



Critical factors for implementing ISO 14001 standard in United States industrial companies

Khalid A. Babakri ^{ab,*}, Robert A. Bennett ^a, Matthew Franchetti ^a

^a *The University of Toledo, Environmentally Conscious Design and Manufacturing Laboratory, College of Engineering, MIME Department, 2801 West Bancroft Street, Toledo, OH 43606, USA*

^b *The Lucas County Solid Waste Management District, 761 Key Street, Maumee, OH 43537, USA*

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Abstract

The purpose of this paper is to present the results of an empirical study carried out on a sample of certified industrial companies that operate in the United States, with the aim of identifying some of the critical factors for successful implementation of the ISO 14001 registration process. The paper reveals that it takes most of the companies between 8 to 19 months to obtain ISO 14001 certification. In addition, the ISO 14001 elements requiring the greatest effort are: identifying environmental aspects, environmental management system (EMS) documentation, training, EMS audits, operational control, environmental management program, objectives and targets, and document control. The survey also reveals that high certification cost and lack of other available resources are the greatest obstacles for implementing the ISO 14001 standard.

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1. Introduction

Since the introduction of ISO 14000 standards in 1996, many corporations around the world are adopting ISO 14000 and requiring that their suppliers move toward adopting the same set of standards. ISO 14000 is series of voluntary international standards for implementing an effective EMS. ISO 14000 series include 20 separate standards ranging from environmental labeling to assessing the life-cycle of products [1]. ISO 14000 standards are designed to help organizations establish management processes for controlling and improving their environmental performance and reducing their impact of operations on the environment.

The most important of ISO 14000 standards is the EMS specification standard, ISO 14001. ISO 14001 is the only standard of the ISO 14000 series to be used for certification [2]. The ISO 14001 standard provides a

framework for establishing or improving an EMS. The ISO 14001 standard is made up of five main elements: the environmental policy, the environmental plan, implementation and operation of programs to meet objectives and targets, checking and corrective action, and management review.

Globally, many countries are adopting ISO 14000 standards. By mid-2001 more than 30,300 organizations worldwide were ISO 14001 certified [3]. In the United State, the adoption of ISO 14001 certification was not attractive at the beginning. In December 1997, there were only slightly more than 70 facilities certified to the standard in the US, compared to approximately 2,300 worldwide [4]. The number of ISO 14001 certified companies started to increase by the end of 1998. More than 330 organizations were certified in the United States by early 1999. The real push for ISO 14001 certification came from the “Big Three” automakers in the US. By the end of 2002, General Motors Inc. will require its suppliers to certify the implementation of EMS in their operations, in conformance with ISO 14000 [5]. Like General Motors, Ford Motor Company announced that it will require suppliers to certify at least one manufac-

* Corresponding author. Tel.: +1-419-530-7395; fax: +1-419-530-8275.

E-mail address: hkhalid80@hotmail.com (K.A. Babakri).

turing site to the ISO 14001 standard by the end of 2001 and all manufacturing sites shipping products to Ford by July 1, 2003.

This paper reports the results of a survey which explored some of the implications of ISO 14001 standards for US industrial companies. The objective of this paper is to identify the important information about ISO 14001 certification for companies that are in the process of adopting the standard to make their certification processes more efficient and successful. This paper reports the time it takes companies to obtain an ISO 14001 certificate. This will allow the companies to anticipate how long it may take them to obtain the certificate. Another important feature is to point out the ISO 14001 standard's elements which require the greatest effort and time to implement. Finally, the paper identifies the biggest obstacles encountered by firms seeking ISO 14001 certification.

2. Methodology of the research

2.1. Description of the sample

The data used in this paper comes from an extensive survey that attempted to analyze the impact of ISO 14001 registration on recycling performance in US industrial companies. The first draft of the questionnaire used in this study was developed in August 2001 based on a comprehensive literature review. The questionnaire was pretested by three faculty members of The University of Toledo and eight ISO 14001 coordinators from different industrial companies. In January 2002, the finalized survey questionnaire was sent to 584 ISO 14001 certified industrial companies in the United States. Of the 584 surveys, 177 completed surveys were returned, yielding a response rate of 30.3%. Company profile information in term of type of industry and company size is presented in Tables 1 and 2.

Table 1
Respondents by industry

Industry type	Number of companies	Percentage
Automotive	69	39.0%
Computer and electronic	28	15.8%
Miscellaneous	21	11.9%
Fabricated metal	16	9.04%
Chemical products	15	8.47%
Machinery and equipment	12	6.78%
Electrical products	7	3.95%
Primary metals	5	2.82%
Textile manufacturing	4	2.26%
Total	177	100%

Table 2
Firms' size by the number of employees

Number of employees	Number of responses	Percentage
Over 500	58	32.77%
251–500	49	27.68%
101–250	39	22.03%
51–100	18	10.17%
1–50	13	7.34%
Total	177	100%

2.2. Critical factors considered

In order to gain understanding about some of the ISO 14001 implications, the following critical factors were considered:

- Time to obtain the ISO 14001 certificate. The value of this variable was obtained by a direct question in the survey where companies were asked how long it had taken them, in months, to obtain the ISO 14001 certificate.
- ISO 14001 elements that require the greatest effort. The respondents were asked to rate the level of effort required for each element on a five-point Likert scale where, 1=very low and 5=very high.
- Problems companies experience in implementing ISO 14001. These problems may occur during the preparation for the certification or during the certification process. Eight obstacles for ISO 14001 certification were identified from the literature review. The respondents were asked to rate their agreement on the importance of each obstacle using a five-point Likert scale where 1=strongly disagree and 5=strongly agree.

3. Results of the analysis

An analysis was performed on the research data to determine time to obtain an ISO 14001 certificate, elements requiring the greatest effort, and major obstacles encountered during implementing ISO 14001.

3.1. Time to obtain an ISO 14001 certificate

With respect to the time to obtain the certificate, 177 companies answered this question. The results are shown in Table 3. It has taken most companies (75.6%) between 8 to 19 months to obtain the certificate. The minimum reported time to obtain the certificate (only 3 respondents) was 3 months or less. The maximum reported time (only 10 respondents) was more than 20 months. This result is similar to that found in Spain where it took most companies (85.4%) between 12 to 24 months to obtain an ISO 14001 certificate [6]. This

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