

Technical Note Report

The Integrated Management Systems of ISO Standards

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Abstract

International standards were mainly developed by the ISO (International Organization for Standardization) and the BSI (British Standards Institution). Their deployment is spreading worldwide. Recently issued standards include ISO 14001: 1996, OHSAS 18001: 1999 (OH&S) and ISO 9001: 2000 in the product quality field. Concerning the management systems in Japan, many harmful cases were seen in which management was being handled individually within the companies and organizations. This research focuses on common items of each standard, proposes an integrated management system and analyzes their effectiveness. Regarding the building of an ISO integrated management system according to the purposes of the organization, the case studies in this study illustrate that the systems are frequently used to reduce future management risks, leading to the conclusion that rational systems that specify their purposes have been built and integration achieved.

KEYWORDS: *international standards, management systems, management improvements*

1. Introduction

Management system standards are published mainly by the ISO (International Organization for Standardization) and the BSI (British Standards Institute), and their deployment is spreading worldwide. Recently issued standards include ISO 14001: 1996 in the environment field, OHSAS 18001: 1999 (OH&S) in the occupational safety field, and ISO 9001: 2000 in the quality field. For this research, documents were examined concerning the number and effects of management systems in major countries and comparisons were made with companies and organizations in Japan.

After doing an original case study as part of the audits experience (about 100 companies from April 1996-August 2003), the major causes for separate handling by companies and organizations deploying such standards was investigated. This research aims to examine the common denominator of the each standard and offer a management model that integrates (1) policy regulations, (2) objective, goal and program creation (policy development tables and so on), (3) creation, maintenance and management of manuals, regulations, procedure manuals and records (document management, records management), (4) clarification of responsibilities and authority, (5) identification and implementation of education

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needs, (6) communication, (7) building and implementing an internal audit system (8) revisions by the management level. This model's effectiveness will also be analyzed.

2. Number of ISO 9001 and ISO 14001 Registrations Worldwide

2.1 Number of ISO 9001 Registrations Worldwide

In July 2002, the ISO (the International Organization for Standardization) conducted a study on the ISO 9001 and ISO 14001 registrations worldwide until the end of 2001. ISO 9001 registrations continued and increased, with 510,616 registrations (up by 101,198) in 161 countries. The top figures were 66,760 for the U.K.; 57,783 for China; 48,109 for Italy; 41,269 for Germany; 37,026 for the U.S., and 27,385 for Japan. Registrations increased by 101,985 items and four countries were added compared to the last survey (end of 2000), which totaled 408,631 items for 157 countries within a one-year period. This increase, much more significant than the 64,988 items added in the one-year period from the end of 1999 to the end of 2000, marked the most registrations recorded since the study began in January 1993. By area, there were 269,950 registration reports in Europe, up 49,823 in the one-year period. The Far East recorded 126,799 registrations, up 44,860 for the same one-year period. The rate of increase shows a very strong upward trend. (China marked the world's largest increase with 32,126 items). In the Far East, the countries and regions leading in registrations were China with 57,783, Japan with 27,385, Korea with 17,676, Taiwan with 5,405, Thailand with 3,870, Hong Kong with 3,814, Singapore with 3,513, Malaysia with 3,195, Indonesia with 1,395, and the Philippines with 961.

Meanwhile, in the United Kingdom, the increase of ISO 9001 certification registrations remained at only 25, up from 63,700 to 63,725 in 1999-2000. An increase in declined registrations was another cause for concern. At the end of 2001, registrations were up by 3,000 items to 66,760 items. This exceeds the number of declined items accompanying the switchover to the 2000 version of ISO 9001. This increase can be attributed to items moved for new certification of the 2000 version. Opinions are emerging that are skeptical of the 2000 version introduction as well as the ISO registration system itself. Further development of ISO 9001 is expected.

2.1 Number of ISO 14001 Registrations Worldwide

As for ISO 14001 registrations, there were 36,765 certification registrations (up by 13,868) from 112 countries. The top-ranking country was Japan with 8,123, followed by Germany with 3,380, the U.K. with 2,722, Sweden with 2,070, and Spain with 2,064. Registrations increased by 13,868 within a one-year period with 14 countries added. The last survey (end of 2000) marked 22,897 registrations from 98 countries. The rate of increase for ISO 14001 registrations shows a trend of stable increase. Japan in particular had 2,567 registrations in 2000-2001. The increase of ISO 14001 registrations was the top number for every country. Looking at the increase rate in major countries, the rate for Taiwan (237%) and China (213%) is high; conversely the rate for the U.K. (7%) is low. According to the data of December 2003, Japan has the most certifications in the world with 13,819. Next is Germany and Spain. Spain has a relatively high number. Germany and Austria exhibit characteristics of EMAS certifications. EMAS is the obligatory standard for environmental statements (including reports of activity content) in addition to the environment management system (Fig.1).

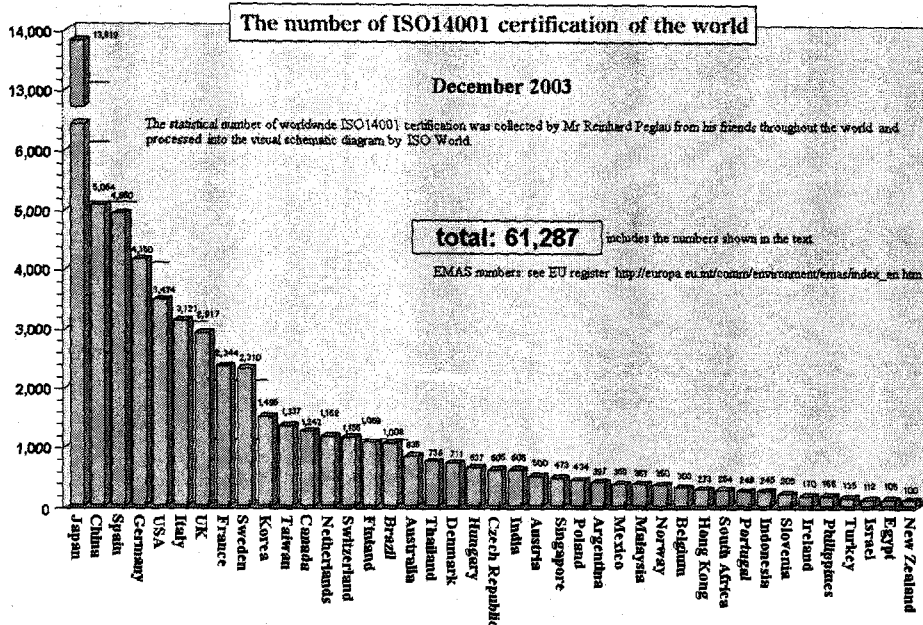


Fig.1 The number of ISO 14001 in the World (prepared by authors based on ISO-World)

3. Comparison of International Standards

International standards have evolved into different management system standards by theme, with different objectives, applicable scope and composition, resulting in separate handling that is becoming a basic element of deploying companies and organizations (Table1). The OHSAS 18001 standard is for risk management in occupational safety and health and the ISO 9001 standard is for consumer satisfaction. ISO 14001, on the other hand, is a standard that was designed to establish a relationship of mutual trust with the various interested parties and be compatible with social needs.

Table 1 Comparative Table of International Standards

Theme	Environment	Occupational Safety and Health	Quality
Standard	ISO 14001:1996	OHSAS18001:1999	ISO 9001:2000
Purpose	<p>To support environmental protection and the prevention of the pollution in balance with the needs of social economy.</p> <p>To establish a social relationship of mutual trust with the various interested parties and compatible to social needs.</p>	<p>To manage occupational safety and health (OHS) risks and prescribe requirements for the performance and possible improvements for an occupational safety and health management system.</p>	<p>To improve the satisfaction of the customer in addition to guarantee product quality as well. (The title of this standard has been changed and no longer includes the words quality assurance.)</p>

When we are looking at the applicable scope of each standard, we must consider the differences between OHS, ISO 9001 and ISO 14001. We must also be increasingly concerned with the scope of deployment and integration.

The coverage area of each international standard is shown in Fig. 2. ISO 14001 has the widest coverage area. ISO 9001 has wider coverage than OHSAS 18001. It is necessary to consider to product liability and use. As for the range of OHSAS 18001, it is mainly limited to on-site concerns, products and services. In other words, it is possible to say that the coverage of the occupational safety and health is narrowed down but it hits a core part in case of risk management.

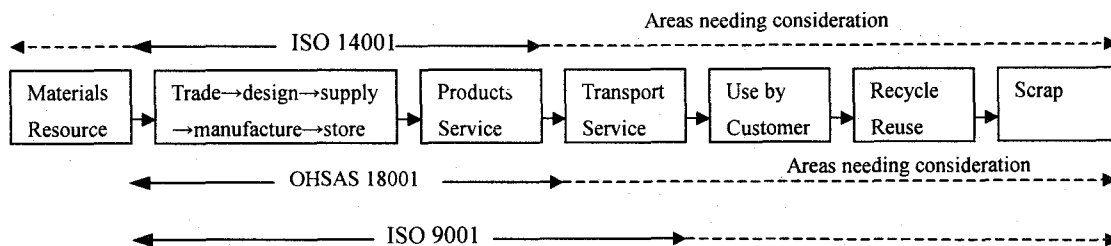


Fig. 2 Coverage of Each International Standard

4. Case Studies of actual implementation of ISO

4.1 Case Studies in Foreign Countries

Feedback cases (from the document survey/ISO market feedback) from the market in foreign countries are shown below. Market research in which ISO was implemented were surveyed from Websites. The following cases are discussed specifically in this study below.

Case 1: FedEx Corp. This is a worldwide company and is registering screenings of ISO 9001 registrations. In this way, it is achieving high competitiveness in the global market. The ISO standard deployed by the company is becoming a common foundation. (Frederick W. Smith, Chairman and CEO, FedEx, USA)

Case 2: Sony Corp. They have deployed environment management in factories in Japan and overseas, and has many years of experience in bringing about the effects useful for business. At each factory, it is not only a prevention measure in terms of operations but effects such as cost reductions and so on are being seen. (Takeo Kaji, Managing Director, (Singapore unit of) Sony Display Device, Japan.)

Case 3: Protector. ISO 9001 is extremely useful for management. A transparent organization was conceived for the organization's composition, making it clear to employees as well. (Westlaw Vic Uzieblo, Director of Marketing, Protector, Poland.)

Case 4: Baxter Healthcare Inc. This company is positioning ISO 14001 as a resource for medium to long-term competitiveness. Environment consciousness of the company itself is rising as customers choose it from all over the world. (Jay Rajangam, Senior Environmental Engineer, Singapore unit of Baxter Healthcare.)

4.2 Japanese Case Studies

As there are similar effects in Japanese offices as well, case studies are shown below, ranging from the authors' ISO 14001 and 90001 inspection cases (authors' analysis information of each company; dealing

with the audit of about 90 ISO 14001 and ISO 9001 cases implemented by April, 1996-August, 2003) to the harmful side of the cases. In terms of surface use of ISO, it is confirmed that effects similar to those overseas have been achieved.

Case 1: Management systems were built and executed with separate organizations for ISO 14001, resulting in overlapping management because unification was not given as a work instruction. Employees at the worksite were also confused.

Case 2: Overlapping rules established for quality document control regulation, environment document control regulation and safety and health document control regulations.

Case 3: In a mid-size company, a quality assurance division, environmental division, industrial safety and health division were created and specialized managements were possible in each division however, a strong tendency to conduct patrols and worksite inspections was observed.

Case 4: Many kinds of cases. Worksite work standards are scattered and confused. For example, boiler operation procedures cannot be carried out without looking at three different procedure manuals, one for operation, one for maintenance and one for anti-pollution.

Case 5: For one accident and problem, countermeasures are prepared in regard to quality and the environment, separately, resulting in overlapping countermeasures.

Case 6: Responsibility of management is divided among three persons, for quality, environment and safety and duplicate management items are not integrated when reported to the management level.

Upon analyzing these cases, in foreign countries and Japan, ISO 9001 and ISO 14001 were found to be utilized as a tool to improve management. In some Japanese case studies, valid utilization was also observed. However, it was concluded that many points overlap in creating organizations and conducting document management for ISO in Japanese cases.

5. Methodology of Integrating International Standards

First, we will analyze the aims and common points of the original standard. The focus is on providing "the flow of business" with documents and records to standardize the work that goes on at present concerning "quality". It is possible to win trust from the customer by "organization and arrangement of the work itself". On the other hand, analyzing work from output to input, business activities, way of working and so on in relation to environmental influences in "the environment" becomes the main objective. To improve performance in the environment such as effective utilization of resources, improving of the way of "removing waste" and efficient work, the proper management of waste by this analysis becomes the purpose and it is possible to win the trust of interested parties or society through environmental protection activity aims.

Furthermore, the use of facilities, maintenance and risk assessment such as human error in the worksite serves as the main components and "occupational safety" becomes the mechanism to achieve zero disasters and zero harm and to ensure workers' health. The way of thinking common to all standards is the Plan Do Check Act (PDCA) cycle. However, there are many common elements, making it possible to proceed with integration.

The common elements are described below.

- (1) Establishment of the policy
- (2) Creation of objectives, targets and programs (policy development tables and so on)
- (3) Management of creation and maintenance of the manual, regulations, procedure manuals and record forms (document control and record management)

- (4) Definition of responsibilities and authority
- (5) Designation of education needs and their implementation
- (6) Communication with the interested parties and inner communication
- (7) Building and implementation of an internal audit system
- (8) Reconsideration by the management layer

Standard integration is moving towards documenting common procedures. For example, all standards can be adapted with a single procedure such as policy management regulations, document control regulations, education and training regulations, and internal audit regulations and so on.

For instance, while it is desirable to make policy content such as the environment policy, quality policy, occupational safety and health policy have characteristics different from actual activity content, the method of policy development is the same and common methods can be developed for objectives, goals, and implementation plans (management program).

ISO 19011 was published in October 2002. The purpose of ISO 19011 was unification of the guideline standard ISO 10011 of the quality management system auditing and the guideline standard ISO 14010-14012 of environment management system auditing. This standard is intended to be used for first person inspections (internal audits), second person auditing (external audits), and third person auditing (external audits by the certification registration organization). Characteristic of this standard are continually improving the internal audit system, performing document examinations, thorough education/reevaluation of the auditor and so on. Looking at these trends, moving forward with integrated inspection step-by-step as much as possible is desirable. For example, in the first fiscal year, because education in requirements is enough, "environment" and "quality" are done separately for execution of the integrated audit for "environment" and "quality". Every department does this from the following year and efficiency of the inspection has improved in some cases. Such a case is shown below.

Case 1: Karitsu Inc. (staff of 2000), in the transportation industry, acquired ISO 9001 and ISO 14001 successively at the head office and two branch offices. They are not only working on quality, the environment including society, excluding the ISO certification section but including occupational safety,

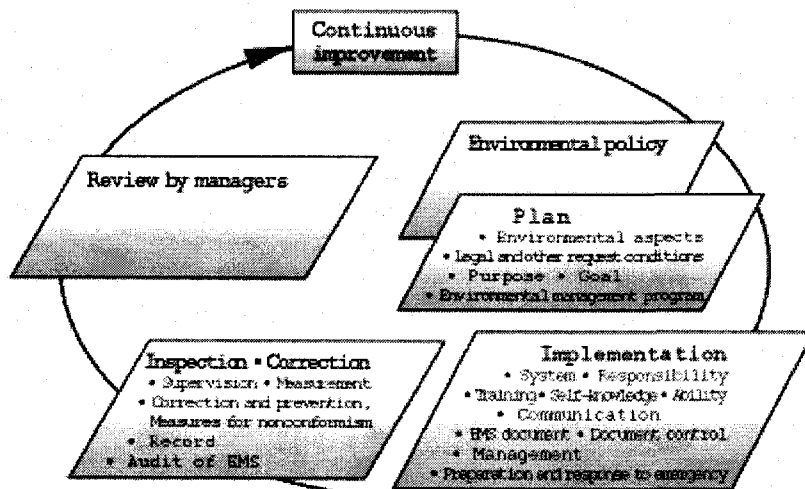


Fig. 3 The ISO 14001 model (prepared by authors based on ISO)

but it is also implementing policy development throughout the entire company. The internal audit section is not only an ISO authentication section but is implementing an integrated inspection for all 27 offices nationwide. As a result, it provides the Office with evaluations of checkpoints for possibly unifying management in terms of policy development and quality, environment at the office, and safety, all at once (general planning manager hearing). However, there are many documents about ISO 9001 and ISO 14001 in the head office. Where they proceed with integrated will become an issue in the future.

Case 2: The maintenance company Kyokuto Eletech Co., Ltd. (staff of 30) acquired ISO 9001, ISO 14001, OHSAS 18001 successively, and built an integrated management system for quality, the environment and occupational safety and health, integrated all business processes such as policy management, education, inspections and attempted to unify its management system. This integrated management system led to ISO becoming a useful tool to top management for solving unification issues of the next system with business management and for resolving management problems (Kyokuto Inc. president hearing).

6. Proposal of an Integrated Management System

The following point must be attended to when building integrated management. External evaluations are difficult when the execution status for "the policy" of each subsystem is mixed—a demerit. All systems work to achieve a policy, but when the purpose of improvements is quality or environmental improvements and the content is mixed, it may not be possible for the conformability of the system to be evaluated. The system integrates and concentrates the quality manual, environment manual, occupational safety and health manual into one as the document for the third person evaluation and it proposes to create regulations in the company and a quotation system with the persons for procedures clear. For external evaluations, above all, it should be easy for the reader to understand and by necessity. Terms unique to the industry are also brought together in a clear way. Fig. 4 is an example of the integrated management system unique to the company. It brings together the quality manual, environment manual, and occupational safety manual. Each manual type that is an external public

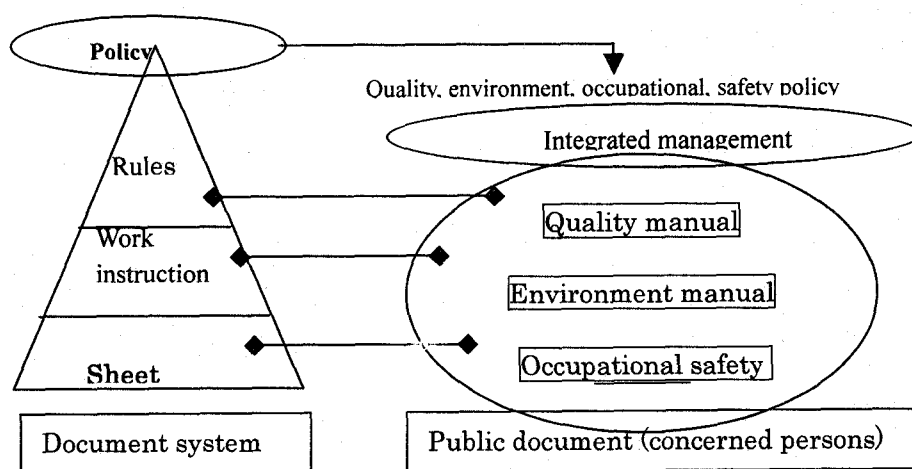


Fig.4 Proposal of an integrated management system

document works together in the business process system of regulation, which is a management document. The work standards, work instruction sheets and so on in the standardization, are integrated and realize a harmony with international standards. When the company and the organization attempt to achieve harmony with international standards, the important task, in the integrated management system, is the placing of each. Fig. 4 shows an example of an integrated management system.

The subsystems are definite. In other words, it is the integrated management manual that takes the position of translation, and the handbook, which relates to each standard of the "environment" "quality" "safety", and works to provide work standards and so on in the manual.

This is done to utilize practice and to gather know-how. "External disclosure goals" and "internal management goals" are distinguished. For example, as for the internal documents, accumulation of know-how as the principal objective is important. On the other hand, when creating "external public documents", positioning needs to emphasize ease of understanding for smooth communication. At present, "an environmental report" is created with the purpose of making communication with the interested parties smooth, but in the future, "an annual report of integrated management" is expected as the output of the integrated management system.

7. Integrated Management System Case Study

Since "quality", "the environment" and "occupational safety" and management objectives are different, it is typical for policies to be created individually for request items.

However, Kyokuto Eletech is developing management targets that affect "quality" "the environment" and "occupational safety" integrated into one and is creating an integrated management policy in business planning manuals. One of the company's goals is to create a common denominator for each standard in its integrated management policy. It promises "information disclosure of policies", "deference to the laws", working towards "continuous improvement" and so on as points of emphasis, points which embody efforts for "safety" "quality" and "the environment".

The company believes that the policy management system can handle outside evaluation, with business planning designating "quality" "the environment" and "occupational safety". This is in line with future trends and can be considered a valid plan.

From the above, the implementation plan manual can be seen as an example of planning documents to promote management improvement for policies and top priority issues. By the third person audit, the implementation planning manual utilizes information and points out items useful for management as much as possible, thus becoming a support model.

ISO 14001 seeks to specify (1) responsibility, (2) a purpose and means of achieving goals, and (3) a process (a schedule) for the content of the implementation plan manual but isn't specifically geared for another standard. If among these, one fails to achieve its purpose and targets, the responsibility, method and so on become ambiguous and the plan may not to be executed. The main element of executing an implementation plan manual is imposing these three conditions on all elements, in an integrated system, and making it into one.

Kyokuto Eletech is applying the ISO 19011 standard and implementing an integrated inspection on three levels, safety, quality, and the environment. However, unless the system was not executed separately at first, the level of internal audit members couldn't have been unified and a valid inspection would have been impossible. The effectiveness of integrated inspections rose in adopting the following method step-by-step and implementing it.

- (1) In the early stages of the introduction, the company implements internal audits of quality, the environment, and organization separately.
- (2) The company implements the simultaneous inspection of quality and the environment and requests an audit organization to do a simultaneous audit and implements it.
- (3) The company implements an integrated inspection that includes safety and requests an audit organization to conduct an audit.

This study confirmed the validity of improvements in the integrated element of the management system in the designation period and implementation of an integrated inspection for inspection.

Looking at an analysis according to corporate scale, the integrated element in small companies resulted in large contributions to management improvements while this was not true for large companies since restructuring took time (Table 2).

Table 2 Summary of Corporate Scale and Time Frame Analysis

	First Stage	Accomplishment Stage
Small companies	Better to introduce by degrees. Inside inspections are also carried out.	The integrated management system is effective
Large companies	Special section deploys and perform inspections	The integrated management system is not effective.

The case studies in this study showed that building an ISO integrated management system according to the purposes of the organization is being used frequently to reduce future management risks. The conclusion can be made that it is a rational system for pointing out gals and successfully achieving integration.

8. Conclusions

Management system standards have spread across the world. On the one hand, there are formal examples of introduction, and on the other there are also cases are not valid in their functionality. As a breakthrough, management systems (ISO 9001/ISO 14001/OHSAS 18001) were introduced successively and cases analyzed which promoted the integration of the management system.

As a result of attempting to make a chronological analysis of the results of the two-company case study in this paper, we've been able to determine that the level of penetration was very effective for individual deployment with a high level of understanding of international standards in the initial deployment stage and also for implementation for each standard of the "environment" "quality" and "safety" in conducting internal audits. In the establishment period, however, we were also able to confirm that integration factors of management systems increase and that conducting integrated audits was more valid.

If a company's scale moves from small to large, rational choices must be made for company-wide integrated management and towards the technical aspect of promoting features of the system.

The use of the third person audit, which is due to the registration system, is significant. Specifically, to evaluate and judge, the company not only has technical features to judge, which is easily susceptible to

influence, but a general judgment is also desired which understands the developmental steps and the corporate scale of management.

Being able to judge which method is appropriate after thoroughly understanding the root of business management in the ISO audit system may indeed contribute to business management and lead to an organization's growth.

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