AN ABSTRACT OF THE THESIS OF

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During the last decade environmental management has moved from reaction-based management to regulatory requirements to a more progressive approach that incorporates regulatory requirements and voluntary programs, such as the ISO 14001 environmental management system (EMS), to successfully administer their environmental programs. Organizations that transitioned from reaction-based to progressive management through certification to the ISO 14001 standard have witnessed improved profitability through more efficiently run operations, a decrease in natural resource and raw material costs, a decrease in waste management costs, increased employee buy-in to the environmental policy and programs, a positive public image, and an improved competitive advantage.

Organizations with legitimate environmental management systems have had their systems certified and registered by a registrar accredited by the national accrediting body for the country in which their organization is domiciled. In the United States (U.S.), the accrediting organization is the American National Accreditation Board (ANAB). The purpose of this study was to determine what third party certification groups exist in the United States and how they obtain their accreditation for certifying environmental

management systems. The study also sought to identify what means third party certification groups use to validate and register environmental management systems. A list of U.S. accredited registrars was obtained from the American National Accreditation Board's website. Registrars of ISO 14001 were contacted via email and their company websites were perused to obtain information on what they do to certify organizations to ISO 14001 and on how they determine conformance to the ISO Standard. The ISO Standards, 14001 (evironmental management systems) and 19011 (auditing) were obtained and examined to determine conformance requirements to the ISO environmental management system and to ascertain what ISO requires of the auditing registrar. Organizations that are seeking to certify their environmental management systems to ISO 14001 have multiple registrars to select from but may not find it easy to begin the process due to a lack of available information to make an educated choice for their organization. Five company's websites stood out for providing substantial information on the certification process in a downloadable document. These documents provided in depth information on the expectations of the registrar and client, the steps of audit process, certification maintenance and use of certification mark, and the complaints and appeal process for the client against the registrar. These documents provide a good foundation for understanding the certification process and for understanding the registrar's methods. The actual auditing techniques of a registrar are, however, considered proprietary and will not be found in public information sources.

Third Party Registrars of Environmental Management Systems

by
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INTRODUCTION

During the late 20th century, the environmental movement became more than the ideology of liberal protestors, but became a legitimate personal and professional value with the introduction of the U.S. Environmental Protection Agency (EPA) and the environmental regulations it promulgated. Such laws as the Clean Water Act, Resource Conservation and Recovery Act, and Superfund became the environmental drivers by defining how companies need to administer their wastewater, stormwater, and hazardous waste programs. It became clear that the capacities of their environment to supply materials and absorb wastes are finite (Canada, 1997). Industry was not sold on being 'green', even though the negative impact on the environment was clear. Pollution consumes resources (material, labor, equipment, money) without generating an offsetting stream of value (Melnyk et al., 2003). Industry believed that improving a firm's environmental performance was a matter of regulatory compliance, an activity that added nothing but economic cost and legal and political complications to the corporate bottom line (Rosen, 2001).

Industry found it increasingly more expensive to operate. The costs associated with the disposal and treatment of chemicals, process and wastewater waste streams increased the costs of doing business. Additional costs associated with protecting the environment, training of employees, storage and treatment equipment, and permit fees were also associated with increased operating costs (Rosen, 2001). Managers viewed environmental protection as a major threat to the challenge of maximizing corporate advantage in the increasingly competitive global market place (Rosen, 2001).

The increased expense of operating due to environmental requirements and increased expenses associated with natural resources (Rosen, 2001), such as electricity, natural gas, and water forced companies to look for new ways of managing environmental concerns on site that would allow them to maintain and/or improve the company's profitability, while meeting and exceeding regulatory requirements (Rosen, 2001).

In recent years there has been a change in the way managers in progressive companies are looking at operating their businesses. Managers are beginning to recognize that superior environmental performance can confer competitive advantage, rather than undercut it, and thus be regarded as a legitimate business function (Rosen, 2001). Production and operations managers, engineers, quality, and purchasing personnel are now recognizing that the reduction of environmental pollution and its associated waste streams is not simply good for the environment, it is also good business (Melnyk et al., 2002). In response to this change of attitude towards strategically managing an organization's environmental function, industrial organizations have started to develop management tools to address environmental issues (Szymanski and Tiwari, 2004).

Even though environmental regulations have increased in number and have become more stringent, the regulators also allowed for companies who were more progressive in their approaches to benefit if they could validate their "green business operations". "Being green" no longer is synonymous with losing money, but with good business (Lorenzi, 1994). Lorenzi (1994) asserts that "progressive companies have moved their audit programs beyond a compliance check toward integrating management systems and accountability into their Environmental Health and Safety (EHS) programs. EHS should be an integral part of a company's overall strategic plan" (p. 35).

In addition to the political push for environmentally responsible business operations, the public has increasingly become aware of how companies operate and if they do so in a green manner, which influences their decision in becoming a customer (Lorenzi, 1994). Customers have become a secondary stakeholder for the businesses that sell their product in the commercial market place. It is in a company's strategic interest to institute environmental management systems that help them reduce waste and manage environmental risk effectively, because this increases efficiency, cutting costs as well as protecting against environmental liabilities (Rosen, 2001). It has also become clear that it is in their firm's strategic self-interest to identify and find ways to embrace the business opportunities inherent in taking a constructive approach to solving society's mounting environmental problems (Rosen, 2001). Successfully implemented environmental management systems take companies from compliance-based (minimum acceptable level) to performance-based environmental management (Gupta, 2003).

The shift from regulatory-based environmental management to performance-based environmental management has opened the door for environmental management systems (EMS) to build on and add to existing environmental efforts such as regulatory compliance, training, records keeping, emergency planning, and preparedness (Gupta, 2003). Gupta (2003) states that EMS integrates environmental considerations into and throughout all of an organization's activities, products, and services based on established business principles, allowing operations managers to address and continually improve environmental concerns based on the 'plan, do, check, review' philosophy.

ISO 14001 sets out elements for developing an EMS that will allow the company to meet its environmental protection objectives (Berthelot, 2004). It is the only standard to which environmental management systems are compared during the ISO 14001 certification process by accredited third party certifiers. ISO 14001 was developed by

the International Organization for Standardization and was formally adopted in the fall of 1996 (Melnyk et al., 2003). ISO 14001 is considered to be a proactive and universal management tool that was created with the aim of providing any organization with a common framework that could be applied to its existing environmental management system (Szymanski and Tiwari, 2004). However, not all organizations use accredited certifiers to certify their environmental management systems. These companies are not allowed to use the ISO14001 logo to advertise their certification, as are organizations that have used accredited third party certifiers. Companies not certified to meet ISO 14001 standards may not be taken seriously by external organizations such as regulators, share owners, and environmental watchdog groups. What can an organization do to identify accredited third party certifiers? In addition, what are these accredited third party certifiers doing to ensure organizational compliance to the ISO14001 standard?

Purpose of the Study

The purpose of this study was to determine what third party certification groups exist in the United States and how they obtain their accreditation for certifying environmental management systems. The study also sought to identify what means third party certification groups use to validate and register environmental management systems.

The following research questions guided this study:

1. What external certification groups exist in the United States to determine the legitimacy of environmental management systems in US domiciled organizations?

2. What criteria do these external certification groups utilize to certify the validity of an environmental management system?

Significance

This study provides any organization seeking ISO14001 certification within the U.S. with an understanding of how environmental management systems are deemed legitimate by third party registrars and what criteria they assess to determine the validity of an EMS. The ISO Environmental Standard is broken down to its required elements and the process in which an EMS can meet these requirements is discussed. The ISO 19011 Auditing standard is also discussed to explain the auditing process and to assist organizations seeking certification to better understand what to expect from their auditing team and the auditing process. The research will also provide organizations with basic information on where to begin the registrar selection process and on how to select a registrar.

Study Limitations

This study is limited by the following:

- The certified third party organizations analyzed in this study were identified by The Registrar Accreditation Board (now known as the ANSI-ASQ National Accreditation Board [ANAB]), the certifying body for the United States. ANAB may not maintain a complete list of all organizations certified to provide environmental management system accreditation and registration to ISO 14001.
- The findings from this study cannot be generalized to all organizations that maintain an environmental management system that are not certified to the ISO 14001 standard.

Definition of Terms

Audit

The systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled.

Audit Evidence

Records, statements of fact or other information, which are relevant to the audit criteria and verifiable.

Auditee

Organization being audited.

Auditor

A person with the competence to conduct an audit.

Continual Improvement

A recurring process of enhancing the environmental management system in order to achieve improvements in overall environmental performance consistent with the organizations environmental policy.

Corrective Action

An action to eliminate the cause of a detected nonconformity

Environment

The surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

Environmental Aspect

An element of an organization's activities or products or services that can interact with the environment.

Environmental Impact

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.

Environmental Management System (EMS)

Part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects. A set of interrelated elements used to establish policy and objectives and to achieve those objectives.

Environmental Objective

Overall environmental goal, consistent with the environmental policy, that an organization sets itself to achieve.

Environmental Performance

The results of an organization's management of its environmental aspects, including waste disposal, raw material consumption, natural resource usage, pollution control, etc.

Environmental Policy

The overall intention and direction of an organization related to its environmental performance as formally expressed by top management.

Environmental Sustainability

Achieving environmental sustainability requires managing and protecting ecosystems to maintain both their economically productive and their ecological functions, maintaining the diversity of life in both human-managed and natural systems, and protecting the environment from pollution to maintain the quality of land, air and water.

Environmental Target

A detailed performance requirement, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

Internal Audit

A systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organization are fulfilled.

ISO14001

Internationally recognized guidelines developed by the International Organization of Standardization for developing an environmental management system.

Life-cycle Analysis/Assessment (LCA)

LCA is the detailed measurement during the manufacture of a product, from the mining of the raw materials used in its production and distribution, through to its use, possible reuse or recycling, and its eventual disposal.

Nonconformity

The non-fulfillment of a requirement.

Organization

A company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

Preventive action

An action to eliminate the cause of a potential nonconformity.

Prevention of Pollution

The use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or

discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts.

Procedure

A specified way to carry out an activity or a process.

Record

A document stating results achieved or providing evidence of activities performed.

LITERATURE REVIEW

"The environment is a growing problem – we are running harder just to stay in the same place" (Cook, 2005, p.20). Businesses with progressive programs are wrestling with how to identify, measure, and quantify one's environmental performance. The 1990s have seen an increase in the level of awareness in manufacturing firms and among production managers surrounding the impact and importance of environmental performance (Melnyk et al., 2002). Rosen (2001) summarizes that turning environmental problems into strategic opportunities, the managers who are furthest along this learning curve are rethinking traditional business models, not just the Environmental, Health & Safety (EHS) function. In addition, they are inventing new models that fuse environmental sustainability into core organizational, financial, production, design, and marketing strategies and systems.

Rosen (2001) gives three reasons for this shift. First, international environmental regulatory regimes are changing. European nations are passing laws that reward firms for establishing environmental management systems and that require firms to set up systems for taking back and recovering value from their products at end of use. Second, the market itself is changing. Spiking energy costs are creating incentives to design products that are more energy efficient. Growing numbers of shareholders are using environmental considerations to measure financial success, rewarding firms on the stock market that can prove they are improving their environmental performance. Third, more is being learned about the environmental problems humanity faces and the role industry plays in creating and/or intensifying them. Therefore, corporate managers are looking for ways to position their firms to take advantage of the business opportunities inherent in society's demand for solutions. The new post compliance strategic approach to

environmental management is being expressed at many levels of the business system and society as a whole (Rosen, 2001).

In 2002, Melnyk et al. (2002) states that there are three recent developments that influence whether businesses will become involved in voluntary environmental practices such as an environmental management system. The first is the recognition that pollution is little more than another form of waste. When seen as a waste, pollution is integrated into the waste management system which allows companies to see costs better while managing the processes more effectively and efficiently. The second development is the increased level of public awareness of pollution. The public can utilize public information regarding a company's environmental performance to influence investing activities of investors and large institutional investors to favor those companies that are perceived to be environmentally responsible. Consequently, those that are poor performers receive less investment money. Lastly, there are various environmental programs for helping companies reduce and eliminate pollution. Environmental Management Systems, such as ISO 14001, are one such program.

In a second study, Melnyk et al. (2003) suggests two major trends in industry for influencing the practices of operations management. The first trend is the movement toward the formal certification of processes in support of certain strategic objectives. This objective was to ensure that the sites had in place the processes needed to deliver quality output and that these processes were documented, widely understood, and followed by the organization's employees (Melnyk et al., 2003). The documentation of these processes that affect the environmental performance of a company provides affected functions further opportunity to streamline operational processes thus potentially eliminating or reducing operational impacts to the environment. By focusing on processes, managers should be better able to identify the sources of environmental waste and then take steps to reduce or eliminate the waste (Melnyk et al. 2002). For

example, a company that utilizes a toxic chemical in one stage of the manufacturing of a final product can document the quantity of chemical used and the attributes of the toxic chemical that make it required for the manufacturing process. Once documented, alternatives for a less toxic chemical can be investigated. Upon implementation of the less toxic chemical the company will most likely see a reduction in cost associated with the actual price of the chemical, a reduction in related waste generated, and disposal costs. The second trend is that of increased environmental awareness. Managers came to see that improved environmental performance benefited more than just the environment (Melnyk et al., 2003). The reduction in raw material and natural resource usage, decreases in waste stream disposal costs, and a stream lining of regulatory requirements were seen to positively impact operational budgets.

Szymanski and Tiwari (2004) similarly summarize the environmental movement of the last three decades of the 20th century. "Policy makers started out with a command and control approach, which in most of countries turned out to be ineffective and too costly. From the mid 1980s, there were attempts to develop approaches based on market mechanisms rather than on command controls, such a tradable permits and pollution taxes. Finally, in the 1990s, environmental regulations entered into its third generation in which an emphasis was placed on voluntary environmental initiatives" (p. 31).

The fourth decade of the environmental movement takes us into the first part of the 21st century where regulatory laws and volunteer compliance programs are integrated and supported by the regulatory agencies and further propelled by organizations themselves. In the United States, the EPA encourages organizations to implement EMS' that result in improved environmental performance and compliance, cost savings, pollution prevention through source reduction and continual improvement (United States, 2006). The EPA also approved of ISO 14001 as a precondition for

contractor's bids (Szymanski and Tiwari, 2004). In addition, ISO 14001 certified companies such as Ford Motor Company, Xerox, and General Motors have begun requesting that their suppliers obtain ISO 14001 certification. Ford Motor Company credits the development of ISO 14001 within its manufacturing plants for saving the company millions of dollars since 1998 (International Organization of Standardization, 2006).

While previous studies indicate the changes in industry that have occurred and that have influenced industry to move towards voluntary environmental programs, it is the ISO 14001 environmental management system that is recognized throughout the world (Berthelot and Coulmont, 2004). Environmental management systems streamline and systematize activities and services to deliver outcomes that aim to improve organizational environmental performance (Ridgway, 2005). ISO 14001 allows for a common thread among diverse companies. If each firm designed its own system to meet its own needs and goals, then it would become difficult to compare the environmental affects resulting form such broadly defined approaches (Szymanski and Tiwari, 2004).

ISO 14001:2004

The International Organization of Standardization has developed a set of standards to assist companies in assessing their environmental priorities, committing to continual improvement, and measuring such progress. These standards are collectively known as ISO 14000. This family of standards are generic management standards that are concerned primarily with environmental management (Technical Committee 207, 2004). A management system refers to the organization's structure for managing its processes or activities that transform inputs of resources into a product or service which meet the organization's objectives, such as meeting environmental targets. "The

purpose of a system of this kind is to enable an organization to establish procedures to set an environmental policy and objectives, achieve compliance with them, ensure continuous improvement through regular updating of knowledge and demonstrate such competence to others" (International Organization of Standardization, 2006). ISO defines a generic standard as one that can be applied to any organization, large or small, whatever its product, and in any sector of activity. The standard may be applied to a business enterprise, a public administration, or a government department. Finally, the 'product' can be a service.

The ISO 14000 family seeks to assist a company through its environmental management to minimize harmful effects on the environment caused by its activities and to achieve continual improvement of its environmental performance (Technical Committee 207, 2004). ISO 14001 exists as a single, universally applicable organizational standard for environmental management (Smithers Quality Assessments, Inc., 2004). One of the objectives of this new standard was to set a higher level of expected environmental management practices world-wide (Vastag and Melnyk, 2002).

The ISO standard reflects global consensus on good environmental practice in the international context that can be applied pragmatically by organizations all over the world in their particular situation (Gagnier and Husseini, 2002). The standard provides a basis for developing an environmental program that meets not only the needs of the regulators but of third party stakeholders as well. ISO 14001 requires an organization to develop a policy statement and to establish environmental objectives that consider all of the organization's significant environmental impacts. Environmental impacts may include, but are not limited to natural resource usage, raw material consumption, emissions, and waste generation. They assist a company in becoming more pro-active in their approach to managing environmental issues (Gagnier and Husseini, 2002).

EMS certification ensures that a company has in position the systems and procedures that are described by the standard (Evangelinos and Halkos, 2002). The ISO14001 standard delineates what is required when establishing, implementing and maintaining an EMS, but does not give direction on how to do so. Table 1 summarizes the standard's requirements, gives a brief description of the requirement, and where it is referenced in the standard. The following information is taken directly from the ISO14001 EMS Standard..

Table 1: EMS Requirements

Reference	Requirement	What it Means
4.1	General Requirements	The organization shall define and document the scope of its EMS.
4.2	Environmental Policy	Top management shall define the organization's environmental policy.
4.3	Planning	
4.3.1	Environmental Aspects	The organization shall ensure that the significant environmental aspects are taken into account in establishing, implementing and maintaining its EMS.
4.3.2	Legal and other Requirements	The organization shall ensure that these applicable legal requirements and other requirements to which the organization subscribes are taken into account in establishing, implementing and maintaining its EMS.
4.3.3	Objectives, targets and program(s)	The organization shall establish, implement and maintain documented environmental objectives and targets, at relevant functions and levels within the organization.
4.4	Implementation and Operation	
4.4.1	Resources, Roles, Responsibility and Authority	Management shall ensure the availability of resources essential to establish, implement, maintain and improve the EMS. Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective environmental management.
4.4.2	Competence, Training, and Awareness	The organization shall ensure that any person(s) performing tasks for it or on its behalf that have the potential to cause a significant environmental impact(s) identified by the organization is (are) competent on the basis of appropriate education, training or experience, and shall retain associated records.
4.4.3	Communication	With regard to its environmental aspects and EMS, the organization shall establish, implement and maintain a procedure(s) for internal and external communication.
4.4.4	Documentation	Documentation shall include documents and records required by ISO14001 and documents determined by the organization to be necessary to ensure the effective planning, operation and control of processes that relate to its significant

		environmental aspects.
4.4.5	Control of Documents	Documents by the EMS and by ISO 14001 shall be controlled.
4.4.6	Operational Control	The organization shall identify and plan those operations that are associated with the identified significant environmental aspects consistent with its environmental policy, objectives and targets, in order to ensure that they are carried out under specified conditions.
4.4.7	Emergency Preparedness and Response	The organization shall establish, implement and maintain a procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and how it will respond to them.
4.5	Checking	
4.5.1	Monitoring and Measurement	The organization shall establish, implement and maintain a procedure(s) to monitor and measure, on a regular basis, the key characteristics of its operations that can have a significant environmental impact.
4.5.2	Evaluation and Compliance	
4.5.2.1		Consistent with its commitment to compliance, the organization shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable legal requirements. The organization shall keep records of the results of the periodic evaluation.
4.5.2.2		The organization shall evaluate compliance with other requirements to which it subscribes. The organization shall keep records of the results of the periodic evaluations.
4.5.3	Nonconformity, Corrective Action and Preventive Action	The organization shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action.
4.5.4	Control of Records	The organization shall establish and maintain records as necessary to demonstrate conformity to the requirements of its EMS and of ISO 14001, and the results achieved.
4.5.5	Internal Audit	The organization shall ensure that internal audits of the EMS are conducted at planned intervals.
4.6	Management Review	Top management shall review the organizations's EMS, at planned intervals to ensure its continuing suitability, adequacy and effectiveness.

Adapted from the ISO 14001:2004 EMS Standard.

ISO 14001 Implementation

ISO identifies the framework for the EMS, but does not establish how a company should go about defining and implementing the processes necessary to meet the criteria of the certified EMS. The following flow chart (Figure 1) adapted from Applied Quality Systems, Inc. (AQS) 36-Hour ISO 14000 Certified Lead Auditor Training Class (AQS,

1996) provides a visual breakdown of how the ISO 14001 requirements integrate and build off of each other.

Figure 1: The EMS Cycle

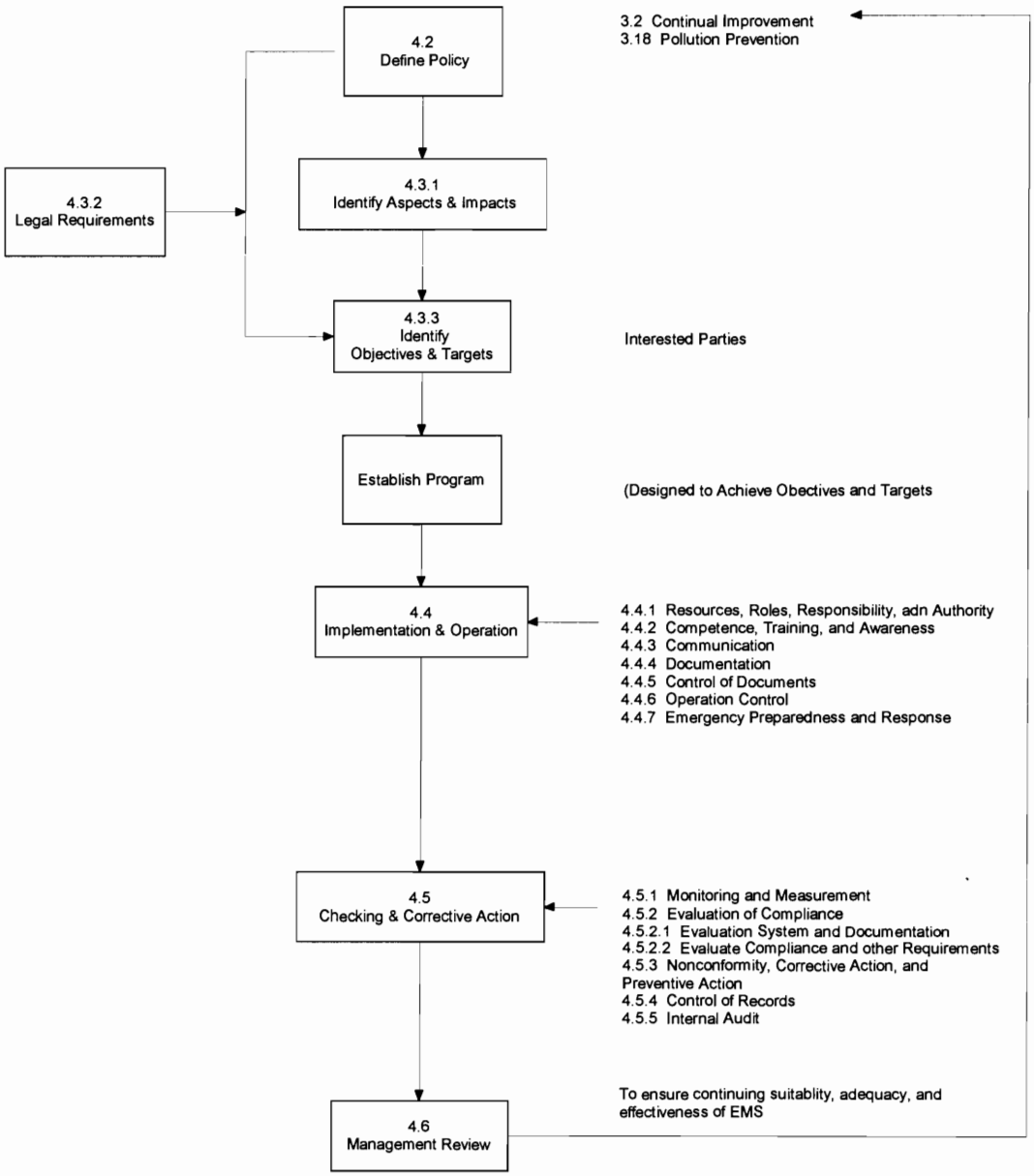

Figure 1: The EMS Cycle adapted from AQS 36-Hour ISO 14000 Certified Lead Auditor Training Class Part C, p. 10

The requirements of the Standard are like the building blocks of a pyramid. A solid base, the policy, must first be developed in order to support the next level. When each step is defined and documented, the developer of the EMS moves to the next step.

Each step requires the completion of the previous to provide a well developed foundation for the next step. In the process, adjunct requirements are reviewed and incorporated providing a systematic and logical approach to developing an environmental management system.

A simple idea of 'plan, do, check, act' summarizes the steps of the chart. The first four steps (plan) require the organization to determine the environmental goals and objectives of the organization, define the roles and responsibilities of various employees, define and document programs, and to document the processes that will support the organization's environmental objectives, targets and goals. During this first step, the organization not only looks at internal business needs, but also reviews external factors such as legal requirements and interested parties such as shareholders.

The next step (do) requires the organization to implement what has been defined in the previous first step through communication, training, documentation, document and operation control, and emergency preparedness. Evangelinos and Halkos (2002) state that a company should develop capabilities and support mechanisms to achieve its environmental policy objectives and targets. The EMS policy and what to do in the event of an emergency must be communicated to all employees, while only employees who may impact the environment through their employment are trained on the requirements of the EMS, how their position may impact the environment, how their roles and responsibilities are integral in the achievement of EMS policy and procedures, and what the potential consequences are for not following procedure. Training must be documented.

The documentation of programs and processes (check) must be documented and controlled so that changes and revisions can be managed and the documents located. In addition, this prevents deviation from policy, objectives, and targets. This allows for consistency when there is a change of personnel or during training so that all

impacted employees are on the same page. Operations that are associated with significant environmental aspects must also be identified and controlled (AQS, 1996). Once the EMS has been implemented, key characteristics of its operations that can have an impact on the environment must be monitored and measured. By monitoring and measuring, data are produced that may be utilized to determine conformance to the EMS, compliance to regulatory requirements, future environmental objectives and for use in pollution prevention. The documentation that is a result of the EMS implementation must be maintained and kept current. These documents are utilized during internal auditing and external auditing by third party registrars to determine conformance to the ISO 14001 Standard.

The final step is management review (act). This requires top management to review the organization's environmental management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness. During the review, top management assess opportunities for improvement and the need for changes to the environmental management system, including the environmental policy and environmental objectives and targets (Technical Committee 207, 2004). The management review is required by the Standard to be documented.

In summary, the four steps of the 'plan, do, check, act' approach to implementing an environmental management system is an easy concept to grasp and is ideal for the sparking of innovative win-win strategies (Evangelinos and Halkos, 2002). The EMS is meant not only to assist an organization in managing its environmental programs, but to also assist the organization in continuously improving the programs as well. By checking on what has already been done and then acting on ways to improve what has been done, the organization meets the ISO 14001 goal of continuous improvement of its EMS. In addition, the organization fulfills its own goal of improved environmental performance.

The International Organization of Standardization does not conduct nor perform certification to their standards, but does consolidate numbers from other sources on the number of companies worldwide that have become certified to ISO 140001. The following graph demonstrates the increasing trend in ISO 14001 certified companies in the United States.

Figure 2. Trend in ISO 14001 Certified Companies in the US (AC Nielsen, 2006).

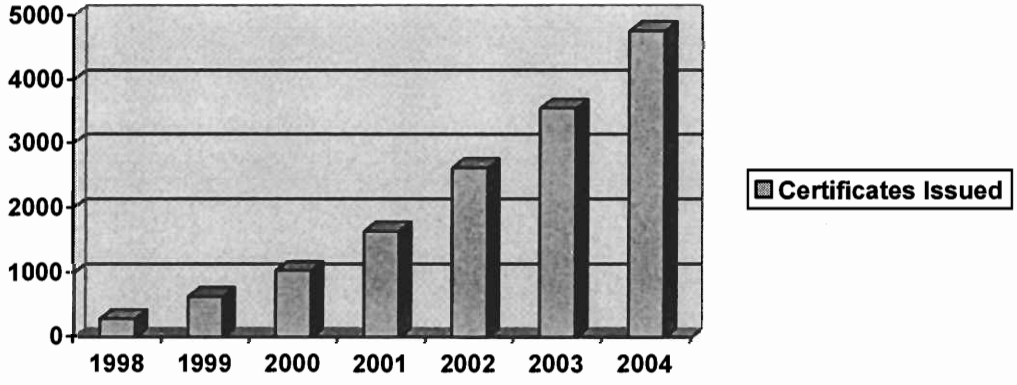

Figure 2 indicates over a 1600 percent increase in company certifications for ISO 14001 environmental management system registration/accreditation from 1998 to 2004. The significant increase in accreditations can be attributed to the more progressive approach to the management of environmental programs. The new post compliance strategic approach to environmental management is being expressed at many levels of the business system and society as a whole (Rosen, 2001). Gupita and Piero (2003) state that successfully implemented environmental management systems take companies from compliance-based (minimum acceptable level) to performance-based environmental management. In addition to this more progressive approach to environmental management, the pressure from current ISO 14001 certified companies

requiring their suppliers to obtain certification has positively influenced the increase in certification of US companies to ISO 14001 (Gupita and Piero, 2003). If a company wants to maintain supplying parts or services to an ISO 14001 certified company, the pressure is there from the certified company for them to obtain certification as well.

Benefits to Implementing ISO 14001 EMS

It is well documented by researchers that the implementation of the ISO 14001 environmental management system at an organization results in improved environmental performance for organizations that implement. (Certification of the program by a third party registrar is implied when referring to ISO 14001 EMS). Certification of an organization's environmental management system to the voluntary ISO 14001 standard is seen as a sign of a company's greenness (Raines, 2003). Raines (2002) surveyed 133 organizations with ISO 14001 certification on whether their organization had made significant environmental improvements after being certified to the ISO 14001 standard. Overwhelmingly, 96% of respondents claimed their firms have made significant environmental improvements because of their implementation of an ISO14001 EMS.

Research by Vastag and Melnyk (2002), assert that the ISO 14001 EMS will enable a company to do the following:

- Establish an environmental policy appropriate to the organization
- Identify the environmental aspects of the organization's products, services and activities to determine both impact and significance.
- Identify priorities and establish objectives.
- Establish a program to implement these policies and objectives.

- Facilitate planning, control, monitoring and changes to insure policy is complied with and remains appropriate for the organization.
- Be ready to adapt to changes in the business environment.
- Identify the relevant legislative and regulatory requirements.

However, to be fully effective, an EMS must be fully integrated into the everyday operation of the organization. By enabling the company to achieve better environmental management, it is anticipated that better environmental performance will follow (Vastag and Melnyk, 2002).

Philips Semiconductors Albuquerque registered their EMS to ISO 14001 in 1997, becoming the second facility in New Mexico to attain ISO 14001 registration. Philips Semiconductors Albuquerque has experienced the following benefits to certification (Cochran, 1999): management now has s systematic approach for evaluating information on environmental performance; created a system where environmental priorities can be set according to risks, costs and benefits; reduced production costs; gives a competitive advantage; improves public image/brand recognition; ensures continued compliance; and protects the consumption of natural resources. These benefits have been substantiated by subsequent research.

Szymanski and Tiwari (2004) have summarized the findings of several studies on why companies should implement ISO 14001. Companies should implement ISO 14001 because it: presents environmental leadership to the community, improves competitive advantage, is needed to respond to environmental demand from the customers and suppliers, is needed to reduce resources usage, costs of disposal, and helps save energy. These findings are consistent with other studies not referenced by Szymanski and Tiwari. Freimann and Walther (2001) found that managers of ISO 14001 certified companies noted that the overall image improvements as the positive effects of EMSs. Raines (2003) found that the highest value of an EMS was placed on its environmental

benefits. Companies value the infrastructure an EMS provides which allows them to reduce their impact on the environment. Berthelot and Coulmont (2004) surveyed 547 Canadian ISO 14001 certified companies. The researchers found that improving environmental performance, enhancing corporate image, developing a competitive edge, improving an existing EMS, responding to current customer demands, and expanding into world markets were motivators for seeking and maintaining ISO 14001 certification . Though Berthelot and Coulmont's study was conducted on Canadian companies, the results can be applied to US companies due to the uniformity of business principles that guide businesses worldwide.

Vastag and Melnyk (2002) also summarize the benefits of attaining ISO 14001 certification. The findings of Vastag and Melnyk are similar to the findings summarized by Szymanski, but they do note a few different reasons for a company to seek certification to ISO 14001. Some differences noted by Vastag and Melnyk (2002) are: improved document control, cost of doing business within the supply chain, peer pressure, improved risk management and liability, creates a common ground, and reduced inspection frequency.

The environmental regulatory agency for the United States, the Environmental Protection Agency (EPA) has a plan for supporting EMS implementation and development in organizations. First and foremost, the EPA plans to lead by example, by developing, implementing and maintaining EMS at appropriate EPA facilities. Additional goals of the EPA include (United States, 2006):

- encouraging widespread use of EMS across a range of organizations and settings;
- promote voluntary adoption of EMS;
- encourage the use of recognized environmental management frameworks such as the ISO 14001 standard;

- collaborate with other key partners, including states, other federal agencies, tribes, local governments, industry and nongovernmental organizations;
- and to foster continual learning by supporting research and public dialogue on EMS that help improve the agency's understanding of circumstances in which EMS can advance the nation's environmental policy goals.

Additional information on the EPA's EMS initiatives can be obtained from www.epa.gov/ems.

Research evidence on whether companies with environmental management systems should certify their system to ISO 14001 is positive. Vastag and Melnyk (2002) found that environmental activities have a more positive impact on plant operations among those facilities that are certified. In addition, Freimann and Walther (2001) found that the regulatory authorities "positively recognize the voluntary efforts" of organizations implementing ISO 14001 EMSs and that these organizations had better contact and cooperation with those authorities (p. 98). During the 2005 Printing World Environment Conference, the inaugural speaker stated that proof of environmental credentials will become a license to operate for printers (Cook, 2005). The speaker was referring to the certification to environmental standards such as ISO 14001 for an industry that has been associated with poor environmental performance and as large consumers of raw and toxic materials. By obtaining certification to ISO 14001, the speaker was inferring that the printing industry is moving in the right direction to improve its environmental performance and that certification demonstrates this momentum.

Even though the evidence is strong supporting the implementation of an ISO 14001 EMS, organizations do not always feel compelled to seek certification based on the positive environmental results and improved image alone. Melnyk et al. (2003) found that organizations will seek certification for additional reasons: the firm feels compelled to do so by economic and market considerations; the firm has access to

adequate resources needed for such an undertaking; the firm has capabilities and skills to attain such certification efficiently; and the firm has an adequate understanding of the ISO 14001 certification standard and its strategic impacts on the firm, both internally and externally. This approach to determining if an organization should seek certification of its EMS is a business decision-making approach rather than relying on more qualitative factors such as improved environmental performance and improved image as the driving forces for certification.

In summary, organizations choose to certify their environmental management system to ISO 14001 for various qualitative and economic reasons. The evidence is strong that ISO 14001 environmental management systems do improve the environmental performance and economic status of a company. However, once a company determines that certification of their EMS to ISO 14001 is right for their organization, the company must then determine how to initiate the registration process. The question, how does a company choose a registrar must be asked. Figure 3, adapted from Applied Quality Systems, Inc. 1996 36 Hour ISO 14000 Certified Lead Auditor Training (Part F, p. 2) (AQS, 1996) suggests a pathway to registration for an organization seeking ISO certification.

Figure 3: Pathway to Registration

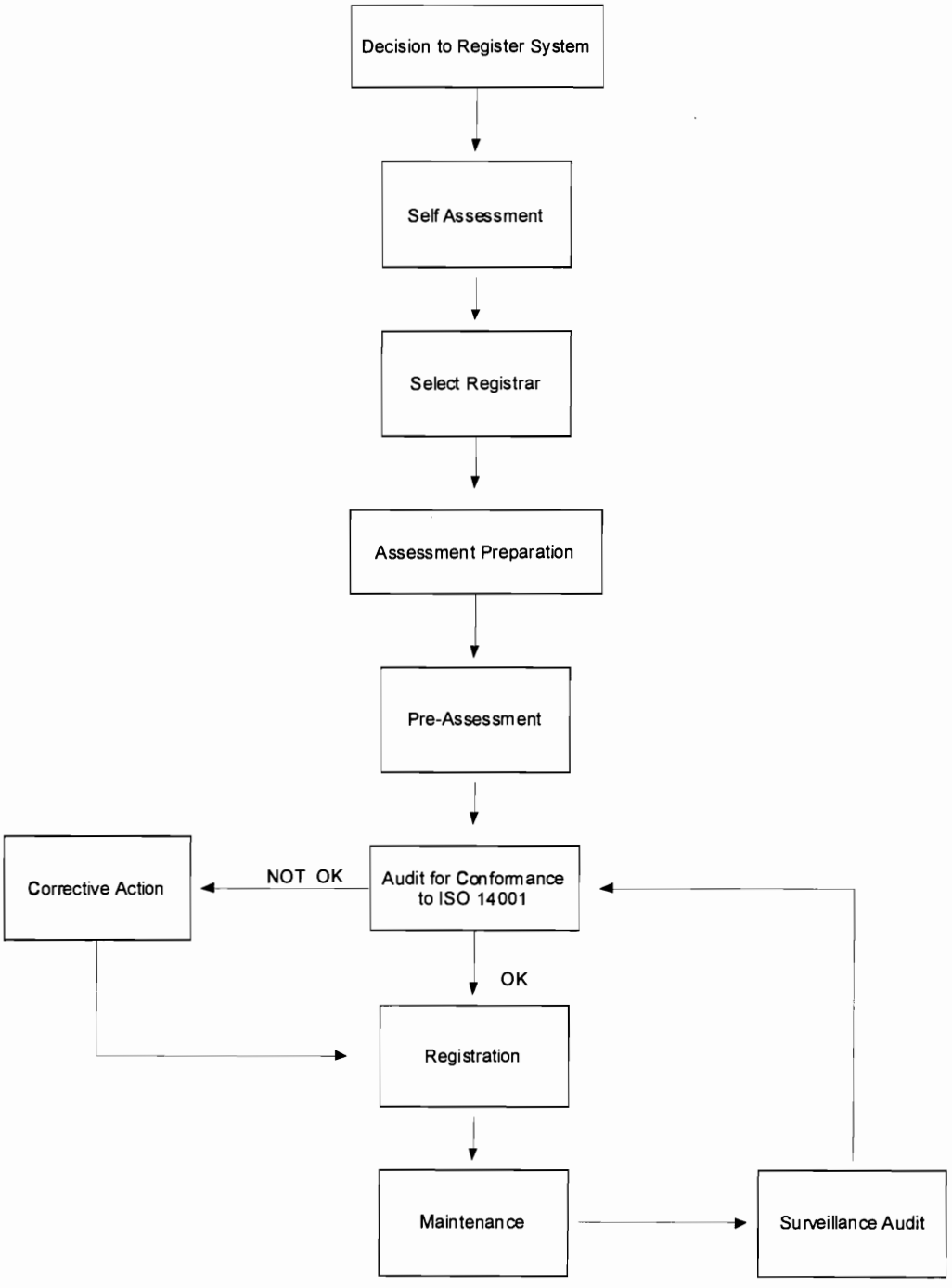

Figure 3: Adapted from AQS 1996 Lead Auditor Training Part F, p. 2.

Becoming a Registrar

The International Organization of Standardization's website includes a list of accreditation organizations for each country. These organizations accredit companies as third party registrars within their country of jurisdiction once the company has completed their application process. The American National Standards Institute (ANSI) and the American Society for Quality, through a joint effort known as ANAB (formerly known as ANSI-Registration Accreditation Board - RAB) accredits companies that provide third party certifications and registration to organizations domiciled in the United States (US) seeking registration of their environmental management systems. Companies that are registered with ANAB to perform third party certifications to ISO standards are listed on the ANAB website with their contact information (ANSI-ASQ, 2006). All companies accredited in the United States to certify Environmental and Quality Management Systems will be listed.

As of October 9, 2004, there were twenty-nine companies that met the ANAB requirements for accreditation. In May 2006, the number of accredited companies had increased to thirty-one. An organization certified by any one of these listed companies is considered to have a valid ISO 14001 certified EMS.

There is a four step process for seeking ANAB accreditation (ANSI-ASQ, 2006):

- Step 1 – Base Requirements Information

  An organization seeking ANAB accreditation must provide evidence to ANAB indicating that the organization meets the base requirements outlined in ISO/IEC Guide 66 – General requirements for bodies operating assessment and certification/registration of environmental management systems and the supplemental IAF Guidance documents which ensure that the organization knows how to apply Guide 66. An application [ANSI-ASQ National Accreditation Board (ANAB) Certification Body (CB) Application for Environmental

management Systems (EMS) Accreditation] must be submitted with supporting documentation and application fee (either $5,000 or $10,000 depending if this is the organization's primary or secondary line of business) to ANAB in English. The application fee is hefty, ensuring only serious candidates apply. The application is assigned an ANAB coordinator who will review the information and either approve or reject the application. If rejected, the organization will be given additional opportunities to meet the initial application requirements.

- Step 2 – Access to Purchase ANAB Applications

  An applicant can only move to Step 2 if their application is approved by their designated ANAB coordinator. Once approved, the organization receives an electronic notification notifying the organization of its status and is given access to purchase the applicable ANAB application. This information is not available to the general public and can only be obtained by the applicant being approved during Step 1 of the accreditation process. Payment is required during Step 2.

- Step 3 – Access to ANAB Applications

  After ANAB receives payment for the application, ANAB will again notify the organization via electronic mail and will give them access to download the specific application purchased.

- Step 4 – Application Information

  There are no fees associated with Step 4 and the applicant can upload in stages and save at various stages in the system. During the final application process, an ANAB assessor is available via telephone, electronic mail, or in person for answering questions and explaining the requirements and the audit process. The ANAB assessor will review the requirements and answer questions but cannot tell an applicant how to meet the requirement.

These steps provided by ANAB (ANSI-ASQ, 2006) do not provide any information on what the final application requires, however; it can be surmised, based on the requirements of ISO 19011 for auditors, that the organization seeking accreditation must provide information on their audit team personnel such as education, work experience, audit experience and history, continuing education in the environmental field, technical expertise, and their knowledge and skills associated with environmental management systems. Once an organization achieves accreditation by ANAB, it is regularly audited by ANAB to ensure conformance to best practices in the auditing and registering field.

Choosing a Registrar

Organizations that have become accredited by ANAB to register environmental management systems to ISO 14001 have gone through a rigorous application process to establish their credibility in the environmental auditing field. It may seem that any organization with ANAB accreditation could register an organization's EMS, which is true if the organization is just looking to get through the process. The registration process, however, is not easy and requires interaction between the organization and their registrar so selecting a registrar that compliments your company's culture is critical. The interpretations and decisions provided by the registrar can have a significant effect on the organization (Cochran, 2006). ANAB provides *Tips for Selecting a Certification Body* which can be downloaded from their website (ANSI-ASQ, 2006). ANAB provides a list of things to consider when selecting a registrar. Things to consider include:

- Accreditation by a reputable body (ANAB in US)
- Industry experience, background and expertise
- Recommendations from your clients or customers

- References provided by your registrar candidate
- Scheduling issues and ability to meet your time frame
- All aspects of the registrar fee schedule, and
- Your comfort level in establishing a long term relationship with the registrar

Cochran (2006) provides similar advice in selecting a registrar. Cochran begins with three questions that must be answered in the affirmative by the potential registrar before continuing the selection process. His three questions are: 1. Are you accredited by a signatory to the International Accreditation Forum (ANAB in US)? Accreditation ensures that the registrar is following the necessary protocols for auditing and adhering to sound business habits. 2. Are you qualified to audit to ISO 14001? If the registrar is not accredited to register ISO 14001 EMS, there is no sense in continuing. 3. Lastly, do you have technical support capabilities that are readily accessible? The organization seeking registration should be able to access their registrar via telephone and email to receive answers on questions that arise during the certification process in a timely manner. The competencies of the technical support personnel can significantly affect an audit's result (Cochran, 2006).

The selection of a registrar can be compared to hiring a new employee for a specific position. The position of the registrar is to work with the organization to achieve certification of its EMS to ISO 14001. Cochran (2006) and ANAB provide questions and points to consider when selecting a registrar. These ideas need to reflect the culture and goals of the organization to ensure the best possible fit between registrar and organization.

EMS Conformance Audit

The International Organization of Standardization released ISO 19011, Guidelines for Quality and/or Environmental Management Systems Auditing, in 2002 to "provide guidance on the management of audit programs, the conduct of internal or external audits of quality and/or environmental management systems, as well as on the competence and evaluation of auditors" (Technical Committee 176, 2002). Two clauses, 4 and 7 are important to this paper. Clause 4 describes the principles of auditing while Clause 7 provides guidance on the competence needed by an auditor and describes a process for evaluating auditors. Understanding the principles of auditing is important because it provides insight for an organization into what to expect from its registration audit. Clause 7 is important because an organization should have a tool for decision-making when it comes time to select its registrar.

ISO 19011 defines an audit as a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled. The audit criteria are the set of policies, procedures or requirements of the environmental management system. The registration audit, an audit conducted by a third party certifier, utilizes auditing techniques to determine if the environmental management system meets the requirements of the ISO 14001 Standard and that the organization is doing what it says it is doing as stated in their policies and procedures. The third party auditor is auditing the EMS against the ISO 14001 Standard to determine if there are any non-conformances. According to Hillary (1998), the purpose of an EMS audit is to determine whether or not an organization's EMS conforms to the ISO 14001 specification, has been properly implemented and maintained, and to provide information on the results of the audit to the organization's management. As stated earlier, the ISO 14001 Standard is process oriented, so the audit team is looking for the identified processes to be in place. The

audit team achieves this by reviewing documented procedures and policies, reviewing documentation, records, and reports, observations of activities and the surrounding work environment and conditions, and by interviewing appropriate personnel (Technical Committee 176, 2002). Appropriate personnel are those employees whose jobs may have an impact on the environmental performance of the organization or who are responsible for the implementation and maintenance of the EMS. By comparing records to procedures, an assessor can determine if requirements are being fulfilled (Wilson, 1999).

Clause 4 focuses on the principles of auditing. These principles make the audit an effective and reliable tool in support of management policies and controls, providing information on which an organization can act to improve its performance (Technical Committee 176, 2002). Adherence to these principles is a prerequisite for providing audit conclusions that are relevant and sufficient and for enabling auditors working independently from one another to reach similar conclusions in similar circumstances (Technical Committee 176, 2002). The principles of auditing, according to ISO 19011 include the following:

a. Ethical Conduct: the foundation of professionalism. Trust, integrity, confidentiality and discretion are essential to auditing.
b. Fair Presentation: the obligation to report truthfully and accurately. Audit findings, audit conclusions and audit reports reflect truthfully and accurately the audit activities. Significant obstacles encountered during the audit and unresolved diverging opinions between the audit team and the auditee are reported.
c. Due professional care: the application of diligence and judgment in auditing. Auditors exercise care in accordance with the importance of the task they

perform and the confidence placed in them by audit clients and other interested parties. Having the necessary competence is an important factor.

d. Independence: the basis for the impartiality of the audit and objectivity of the audit conclusions. Auditors are independent of the activity being audited and are free from bias and conflict of interest. Auditors maintain an objective state of mind throughout the audit process to ensure that the audit findings and conclusions will be based only on the audit evidence.

e. Evidence-based approach: the rational method for reaching reliable and reproducible conclusions in a systematic audit process. Audit evidence is verifiable. It is based on samples of the information available, since an audit is conducted during a finite period of time and with finite resources. The appropriate use of sampling is closely related to the confidence that can be placed in the audit conclusions.

The following flow chart (Figure 4) depicts a general audit process.

Figure 4: General Audit Process

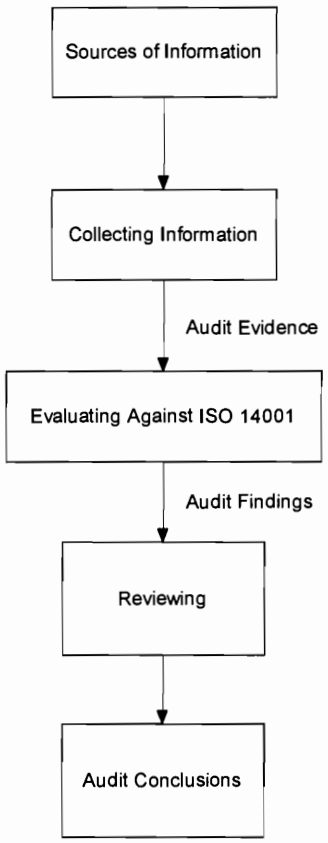

Figure 4: Adapted from ISO 19011:2002 p. 17

Clause 7 of ISO 19011 focuses on the competency and evaluation of auditors. The quality of the audit performed corresponds directly to the quality of the auditor performing it. According to ISO 19011, auditors develop, maintain and improve their competence through continual professional development and regular participation in audits. Auditors performing EMS conformance audits should have knowledge and skills in the following areas (Technical Committee 176, 2002).

a. Audit principles, procedures and techniques to enable the auditor to apply those appropriate to different audits and ensure that audits are conducted in a consistent and systematic manner.

b. Management system and reference documents to enable the auditor to comprehend the scope of the audit and apply audit criteria.
c. Organizational situations to enable the auditor to comprehend the organization's operational context.
d. Applicable laws, regulations and other requirements relevant to the discipline to enable the auditor to work within, and be aware of, the requirements that apply to the organization being audited.
e. Environmental management methods and techniques to enable the auditor to examine environmental management systems and to generate appropriate audit findings and conclusions.
f. Environmental science and technology to enable the auditor to comprehend the fundamental relationships between human activities and the environment.
g. Technical and environmental aspects of operations to enable the auditor to comprehend the interaction of the auditee's activities, products, services and operations with the environment.

In addition to the knowledge and skills described above the audit team leader should have additional knowledge and skills in audit leadership to facilitate the efficient and effective conduct of the audit (Technical Committee 176, 2002). Auditors should seek professional development to continually improve their knowledge and skills of auditing EMSs and maintain and demonstrate their auditing abilities by regular participation in audits.

METHODOLOGY

Data Collection

All companies listed on the ANAB (formerly known as ANSI-RAB) web site in October 2004 were contacted via email with a request for a copy of their methods for determining compliance with the ISO 140001 standard. For companies that did not respond via email or if the email was rejected by the server, then their corporate web site was searched to obtain their method of determining the compliance of a company's EMS to the ISO 14001 standard.

Appendix A shows the email sent to ANAB listed companies requesting the company's criteria for determining a company's conformity to the ISO 14001 EMS standard. The email was sent out two times to the specified contact person and email listed on the ANAB website's list of accredited companies for performing registration audits to ISO 14001. The first email was sent October 24, 2004. Contact persons who did not respond to the initial email were sent a second email one week later on October 31, 2004. There were no emails for which a message was returned due to 'unrecognized by receiving server'.

The study analyzed the qualitative data obtained from company websites and information received via email from company representatives to determine the methods third party certifiers are utilizing to endorse the validity of an organization's EMS.

Data were collected from third party certifier's web sites where documentation on their auditing criteria and processes were amassed, and from email attachments from specific third party certifying companies. ANAB provides a directory (ANSI-ASQ, 2006) of registrars that provides contact information in the form of the company's address, telephone number(s), email addresses, and company websites. Company websites obtained from this directory were utilized to obtain information on their auditing criteria

and processes. The email addresses listed of company contacts were utilized to request copies of their working methods for certification audits. In addition to obtaining information from websites and emails, the ISO 14001 EMS and ISO 19011 Guidelines for Quality and/or Environmental Management Systems Auditing Standards were reviewed to determine the requirements for an ISO 14001 certified EMS and the best management practices for auditors in performing audits.

RESULTS

The following results were assessed for the two research questions asked during this study.

Research Question One

The first research question asked, what external certification groups exist in the United States (U.S.) to determine what environmental management systems (EMS) in US domiciled organizations are legitimate? There are several consulting groups in the United States that offer EMS certification and registration to the ISO 14001 Standards. These companies can be identified and verified through the American National Accreditation Board's website (ANSI-ASQ, 2006). As of October 9, 2004, there were twenty-nine companies that met the ANAB requirements for accreditation, but two of them do not certify environmental management systems to ISO 14001. An organization certified by any one of these listed companies accredited to certify ISO 14001 EMS' is considered to have a valid ISO 14001 certified EMS. For the purpose of this study, the twenty-nine listed companies were contacted via email requesting information on how they asses compliance to the ISO 14001 standard. Table 2 identifies the companies contacted and their response. In addition, Table 2 also identifies which companies provide information on their websites pertaining to their requirements for certification and their working methodology for determining compliance with the ISO 14001 standard. A clarification must be made for companies that were listed as not providing information on their websites. These companies have general information regarding their accreditation by ANAB to perform registration audits to ISO 14001 in addition to general knowledge about their experience and knowledge in the field. However, the information was lacking regarding what they specifically do or the steps they take to assist an organization seeking to certify their EMS to ISO 14001. The information available from websites for

twelve companies did provide sufficient information into their registration and audit process for prospective clients to provide a basic understanding of what to expect during the registration process and how the company would break the process down. Five websites of registrars provided in depth information into the process for obtaining certification. Even though the websites provide information, it was difficult to navigate and locate the appropriate information. The actual registration audit process is considered by registrars to be proprietary and that the way in which they execute the process is available only to clients. All websites did provide a contact person, number, or email for a prospective client to contact for an application package.

Table 2: Summary of Organization's Response to Request for Information and Web Site Search for Working Methods

	No Website Information Available	Email Response 'too busy to assist'	Email Response 'working papers are proprietary'	Email Response with information attached	No Email Response	Does not Certify to ISO14001
ABS Quality Evaluations, Inc.					x	
AIB Vincotte USA					x	
AQA International, LLC					x	
AQSR International, Inc.					x	
Advanced Waste Management Systems	x				x	
American Systems Registrar (ASR)	x				x	
BSI America Inc.					x	
Bureau Veritas Quality International (NA) Inc.				x		
CRS Registrars, Inc.					x	
DQS German American Registrar for Management Systems, Inc.	x				x	
Det Norske Veritas Certification, Inc.					x	
EAGLE Registrations Inc.	x				x	
ITT Techonologies, Inc.	x				x	

Interek ETL Entela Automotive Certifications					x	x
KEMA-Registered Quality, Inc.	x		x			
Lloyd's Register Quality Assurance, Inc.	x				x	
NSF International Strategic Registrations, Ltd.					x	
National Quality Assurance, USA				x		
Orion Registrar, Inc.					x	
Performance Review Institute Registrar					x	
Perry Johnson Registrars, Inc.	x	x				
Quality Systems Registrars, Inc.	x				x	
SGS Systems and Services Certification	x				x	
Smithers Quality Assessments, Inc.					x	
Steel Related Industries (SRI) Quality System Registrar					x	
TRA Certification (TRA-CD)					x	x
TUV America Inc., Management Service Division					x	
TUV Rheinland of North America, Inc.					x	
Underwriters Laboratories, Inc.					x	

As indicated in Table 2, only four companies responded to an electronic inquiry for information. Two respondents provided attached information, one respondent

indicated that the company was too busy to participate in the request, and the last respondent indicated that their company's working papers were proprietary. Two companies do not certify ISO 14001 environmental management systems and ten companies do not provide adequate information on their company's website to extrapolate findings for this study. Therefore, twelve companies were eliminated from the study due to the following:

- Do not certify companies to ISO 14001 standard, and
- Not enough information on their websites to extrapolate pertinent data

The remaining seventeen companies were assessed to determine what they were doing to determine the legitimacy of ISO 14001 environmental management systems prior to certification.

Research Question Two

The second research question sought to determine the criteria external certification groups use to certify the validity of an EMS. The ISO 14001 Standard is utilized to determine if the requirements of the ISO 14001 Standard is being met by the organization's environmental management system. The accredited organization will break down the Standard and then audit the company seeking certification against what the Standard requires. The registration audit is a process audit and the registrar is looking for significant nonconformance to ISO 14001. Significant nonconformance to the Standard results in the organization not receiving certification, while minor non-conformances that can be corrected and verified without a visit often results in the organization receiving certification. The certification is granted once the minor non-conformances are verified to be corrected by the registrar. A registration audit resulting in full conformance to ISO 14001 results in immediate certification. The techniques utilized to verify compliance with the Standards vary by company and are often

proprietary. However, information was obtained either from company representatives or their websites that break down what these companies are looking for when auditing a company seeking certification and registration of their EMS.

This process is not intended for companies who are developing their environmental management system. Prior to seeking ISO14001 certification, a company must have a fully documented and functional environmental management system in place. The data, when compiled and simplified, indicate a four step approach is utilized by third party registrars in the certification and registration of a company's EMS. The four steps consist of the following, with steps and sub steps identified in Table 3.

1. Pre-Site Visit

   An auditor is assigned to a client who then works with a company representative, after reviewing their registration packet, to review the ISO 14001 standard and requirements with the representative. This step ensures that the company seeking registration to the ISO 14001 Standard understands the requirements of the standard and how the auditing process will work.

2. Certification Steps

   Certification generally consists of four steps: pre assessment, preliminary evaluation, documentation review, and the certification audit. The pre assessment evaluates the existing EMS against the standard requirements and identifies areas of concern. This is generally done off site through dialogue with the representative, with minimal document review. These concerns are documented and provided to the company. The company is then given the opportunity and time to address the concerns before continuing to the preliminary evaluation.

Table 3: The Sub Steps of Certification

Steps	Pre Site Visit		Certification Steps				Granting of Registration	Maintenance of Registration	
Sub Steps	Registration Packet	Information Meeting	Pre Assessment	Preliminary Evaluation	Documentation Review	Certification Audit		Annual Assessment	Semi Annual Assessment
ABS Quality Evaluations, Inc.			x	x	x	x	x	x	x
AIB Vincotte USA	x	x	x	x	x	x	x	x	x
AQA International, LLC			x	x	x	x	x		
AQSR International, Inc.	x		x	x	x	x	x	x	x
BSI America Inc.	x	x	x	x		x	x	x	
Bureau Veritas Quality International (BVQI) Inc.	x	x		x	x	x			
CRS Registrars, Inc.	x		x	x	x	x	x	x	
Det Norske Veritas Certification, Inc.			x	x	x	x	x	x	
NSF International Strategic Registrations, Ltd.	X		x	x	x	x	x	x	x
National Quality Assurance, USA	x			x	x	x	x	x	x
Orion Registrar, Inc.	x		x	x	x	x	x	x	x
Performance Review Institute Registrar	x		x		x	x	x		
Smithers Quality Assessments, Inc.	x		x	x	x	x	x	x	x
Steel Related Industries (SRI) Quality System Registrar	x	x	x	x	x	x	x	x	x
TUV America Inc., Management Service Division	x	x	x	x	x	x	x	x	
TUV Rheinland of North America, Inc.	x	x	x	x		x	x	x	
Underwriters Laboratories, Inc.	x		x	x		x	x	x	x

The preliminary evaluation and document review occurs simultaneously on site. This step includes an assessment of the organization's procedures, documentation, and key elements to meet the ISO 14001 requirements. The primary goal of this step of the registration process is to determine if a company is ready for the certification audit. If gaps are identified in the processes, documents and/or key

elements of the EMS, they are documented and a corrective action plan is developed. The company is given time to implement the corrective action before the certification audit is conducted. The company should have a comprehensive understanding of ISO14001 and where their company's position is related to meeting the ISO 14001 EMS requirements prior to initiating the certification audit. The third party certifier should work with the company to ensure readiness and should be forthcoming with them if they are not in a position to pass the certification audit.

The certification audit consists of an on site evaluation of the company's environmental management system against the requirements of the ISO14001 Standard. The audit team questions employees and management involved in the processes and procedures that are in place to support the EMS to verify that the company is doing what they say they are doing. In addition to interviewing employees and reviewing processes, documentation will also be evaluated to ensure conformity to the standard. At the end of the audit, the lead auditor is responsible for determining if the company will be recommended for registration, based on the audit findings, to the ISO 14001 Standard.

3. Granting of Registration

Registration to the ISO14001 Standard is granted to companies that have no major non-conformances to the Standard. These companies receive a certificate of compliance that registers them as ISO14001 compliant. Companies may also be recommended for registration if they have one or more major non-compliances if the lead auditor can verify correction without a full re-audit. Once the non-conformances are corrected and verified, then registration is granted. If the company is seen to have major non-conformances that represent a breakdown of their environmental management system, then they are not recommended for registration and must be re-audited and pass to gain registration.

4. Registration Maintenance

Companies registered to the ISO14001 Standard must undergo a verification audit by a third party certifier during the third year of registration to verify continuing EMS competency. Companies may elect to have surveillance audits on a semi annual or annual basis that focus on specific elements of the EMS to ensure its effectiveness. Surveillance audits to maintain the EMS are not required, but recommended.

A step not designated for the registrars listed in Table 4 does not indicate that they do not provide that service, but that the information was not available on their website on whether they provided that service or not.

Five companies (AIB, Orion, SRI, BVQI, and Underwriters Laboratories, Inc.) provided substantial information on their respective websites. Orion provides similar information as what is found on the other registrar's websites, but where they exceed the basics is by providing a downloadable *Orion Registration Regulation* document that outlines the process of obtaining and maintaining certification of an organization's EMS to ISO 14001 and their registration of the system under Orion. What stands out in this document is that Orion defines what their responsibilities are to the organization seeking certification, what the process is for filing a complaint or appeal against Orion regarding the audit process or outcome of the registration audit, and what Orion's responsibilities are in communicating changes to the Orion requirements that may affect their client. The document reads somewhat like a contract or an agreement between two entities but without the legal jargon.

SRI provides a downloadable document on their website called *R20.11E: EMS Registration Audit Procedures Flow Chart*. What makes this flow chart stand out from flow charts found on other registrar's websites is that SRI breaks down the steps into substeps and explains what the requirements are for SRI and the organization seeking

ISO 14001 registration through them. Review of this document provides the organization seeking registration substantial insight into how SRI proceeds with certifying prospective organizations to ISO 14001. In addition, SRI provides a common timeline built into the step explanations for the registration. This timeline is important because it provides an organization without any knowledge of the process an idea for how long it takes to register their EMS. This information will assist the organization in allocating the appropriate personnel to participate in the registration project.

Underwriters Laboratories, Inc. (UL) provides a downloadable document on their website called *ISO 14001 Registration Program Requirements*. This document details the UL ISO 14001 registration process. Like the document Orion provides, this one also reads like an agreement or contract without the legal jargon. This document stands out due to the amount of detail it provides prospective clients. It provides a section on terms and definitions that may not be familiar to an organization first seeking certification to the ISO 14001 Standard. The document also cites the Standard as an addition resource of information. The most notable information provided by this document are UL's requirements of the organization seeking registration, UL's requirements towards its client, the information provided for each step of the process, use of the certification mark and an explanation of the complaints and appeal process for the client against UL. After reading this document, a prospective client to UL will have a superior understanding the expectations and requirements of UL's registration process.

AIB also provides a downloadable document on their website that provides a potential client with an understanding of their registration audit process. The document is called, *Quality, Safety, and Environmental Management System Certification General Regulations*. Like the previous registrar's documents, AIB breaks down their audit process and provides a description of activities that take place during each step and the requirements for the client and themselves. This document provides superior

information on the actual registration and publication of the client's certification to ISO 14001 and on what options are available to a client seeking multiple certifications (to other standards), modification of the certification, and on co-certification where AIB works with another registrar to provide certification services to a client.

BVQI provides a useful downloadable document on their website titles, *Guidance for EMS Auditors BVQI Expectations for Companies Registering to ISO 14001:1996, Interpretations of Key Requirements*. The title of this document references the previous version (1996) of the ISO 14001:2004 Standard, but is still appropriate for use when an organization is in the process of selecting their registrar. The intent of the document "is to be a guidance tool for BVQI auditors, providing common understanding on the intent of the standard and for clarification of text in the standard" (p. 1). The document breaks down the Standard and provides BVQI's interpretation of what the requirement is asking for and what is required to conform to it. It also explains the difference between compliance and conformance. Compliance being a term linked to regulatory requirements and conformance a term associated with management system requirements. This document does not break down the audit process, but it does provide an invaluable tool to organizations seeking registration to ISO 14001 because it provides information on what the registrar is looking for and how they are going to interpret the Standard during the audit.

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Discussion

The intent of this research was to establish what external certification groups exist in the United States to determine the legitimacy of environmental management systems in US domiciled organizations and to determine what criteria do these external certification groups utilize to certify the validity of an environmental management system.

The first question is easily defined, but the requirements of the process in which these companies become accredited are vague. The ISO (International Organization of Standardization, 2006) website provides a directory of all nations with the names and contact information of their accrediting bodies. In the United States, the American National Accreditation Board (ANAB) accredits companies to register/certify other companies and organizations to international and national standards. The research in this paper specifically looked at the registration/certification of US domiciled organizations to the ISO 14001 environmental management standard. Once the accrediting body has been identified, an organization seeking certification to ISO 14001 may go to the ANAB website (ANSI-ASQ, 2006) to locate a current list of contact and website information of accredited companies.

The ANAB website (ANSI-ASQ, 2006) also provides basic information on the initial process for a company to become accredited. Investigation into this process revealed that for a company to become accredited it must go through a four step process which includes paying a handsome fee to the accrediting body. Step 1 involves the company submitting a base application with fee to ANAB for approval to continue to the next step. The initial application requires the company to provide documentation of their conformance to various standards and associated guides. Step 2 can only be reached by receiving approval from ANAB in Step 1. Step 2 involves the company

receiving limited access to the electronic application (not available to the general public) and payment for accreditation. Once payment is received, the company receives full access to the application which is Step 3. Step 4 is the submittal of the application. An ANAB assessor is assigned to the company to assist in this phase of the application process, but may only be utilized as a consultant. The assessor cannot tell the applicant how to meet the requirements.

The four steps of the accreditation process are ambiguous to those who are not knowledgeable about the certification of environmental management systems to ISO 14001 (Technical Committee 207, 2004) and its associated standards, such as ISO 19011 (Technical Committee 176, 2002). The process is intended for those companies that are active in the field, who possess experience in the field, and whose employees have experience and knowledge in the field. The requirements for accreditation appear to be onerous and expensive to ensure legitimate candidates apply and become accredited. Potential clients of a registrar have to put their trust in the system that it will provide them with a professional and knowledgeable organization. However, a potential client must not make the decision to utilize a registrar based solely on their accreditation status.

An organization seeking to engage a registrar for certification of their EMS should use accreditation as a first step in the selection process. The ANAB website (ANSI-ASQ, 2006) provides a directory of organizations accredited to certify EMS to ISO14001 (Technical Committee 207, 2004). This directory not only provides a contact name, but a website to the company. The websites provide basic information on the company and their ability to provide certification services. All websites provided a means of contacting the company to initiate the selection process. Some websites provided better information than others. Five company's websites stood out for providing substantial information on the certification process in a downloadable document. These documents

provided in depth information on the expectations of the registrar and client, the steps of audit process, certification maintenance and use of certification mark, and the complaints and appeal process for the client against the registrar. These documents provide a good foundation for understanding the certification process and for understanding the registrar's methods. The actual auditing techniques of a registrar are considered proprietary and will not be found in public information sources.

In addition to the initial identification of registrars and assessment of the information found on their websites, an organization should interview the potential candidates to determine if they are a good fit with the company culture and to determine their experience, knowledge and expertise. Cochran (2006) also suggests that an organization ask the registrar candidate for references from previous and or current clients; ask their own clients or customers for recommendations, look at scheduling, registration fees, and the overall comfort in establishing a long term relationship with the registrar. The selection process can be related to the hiring process for a new employee. Before a hiring a new employee, a company wants to know about their experience, expertise, knowledge in the position available, check references, and determine if the potential employee would integrate well into the existing corporate culture. An organization would neither hire an individual that does not meet the requirements and expectations of the open position nor one that would not 'fit' well into the corporate culture. The organization should use the same discretion in selecting a registrar as it does in selecting a future employee.

Once a registrar has been selected, an organization will want to know what criteria the registrar will utilize to certify the validity of their environmental management system. The validity of the EMS is confirmed when the requirements of the ISO 14001 Standard are met. When the components of the Standard are met, the system is considered certified, which implies validity. Cochran (1999) concludes that implementing

an ISO 14001 EMS is not as difficult as it may seem, but it is not as easy as buying a book on ISO 14001 and filling in the blanks of the draft policies contained in the index. It was stated previously that the Standard is process-based, so filling in the blanks to meet the requirements is not adequate. The processes must also be in place to support the requirements in order for the EMS to conform to the Standard.

The certification audit is a process audit that is intended to determine whether or not an organization's EMS conforms to the requirements of the Standard and is properly implemented and maintained (Hillary, 1998). The ISO 19011 Standard, Guidelines for Quality and/or Environmental Management Systems Auditing (Technical Committee 176, 2002) provides guidance to the auditor on how to carry out the audit of an EMS and provides the organizations seeking certification with information on what should be expected from the audit.

Determining the validity of the EMS begins with the ISO 14001 Standard itself (Technical Committee 207, 2004). The organization seeking certification should be knowledgeable in the Standard's requirements and have the policies and processes in place to support them. Once the registrar is selected, the auditing process begins. Figure 4 provides a simple flow chart depicting the audit process. Information is obtained through interviews of employees, observations of key processes, and the review of key documents. Once collected, the data are evaluated against the Standard to determine conformance. The findings are reviewed and the audit findings documented. Conformance to the Standard results in immediate certification. Certification can also be granted when minor non-conformances are identified if they can be corrected and verified within a set time period by the registrar without an on-site visit. Once the minor non-conformances are verified as corrected, certification can be granted. If significant non-conformances are identified, certification is not granted. The

organization must correct the significant non-conformance and participate in a modified audit to determine the soundness of the corrective action.

It must also be noted that certification to the ISO 14001 Standard is not for all companies. Due to the expense and time involved, companies that are market sensitive are better suited to pursue certification than those who are looking to operate green. Green companies may choose not to obtain accreditation, but to operate their company in a manner that assumes accreditation. An organization can utilize the information available in the ISO 14001 Standard to develop an environmental management system and an internal auditing approach to ensure its environmental goals are being met. This will allow them the benefits of an EMS, without the cost and time expenditures involved in the ISO 14001 certification process.

Conclusions

Organizations that have implemented ISO 14001 certified environmental management systems benefit three ways: socially, environmental, and economically. These organizations have a good reputation in the communities in which they operate and are seen as environmentally responsible organizations. This positively impacts third party stake holders such as investors, environmental groups, and regulators. These organizations show environmental benefits from the continual improvement requirement of the ISO 14001 Standard. The Standard requires organizations to continually improve their programs, which results in an improved relationship with regulators, a decrease in pollution generation, more efficiently run processes, and more innovative approaches to managing environmental factors. Organizations are economically benefiting from more innovative approaches to managing processes and more efficient operations which cost less to run and use fewer resources – materials and personnel, which cost the organization less financially.

Organizations with legitimate environmental management systems have had their systems certified and registered by a registrar accredited by the national accrediting body for the country in which their organization is domiciled. In the United States, this body is the American National Accreditation Board (ANAB). ANAB requires companies seeking accreditation to go through a lengthy and detailed application process where they are required to document and substantiate their expertise, knowledge, and professionalism in the standard auditing field. They are audited by ANAB to maintain their accreditation which ensures that the registrar maintains their professionalism.

Organizations that are seeking to certify their EMS to ISO 14001 have multiple registrars to select from but may not find it easy to begin the process due to a lack of availability of condensed information to make an educated choice for their organization. An organization seeking registration to the ISO 14001 Standard nee ds to begin with the national accrediting body for their country, in the United States that body is ANAB. ANAB provides a list of US ISO 14001 accredited companies with their contact information on their website (ANSI-ASQ, 2006). After reviewing the list, an organization can either contact the company directly or peruse their website for information relating to their certification services. However, the research done in this paper shows that the information available on these websites is meager and at times difficult to locate, although there are some registrars that provide a substantial amount of information for an organization to begin their selection process. Five company's websites stood out for providing substantial information on the certification process in a downloadable document. These documents provided in depth information on the expectations of the registrar and client, the steps of audit process, certification maintenance and use of certification mark, and the complaints and appeal process for the client against the registrar. The actual auditing techniques of a registrar are considered proprietary and will not be found in public information sources.

Regardless, all websites provide some basic information and further contact information for an organization to pursue further.

Recommendations

Investigation into the processes for achieving accreditation by the US national accrediting body and the registration process for organization's seeking ISO 14001 certification is vague and reflective of the Standards (14000 series and 19011). In addition registrars should provide more public information on the registration process. Organizations that provide better information to potential clients would have a competitive advantage over those that do not. Additional research into these processes and on the benefits of ISO 14001 EMS implementation are necessary to provide additional insight into the accreditation and certification processes organizations must go through which will allow organizations to make better decisions when selecting a registrar and in determining if certification is beneficial to an organization. By developing a greater understanding of these processes, organizations who wish to take a business approach to determining if certification is an option, will be better able to estimate the cost for seeking certification and determine if the benefits of certification outweigh the costs.

A quantitative business approach is also necessary to determine the cost of operating an environmental management system. A system for determining the cost of environmental operations needs to be further explored and developed. There are accounting measures for standard business functions, but due to the elusiveness of environmental costs, a quantitative accounting system that is viable is not available to environmental professionals.

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APPENDIX A

Copy of Email Request for Information to Companies listed on ANAB Website

Copy of Email Request for Information to Companies listed on ANAB web site.

Hello Mr./Ms. [*Insert Company Representative*]

I am a graduate student at Oregon State University working on my Masters Thesis, I am in the process of accumulating information on what third party registrars are looking for from potential ISO 14001 certified companies.

Does *INSERT COMPANY NAME* have a written set of criteria that their audit team uses to certify companies as ISO 14001? Is there a short list of set criteria that is a must for certification?

Is it possible to get a copy of this information for use in the development of my Master's thesis?

I can be reached the following ways:

Judi Younce
(personal contact information removed)

I appreciate any assistance that can be given to me to help me finish this project.

Thank you,

Judi Younce

APPENDIX B

Contact list of Certified Registrars Available on ANAB Website.

Contact list of Certified Registrars available on ANAB website.

ABS Quality Evaluations, Inc.
Sales Services
16800 Greenspoint Park Drive
Suite 300 South
Houston TX 77060-2393
United States
Phone: 281-673-2843
Fax: 281-673-2844
Other Qualifications:
RC 14001
RCMS
Web site: www.abs-qe.com
Emain: qe_cust_serv@eagle.org

AIB Vincotte USA
Alan Smith
6161 Savoy Lane
Suite 837
Houston TX 77036-3308
United States
Phone: 713-532-9600
Fax: 713-532-9601
Web site: www.aib-vincotte.com
Email: alansmith@avusa.net

AQA International, LLC
Patricia Mayer
1107 Belleview Avenue
Columbia SC 29201
United States
Phone: 803-779-8150
Fax: 803-779-8109
Web site: www.aqausa.com
Email: patricia@aqausa.com

AQSR International, Inc.
Brad Kitchen
315 Eisenhower Parkway
Suite 115
Ann Arbor MI 48108
United States
Phone: 888-866-5666 x303
Fax: 905-624-7213
Web site: www.aqsr.com
Email: bradkitchen@aqsr.com

Advanced Waste Management Systems
Jim Mullican
6430 Hixson Pike
PO Box 100
Hixson TN 37343
United States
Phone: 423-843-2206
Fax: 423-843-2310
Web site: www.awm.net
Email: mullican@awm.net

American Petroleum Institute Quality Registrar
Chip Evans
1220 L Street, NW
Washington DC 20005
United States
Phone: 202-682-8574
Fax: 202-682-8070
Web site: www.api.org
Email: evanst@api.org

American Systems Registrar (ASR)
Richelle Kinzie
5989 Tahoe Drive SE
Suite 120
Grand Rapids MI 49456
United States
Phone: 888-891-9002
Fax: 616-942-6409
Web site: www.asrworldwide.com
Email: richelle@asrworldwide.com

BSI America Inc. trading as BSI, Inc.
Tom shelley
12110 Sunset Hills Road
Suite 200
Reston VA 20190-3231
United States
Phone: 703-464-1931
Fax: 703-437-9001
Other qualifications:
RC 14001
RCMS
Web site: www.bsiamericas.com
Email: tom.shelley@bsi-global.com

Bureau Veritas Quality International (NA) Inc.
Reid Van Every
509 North Main Street
Jamestown NY 14701
United States
Phone: 716-484902 x104
Fax: 716-484-9003
Other qualifications:
RC 14001
RCMS
Web site: www.bvqina.com
Email: rvanevery@bvqina.com

DQS German American Registrar for Management Systems, Inc.
3601 Algonquin Road
Suite 305
Rolling Meadows IL 60008
United States
Other qualifications:
RC 14001

Det Norske Veritas Certification, Inc.
Garnett Davis
16340 Park Ten Place
Suite 100
Houston TX 77084
United States
Phone: 281-721-6737
Fax: 281-721-6903
Other qualifications:
RC 14001
RCMS
Web site: www.dnvcert.com
Email: garnett.davis@dnv.com

EAGLE Registrations Inc.
Ellen Cloonan
40 North Main Street
Suite 402
Dayton OH 45423
United States
Phone: 937-293-2000
Fax: 937-293-0220
Web site: www.eagleregistrations.com
Email: ellen.cloonan@eagleregistrations.com

ITT Technologies, Inc.
Joel T. White
2401 Research Drive
Raleigh NC 27695-8301
United States
Phone: 919-513-7704
Fax: 919-882-9410
Email: joelw@it3-services.com

KEMA-Registered Quality, Inc.
Lauren Funk
4377 County Line Road
Chalfont PA 18914
United States
Phone: 215-997-4519
Fax: 215-997-3810
Web site: www.krqusa.com
Email: Lauren.Funk@kema.com

NSF International Strategic Registrations, Ltd.
Kelly Lavoisne
789 N Dixboro Road
Ann Arbor Mi 48105
United States
Phone: 734-913-5758
Fax: 734-827-7107
Other qualifications:
RC 14001
RCMS
Web site: www.nsf-isr.org
Email: lavoisne@nsf.org

National Quality Assurance, USA
Arlen Chapman
4 Post Office Square Road
Acton MA 01720
United States
Phone: 978-635-9256 x231
Fax: 978-263-085
Web site: www.nqa-usa.com
Email: achapman@nqa-usa.com

Orion Registrar, Inc.
Kaci Fults
7850 vance Drive Suite 210
Arvada CO 80003
United States
Phone: 303-456-6010
Fax: 303-456-6681
Web site: www.orion-iso.com
Email: info@orion4value.com

Performance Review Institute Registrar
Pete Kucan
161 Thornhill Road
Warrendale PA 15086-7527
United States
Phone: 724-772-7170
Fax: 724-772-1699
Web site: www.pri.sae.org
Email: pkucan@sae.org

Perry Johsnon Registrars, Inc.
Terry Boboige
26555 Evergreen Road
Suite 1340
Southfield MI 48076
United States
Phone: 800-800-7910
Fax: 248-358-0882
Other qualifications:
RC 14001
RCMS
Web site: www.pjr.com
Email: tboboige@pjr.com

Quality System Registrars, Inc.
Scott Kleckner
22630 Davis Drive
Suite 220
Sterling VA 20164
United States
Phone: 703-318-3151
Fax: 703-478-0541
Other qualifications:
RC 14001
Web site: www.qsr.com
Email: scottk@qsr.com

SGS Systems and Services Certification, a division of SGS US Testing Co. Inc.
Grant O'Brien
Meadows Office Cmplex
201 Route 17 North
Rutherford NJ 07070
United States
Phone: 201-508-3012
Web site: www.us.sgs.com
Email: grant.obrien@sgs.com

Smithers Quality Assessments, Inc.
Tim Brown
425 West Market Street
Akron OH 44303
Untied States
Phone: 330-762-4231
Fax: 330-762-7447
Web site: www.us.sgs.com
Email: tbrown@smithersmail.com

Steel Related Industries Quality System Registrar
Christopher Lake
105 Bradford Road
Suite 400
Wexford PA 15090
United States
Phone: 724-934-9000 x671
Fax: 724-935-6825
Web site: www.sriregistrar.com
Email: clake@sriregistrar.com

TRA Certification (TRA-CD)
Rob Podawiltz
700 East Beardsley Avenue
Elkhart IN 46514
United States
Phone: 574-264-0745
Fax: 574-264-0740
Web site: www.tra-cd.com
Eamil: rpodawiltz@trarnold.com

TUV America Inc., Management Service Division
Sales Department
5 Cherry Hill Drive
Danvers MA 01923
United States
Web site: www.tuvamerica.com
Email: info@tuvam.com

TUV Rheinland of North America, Inc.
12 Commerce Road
Newtown CT 06470
United States
Web site: www.tuv.com

Underwriters Laboratories Inc.
Michael Caruso
1285 Walt Whitman Road
Melville NY 11747
United States
Phone: 631-271-6200 x22340
Fax: 631-439-6022
Other qualifications:
RC 14001
RCMS
Web site: www.ul.com
Email: Michael.J.Caruso@us.ul.com