards that could be applied equally across the member countries. The ISO standards were developed by consensus of the member organizations as voluntary, private sector standards (however, a number of governments have adopted the ISO standards as requirements for purchasing and/or market entry).

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<sup>25</sup> These efforts generally have not yet resulted in significant developments.

In the 1980s ISO began a move away from strictly technical or scientific standards with the development of the quality management standards—ISO 9000. By 1987 the ISO 9000 family of standards had gained worldwide acceptance and adoption as the benchmark of Quality Management Systems (QMS). It was recognized that adoption of ISO 9000 often could add value to an organization's quality programs, and it has become a requirement for trade in some areas such as Europe.

The essence of the ISO 9000 standards is a set of five standards that guide the development and implementing of a QMS. A QMS manages an organization's activities that are intended to meet any specific customer's quality-related requirements. Conformance with the ISO 9000 standards does not mean that a particular product or service will meet customers' quality requirements, only that the QMS is capable of meeting some specified level of quality.<sup>26</sup>

There are five standards that currently comprise ISO 9000:

- ISO 9000-1 provides guidance and basic definitions, and support in selecting the appropriate standard from ISO 9001, 9002, or 9003.
- ISO 9001 is a model for an organization to certify its quality system for a product or service, starting with product or service initial design through production, installation and servicing.
- ISO 9002 is identical to ISO 9001, except it does not require documentation of the design/development process.
- ISO 9003 provides guidelines for organizations to show that they are delivering a desired product or service.
- ISO 9004-1 provides basic guidance that help organizations develop and implement a QMS.

The ISO 14000 family of standards, like the ISO 9000 family, consists of the standards and supporting documents on management systems, terminology, and tools such as auditing. Both of the standards are process driven, focusing on how the work is accomplished and not the result of the work. In other words, they focus on the process and not the end product. ISO 9000 establishes the framework for ensuring that products or services will consistently be at a given level of quality, and does not itself establish the quality goals. ISO 14001 establishes the processes and methods to be implemented by an

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<sup>26</sup> Pearch, C., Kitka, J., "A Look At The New ISO 9000:2000," Hydrocarbon Publishing (August 2000).

organization to control its impact on the environment, and does not define the organization's obligations, goals, or limits.

Although they are both process standards with similar structure, terminology, and management system principles, ISO 14001 is more specific as to the elements of an EMS while ISO 9001, 9002, and 9003 allow for much more flexibility in the approach an organization can take designing a QMS.

Table 3 identifies the common elements and differences between the ISO 14001 EMS Standard and ISO 9001, 9002, and 9003 QMS standards.

**For ISO 9000, the "customer" is the recipient of the product or service. For ISO 14001, the "customer" potentially is many different internal and external interested parties.**

As shown in Table 3 (page 35), the two standards have many more common elements than differences. However, there are some significant differences that should be discussed.

The most significant differences between the two standards is the level of specificity provided in the ISO 14001 EMS standard and the "customer" that receives the value of adoption and certification to the standards. With respect to the ISO 9000 standards, the "customer" is the entity that receives the quality end product or service. The ISO 14000 standards address a broad range of interested parties, such as nearby communities, governments (through legal requirements) and the changing needs and requirements for increased environmental protection. Also, environmental management is controversial, confrontational, political, and can result in civil and criminal liabilities. Quality management achieves its goals if the customer is satisfied with his or her purchasing experience. ISO 9000 also requires a much higher level of documentation than ISO 14001 and therefore is more burdensome.

As previously stated, both of the standards are designed to be process-oriented, not end-product oriented. However, ISO 9000 identifies the methods an organization can employ to demonstrate the processes that will achieve quality products and services. In contrast, ISO 14001 specifies:

- The processes to be implemented to minimize the impact of an operation on the environment.
- The elements of an EMS.
- Guidance on how to improve an existing EMS.
- Advice on how to meet performance expectations.

The requirement for continual improvement is integral to the ISO 14001 standard and philosophy. The current versions of the ISO 9000 standards embrace the concept of continuous improvement, but do not require it. However, proposed changes to the 9000 standard will further harmonize the two standards in this area.

The ISO 9000 standards have recently undergone their third revision and have been issued for review to the member organizations.<sup>27</sup> The final draft was released during the third quarter of 2000 with the final revised standard released during fourth quarter 2000. Companies are currently becoming certified to ISO 9000:2000.

A significant effort during the revision process was directed towards enhancing the compatibility of the 9000 standard with ISO 14001, especially with regard to terminology and content. Specifically, the following changes have been made to ISO 9000, to create a closer alignment of the two standards:

- Inclusion of continual improvement process
- Increased emphasis on the role of top management
- Consideration of legal and regulatory requirements
- Establishment of measurable objectives at relevant levels and functions
- Attention to resource availability
- Consideration of benefits and needs of all interested parties.

In addition to the revisions to ISO 9000, the ISO 10011 auditing standard for quality systems and ISO 14010, 14011, and 14012 Environmental Auditing Standards are currently being merged into one common auditing standard, ISO 19011. The combined auditing standard is scheduled for publication during the third quarter of 2001. At the same

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<sup>27</sup> Ibid.

time the ISO 14001 and 14004 EMS standards are undergoing review to further enhance their compatibility with ISO 9000.

**TABLE 3**  
**COMPARISON OF ISO 14001 AND 9001 REQUIREMENTS**

<b><u>9001</u></b> <b><u>SPECIFIC</u></b>	<ul style="list-style-type: none"> <li>• <b>Maintaining / Improving</b></li> <li>• <b>Quality of Product / Service</b></li> <li>• <b>Product ID and Traceability</b></li> <li>• <b>Use of Statistical Techniques</b></li> </ul>
<b><u>19001 / 14001</u></b> <b><u>COMMON</u></b>	<ul style="list-style-type: none"> <li>• <b>Policy</b></li> <li>• <b>Objectives and Targets</b></li> <li>• <b>Organization, Roles, and Responsibilities</b></li> <li>• <b>Training</b></li> <li>• <b>Monitoring and Measuring</b></li> <li>• <b>Non-conformance and Corrective Action</b></li> <li>• <b>Document Control</b></li> <li>• <b>Records</b></li> <li>• <b>Auditing</b></li> <li>• <b>Management Review</b></li> </ul>
<b><u>14001</u></b> <b><u>SPECIFIC</u></b>	<ul style="list-style-type: none"> <li>• <b>Internal and External Stakeholders</b></li> <li>• <b>Aspects and Impacts Analysis</b></li> <li>• <b>Continuous Improvement</b></li> <li>• <b>Regulatory and Legal Compliance</b></li> <li>• <b>Communication</b></li> <li>• <b>Emergency Preparedness and Response</b></li> </ul>

The ISO technical committees for the 9000 and 14000 standards are making a concerted effort to bring the two standards closer together through the revision process. Some experts believe that in the future the two standards will be consolidated into one. Until that time, organizations that are pursuing registration will have to weigh the value, efficiency and risks associated with combining or segregating the two very similar management systems.

## **1.5 APPLICATION OF INTERNATIONAL AND NATIONAL STANDARDS TO THE OFFSHORE OIL AND GAS INDUSTRY**

### **1.5.1 The Petroleum Industry and the Development of ISO 14001**

Representatives of the petroleum industry were among the dominant participants during the development of the ISO 14000 standards. A representative of ARCO led one of the TAGs, while ExxonMobil played a leadership role in the development of the ISO 14000 standards and continues to do so. Several petroleum companies, along with automotive manufacturers, retained an attorney during the development of the standards to represent them, to ensure that the standards did not become overly prescriptive or include any references, such as to global warming, which could negatively impact the petroleum or the automotive industries.<sup>28</sup>

### **1.5.2 Relationship of the Safety and Environmental Management Program (SEMP) to ISO 14001**

**SEMP does not focus on environmental issues to the same extent that it does safety.**

SEMP as described in API's RP-75 is a 12-section guideline, with each section containing sub-sections, as listed below.<sup>29</sup>

#### **1. General**

1.1 Purpose and Objective; 1.2 Management Program Elements and Principles; 1.3 Scope; 1.4 Definitions; 1.5 Standards, Regulations, and References

<sup>28</sup> Information in this paragraph is from the experience of one or more of the authors of this report.

<sup>29</sup> Recommended Practice 75, American Petroleum Institute (2<sup>nd</sup> edition, 1998).

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2. Safety and Environmental Information
  - 2.1 General; 2.2 Process Design Information; 2.3 Mechanical and Facilities Design Information
3. Hazards Analysis
  - 3.1 Application; 3.2 Methodology; 3.3 Initial Analysis; 3.4 Periodic Analysis; 3.5 Analysis Personnel; 3.6 Analysis Report
4. Management of Change
  - 4.1 General; 4.2 General in Facilities; 4.3 Change in Personnel; 4.4 Managing the Changes
5. Operating Procedures
  - 5.1 General; 5.2 Content of Operating Procedures; 5.3 Periodic Review
6. Safe Work Practices
  - 6.1 General; 6.2 Safe Conduct of Work Activities; 6.3 Control of Materials; 6.4 Contractor Selection
7. Training
  - 7.1 General; 7.2 Initial Training; 7.3 Periodic Training; 7.4 Communication; 7.5 Contractor Training
8. Assurance of Quality and Mechanical Integrity of Critical Equipment
  - 8.1 General; 8.2 Procurement; 8.3 Fabrication; 8.4 Installation; 8.5 Maintenance; 8.6 Testing and Inspection
9. Pre-Startup Review
  - 9.1 General
10. Emergency Response and Control
  - 10.1 General; 10.2 Emergency Action Plan; 10.3 Emergency Control Center; 10.4 Training and Drills
11. Investigation of Incidents
  - 11.1 General; 11.2 Investigation; 11.3 Follow-up
12. Audit of Safety and Environmental Management Program Elements
  - 12.1 General; 12.2 Audit Reporting.

If this summary of RP-75 is compared with the synopsis of ISO 14001 (see Section 1.2.1), it will be noted that SEMP is more proscriptive and focuses to a greater extent safety issues. SEMP has been described as including a "Capital 'S' for safety but a lower-case 'e'

for environmental”—that is, SEMP does not stress environmental issues to the same extent that it does safety issues.

This is not surprising, because SEMP, unlike ISO 14001, requires a hazard analysis, which focuses on “uncontrolled releases and other safety or environmental incidents.” Thus, a SEMP hazards analysis under API RP75, Section 3, will focus on incidents, whereas an analysis under ISO 14001, Section 4.3.1, will focus on “aspects and impacts” which are much broader in scope. For instance, the delivery of supplies to a platform creates environmental aspects and potential impacts such as those from exhaust emissions from the vessel transporting the supplies. Yet it is unlikely that these would be incidents or hazards that a SEMP analysis would recognize. While a SEMP MS *allows* for the management of environmental issues to the same degree of rigor as ISO 14001, the API RP-75 guidelines do not *require* it.

This difference appears in other areas, as well. For instance, ISO 14001 Section 4.4.3 requires the organization to establish and maintain procedures for communicating with external interested parties. A SEMP MS could have such procedures, but they are not required.

Since safety concerns and impacts often are more obvious and tangible than environmental concerns and impacts, safety management programs are well integrated throughout most OO&G organizations. Due to the inherently hazardous nature of the petroleum industry, most safety analyses are hazard and risk-based and companies safety management systems, tools and programs are very well developed.<sup>30</sup>

This demonstrates one very important difference between the ISO 14001/EMAS model of environmental management and the other tools widely used by the petroleum industry (SEMP, HSE Case Management). For ISO 14001 the criteria for determining the significance of environmental aspects are hazard-based rather than risk-based. Thus, an environmental aspect/impact does not lose significance because the risk has been reduced due to an increase in the level of control. It is a function of the EMS to ensure that the correct controls remain in effect in order to maintain an acceptable level of risk.<sup>31</sup>

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<sup>30</sup> “Hazard-based” refers to a review or analysis that deals with any undesired event, even if it is of low likelihood or can be addressed by protective measures. “Risk-based” refers to a review or analysis that does take into account the likelihood of the event occurring, and measures that can be taken to mitigate against it.

<sup>31</sup> A guide to ISO 14001 and EMAS; Environmental Management for Gas Plants, Sponsored by BGplc, BP, Shell, IExpro.

### **1.5.3 Adoption of the “Guidelines for the Development and Application of Health, Safety, and Environmental Management Systems” (E&P Forum)**

The International Association of Oil and Gas Producers (OGP) was founded in 1974 as the oil industry International Exploration and Production Forum (E&P Forum). OGP has 52 members representing 38 oil companies and 14 national oil industry associations operating in 60 different nations. It was established to represent members’ interests in the regulation of the exploration and production of oil and gas because of the extensive occupational health and safety legislation and requirements applicable to the industry.

In addition to the American Petroleum Institute (API) recommended practices such as RP-75, OGP developed the “Guidelines for the Development and Application of Health, Safety, and Environmental Management Systems” (E&P Forum), to assist its members with the development, implementation and maintenance of an HSE MS.<sup>32</sup> Both the guidelines and the organization itself are often referred to as the “E&P Forum,” although the organization has taken on the new name of OGP.

The E&P Forum guidance document is a set of guidelines, with many but not all of the seven sections containing subsections, as listed below.

1. Leadership and Commitment
2. Policy and Strategic Objectives
3. Organization, Resources and Documentation
  - 3.1 Organizational Structure And Responsibilities; 3.2 Management Representative(s); 3.3 Resources; 3.4 Competence; 3.5 Contractors; 3.6 Communication; 3.7 Documentation And Its Control
4. Evaluation and Risk Management
  - 4.1 Identification of Hazards And Effects; 4.2 Evaluation; 4.3 Recording Of Hazards And Effects; 4.4 Objectives And Performance Criteria; 4.5 Risk Reduction Measures
5. Planning
  - 5.1 General; 5.2 Asset Integrity; 5.3 Procedures and Work Instructions; 5.4 Management of Change; 5.5 Contingency And Emergency Planning

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<sup>32</sup> Guidelines for the Development and Application of Health, Safety and Environmental Management Systems, Report No. 6.36/210, 45 pages, OGP, 1998.

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## 6. Implementation And Monitoring

6.1 Activities And Tasks; 6.2 Monitoring; 6.3 Records; 6.4 Non-Compliance And Corrective Action; 6.5 Incident Reporting; 6.6 Incident Follow-up

## 7. Auditing And Reviewing

7.1 Auditing; 7.2 Reviewing

The E & P forum documentation includes extensive supplementary material that provides detail for each section.

**SEMP / RP-75 / E&P Forum use a risk management approach and therefore are not as robust as the ISO 14001 environmental aspects process.**

The guidelines included in the SEMP / RP-75 / E&P Forum guidelines for HSE management systems are more detailed than the guidelines in ISO 14001. However, they call for consideration of the *probability* of the occurrence of an undesired event. Therefore, they are not inherently as protective or robust as the ISO 14001 environmental aspects process upon which much of an ISO 14001 EMS is built. This is a consequence of the difference between the SEMP / RP-75 / E&P Forum use of a risk management approach, as opposed to the ISO 14001 identification of hazards and positive aspects (i.e., environmental aspects) approach.

All the guidelines and standards discussed above follow the same general approach, but ISO 14001 is a specification standard, rather than a set of guidelines, and is therefore by nature more succinct.

Many petroleum and petroleum supplier companies have adopted or are developing HSE MSs which are hybrids of the SEMP / RP-75 / E&P Forum HSE guidelines and ISO 14001. In addition, most OGP member companies are beginning to develop their EMS and blend them with their existing health and safety management systems.

### 1.5.4 HSE Case Management

The purpose of an HSE Case is to demonstrate that hazards associated with a facility or operation are properly managed. An HSE Case is a document, or report, which demonstrates how the HSE MS applies to a specific facility or operation, which has a

significant hazard potential. Typical operations that would require a HSE Case include survey operations, drilling, and production and maintenance. Design, decommissioning, logistics and supply base operations may or may not require HSE Cases.

A documented HSE Case has seven distinct parts:

Part 1: The Management Summary and Introduction provides a brief introduction to the main document, presents management endorsement of the Case, a summary of the Case objectives and the main findings and operational risks.

Part 2: The Operations of Facility HSE MS describes the elements of the HSE MS directly applicable to the facility or operation.

Part 3: Activities Catalogue contains the quality record for HSE critical activities applicable to the operation or facility.

Part 4: Description of Operation provides a description of the operation as background information of the hazard effects analysis to foster a clear understanding of HSE critical aspects.

Part 5: Hazard and Effects Analysis, Hazards and Effects Register demonstrates that all of the potentially significant hazards and effects have been identified evaluated, and understood, and that all of the necessary controls are in place to manage the causes and potential consequences.

Part 6: Identifies shortfalls and a Remedial Work Plan summarizes any shortfalls with a plan to improve the operation.

Part 7: Conclusion Statement of Fitness affirms that conditions are satisfactory to continue operation.<sup>33</sup>

Prior to 1985, the workforce for the oil and gas exploration and production industry was predominantly made up of company employees. Since 1990 there has been a significant trend towards increasing the use of contractor staff, resulting in a shift in responsibility and risk to the contractor's company.<sup>34</sup> While contractors manage the environmental aspects of specific operation, the petroleum companies still retains environmental liability exposures. It is essential in these HSE Cases that all hazard controls have a specified business process owner-someone in a specific job that is responsible for hazard control. Often a bridging document between the petroleum company's and the contractor's EMS is needed.<sup>35</sup>

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<sup>33</sup> Implementing and Documenting HSE Management System and HSE Cases, EP 95-0310 HSE Manual Volume 3 Hazards and Effects Management, Shell International Exploration and Production, B.V.

<sup>34</sup> HSE Management- Guidelines For Working Together In A Contractor Environment (OGP, 1998).

<sup>35</sup> Ibid, 7.

### 1.5.5 International Standards Used in the Oil and Gas Industry

Over 900 international standards are utilized in the oil and gas industry. A detailed listing can be found in the OGP "Catalogue of international standards used on the petroleum and natural gas industries"<sup>36</sup> (Report No. 1.24/299 11/99).

Most of these standards are technical standards involving valves, steel fasteners, etc. As an example, ISO 10432, unlike ISO 14001, is a specific technical standard for subsurface safety valves and not a process or performance standard.

### 1.6 COMPARISON BETWEEN ISO 14001 AND MMS REGULATIONS

There is a range of strong, potential and weak correlations between the ISO 14001 standards and the MMS regulations governing offshore oil and gas production. However, these two sets of requirements evolved for different purposes, which limits the number of correlations.

Fundamentally, ISO 14001 is designed to ensure that an organization:

- (1) identifies the significant environmental aspects and impacts of its operations,
- (2) allocates resources to manage those impacts at a level that senior management deems appropriate,
- (3) is either in compliance with statutory, regulatory and self-assumed requirements, or is taking appropriate steps to ensure compliance
- (4) appropriately communicates internally and externally about its environmental activities, and
- (5) has a management system that adequately meets and documents items 1 through 4.<sup>37</sup>

**The correlation between ISO 14001 and a number of MMS regulations is partial or non-existent because ISO 14001 does not set regulatory-style standards, and because many ISO 14001 requirements call for extra-regulatory activities.**

ISO 14001 is a process standard. That is, ISO 14001 is intended to ensure that an organization has appropriate processes in place. ISO 14001 generally does not set requirements for how an organization should implement a standard. The important thing to note, in this context, is that there are no absolute performance requirements in ISO 14001,

<sup>36</sup> OGP, November 1999.

<sup>37</sup> This is a general list. As mentioned, ISO 14001 requires a commitment to continual improvement and pollution prevention, and ISO 14001 requirements are much more detailed.

at least in the traditional regulatory sense. This means that a large portion of the OO&G regulations don't correlate very strongly with ISO 14001, because the regulations don't affect the processes that ISO 14001 requires of an organization. Thus, the definitions in the regulations, which are fundamental to the regulations, correlate only weakly with the ISO 14001 standard. Similarly, ISO 14001 requirements for top management review of EMS performance correlates with few MMS OO&G regulations. For instance, looking at communication (ISO 14001 standard 4.4.3), there is no requirement that the organization communicate to specific parties, such as state environmental officials. However, it would be an unusual EMS that failed to provide for communication with state officials. ISO 14001 is a process standard, and it relies upon the organization implementing an EMS to fill in the content, such as determining with whom the organization should communicate (or, for other parts of ISO 14001, what makes an environmental impact significant, or what level of resources is adequate). Thus, there are many more opportunities for choices by a facility in conforming to ISO 14001 than in complying with MMS regulations.

To look at another example, 30 CFR Section 253 establishes the specific amount of financial resources a company must have in the event of an oil spill, based upon worst-case oil spill discharge volume. If ISO 14001 were revised to address this specific issue, it might require a company to develop a process based on environmental impacts, but it would not establish specific financial amounts. While the company might choose to use the financial amounts set by Section 253, ISO 14001 would not require the company to use any specific formula or amount; rather, it would simply require the company to use a reasonable procedure to determine an appropriate amount.

**ISO 14001's flexibility creates both benefits and detriments and therefore cannot by itself ensure compliance.**

Obviously, there are both potential benefits and potential detriments to the flexibility of ISO 14001. On the benefit side of the ledger, ISO 14001's flexibility allows an organization to determine very precisely what its environmental impacts are, and to devote resources to the most significant environmental impacts. Further efficiency stems from the option for the organization to determine the means it will use to meet a specific environmental requirement. These efficiencies mean that an organization can get a better

return from its environmental expenditures. This flexibility also means that the organization can choose to go beyond compliance, and have a means to ensure that support for success beyond compliance is integrated into its business processes.

On the detriment side of the ledger, ISO 14001's flexibility, with respect to the process for determining the significance of an organization's environmental impacts and aspects, can result in an EMS being certified to ISO 14001 even though the organization has not rigorously identified its environmental impacts, or has not identified some of its environmental aspects. Similarly, an organization can be certified as conformant with ISO 14001, even though it is not in compliance with all the applicable environmental regulations or statutes.

**A rigorous ISO 14001 EMS will usually outperform a traditional compliance-oriented program.**

It should be clear that, for a variety of reasons, a rigorously designed and implemented ISO 14001-conformant EMS will usually outperform a traditional compliance-oriented program. Most importantly, such an EMS is usually more comprehensive and integrated into business operations—which translates into stronger support by management, more resources for environmental management and greater ability to improve the EMS. In contrast, a weakly designed and implemented ISO 14001-conformant EMS will not provide these benefits, nor is it likely to improve compliance.

An ISO 14001-conformant EMS cannot by itself ensure regulatory compliance, nor was it intended to. ISO 14001 can help ensure greater compliance, and MMS could likely benefit from companies' use of ISO 14001 for this reason alone, although there are other advantages. However, regulations and compliance reviews will always be necessary for those organizations that lack a rigorous approach to environmental management — whether that approach is a traditional compliance approach or an ISO 14001 approach.

Given the differences in purpose between the ISO 14001 standard and the MMS regulations for the OO&G industry, it is not surprising that direct correlation between the two are difficult to identify. However, four sections of ISO 14001 do show relatively strong correlation with the OO&G regulations. These are:

- **ISO 14001 4.3.2 Legal and Other Requirements**, which requires organizations to identify applicable environmental legal and self-imposed requirements,<sup>38</sup>
- **ISO 14001 4.3.3 Objectives and Targets**, which requires organizations to establish and maintain appropriate objectives and targets<sup>39</sup>
- **ISO 14001 4.4.7 Emergency Preparedness and Response**, which requires organizations to identify potential for and responses to accidents and emergency situations, and for preventing and mitigating associated environmental impacts. It also requires organizations to review and revise preparedness and response procedures after emergency or accident situations, and test procedures where possible.<sup>40</sup>

**ISO 14001 4.5.2 Nonconformance and Corrective and Preventive Action**, which requires organizations to develop process to appropriately handle, investigate and document nonconformance(s), mitigating any environmental impacts and taking preventive action.<sup>41</sup>

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<sup>38</sup>This ISO 14001 section correlates with 30 CFR Sec. 250.107; 30 CFR Sec. 250.120; 30 CFR Sec. 250.191; 30 CFR Sec. 250.300; 30 CFR Sec. 250.301; 30 CFR Sec. 250.303; 30 CFR Sec. 250.304; 30 CFR Sec. 250.503; 30 CFR Sec. 250.1503; 30 CFR Sec. 253.13/253.14/253.15; 30 CFR Sec. 253.40/253.41; 30 CFR Sec. 254.1/254.2/254.4; 30 CFR Sec. 254.5; 30 CFR Sec. 254.22-254.26; 30 CFR Sec. 254.30; 30 CFR Sec. 254.41; 30 CFR Sec. 254.42; 30 CFR Sec. 254.44; 30 CFR Sec. 254.46; 30 CFR Sec. 254.50; and 30 CFR Sec. 254.54.

<sup>39</sup> 30 CFR Sec. 250.107; 30 CFR Sec. 250.120; 30 CFR Sec. 250.191; 30 CFR Sec. 250.300; 30 CFR Sec. 250.301; 30 CFR Sec. 250.303; 30 CFR Sec. 250.304; 30 CFR Sec. 253.13/253.14/253.15; 30 CFR Sec. 253.40/253.41; 30 CFR Sec. 254.1/254.2/254.4; 30 CFR Sec. 254.5; 30 CFR Sec. 254.50; and 30 CFR Sec. 254.54

<sup>40</sup> This ISO 14001 section correlates with 30 CFR Sec. 250.107; 30 CFR Sec. 250.120; 30 CFR Sec. 250.191; 30 CFR Sec. 250.503; 30 CFR Sec. 253.13/253.14/253.15; 30 CFR Sec. 253.40/253.41; 30 CFR Sec. 254.1/254.2/254.4; 30 CFR Sec. 254.5; 30 CFR Sec. 254.22-254.26; 30 CFR Sec. 254.30; 30 CFR Sec. 254.41; 30 CFR Sec. 254.42; 30 CFR Sec. 254.44; 30 CFR Sec. 254.45; 30 CFR Sec. 254.46; 30 CFR Sec. 254.50; and 30 CFR Sec. 254.54.

<sup>41</sup> This ISO 14001 section correlates with 30 CFR Sec. 250.120; 30 CFR Sec. 250.191; 30 CFR Sec. 250.300; 30 CFR Sec. 250.301; 30 CFR Sec. 250.503; 30 CFR Sec. 253.13/253.14/253.15; 30 CFR Sec. 253.40/253.41; 30 CFR Sec. 254.1/254.2/254.4; 30 CFR Sec. 254.5; 30 CFR Sec. 254.22-254.26; 30 CFR Sec. 254.30; 30 CFR Sec. 254.41; 30 CFR Sec. 254.44; 30 CFR Sec. 254.45; 30 CFR Sec. 254.46; 30 CFR Sec. 254.50; and 30 CFR Sec. 254.54

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Table 4 provides a comparison between the MMS regulations and ISO 14001.

**TABLE 4**  
**CORRELATION BETWEEN ISO 14001 AND MMS REGULATIONS**

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 250.107 Safe, workmanlike operations & equipment; correct hazards	Sec. 250.120 Control, remove, or correct hazards	Sec. 250.191 Report all spills as per Sec. 254	Sec. 250.300 No banned pollution; control/remove pollution. Handle potentially polluting processes/ objects properly	Sec. 250.301 Regular pollution inspections; immediate correction; keep records	Sec. 250.303 Determine potential air impacts & limits
<b>ISO 14001 4.2: Environmental Policy Development:</b> Continual improvement, pollution prevention, commit to compliance, document & communicate to employees, publicly available	<b>P</b>	<b>P</b>	<b>P</b>	<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.3.1 Environmental Aspects:</b> Identify significant environmental aspects/impacts, include in environmental policy				<b>S</b>		<b>S</b>
<b>ISO 14001 4.3.2 Legal and Other Requirements:</b> Identify applicable (legal & other) requirements	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.3.3 Objectives and Targets:</b> Establish and maintain appropriate objectives and targets	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.3.4 Environmental Management Program(s):</b> Establish/maintain program to achieve goals/targets, which is updated						
<b>ISO 14001 4.4.1 Structure and Responsibility:</b> Establish roles and responsibilities, allocate adequate resources. Management representative to ensure EMS functionality.	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.2 Training, awareness and competence:</b> Identify & provide appropriate, relevant training	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.3: Communication</b> Communicate internally and externally			<b>S</b>			
<b>ISO 14001 4.4.4 Environmental Management System Documentation</b> Document EMS					<b>S</b>	

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 250.107 Safe, workmanlike operations & equipment; correct hazards	Sec. 250.120 Control, remove, or correct hazards	Sec. 250.191 Report all spills as per Sec. 254	Sec. 250.300 No banned pollution; control/remove pollution. Handle potentially polluting processes/objects properly	Sec. 250.301 Regular pollution inspections; immediate correction; keep records	Sec. 250.303 Determine potential air impacts & limits
<b>ISO 14001 4.4.5 Document Control</b> 14001 required documents are current, available; stale documents removed					<b>S</b>	
<b>ISO 14001 4.4.6 Operational Control</b> Policies/procedures ensure that activities, goods and services, comply with policy, objectives and targets.	<b>S</b>	<b>S</b>		<b>P</b>	<b>S</b>	
<b>ISO 14001 4.4.7 Emergency Preparedness and Response</b> Identify potential for/responses to accidents/emergencies; prevent/ mitigate impacts. After event, review/revise; test if possible	<b>S</b>	<b>S</b>	<b>S</b>	<b>P</b>	<b>P</b>	
<b>ISO 14001 4.5.1 Monitoring and Measurement:</b> Track and document EMS performance			<b>P</b>		<b>S</b>	<b>P</b>
<b>ISO 14001 4.5.2 Nonconformance and Corrective and Preventive Action</b> Handle/investigate/document nonconformance, mitigate impacts, take preventive action		<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	
<b>ISO 14001 4.5.3 Records:</b> Identify/maintain environmental/training records & results of audits and reviews.			<b>P</b>		<b>S</b>	
<b>ISO 14001 4.5.4 Environmental Management System Audit:</b> Conduct periodic EMS audits, determine conformance with 14001, provide audit results to top management	<b>P</b>	<b>P</b>			<b>S</b>	
<b>ISO 14001 4.5.6 Management Review</b> Top management regularly reviews EMS for suitability, adequacy and effectiveness					<b>S</b>	

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 250.304 Determine air impacts; set emission limits	Sec. 250.503 Emergency shutdown system	Sec. 250.1503 Employee training requirements	Secs. 253.13, 253.14, 253.15 1. OSFR dollar amount 2. Deduce worst case oil-spill 3. General OSFR compliance responsibilities	Secs. 253.40, 253.41 1. Submit OSFR evidence 2. Terms included in OSFR evidence	Sec. 254.1, 254.2, 254.4 1. Who submits spill-response plan 2. When submit plan 3. Plan references other documents
<b>ISO 14001 4.2: Environmental Policy Development:</b> Continual improvement, pollution prevention, commit to compliance, document & communicate to employees, publicly available						
<b>ISO 14001 4.3.1 Environmental Aspects:</b> Identify significant environmental aspects/impacts, include in environmental policy	<b>S</b>			<b>S</b>		<b>S</b>
<b>ISO 14001 4.3.2 Legal and Other Requirements:</b> Identify applicable (legal & other) requirements	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.3.3 Objectives and Targets:</b> Establish and maintain appropriate objectives and targets	<b>S</b>	<b>P</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.3.4 Environmental Management Program(s):</b> Establish/maintain program to achieve goals/targets, which is updated	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.1 Structure and Responsibility:</b> Establish roles and responsibilities, allocate adequate resources. Management representative to ensure EMS functionality.						
<b>ISO 14001 4.4.2 Training, awareness and competence:</b> Identify & provide appropriate, relevant training			<b>P</b>			
<b>ISO 14001 4.4.3: Communication</b> Communicate internally and externally				<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.4.4 Environmental Management System Documentation</b> Document EMS					<b>S</b>	<b>S</b>

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 250.304 Determine air impacts; set emission limits	Sec. 250.503 Emergency shutdown system	Sec. 250.1503 Employee training requirements	Secs. 253.13, 253.14, 253.15 1. OSFR dollar amount 2. Deduce worst case oil-spill 3. General OSFR compliance responsibilities	Secs. 253.40, 253.41 1. Submit OSFR evidence 2. Terms included in OSFR evidence	Sec. 254.1, 254.2, 254.4 1. Who submits spill-response plan 2. When submit plan 3. Plan references other documents
<b>ISO 14001 4.4.5 Document Control</b> 14001 required documents are current, available; stale documents removed				<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.4.6 Operational Control</b> Policies/procedures ensure that activities, goods and services, comply with policy, objectives and targets	<b>S</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.7 Emergency Preparedness and Response</b> Identify potential for/responses to accidents/emergencies; prevent/ mitigate impacts. After event, review/revise; test if possible		<b>S</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.5.1 Monitoring and Measurement:</b> Track and document EMS performance				<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.5.2 Nonconformance and Corrective and Preventive Action</b> Handle/investigate/document nonconformance, mitigate impacts, take preventive action	<b>P</b>	<b>S</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.5.3 Records:</b> Identify/maintain environmental/training records & results of audits and reviews	<b>P</b>	<b>P</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.5.4 Environmental Management System Audit:</b> Conduct periodic EMS audits, determine conformance with 14001, provide audit results to top management	<b>P</b>	<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.5.6 Management Review</b> Top management regularly reviews EMS for suitability, adequacy and effectiveness.	<b>P</b>	<b>P</b>		<b>P</b>	<b>P</b>	<b>P</b>

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 254.5 General response plan requirements	Sec. 254.22-Sec. 254.26 Information to be included with emergency response plan documentation	Sec. 254.30 Response plan revision	Sec. 254.41 Training response personnel	Sec. 254.42 Exercises for response personnel and equipment	Sec. 254.44 Calculating effective daily recovery capacities for response equipment
<b>ISO 14001 4.2: Environmental Policy Development:</b> Continual improvement, pollution prevention, commit to compliance, document & communicate to employees, publicly available						
<b>ISO 14001 4.3.1 Environmental Aspects:</b> Identify significant environmental aspects/impacts, include in environmental policy						<b>P</b>
<b>ISO 14001 4.3.2 Legal and Other Requirements:</b> Identify applicable (legal & other) requirements	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.3.3 Objectives and Targets:</b> Establish and maintain appropriate objectives and targets	<b>S</b>					
<b>ISO 14001 4.3.4 Environmental Management Program(s):</b> Establish/ maintain program to achieve goals/ targets, which is updated	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.1 Structure and Responsibility:</b> Establish roles and responsibilities, allocate adequate resources. Management representative to ensure EMS functionality.	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.2 Training, awareness and competence:</b> Identify & provide appropriate, relevant training		<b>S</b>		<b>S</b>	<b>S</b>	<b>S</b>
<b>ISO 14001 4.4.3: Communication</b> Communicate internally and externally	<b>P</b>	<b>S</b>	<b>S</b>			
<b>ISO 14001 4.4.4 Environmental Management System Documentation</b> Document EMS	<b>P</b>	<b>S</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>
<b>ISO 14001 4.4.5 Document Control</b> 14001 required documents are current, available; stale documents removed	<b>P</b>	<b>S</b>	<b>S</b>	<b>P</b>	<b>P</b>	<b>P</b>

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 254.5 General response plan requirements	Sec. 254.22-Sec. 254.26 Information to be included with emergency response plan documentation	Sec. 254.30 Response plan revision	Sec. 254.41 Training response personnel	Sec. 254.42 Exercises for response personnel and equipment	Sec. 254.44 Calculating effective daily recovery capacities for response equipment
<b>ISO 14001 4.4.6 Operational Control</b> Policies/procedures ensure that activities, goods and services, comply with policy, objectives and targets	P	P	P	P	P	P
<b>ISO 14001 4.4.7 Emergency Preparedness and Response</b> Identify potential for/responses to accidents/emergencies; prevent/ mitigate impacts. After event, review/revise; test if possible	S	S	S	S	S	S
<b>ISO 14001 4.5.1 Monitoring and Measurement:</b> Track and document EMS performance	P	P	P			P
<b>ISO 14001 4.5.2 Nonconformance and Corrective and Preventive Action</b> Handle/investigate/document nonconformance, mitigate impacts, take preventive action	S	S	S	S	P	S
<b>ISO 14001 4.5.3 Records:</b> Identify/ maintain environmental/training records & results of audits and reviews	P	P	P			P
<b>ISO 14001 4.5.4 Environmental Management System Audit:</b> Conduct periodic EMS audits, determine conformance with 14001, provide audit results to top management	P	P	P	P	P	P
<b>ISO 14001 4.5.6 Management Review</b> Top management regularly reviews EMS for suitability, adequacy and effectiveness	P	P	P	P	P	P

<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 254.45 Verify response equipment	Sec. 254.46 Who notify if oil spill occurs	Sec. 254.50 Spill response plans for facilities located in State waters seaward of the coast line	Sec. 254.54 Spill prevention for facilities located in State waters seaward of the coast line		
<b>ISO 14001 4.2: Environmental Policy Development:</b> Continual improvement, pollution prevention, commit to compliance, document & communicate to employees, publicly available	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		
<b>ISO 14001 4.3.1 Environmental Aspects:</b> Identify significant environmental aspects/impacts, include in environmental policy			<b>S</b>	<b>S</b>		
<b>ISO 14001 4.3.2 Legal and Other Requirements:</b> Identify applicable (legal & other) requirements		<b>S</b>	<b>S</b>	<b>S</b>		
<b>ISO 14001 4.3.3 Objectives and Targets:</b> Establish and maintain appropriate objectives and targets	<b>P</b>		<b>S</b>	<b>S</b>		
<b>ISO 14001 4.3.4 Environmental Management Program(s):</b> Establish/ maintain program to achieve goals/ targets, which is updated			<b>S</b>	<b>S</b>		
<b>ISO 14001 4.4.1 Structure and Responsibility:</b> Establish roles and responsibilities, allocate adequate resources. Management representative to ensure EMS functionality.						
<b>ISO 14001 4.4.2 Training, awareness and competence:</b> Identify & provide appropriate, relevant training			<b>P</b>	<b>P</b>		
<b>ISO 14001 4.4.3: Communication</b> Communicate internally and externally		<b>S</b>	<b>P</b>			
<b>ISO 14001 4.4.4 Environmental Management System Documentation</b> Document EMS			<b>S</b>	<b>S</b>		
<b>ISO 14001 4.4.5 Document Control</b> 14001 required documents are current, available; stale documents removed			<b>S</b>	<b>S</b>		
<b>ISO 14001 4.4.6 Operational Control</b> Policies/procedures ensure that activities, goods and services, comply with policy, objectives and targets	<b>S</b>	<b>P</b>	<b>S</b>	<b>S</b>		

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<b>S = Strong Correlation</b> <b>P = Potential Correlation</b> <b>{blank} = Weak or No Correlation</b>	Sec. 254.45 Verify response equipment	Sec. 254.46 Who notify if oil spill occurs	Sec. 254.50 Spill response plans for facilities located in State waters seaward of the coast line	Sec. 254.54 Spill prevention for facilities located in State waters seaward of the coast line		
<b>ISO 14001 4.4.7 Emergency Preparedness and Response</b> Identify potential for/responses to accidents/emergencies; prevent/ mitigate impacts. After event, review/revise; test if possible	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>		
<b>ISO 14001 4.5.1 Monitoring and Measurement:</b> Track and document EMS performance	<b>S</b>					
<b>ISO 14001 4.5.2 Nonconformance and Corrective and Preventive Action</b> Handle/investigate/document nonconformance, mitigate impacts, take preventive action	<b>S</b>	<b>S</b>	<b>S</b>	<b>S</b>		
<b>ISO 14001 4.5.3 Records:</b> Identify/ maintain environmental/training records & results of audits and reviews	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		
<b>ISO 14001 4.5.4 Environmental Management System Audit:</b> Conduct periodic EMS audits, determine conformance with 14001, provide audit results to top management	<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>		
<b>ISO 14001 4.5.6 Management Review</b> Top management regularly reviews EMS for suitability, adequacy and effectiveness.	<b>P</b>		<b>P</b>	<b>P</b>		

## **2.0 IMPACT OF ISO 14001 ON THE OFFSHORE OIL AND GAS INDUSTRY**

### **2.1 DRIVERS TO GO BEYOND COMPLIANCE**

There are numerous drivers for companies or facilities to engage in environmental management activities that “go beyond compliance,” i.e., activities that are not required by any law or regulation, yet the company or facility still pursues them.

These drivers vary both as to their sources and the type of industry or facility to which they can apply. Thus, one, several, or all of these drivers may apply to a single company or facility. Table 5-a provides drivers and examples that are oil and gas company-specific, either domestic or international. Table 5-b provides drivers and examples from other types of businesses.

Any of the drivers described in Table 5 could apply to OO&G E&P activities, given the broad range of issues involved. In the course of interviews with companies working in E&P, the following drivers were cited:

- Improved relations with regulators,
- Customers’ requirements for beyond-compliance activities
- Improved relations with NGOs and community groups
- Access to some areas of the world where specialized environmental programs are preferred
- Incidents inside and outside the oil and gas industry
- Integration of environmental activities into other management programs, especially occupational health and safety, and
- Commitment to sustainable development.

This is not a comprehensive list, but rather indicates some of the drivers that the companies interviewed readily identified.

**TABLE 5-a**  
**DRIVERS TO GO BEYOND COMPLIANCE**  
**Oil and Gas Industry Specific Examples**

<b>Driver</b>	<b>Example(s)</b>
The Chief Executive Officer, President, or another senior executive places a high priority on environmental values.	Senior management at Shell, Halliburton, Petrobras, BP-Amoco, Chevron and ExxonMobil has taken positions in favor of high environmental performance.
The company's customer(s) require "beyond compliance," or use the environmental activity in choosing suppliers.	A number of the large OO&G companies require that their contractors have functioning EHS management systems, that are ISO 14001 conformant and or certified, or in some cases, meet the requirements of the company EMS.
Communities and NGOs value environmental integrity and performance. They play substantial role in natural resource management. This is especially true with the availability of information on the intranet.	A major petroleum company, along with Halliburton, developed a comprehensive environmental plan including re-vegetation with native species and the banning of hunting and fishing at a location where ecosystem integrity was very important to the community.
The company believes that going beyond compliance will improve relations with the regulators for the relevant industry.	One major oil and gas producer cited this reason, among others, for going beyond compliance.  The existence of an EMS, in some cases, is a non-monetary requirement for the rewarding of oil and gas acreage in some foreign countries.
The company, despite maintaining a high level of compliance in its processes, experiences a series of incidents. Alternatively, the company observes incidents such as the Bhopal disaster, the ExxonMobil Valdez spill, and other uncontrolled crude oil spills. Beyond compliance steps are deemed necessary to avoid further or potential incidents.	Several major oil and gas companies have decided to go beyond compliance, in part for this reason, and have established an EMS as part of their beyond compliance efforts.
A company is responding to a court or regulatory order and is engaged in the activity as part of a settlement decree or other agreement.	BP started to develop the ISO 14001 portion of their HSE MS because of a consent order, even though it was a contractor that violated the law.

Driver	Example(s)
<p>The environmental activities are well integrated into other management programs, and therefore receive significant support.</p>	<p>Business unit managers have environmental responsibilities included in their job descriptions, and are evaluated, in part, on their environmental performance. Therefore they ensure that business operations go beyond compliance. Several oil and gas companies cited this as an example of how they help to incentivize their operations to go beyond compliance.</p>
<p>The “beyond compliance” activity results in competitive advantages, such as quicker time to market, marketing advantages, or improved supplier relations.</p>	<p>At least one OO&amp;G company cited competitive advantage in dealing with certain of its customers and countries in which it operates as a reason for going beyond compliance. Any delay due to environmental permitting could create a competitive disadvantage. Another OO&amp;G company cited a marketing advantage gained from advertising its beyond - compliance activities.</p>
<p>The company believes that the financial markets, insurers, and banks, reward “beyond - compliance” practices.</p>	<p>Oil and gas companies are responding to innovative analysis from the financial sector that links financial performance with environmental performance in choosing environmental activities that go beyond compliance, such as conducting non-required waste site clean-ups. BP has been included in an investment portfolio that focuses on companies that support sustainable development.</p>

**TABLE 5-b**  
**DRIVERS TO GO BEYOND COMPLIANCE**

**Non-Oil and Gas Company-Specific Examples**

<b>Driver</b>	<b>Example(s)</b>
Countries where the item or service is sold require the activity, even if the country where the item is manufactured does not.	The United States does not allow the import of some foods grown using certain pesticides, such as DDT, heptachlor, dieldrin, and endrin, among others. Although these pesticides were banned long ago in the United States, they are still used in some countries.
There are financial advantages.	A company that is cleaning circuit boards changes from a solvent, which may be legal to use, but has a negative environmental impact, to a less expensive, unregulated terpene -based solvent produced from citrus peels. Both AT&T and Motorola began making this shift in the early 1990s.
The company is particularly sensitive to brand protection	This is the case with many consumer retail items, such as apparel, cosmetics, food, electronics, tourism, and travel. A specific example is Nike, which has significantly improved its safety and environmental performance following negative publicity about the working conditions in factories manufacturing its products in developing countries.
The company is responding to a court or regulatory order resulting from previous non-compliance (civil or criminal), and is engaged in the activity as part of a settlement decree or other agreement.	A large U.S. conglomerate, after settling a major solid and hazardous waste lawsuit, conducts internal audits and develops an EMS, as part of the decree settling the case. United Technologies Corporation, the parent company for Pratt & Whitney and Otis Elevator, among other companies, entered into such a consent decree in 1993.

<b>Driver</b>	<b>Example(s)</b>
<p>The company operates in a heavily regulated industry, and has high visibility. Any non-compliance is likely to result in a disproportionately heavy penalty, so the company “over-complies.” This is seen as less expensive than potential penalties.</p>	<p>Many chemical companies, such as DuPont, and pharmaceutical companies, such as Baxter and Abbott, choose to over-comply due, in part, to the heavy regulatory and news media scrutiny they receive.</p>
<p>The company operates in a market in which “beyond compliance” is the norm.</p>	<p>Although U.S. farmers may legally use many synthetic pesticides and fertilizers, farmers selling to the organic food market must choose not use these synthetic substances, because of the market requirements.</p>
<p>The company is participating in a governmental program which offers rewards for “beyond compliance” activities.</p>	<p>EPA’s Energy Star (for companies that produce energy-efficient products) and Achievement Track (for companies with high performing EMS’s), offer branding advantages or regulatory flexibility. Many computer and appliance manufacturers, such as Whirlpool, Panasonic, Ricoh, Viking Industries, and Sun Microsystems, participate in the “Energy Star” program, in part to obtain marketing advantages.</p>
<p>A particular person in a facility has a high regard for environmental concerns, and serves as a catalyst for “beyond - compliance” activities.</p>	<p>A facility engineer is a gardener, hiker, white-water rafter, or a member of Sierra Club, and makes it his or her personal mission to reduce the facility’s environmental impacts.</p>
<p>The company wants to enhance or strengthen employee morale by ensuring that employees are working for a company that does “the right thing”—in this case, the “right thing” is seen as a higher-than-compliance level of environmental performance.</p>	<p>Patagonia, a company producing and selling clothing and equipment for backpacking and mountain climbing, uses organic cotton and recycled polyester in its products, even though it could use conventional cotton and virgin polyester.</p>
<p>The company sees “beyond compliance” as one aspect of presenting an image as an industry leader, and that image is considered important.</p>	<p>Boeing, Hewlett-Packard, Intel, Shell and BP all use their environmental programs and performance to as part of their strategy to position their companies as industry leaders.</p>

Driver	Example(s)
The company sees the issue of sustainability as strategic to its future success, and sees "beyond compliance" as intrinsic to sustainability.	Some companies in the lumber industry use this strategy, due to the relatively long time frame required to grow and harvest trees for lumber and the political and social issues associated with harvesting old growth timber.
The company finds a market for a substance that was formerly considered as a pollutant.	At the famous Kalundborg industrial ecosystem in Denmark, the Asnaes coal-fired power plant filters sulfur from its emissions and sells it to a sulfuric acid manufacturer, also selling its fly ash to a cement plant.
The company has recently faced negative publicity in a non-environmental area, and is attempting to compensate by using environmental management, or seeks to avoid a similar event in its environmental affairs.	Nike has significantly increased up its environmental management activities following negative publicity about a non-environmental issue: working conditions in factories manufacturing its products in developing countries.

**Companies most commonly cite market drivers as the reason to go beyond compliance**

The drivers to go beyond compliance vary in their mode of operation, the degree of senior management support, and the type of market in which the company operates, among other factors. However, the drivers that are most commonly cited are the market factors:

- Customer demand,
- Country of operation requirements,
- Response to a regulatory order, and
- Competitive branding and marketing.

To facilitate companies implementing beyond compliance activities, MMS could promote a range of measures. These might include:

- 1) Developing incentives that parallel EPA's Performance Track or Energy Star programs, which offer regulatory flexibility and branding incentives to companies that perform "beyond compliance."

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- 2) Publicizing incentives, such as financial market attention to environmental performance.

## **2.2 INDUSTRY RESPONSE TO ISO 14001**

### **2.2.1 Trends Influencing Industry In General**

As discussed in Section 1.3, "Certification in the U.S. and Around the World," the number of companies adopting and certifying to ISO 14001 is growing rapidly each year, with the greatest growth in Western Europe and the Far East.

Domestically, the following trends are influencing industry's response to ISO 14001:<sup>42</sup>

Many firms are phasing elements of ISO 14001 (such as policy development, objectives and targets, and communication) into their current EMSs.

Firms are delaying obtaining third-party certification to ISO 14001 because:

- They do not see any value in certification. That is, a certified system may not be as good as or any better than an existing system or one that is not certified.
  - ISO 14001 auditors may not have the industry-specific technical expertise to understand the management system and conduct the audit.
  - Companies have not had customer requests for certification.
  - The current ISO 14001 certification process and audit cycle is perceived as relatively expensive (ISO 14001 audits typically occur on a six-month or annual cycle, compared with business third-party compliance audits that typically occur every three years).
  - Many companies did not find that registration to ISO 9000 added much value to their current operations, even though establishing a quality management system did add value.
3. Some companies are integrating their EMS into their safety management system along with frameworks drawn from ISO 14001, E&P Forum HSE MS Guidelines, OSHA Voluntary Protection Program, OSHA cooperative compliance program, and international programs such as EMAR/EMAS.<sup>43</sup>
  4. The sporadic growth of governmental (federal and state) programs utilizing ISO 14001, such as EPA's Performance Track program. Programs such as this are in their infancy. Therefore, the benefits and costs to business of participating in these programs are often uncertain. Most companies are approaching these programs with caution; however, Performance Track already has enrolled over 200 facilities.

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<sup>42</sup> Ibid. See also Partners for the Environment, U.S. EPA, 7-89 (Spring 1998).

<sup>43</sup> Weinfield, D., Environmental Management, Legal Analysis & Regulations (MAPI, September 1998).

**The U.S. command and control regulatory approach does not facilitate the adoption of ISO 14001.**

With respect to the growth of governmental programs utilizing ISO 14001, it is important to note that the U.S. command and control system of regulations does not facilitate the implementation of ISO 14001, and companies generally are not seeing any benefit from certification with respect to regulatory requirements. Recently, there have been cases where state and federal agencies have used the implementation of an EMS as part of a settlement for problems associated with non-compliance.

The USEPA Office of Criminal Enforcement, Forensics, and Training has developed a "Compliance Focused Environmental Management System- Enforcement Agreement Guidance"<sup>44</sup> which presents what the agency believes to be the key elements of an EMS and guidance as to how it can be incorporated into a settlement agreement. Not surprisingly, the key elements of that guidance directly align with the ISO 14001 standard and any organization that establishes its EMS based upon ISO 14001 would meet those requirements as defined by EPA. However, the guidance falls short of requiring certification to any specific standard, and includes numerous requirements for agency review and approval.

Although it is generally believed that conformance with ISO 14001 translates into financial and marketing benefits, this has yet to be effectively quantified. For new business and operations, ISO 14001 provides a framework for the development of an effective and efficient EMS and avoids the financial and organizational impact of revising or redesigning an existing management system.

ISO 14001, like ISO 9000, is voluntary and will succeed or fail based upon its perceived or realized value to an organization. Without market and customer demand there are few incentives for companies to seek certification. However, because of the value derived from establishing an EMS as a management tool, ISO 14001 is becoming a globally accepted business standard and an ISO 14001 conformant EMS may, over time, become a defacto requirement for doing business in much of the world.

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<sup>44</sup> See, e.g., 30 C.F.R. 250.107, et seq.

## 2.2.2 Oil and Gas Industry Response to ISO 14001

OO&G E&P environmental management systems have their roots in the OO&G industry's experience with safety management. In order to understand the industry's response to ISO 14001, it is essential to understand the industry's response to managing worker safety issues.

The exploration and production of petroleum products is, by its very nature, hazardous. Petroleum and some of its by products, such as hydrogen sulfide, are flammable, volatile and toxic. In the production of petroleum, personnel work at heights with heavy equipment, often on slippery surfaces exposed to the wind and other extreme conditions. There have been tragic incidents such as platforms exploding or tipping over, with many lives lost in a single incident. These conditions and disasters have resulted in extensive safety legislation and regulation for exploration and production activities, both domestically and internationally.<sup>45</sup> As a result, many operators have developed strategies to manage the inherent safety risks and regulatory requirements, using Safety Management Systems (SMS) as a principle component of these strategies. Guidelines for implementing a SMS have been developed by companies, industry groups, and national and international bodies. The implementation of a SMS, with an educational, goal-setting approach, by the E&P industry has resulted in measurable reductions in work related injuries and illness as indicated in Figures 3 and 4 below.<sup>46</sup>

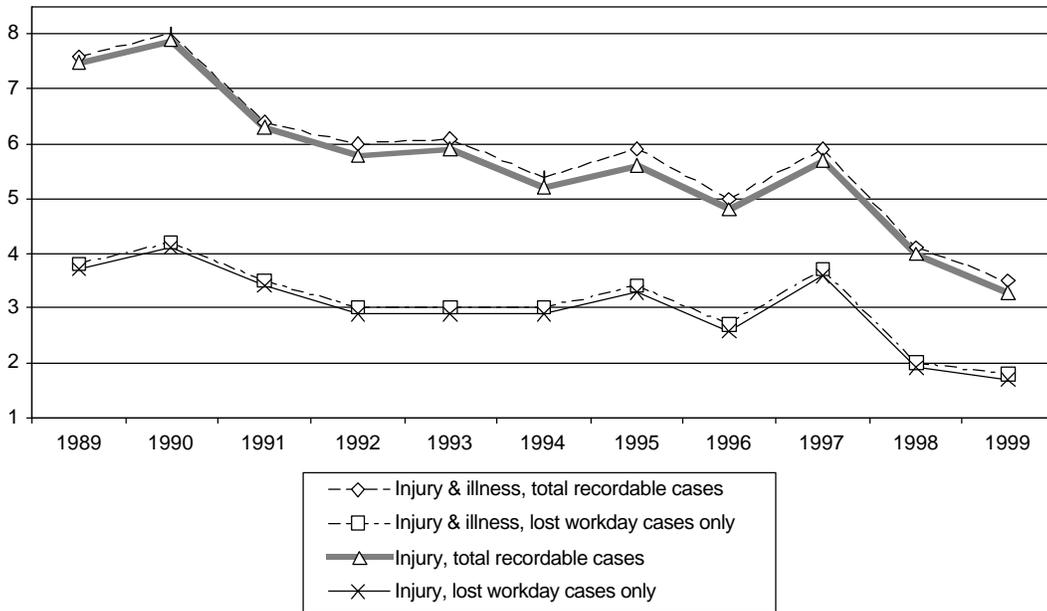
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<sup>46</sup> Based upon the experience and expertise of the project team.

<sup>46</sup> [www.OSHA.gov](http://www.OSHA.gov) (available December 2000).

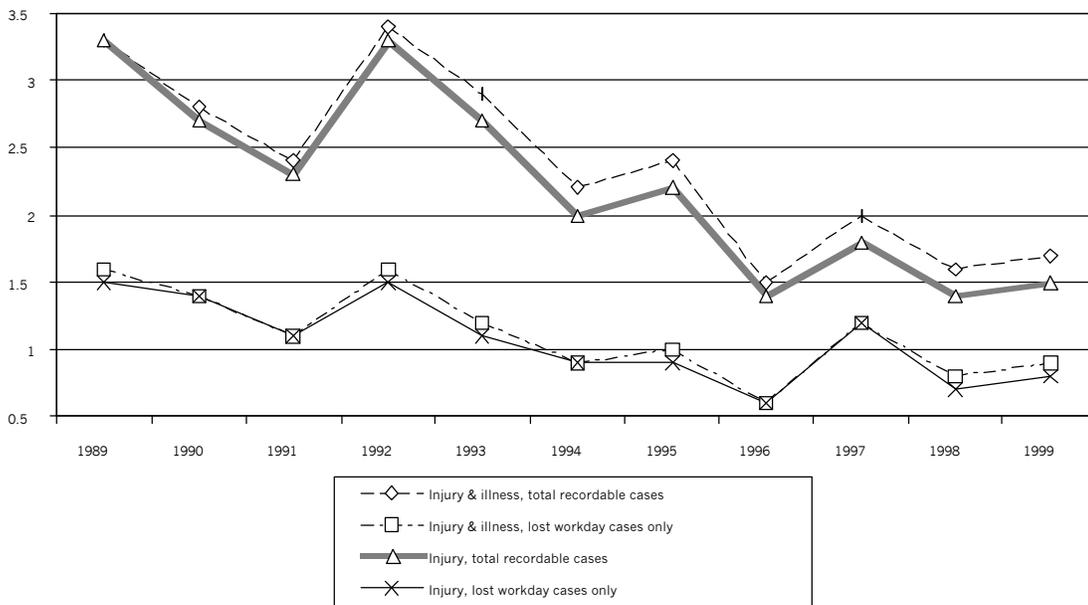
**FIGURE 3**

**Annual Injury & Illness Rates Per 100 Full-Time Workers  
Oil & Gas Extraction**



**FIGURE 4**

**Annual Injury and Illness Rates Per 100 Full-Time Workers  
Crude Petroleum and Natural Gas**



MMS introduced its SEMP concept in the Federal Register on July 2, 1991,<sup>47</sup> to begin to more formally address safety and, to a lesser extent, environmental concerns in the offshore oil and gas industry. In response, OCS operators requested that they be given an opportunity to further develop SEMP and a chance to demonstrate that they could voluntarily adopt it on a widespread basis. MMS joined with a broad-based industry committee to refine the SEMP concept under the aegis of the API. In May 1993, the API published RP-75 as its response to SEMP. As discussed in Section 1.5., these approaches (SEMP and RP-75) do not fully address environmental issues associated with OO&G industry.

**Environmental management in the OO&G E&P industry has not always kept pace with safety management.**

Historically, forward-looking E&P companies have adopted safety management systems, such as SEMP. As companies continually improve their SMS, they tend to add health and environmental management, or develop concurrent health and environmental management systems, to eventually mirror the strengths of their SMS. Nonetheless, it has been recognized that “The requirements of health, safety and environmental management are not always in harmony. For example measures necessary to safeguard personnel in emergencies may have adverse environmental effects and vice versa.”<sup>48</sup> Therefore, improvements in health and environmental management do not always follow improvements in safety performance.

In order to more fully address health, safety and environmental issues, the International Association of Oil and Gas Producers (OGP, formerly E&P Forum) formed a task force with members from ExxonMobil, Agip, Amoco, British Gas, BP, Halliburton, Kuwait Oil Company, Petromina, Phillips, SIPM, Statoil, and UNOCAL to develop the “Guidelines for the Development and Application of Health, Safety and Environmental Management Systems.”<sup>49</sup> The approach outlined in this document is consistent with the Malcolm Baldrige model used by many companies in developing their quality

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<sup>47</sup> 56 F.R. 30400

<sup>48</sup> Guidelines for the Development and Application of Health, Safety and Environmental Management System, Report No. 6.36/210, (The E&P Forum, July 1994).

<sup>49</sup> Ibid

management systems. Many E&P companies and some contractors have utilized these guidelines along with other models, such as SEMP, as the foundations of their environmental, health and safety MS.<sup>50</sup>

**Smaller companies generally direct their resources toward compliance with regulations and not the development of HSE management systems.**

Not all E&P companies have EMS, HSE MS or SMS.<sup>51</sup> All the large companies interviewed for this report have EMS, HSE MS, and/or SMS, and their systems are more robust than those of the mid-sized and small companies interviewed. The management systems of the mid-sized companies interviewed are primarily focused on SEMP, which is implemented to a greater or lesser extent. Smaller companies generally direct their resources towards compliance with regulations and not the development of HSE management systems.

The trend among the large OO&G companies interviewed is a consistent, integrated approach to HSE management as opposed to separate HSE management systems. Some large E&P companies and contractors, due to the success of their SMS, the existence of the E&P HSE MS guidelines and a desire for an economical, consistent, balanced and systematic approach have developed an integrated HSE MS. Companies advocating this approach include BP, Shell, ExxonMobil, Halliburton, Chevron, Eni, ADNOC, Kuwait Oil Company, Petrobras and Schlumberger. These systems traditionally have a stronger safety element, but as some of these companies incorporate all or most of the ISO 14001 requirements into their management systems, the environmental portion is becoming more robust. Other industry studies, such as "Best in Class" (a study of the HSE MS of the manufacturing, beverage, agricultural /construction equipment, medical and electronic equipment industries), have revealed that the safety portion of the management systems are more well developed and, overall, safety is more integrated throughout the organization, from the chairman of the board to front line employees, than environmental concerns.<sup>52</sup>

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<sup>50</sup> This data is drawn from interviews with E&P companies and contractors.

<sup>51</sup> See Section 2.6, Impact on Large and Small Operators.

<sup>52</sup> Stanley Works , Best in Class HSE MS Study, Environmental Management Strategies,1997; see also Environmental Management in Organizations, [www.enviroglobe.com/cost/articles /cost-art22.htm](http://www.enviroglobe.com/cost/articles /cost-art22.htm) (available Dec. 10, 2000).

Although an integrated EHS management system appears to be the direction in which the OO&G industry is heading, some large companies prefer to manage environmental issues via a separate management system.

Overall, larger OO&G companies are taking the lead in the implementation of ISO 14001 EMS and EMSs in general. This extends to their relationships with their contractors. In the US, one major OO&G E&P company has stated that it would like its contractors to have an ISO 14001 conformant EMS by the end of 2001. Other E&P firms have specified this for international locations, and depending upon the region, required ISO 14001 certification of contractors' EMS for some locations. Other firms interviewed require that their contractors have an EMS but do not require that it conform to ISO 14001.

In those companies interviewed that are taking the lead with ISO 14001, its implementation is seen as supporting the integration of the EMS into business operations, and is producing positive changes in how environmental management is viewed (see Table 7, page 77). Another positive consequence is that responsibility for environmental management is being driven deeper into the organization, so that issues can more often be addressed closer to their point of origin.

### **2.3 IMPACT OF U.S. OFFSHORE OIL AND GAS EXPLORATION AND PRODUCTION REGULATIONS ON THE ADOPTION OF ISO 14001**

Literature research and interviews with oil and gas companies and oil and gas contracting companies suggest that the regulations MMS is charged with enforcing, at 30 C.F.R. 250.107, et seq., generally have little or no impact on the adoption of ISO 14001. While many of these regulations are compatible with ISO 14001, and would be addressed in an ISO 14001 EMS, the regulations themselves do little to support or inhibit a company's decision to adopt an ISO 14001 or any other EMS. However, the regulations have the potential to be revised to encourage companies to adopt an ISO 14001 EMS.

The 30 C.F.R. regulations have played a role in driving some companies towards the adoption of EMSs generally, although not ISO 14001 specifically. A number of companies interviewed referred to concerns about both penalties and maintaining a good reputation as drivers for the adoption of an EMS. To the extent that an organization's

activities might violate these regulations, create penalties and harm its reputation, it is not surprising that companies would establish an EMS, at least in part to reduce the potential for violations.

**Reasons that companies cite for adopting an EMS are generally unrelated to the 30 C.F.R. regulations.**

The general absence of concern about specific regulations (as opposed to fines and penalties) is illustrated by the reasons OO&G E&P companies give for adopting EMSs generally and in some cases, ISO 14001-conformant EMSs:

- Customer requests or requirements.
- Senior management establishes environmental values as a priority.
- Response to incidents and accidents within itself and in outside industries.
- Response to NGO and community concerns.
- Need to standardize processes and institutionalize expertise.
- EPA required the development of an EMS as the result of an environmental incident.
- Desire to do the right thing.
- Prevention of environmental impacts and harm to employees.
- Open international opportunities and markets.
- Corporate governance shifted from U.S. to international, creating a need for common tools and language.
- Standardize EHS approach across a wide range of product lines.
- Miscalculations on environmental issues, which required additional expensive equipment and services.
- Involvement with RP-75 and SEMP.
- RP-75 and SEMP provided a template that made it easier to design an EMS.
- Top management's desire to: meet society's expectations for the management and integrity of their operations, have consistency across business operations, and be a leader in HSE performance.

It is equally important to note that some companies' concerns about violations of the 30 CFR regulations are a driver for adoption of an EMS. Table 6 summarizes the ways companies perceive the MMS regulations as supporting or inhibiting the adoption of an EMS.

**TABLE 6**  
**Ways MMS Regulations Support or Inhibit EMS**

<b>Ways Regulations Support Adopting an EMS</b>	<ul style="list-style-type: none"> <li>▪ Improved performance and reduced Incidents of Non-Compliance (INCs) are anticipated from a systematic approach</li> <li>▪ Validate the need for the system and provide a metric (INCs) to evaluation performance.</li> <li>▪ Demonstrate value of EMS by providing a metric of compliance.</li> <li>▪ Create more cooperation between operators and subcontractors because MMS holds operators responsible for actions of contractors.</li> <li>▪ Heighten operator awareness and improved internal visibility of EHS.</li> </ul>
<b>Ways Regulations Inhibit Adopting an EMS</b>	<ul style="list-style-type: none"> <li>▪ Regulations do not require all operators to have an EMS, which creates an uneven playing field.</li> <li>▪ Prescriptive regulations do not allow for much flexibility.</li> <li>▪ Training requirements are too prescriptive, not performance-based</li> </ul>

**The perception of MMS staff and inspectors is that some segments of the regulated community prefer the certainty of a prescriptive regulatory approach.**

The perceptions of MMS staff and inspectors concerning the importance and function of an EMS, summarized below, provide useful insight into how the regulations affect companies' adoption of an ISO 14001 EMS:

- Smaller operators like a prescriptive approach because it is already understood and well defined.
- An EMS approach is hard for small operators to fully comprehend.
- Performance-based systems like EMSs are effective when the economy is strong, but may get less company attention when the economy weakens.
- Management systems tend to get implemented in response to an accident or release, and after a root cause analysis of the incident.
- MMS currently has no vehicle or leverage to promote SEMP or ISO 14001.
- Participation in ISO 14001 or SEMP is due to a desire on the part of companies to go beyond compliance, not regulatory pressure.
- The more prescriptive portions of SEMP are being implemented more strongly.
- Large companies are more interested in performance-based systems than the prescriptive regulation approach.
- The regulations do not prohibit or promote beyond-compliance actions by the companies.

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- Companies' need for certainty in the regulations is a limiting factor for performance-based management systems.
- Some smaller companies prefer detailed requirements.

**ISO 14001 was designed to address environmental concerns that are broader than, and different from, the primary concern addressed by the 30 C.F.R. regulations: i.e. spilled crude petroleum.**

To gain a better understanding of why many companies active in OO&G E&P do not perceive the 30 C.F.R regulations as having an impact on their decision to adopt an ISO 14001 EMS, it is helpful to understand some of the history of ISO 14001. The environmental regulations and the pollution that ISO 14001 is designed to address resulted from the activities associated with the *manufacturing of goods*, such as tires, cars, computers, airplanes, etc. rather than the *extraction of a natural resources*, such as crude petroleum.

The environmental concerns from manufacturing are generally due to the *range of waste by-products* such as wastewater discharges into streams and other bodies of water, the disposal of metal grindings into a waste site, and the emission of chemicals into the air. In contrast, the primary (although not only) environmental concern in OO&G E&P is the discharge of crude petroleum, which is the primary product. Thus, ISO 14001 is designed to address the management of a wide range of environmental concerns, but the 30 C.F.R. regulations focus on one primary environmental concern. This difference limits the number of points of intersection between ISO 14001 and the regulations governing the management of the OO&G industry.

Also, the uncontrolled discharge of crude petroleum represents an economic loss to OO&G E&P companies. OO&G companies have a strong incentive, independent of any regulation, to adopt systems such as an ISO 14001 EMS to help them minimize the loss of product.

MMS regulations address only a portion of the issues and aspects that are covered by a company's EMS. Environmental aspects of offshore oil and gas operations such as air emissions, hazardous waste management, and wastewater discharge are generally governed by the regulations of the federal or state environmental agencies. It was noted that the MMS Gulf of Mexico OCS Region, New Orleans District

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annually inspects all the platforms in its district, but conducts only 10-15 EPA Air and NPDES inspections each year. The results of the inspections are sent to the EPA regional office for action. This further limits the opportunities for interaction between an ISO 14001 EMS and the 30 CFR regulations.

**A shift by MMS to performance-based training requirements could support EMS implementation.**

In the course of interviewing OO&G E&P companies, one suggestion was offered concerning a regulatory shift that could support performance-oriented EMSs generally and ISO 14001 EMSs specifically. Currently, there is no option for facility personnel to "test out" of the 30 C.F.R. training requirements, such as those at 30 C.F.R. 250.1503. Thus, facility personnel may be required to go through training, even though they are already competent in the subject matter.

While such a training requirement does not inhibit the adoption of an ISO 14001 EMS, it fails to support implementation because ISO 14001 establishes a performance requirement for appropriate and relevant training. If facility personnel could test out of the 30 C.F.R. training requirements by demonstrating their proficiency in the subject addressed by the specific regulation, they could then be trained on other environmental management topics, which might provide additional environmental benefits.

It was noted during discussions with MMS and industry representatives that the recent internal MMS discussion of performance-based training requirements on the part of MMS is a positive step in support of EMSs. This kind of initiative promotes a less prescriptive and more flexible, performance-based regulatory regime that also promotes compliance.

## **2.4 APPLICABILITY/TRANSFER OF NON U.S. EMSs TO U.S. OPERATIONS**

**There are no "foreign EMS standards" that could be applied to the U.S., only lessons learned from a specific EMS.**

When considering the applicability or transfer of EMS standards to the U.S., it is important to distinguish between EMS **standards**, such as EMAR/EMAS, ISO 14001, and **guidelines** such as the E&P Forum, and Environmental Management **systems**. An

EMS is designed to a standard and applied to a specific facility or operation. For example, ISO 14001 is *not* an EMS. Rather, it is a standard to which an EMS can be designed. These standards are not "U.S." or "non-U.S.," and therefore can be applied to the development of EMSs for business operations within or outside of the U.S.

In general, the OO&G companies surveyed during this project, and companies in general, are developing customized Environmental Management **Systems** that meet the companies' perceived needs and requirements. An EMS may include a few, many, or all the elements from existing standards such as SEMP, ISO 14001, EMAR/EMAS, or any other standard or guideline a company finds valuable. This is because some standards / guidelines (or elements of a standard) will tend to be more appropriate within a given set of circumstances or corporate culture. For instance, the EMAR/EMAS model (discussed in Section 1.1) requires more information disclosure to the public than does ISO 14001. Given that the U.S. tends to be more litigious than the EU<sup>53</sup>, U.S.-based companies and international companies operating in the U.S. may refrain from adopting the information disclosure element of EMAR/EMAS.

Once a company has established a corporate EMS model, and implemented EMSs for locations in different countries, it may take the experience from an EMS in one country and incorporate it into the design and deployment of an EMS in another country or operation. For instance, a company might incorporate the lessons learned from a North Sea operation into the design or implementation of an EMS for the Gulf of Mexico. A company might also draw on a variety of EMS standards or elements of a standard in developing its own EMS.

While a detailed comparison of the various EMS models is beyond the scope of this report, it is important to note that most of the EMSs, including those developed by OO&G E&P companies, contain a number of identical or similar elements, such as:

- Commitment and Leadership by Senior Management
- Policy and Objectives
- Auditing/Checking/Reviewing
- Implementation/Operation
- Planning, including Risk Analysis/Management

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<sup>53</sup> This data comes from the experience and knowledge of one or more of the authors.

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- Organization
- Resources
- Documentation
- Training
- Management Review

The former E&P Forum (now the International Association of Oil and Gas Producers (OGP)) safety and environmental management model, (discussed in Section 1.5.) is being adopted by more than one of the companies interviewed. Several of the companies stated that they perceived the E&P Forum as being more comprehensive than the API RP-75/SEMP approach and therefore more relevant to their operations. Each of these companies has taken appropriate elements from the E&P Forum model and adopted them into its system.

One large company interviewed is applying the following elements of the E&P Forum guidance to its EMS: Leadership & Commitment, Policy & Strategic Objectives, Organization, Resources & Documentation, Evaluation & Risk Management, Planning, Implementation & Monitoring, and Reviewing and Editing. Several companies incorporated elements of ISO 14001 into their global EMS in addition to elements of the E&P Forum model. A third company used elements of the American Chemistry Council (formerly the Chemical Manufacturers Association) Responsible Care program in the development of its EMS. In addition to integrating these elements into an environmental management system, a number of the companies have incorporated, or are incorporating, environmental, health and safety management systems into a *combined* HSE management system.

**SEMP can play a valuable role in supporting the development of EMSs, particularly for resource-constrained companies.**

SEMP has also received a noticeable degree of acceptance among the OO&G E&P companies interviewed. Two of the smaller companies interviewed have adopted SEMP, because of (1) their familiarity and comfort with it, and/or (2) SEMP's acceptance, if not adoption, by other OO&G E&P companies. One large company saw

SEMP as too limiting a model for its EMS, while another is using SEMP as a transitional step while it moves to an ISO 14001 conforming EMS. According to interviews with MMS personnel in the New Orleans District, smaller companies tend to perceive SEMP as just another regulatory requirement.

The widespread recognition of SEMP among the OO&G companies interviewed suggests that SEMP, because of

- its links to API RP-75,
- its perceived acceptance (and indeed, sponsorship) by MMS, and
- its functionality as a performance-based standard rather than a prescriptive regulation,

can play a valuable role, particularly for companies moving towards an EMS approach, and perhaps for companies that are more resource constrained. In addition, through MMS involvement with SEMP, a higher level of awareness and understanding of OO&G companies' EMSs is developing within the agency.

The decision as to which standard or elements of a standard to include in a given corporate EMS will depend upon many factors, including the type of operations, location, corporate strategy, corporate culture, history, and others. Companies that are reluctant to dedicate the resources to developing a unique EMS may use SEMP or another standard as a template, with little customization.

## **2.5 MAJOR PLAYERS IN THE OFFSHORE OIL AND GAS INDUSTRY.**

The OO&G Industry has been involved with the ISO 14001 standard from its beginning. The industry actively participated in the formation of the ISO 14000 standards and continues to participate in the ongoing revisions to the standard.<sup>54</sup>

- API sent a representative to the U.S. TAG meetings;
- A representative from ARCO ran the ISO 14000 Subcommittee on Environmental Performance Evaluation (EPE);
- Individual E&P companies funded an attorney to attend all of the U.S. TAG meetings, taking a leadership role to ensure that the standards would not become too onerous or cast any negative aspersions on the E&P industry.

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<sup>54</sup> Data sources include trade and professional publications.

- A large US-based E&P company usually sent two representatives to the TAG meetings (both domestically and abroad) to ensure that its interests were represented.

Table 7 details the E&P firms, and E&P support firms, that have demonstrated the strongest commitment to implementation of an ISO 14001 EMS / or an ISO 14001 portion of their HSE MS, based upon public statements, involvement with ISO 14001 activities, and reported ISO 14001 implementation and certification.<sup>55</sup> These leading companies generally have their central headquarters outside of the United States, as shown.

**Larger OO&G companies are generally the leaders in ISO 14001 implementation.**

Many E&P firms have developed and aggressively implemented their ISO 14001 conformant EMS outside of the United States. They have done so for a wide variety of reasons including:

- The MS approach to environmental management has strong roots outside of the US, and is highly accepted and developed in other regions.
- Other countries/nations wanted a universal/international method to evaluate an OO&G company's HSE management.
- Certain countries/governments want some assurance that the manner in which an E&P company conducted HSE management was consistent irrespective of the nation.

This last concern arose in part due to the belief that some industries would move their worst-polluting operations to locations outside of the United States where environmental regulations are not as protective, to be able to spend less on environmental protection and thereby increase profits.

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<sup>55</sup> See ANSI-RAB EMS NAP Document E3.1 Revision October 28, 1997.

**TABLE 7**  
**Leaders in ISO 14001 MS Implementation**

<b>Headquartered in the United States</b>	<b>Headquartered Outside the United States</b>
Halliburton	Banchak Petroleum
	BG International
	ADNOC
	British Petroleum (BP)
	Chinese Petroleum
	Eni (Agip)
	Grupa IRSA
	Idemitsu
	LASMO
	National Petrochemical
	Nihokal
	Nippon
	Petro Authority of Thailand
	Petrobras
	PTT Exploration and Production Company Limited
	Quatar Petroleum
	Royal Dutch Shell
	Statoil
	Sun Nam
	Thai Oil
	Tunex
	Venezuela National Oil Company

BP has implemented and certified ISO 14001 EMSs for most of its locations within the United States. Halliburton has implemented and certified ISO 14001 EMS in the U.S. and internationally. Shell has implemented and certified ISO 14001 EMS in many countries outside of the U.S., and is currently working on implementing and certifying operations in the U.S. Chevron is currently developing the ISO 14001 environmental

portion of their integrated HSE MS for locations outside of the U.S., where market conditions are a driving factor. ExxonMobil has its OIMS HSEMS attested by a third party as conforming to ISO 14001. Some E&P firms have been able to enter markets and received contracts because of their HSE record and an ISO 1400-certified HSE MS.

These data again indicate how larger OO&G companies are primarily taking the lead in ISO 14001 implementation. One unique aspect of OO&G company operations, in comparison with many traditional manufacturers, is that these companies have frequently had large community affair programs. The OO&G industry can have a dramatic impact on the environment and local community, so Community Plans have usually been a dominant factor in several E&P companies' business plans. With the advent of the Internet and easy access to information, non-governmental organizations (NGOs) can research industries and have a direct influence on how the E&P industry conducts business in a community or area.<sup>56</sup> These community affair programs are now often integrated into or coordinate with HSE programs. Thus, it is illuminating to review how an ISO 14001 EMS addresses community affairs.

Five sections of ISO 14001 directly or indirectly address community interests.

1. The environmental policy should be publicly available.
2. Legal and other requirements need to be identified.
3. Interested parties should be considered when forming objectives and targets.
4. Procedures need to be established for handling communications from external interested parties.
5. The organization needs to develop an appropriate process for external communication of its significant environmental impacts.
6. Targets and objectives should consider the views of interested parties.

The implementation of an ISO 14001-conformant EMS can drive a company to more broadly address community concerns with respect to the potential the HSE environmental impact of its operations. In areas with ecosystems and other natural resources, such as fisheries and other wildlife that attract commercial and recreational interests, some subtler E&P environmental/community impacts may cause unwanted changes. The importance of including community and ecological concerns into MS was highlighted by several officials of the Nigerian government, including the President of

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Nigeria, at the Society of Petroleum Engineers International Conference of Health, Safety and Environment in the Oil and Gas Exploration and Production, on June 26-28, 200 in Stavaneger, Norway.

## 2.6 IMPACT ON LARGE AND SMALL OPERATORS

**The drivers for ISO 14001 EMS implementation are either internal to a company, or come from outside the U.S. Currently, there are no apparent U.S. market drivers for adoption of an ISO 14001 EMS.**

The major players with respect to ISO 14001 EMS implementation, and EMS implementation in general, are the large OO&G companies and the large support contractors. Some mid-sized companies are allocating resources for EMSs (generally non-ISO 14001 EMS), so that they can better manage their environmental affairs and to improve relationships with MMS. Traditionally, the larger OO&G companies have been the leaders in technology and new developments such as HSE MS, and the middle and smaller organizations follow suit. Often contractor firms such as Halliburton, Schlumberger or Baker Hughes will assist the mid-size to smaller operator with the newer technologies and/or practices that have been adopted by the larger E&P companies. Generally, it is the larger companies, such as BP and Shell, with global headquarters outside of the continental U.S., and Halliburton and ExxonMobil, headquartered in the US, that are implementing ISO 14001-conformant HSE MS.

For many E&P and support companies, the decision to certify on a global basis is often determined by local market drivers. Currently, there are no market drivers for E&P companies to adopt an EMS or ISO 14001 for U.S. operations. While MMS encourages companies to adopt SEMP, the companies that have implemented a SEMP-based management system have not realized preferential treatment from regulators or the marketplace.

Medium and small companies tend to focus on compliance with the regulations and not on an EMS that could move them beyond compliance. Most mid-size operators have safety systems in place and some have or are working toward SEMP. Smaller companies generally are not implementing EMS, except as mentored or required by

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<sup>56</sup> A. Hinds, VP HSE Halliburton Co., personal conversation, June 10, 2000

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larger E&P companies which require their contractors to have an EMS, or by larger contractors, which provide EMS expertise to the smaller E&P companies. In addition, smaller companies usually do not utilize a systems approach to manage HSE or other issues.

Larger companies are trending towards integrated management systems, evaluating contractors' management systems, and increased involvement of line management.

The interviewed larger offshore operators are moving toward establishing unified health, safety and environmental management systems (HSE MS). This is an integrated approach to using a "management by objectives" (MBO) approach for the company's policies, objectives, targets, and performance measures. Some of these companies are also considering incorporating an evaluation of their suppliers' and contractors' EMSs and HSMSs in their procurement criteria. In addition, some of the large companies interviewed indicated a preference for contractors with robust EMS and HSMS, because these management systems can lower the company's risk for injury to personnel and/or environmental liability.

Larger companies (including contractors), place greater emphasis on facility management and line personnel taking responsibility for environmental performance. For instance, in one large company, the EMS includes a requirement that Team Leaders for each facility establish the necessary roles and responsibilities to implement the EMS, in addition to the environmental responsibilities held by employees at the business unit level.

At the larger companies, the barriers to the adoption or integration of an EMS include issues such as:

- Resolving a complex set of issues that take time to clarify or implement,
- Friction as managers rotate through jobs that have greater or lesser environmental responsibilities,
- Developing corporate-wide programs from information previously held by a handful of experts, and
- The difficulty of measuring and demonstrating the value of an EMS. (Given the magnitude of the effort needed to create and then maintain a complete HSE MS, even larger companies may find the burden of an ISO 14001 EMS to be more than they can justify, based on the benefits received.)

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Larger companies also cited perceived benefits from the adoption of an EMS that included:

- Access to drilling areas,
- Market advantage in obtaining clients,
- Improved investor relations,
- Increased energy conservation,
- Improved relationships with MMS,
- Decreases in injuries, releases and fines,
- A perceived increase in operating efficiency, and
- Deployment of best practices across the organization.

ExxonMobil provides an interesting example of one larger company's response to ISO 14001. Although ExxonMobil has had an ISO registrar review its HSE MS, "Operations Integrity Management System" (OIMS), and determine that it meets the requirements of ISO 14001, ExxonMobil has not had OIMS certified to ISO 14001. Rather, ExxonMobil utilized third - party attestation to establish that the company's EMS is in conformance with ISO 14001 requirements. By auditing a sample of operating locations, the third party confirmed with reasonable certainty that the EMS has been implemented throughout the company. The attestation activity is carried out by an accredited third - party registrar and is valid for three years, at which point it is repeated. ExxonMobil believes that this is a more efficient option causing less disruption of operations, provides the necessary assurance as to the adequacy of the EMS, and provides the benefits of certification, where certification to ISO 14001 would otherwise be required.

**Mid-size and smaller companies are less likely to adopt an EMS, because they have few or no incentives from markets or regulators, because costs are disproportionately high, and due to inexperience with a management system approach.**

Most mid-size operators have safety systems in place and some have or are working toward SEMP. For these companies, value is seen as arising from the improved tracking of environmental issues so that goals and deadlines can be achieved, and

improved relations with MMS. However, in some cases, there is a perception that implementing an EMS delivers no value.

In mid-size and smaller companies, there are a number of significant barriers to the adoption of any EMS, including an ISO 14001 EMS. Perhaps the most important barriers are the lack of market or regulatory incentives for E&P companies to adopt an EMS or ISO 14001 for U.S. operations. While MMS has encouraged companies to adopt SEMP as a model for an EMS, the companies that have implemented SEMP have not received recognition in the marketplace. Additionally, these companies have not received any preferential treatment from MMS, even if the EMS has resulted in improved environmental performance.

Theoretically, some of the incentives for larger companies described above (such as increased operating efficiency) could also apply to mid-size and smaller companies. However, in practice, the costs of implementing an EMS are perceived to far outweigh the benefits. Based upon interviews with OO&G industry representatives and MMS personnel, barriers to the adoption or integration of an EMS by small and mid-size companies include:

- Smaller companies cannot amortize the cost of developing an EMS across a large number of operations. This means that the perceived cost per facility can be prohibitively high.
- Many of the smaller companies do not apply a systems approach to their business operations and tend to respond reactively to many of their business issues, rather than in planned fashion.
- Resistance on the part of middle and upper management, which does not place a high priority on EMS development and implementation.

**Medium and small companies tend to be focused on compliance with the regulations and not on an EMS that would move them beyond compliance.**

Because small and mid-size companies often operate on tighter profit margins than do larger companies, they are less able to invest in their businesses generally, including investment in an EMS. In the absence of an environmental emergency or a market incentive, they will tend to invest in functions that are seen as producing a more immediate financial return.

## **2.7 ROLE OF THIRD-PARTY REGISTRARS AND AUDITORS**

### **2.7.1 Role of Third-Party Registrars**

Organizations or facilities that wish to certify or register their EMSs will need to contract with an independent, third - party organization to evaluate conformance to the requirements of the standard. Such an organization is called a “registrar,” and its employees (auditors) conduct ISO 14001 certification audits. It is important to ensure that the registrar chosen to certify an EMS is accredited by an authoritative body to ensure that the registrar is competent and will conduct the conformance review in accordance with internationally accepted criteria. In the United States the authoritative body that provides accreditation to registrars is the American National Standards Institute – Registrar Accreditation Board (ANSI-RAB).

The ANSI–RAB National Accreditation Program (NAP) has published criteria to govern the accreditation of registration bodies of environmental management systems in a document titled Criteria for Bodies Operating Registration of Environmental Management Systems. The criteria document specifies the requirements that a third party operating an Environmental Management System (EMS) registration program shall meet if it is to be recognized at a national or international level as competent and reliable in the conduct of EMS registration. These requirements are used in the ANSI-RAB Environmental Management Systems National Accreditation Program (EMS NAP) for evaluation of the competence and reliability of EMS registration bodies (registrars). The Criteria document and a list of the 27 US registrars that have achieved ANSI-RAB NAP accreditation can be accessed at the RAB web site at [www.rabnet.com](http://www.rabnet.com).

To determine if a registrar meets the ANSI-RAB NAP accreditation criteria, the registrars’ policies and procedures and the credentials of auditors working for the registrar are evaluated. In addition, an independent team conducts a site review of the registrar’s operation, policies and procedures and witnesses a client registration audit conducted by the registrar. Accreditation is valid for four years with surveillance audits six months after initial accreditation and annually thereafter. A complete reassessment is conducted every four years.

When the ISO 14000 standards were first released there was some concern that

1. The standard would not be consistently applied globally, and

2. There was a potential for governments and organizations to certify organizations without adequately verifying the implementation of the underlying management principles.

Use of independent national organizations such as ANSI-RAB, and establishing accepted criteria for organizations registering EMSs, helps to ensure global consistency in the application of the certification/registration process.

### **2.7.2 Role of Third - Party Auditors**

In addition to establishing the criteria for accreditation of registrars, ANSI-RAB has established certification criteria for EMS auditors. In order for a registrar to be able to register/certify an organization's EMS, certified EMS auditors must be utilized. These auditors review and evaluate the system, and determine its level of conformance to the ISO 14001 standard.

Utilizing the criteria of education, EMS auditor training course attendance, environmental work experience, personal attributes, and EMS or environmental audit experience, individuals can be certified as any of the following:

- **Provisional Auditor (E-PA):** Satisfied the basic requirements, but has not performed environmental audits
- **Environmental Auditor (E-A):** Satisfied the basic requirements and has performed environmental audits, either alone or as a member of a team.
- **Environmental Management System Auditor (EMS-A):** Satisfied the basic requirements and has performed an audit of all or part of an environmental management system, either alone or as a member of a team.
- **Environmental Management Systems Lead Auditor (EMS-LA):** Satisfied all the basic requirements and has managed a complete environmental management system audit according to ISO 14011.

RAB-certified auditors have met the requirements established in ISO 14012 Guidelines for Environmental Auditing- Qualification Criteria for Environmental Auditors.

### 2.7.3 Industry Use of Third Party Auditors

Facilities or companies that decide to develop or modify their existing EMS to obtain ISO 14001 certification may do so for a number of reasons including:<sup>57</sup>

- (1) a specific customer demand for certification,
- (2) strong societal support in a specific country or region,
- (3) a directive from senior management,
- (4) ISO 14001 certification is seen as a method to improve the efficiency of the EMS, and
- (5) In developing countries, because environmental regulations and/or enforcement are seen as so lax, ISO 14001 certification provides an endorsement in attracting customers from developed countries.

As was previously discussed in Section 1.2.3, an organization can seek third-party registration by an accredited registrar or make a self-declaration to the standard. Many U.S. firms are choosing to self-declare to the ISO 14001 standard rather than use third-party certification because, in the current absence of market demand, the benefits of third-party certification are not apparent or do not justify the cost. However, a small, but growing number of firms believe that an ISO 14001 EMS will not bring the benefits they seek unless it is validated by an outside party.

**Companies are exploring a wide range of options for demonstrating conformance to ISO 14001.**

Organizations can self-certify utilizing internal resources or may have their self-declaration validated by an outside party, such as a consultant who may or may not be an accredited registrar. Some states, together with the U.S. EPA, are exploring this option for medium and small companies so that the companies need not go through the very expensive registration process, yet still have an EMS that conforms to ISO 14001. Although an ISO 14001 - conformant EMS is not a regulatory requirement, the states and EPA are interested in the standard as a tool to encourage companies to go beyond compliance. Validation by the EPA, a state government, or a consultant may provide the desired credibility to outside stakeholders and internal personnel, but spare the company the expense of an outside registrar and ongoing surveillance audits.

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<sup>57</sup> See, generally, Weinfield, D., Companies Find Range of Reasons to Take Various Standards on ISO 14000, Legal Analysis & Regulations (MAPI, Sept. 1998).

Other companies are revising their company-wide or business unit-wide EMSs to become ISO 14001 conformant, but are only registering specific facilities or operations to the standard in response to market drivers or customer requests. This is due in part to the fact that the registration process for ISO 14001 is perceived to have some inherent flaws.

- First, the auditors that perform the certification audits often do not have robust environmental experience, coming instead from a quality background, and therefore often focus on inconsequential details and overlook some of the more important components of an functioning EMS. This can result in an organization's EMS becoming certified to ISO 14001 without meeting the requirements of the standard or obtaining full value from registration.
- Second, 14001 audits occur annually, at a minimum, and more commonly every six months. In contrast, most corporations have typically scheduled their third-party audits for every three years unless a site has been determined to be high risk, have a history of non-compliance or non-conformance, or a previous audit has identified many problems.
- Third, ISO certification audits are perceived by industry to be a source of income for the registrar without producing much value for business.

In addition to the perceived problems with the audit process, companies that have registered to ISO 14001 have had difficulty quantifying the actual benefits achieved.

The most frequently cited, and easily measured, benefit is in the area of waste minimization. Another reported benefit to certification is improved public image. Some companies claim to have noticed a positive public relations response to their certification and some companies have used registration to offset negative publicity associated with accidents, releases and non-compliance. As part of a proactive communications strategy to demonstrate the organization's commitment to the environment, ISO 14001 registration provides a framework to communicate environmental performance with a higher level of credibility. Achieving certification demonstrates to the companies' stakeholders a commitment to improving its performance, enhancing its credibility, and provides the momentum for a proactive communication program.

One OO&G company noted that the outside registrar selected to certify the organization was extremely helpful in identifying areas for improvement of its EMS. They indicated that an internal audit would probably not have identified these areas and the independent third - party view can add value and consistency to the process.

**Countries with strong command and control programs are slow to ease regulatory oversight, despite the commitment to environmental management that an ISO 14001 EMS demonstrates.**

When the ISO 14000 family of standards was first developed, it was believed, somewhat optimistically, that registration would bring regulatory relief to organizations that certify their operations to the standard. Although it is recognized that ISO 14001 certification demonstrates a level of commitment to environmental management, in countries with established strong command and control programs there is a reluctance to ease the current commitment to regulatory oversight. There are exceptions, such as the ExxonMobil facility in the Netherlands that received a “License on Outlines” without having achieved registration to ISO 14001.<sup>58</sup> However, the Dutch government is generally acknowledged to be in the forefront of government-business cooperation in environmental regulation.

In countries where the environmental regulatory framework is not robust, regulatory relief for ISO registered organizations has a greater potential for adoption. By requiring or encouraging that companies achieve certification, developing countries can establish a performance-based environmental program without the commitment of resources to developing the regulations and infrastructure associated with a command and control system. It is also believed that promoting certification as opposed to developing and enforcing regulations provides an incentive for companies to establish operations in these countries and at the same time establishes a significant level of environmental protection.

**While companies report many benefits from conformance with or registration to ISO 14001, many benefits are linked to improved operational efficiencies, rather than improved environmental performance.**

Although conformance and/or registration to the ISO 14001 standard is designed to improve the environmental performance of an organization, many of the real and perceived benefits are not linked to environmental performance, but rather to the improved efficiency of the operation.

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<sup>58</sup> C.J. Corbett and D. A. Lynch, ISO 14000: an agnostics report from the front line, *ISO 9000+14000 NEWS*, 2000.

Commitment to ISO 14001 certification requires that an organization adopt an integrated and comprehensive approach to environmental management. The aspects and impacts analysis alone requires the involvement and commitment of many functional areas within an operation. In order for an EMS to meet the certification requirements of ISO 14001 and achieve increased operational efficiency, environmental management responsibility will need to be distributed through the organization. This requires the development of relationships and connections between the various functional groups of the organization that may not have previously existed. Also, ISO 14001's systematic training program requirements help ensure that those who have operational responsibility also have the knowledge and training necessary to manage the environmental aspects which they control. As a secondary benefit, companies such as OPP Petrochemicals in Brazil have reported that the training associated with environmental management is enthusiastically received by the employees and contributes to improved morale.<sup>59</sup>

The attitude of the oil and gas companies with respect to third-party registrars and auditors parallels the attitudes and position of industry in general. While recognizing the value and credibility an independent review of their EMS provides, the companies interviewed during this project preferred to use internal resources to audit their processes. This is the result of the belief that external registrars and auditors do not understand the business and are not qualified to evaluate their systems. However, whenever a company's customer or a country where the company does business requires registration, the companies are pursuing third-party registration for the specific location and operation.

One large company that has self-declared conformance to ISO 14001 has gone as far as to have an independent third party review their EMS and attest that the system is "... consistent with the intent and meets the requirements of the ISO 14001 Environmental Management Systems Standard".<sup>60</sup> Although this is less than formal registration, they believe that it satisfies their customer and stakeholder needs.

Other large oil and gas companies have registered individual operations when required, and are moving their EMSs towards conformance and future registration when

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<sup>59</sup> Ibid.

<sup>60</sup> Meeting Environmental Expectations (Exxon, April 1998).

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driven by market conditions. The medium and small companies contacted were not developing ISO 14001 conformant EMSs, or did not have an EMS, and so the issue of third-party registration has not been considered.

Although ISO 14001 registration is not excessively difficult or expensive for an organization or facility that is ISO 9000 registered, or has an EMS in place, many companies are not going to commit the resources for the initial registration and the ongoing surveillance audits without a significant and obvious business benefit to registration. Recognizing that, in some instances, regulators and other stakeholders expect an organization to back up its commitment through the formal registration process, many companies interested in ISO 14001 will choose to conform to the requirements, but not formally register their EMS until the benefits to registration can be demonstrated and quantified.

### **3.0 RECOMMENDATIONS**

In comparison with other U.S. regulatory agencies with which the authors are familiar, MMS appears to have a positive and effective relationship with the regulated community. This strength can provide a foundation for initiatives to encourage OO&G companies to develop and implement Environmental Management Systems (EMSs) and achieve beyond - compliance performance.

Although the original scope of this project did not include developing recommendations for MMS, in the course of researching and preparing this report the authors, individually or jointly, developed information which suggests a number of options which may encourage and support the development and implementation of EMSs in the OO&G industry. The following options are offered to MMS for consideration, recognizing that any decision to pursue any option rests entirely with MMS.

1. Initiate a review process for SEMP to identify areas that might be revised or expanded to strengthen its environmental components. ISO 14001 could be used as the template for such a revision, so that those companies that adopt SEMP would be moving towards ISO 14001 conformance.
2. Initiate a comprehensive review of MMS regulations to identify potential areas where performance-based requirements could be introduced while maintaining the same level of protection as provided by the existing regulations. Training is an example of an area where current prescriptive regulations could be rewritten to take a performance-based approach. This might allow companies to optimize the allocation of environmental management resources to environmental management needs instead of repetitive training.
3. Develop incentives for companies that both implement EMSs and demonstrate beyond - compliance performance. Incentives could include publicity, awards, and regulatory relief. Incentives could also be offered to companies that reach out to help others in the industry to establish EMSs and /or improve their performance.
4. Develop a process and programs to facilitate the sharing of best management practices and mentoring between companies within the OO&G industry. As an example, the transfer of the EMS approach seems strongly supported by the activities of contractors, particularly the larger contractors. Because they work with E&P companies over a range of sizes, they have EMS knowledge that they can bring to smaller E&P companies. It may be valuable for MMS to more fully determine the extent of this transfer of EMS expertise, and whether there are means for MMS to support it.

5. Consider allowing electronic record keeping and reporting by facilities that operate an EMS that meets MMS requirements. This could serve as an incentive for OO&G companies to implement an EMS. It might also improve the effectiveness of MMS's inspection program by allowing inspectors to spend more time at an offshore facility actually inspecting, as opposed to record review. The ISO 14001 guidelines allow for records to be stored via electronic means, such as computerized databases. MMS inspectors spend a significant amount of their time on offshore facilities reviewing environmental and safety records. If the MMS regulations were revised to allow required records to be stored and reported electronically, record reviews could be conducted (1) more quickly; (2) onshore, reported via Internet or other electronic connection; and/or (3) automatically, by software designed to locate data that indicates violations or other conditions requiring review. If records were reviewed onshore, inspectors could develop a short-list of items to inspect even before they reach the offshore facility, saving time for the inspectors and company representatives.
6. Increase training of inspectors on EMS and SEMP. This would provide them with a level of understanding whereby they could transfer information and provide help to medium and small operations that are interested in developing an EMS.

Also, while not specific to EMS issues, if MMS inspectors from a given MMS District were allowed to participate in inspections with MMS inspectors from a different MMS District, then knowledge from one MMS District could more readily transfer to other MMS Districts. This technique is used in the private sector to facilitate the transfer of techniques and skills across the entire organization.

7. Consider developing the expertise to implement an MMS - sponsored SEMP / EMS conformance review program to evaluate the EMSs that OO&G companies have implemented, and provide assistance to companies that are in the process of developing their SEMP / ISO 14001- based EMS. This could be a resource to the industry to assist in moving operations beyond compliance. The practicality and acceptance of such a program would depend on adoption of the other recommendations made in this report.

**TAB 1****ISO14001 CERTIFICATIONS**

Regional share Expressed in percent	Cut-off date for each cycle				
	Cycle 5 1995-12- 31	Cycle 6 1996-12- 31	Cycle 7 1997-12- 31	Cycle 8 1998-12- 31	Cycle 9 1999-12-31
Africa/West Asia	0.39	0.67	1.65	1.75	2.39
Europe	87.94	63.58	59.24	53.94	52.21
Central and South Americas	1.17	1.01	2.21	1.83	2.19
North America	0.39	2.88	2.64	5.50	6.91
Far East countries	9.73	1.01	30.59	32.10	30.84
Australia/New- Zealand	0.39	3.76	3.68	4.88	5.46

By the end of 1999, 14,106 environmental certificates were held in 84 countries, an increase of 12 over 1998. Japan shows the highest increase with 1473 new certificates awarded. The United Kingdom follows with an increase of 571 and Sweden comes in third with an increase of 547 certificates.

The following countries had at least one company certified for the first time in 1998: Chile, Jordan, Peru, Venezuela, Costa Rica, Lebanon, Puerto Rico, Zambia, Ecuador, Liechtenstein, Qatar, Romania, Estonia, Lithuania, Tunisia, Guatemala, Vietnam

The following countries had at least one company certified for the first time in 1999: Afghanistan, Bahrain, Cyprus, Macao, China, Monaco, Morocco, Namibia, Saint Lucia, Syria, Arab Republic, Trinidad & Tobago, Yugoslavia, Zimbabwe

## ISO 14001 Certifications / Industrial Sectors

As in the case of ISO 9000 certificates, not all those surveyed were able to provide data according to the EAC codes. Nevertheless, 90% of the certificates are classified below.

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EA Code Nos.	ISO 14001 by Industrial Sectors	1998	1999	EA Code Nos.	ISO 14001 by Industrial Sectors	1998	1999
1	Agriculture, fishing	16	85	21	Aerospace	49	49
2	Mining and quarrying	88	122	22	Other transport equipment	312	445
3	Food products, beverage and tobacco	272	390	23	Manufacturing not elsewhere classified	70	118
4	Textiles and textile products	91	100	24	Recycling	109	333
5	Leather and leather products	22	94	25	Electricity supply	298	258
6	Wood and wood products	34	109	26	Gas supply	36	68
7	Pulp, paper and paper products	209	232	27	Water supply	47	107
8	Publishing companies	12	29	28	Construction	298	500
9	Printing companies	63	132	29	Wholesale & retail trade; repairs of motor vehicles, motorcycles & personal & household goods <sup>129</sup>		340
10	Manufacture of coke & refined petroleum products	106	114	30	Hotels and restaurants	105	51
11	Nuclear fuel	6	10	31	Transport, storage and communication	144	345

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12	Chemicals, chemical products & fibers	693	1073	32	Financial institutions, real estate, renting	13	80
13	Pharmaceuticals	42	54	33	Information technology	22	147
14	Rubber and plastic products	193	380	34	Engineering services	106	139
15	Non-metallic mineral products	88	121	35	Other services	212	450
16	Concrete, cement, lime, plaster etc.	105	251	36	Public administration	21	78
17	Basic metal & fabricated metal products	294	458	37	Education	15	46
18	Machinery and equipment	569	699	38	Health and social work	38	44
19	Electrical and optical equipment	2 147	2233	39	Other social services	29	89
20	Shipbuilding	9	248				
<b>Totals</b>						7,112	10,881

Highest number of certificates by industrial sector

<b>Sector</b>	<b>1998</b>	<b>1999</b>
Electrical and optical equipment	2147	2233
Chemicals, chemical products & fibers	693	1073
Machinery and equipment	569	699
Other Transport equipment	312	N/A
Construction	298	500
Electricity supply	298	458

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## ISO 14000 Certifications Worldwide: Growth from 1995 to end of 1999

Countries	Dec. 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
Africa/West Asia					
Afghanistan					1
Bahrain					2
Egypt		1	7	13	35
India	1	2	28	40	111
Iran			2	8	12
Israel		4	6	25	25
Jordan				2	8
Lebanon				1	4
Mauritius		1	1	2	3
Morocco					1
Namibia					1
Oman			1	1	1
Pakistan		1	2	2	2
Qatar				1	1
Saudi Arabia			1	1	3
South Africa			21	30	82
Syrian Arab Republic					2
Tunisia				1	1
United Arab Emirates		1	4	9	36
Zambia				2	2
Zimbabwe					4
Africa/West Asia	1	10	73	138	337
Share in percent	0.39	0.67	1.65	1.75	2.39
No. of countries	1	6	10	15	21

Countries	March 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
Central & South Americas					
Argentina	1	5	28	37	84
Barbados		3	3	3	3
Brazil	2	6	63	88	165
Chile				1	5

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Colombia		1	3	3	13
Costa Rica				1	7
Ecuador				1	1
Guatemala				1	1
Puerto Rico				1	4
Peru				4	7
Saint Lucia					1
Trinidad & Tobago			1		1
Uruguay			1	3	10
Venezuela				1	7
Central and South Americas Subtotal	3	15	98	144	309
Share in percent	1.17	1.01	2.21	1.83	2.19
No. of countries	2	4	5	12	14

Countries North America	March 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
Canada		7	27	104	276
Mexico		2	11	39	63
USA	1	34	79	291	636
North America	1	43	117	434	975
Share in percent	0.39	2.88	2.64	5.50	6.91
No. of countries	1	3	3	3	3

Countries Europe	Dec. 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
Austria	11	56	80	132	156
Belgium		8	37	73	74
Croatia			2	3	8
Cyprus					3
Czech Republic			4	42	60
Denmark	21	96	270	314	430
Estonia				1	4
Finland	10	41	151	206	470
France	3	23	52	295	462
Germany	35	166	352	651	962

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Greece		1	6	10	20
Hungary		3	12	28	121
Iceland			1	1	2
Ireland		3	8	8296	115
Italy		27	103	123	243
Liechtenstein				13	19
Lithuania				1	1
Luxembourg		1	6	6	6
Monaco					2
Netherlands	74	119	263	341	403
Norway	3	13	35	61	133
Poland			8	15	72
Portugal		1	7	15	28
Romania				1	1
Slovakia		1	6	15	24
Slovenia			5	12	19
Spain		13	92	164	573
Sweden	2	25	194	304	851
Switzerland		18	170	360	543
Turkey		3	6	4450	66
United Kingdom	61	322	644	921	1492
Yugoslavia					2
Europe	226	948	2626	4254	7365
Share in percent	87.94	63.58	59.24	53.94	52.21
No. of countries	11	20	25	29	32

Countries Far East	Dec. 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
China	9	22	94	222	
Hong Kong, China		7	46	56	51
Macao, China					1
Taipei Chinese	2	42	183	203	216
Indonesia		3	45	55	55
Japan	4	198	713	1542	3015
Korea, Republic of	19	57	174	263	309
Malaysia		7	36	86	117
Philippines		1	11	27	39
Singapore		37	65	78	87

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Thailand		58	61	126	229
Vietnam				2	9
Far East	25	419	1356	2532	4350
Share in percent	9.73	28.10	30.59	32.10	30.84
No. of countries	3	10	10	11	12

Countries	Dec. 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
Australia/New Zealand					
Australia	1	53	137	352	708
New-Zealand		3	26	33	62
Australia/New -Zealand	1	56	163	385	770
Share in percent	0.39	3.76	3.68	4.88	5.46
No. of countries	1	2	2	2	2

World Results	Dec. 1995	Dec. 1996	Dec. 1997	Dec. 1998	Dec 1999
World total	257	1,491	4,433	7,887	14,106
World growth		1,234	2,942	3,454	6,219
Number of countries	19	45	55	72	84

**TAB 2**  
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**TAB 3**  
**CONTACTS**

**Mr. James F. Bennett**

Minerals Management Service  
Environmental Assessment Branch  
381 Elden Street  
MS 4042  
Herndon, VA 20170-4817  
703-787-1660

**Mr. Robert R. Sands**

President,  
Environmental and Safety Solutions, Inc.  
445 Spoonbill Lane  
Melbourne Beach, FL 32951  
321-722-1740

**Douglas B. Weinfield, Esq.**

3470 39<sup>th</sup> Street, NW, #647B  
Washington, DC 20016  
202-966-1489

**Ms. Susan Rost**

Environmental Management Strategies  
2432 Brockton Circle  
Naperville, IL 60565  
630-527-1488