

# The Successive Implement of ISO 9001, ISO 14001 & OHSAS 18001 for Large Enterprises in Thailand

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Abstract— The purpose of this paper is to present the successive implementation of ISO 9001 Quality Management System, ISO 14001 Environmental Management System and OHSAS 18001 Occupational Health and Safety Assessment Systems for large enterprise in Thailand. In addition, this paper studies the key success factor to drive the implementation of ISO standards system in the designated factories which defined by The Energy Conservation and Promotion ACT (No.2) 2550. The factors of global economy are drived the business partners to communicate with international standard, which the different Thai Standard Industrial Classification (TSIC) many have the different factors for driving implementation. The beginning state of introduction ISO 9000 aim to improve quality system and the efficiency of communication between buyer and supplier until the resent revised of ISO 9001:2008 had emphasis management responsibility and customer satisfaction. Furthermore, ISO 14001 and OHSAS 18001 are introduced to emphasis organization to control the environmental management system and follow the occupational health and safety laws. The ISO are still an interested from many enterprises to certify the implementation and the opportunity of growth of ISO standard in Thailand industrials. Finally, the fabricated metal, parts, equipment and electronic component or TSIC 38 is the night rank of certified ISO for designated factories in Thailand.

*Keywords*— The International Organization for Standardization (ISO), The Occupational Health & Safety Management System (OHSMS), The Integrated Management System (IMS), The Occupational Health and Safety Assessment Series (OHSAS), Thai Standard Industrial Classification (TSIC).

#### 1. INTRODUCTION

During the past two decades, the global economic significantly grows in the western countries and flow to the Asia countries. The globe economic and the demand of the good quality products at the affordable cost are leading the large enterprises from the western countries in Europe and North America, are looking for the new manufacturing base in the developing countries. One of the most barriers at the begging of the transferring or relocation manufacturing base from the western countries to the new location with the lower manufacturing cost at the acceptable quality products is the communication in the common understanding. The beginning of the 20<sup>th</sup> century, business of components, parts, service and suppliers are the most demand for western countries. The interaction has been between purchaser from western countries and supplier in the developing countries on the local tariffs, regulations, standard and technical specifications exchanges would be a critical barriers and exceeding difficult. The consequence of the international trading activities required a common understanding of products requirement, technical specification, regulations and repeatability quality. The international standard had developed and aimed to define the generic standardization requirement and repetitive applications in the industry, engineering, science, technology and economy. At the staring of standardization arose to limit the anti-economic diversity to their interchangeability, facilitating activities at manufacturing and the repair and maintenance of products and services [1].

The International Organization of Standardization (ISO) founded on 23th February 1947 at Geneva, Switzerland. The ISO was first create after the World War II, known as BS5750, to solve the problems in the British high-tech Industries. However, BS5750 is known as a management standard because there is no specified on what it is manufactured, but how does the manufacturing process manage. In 1987, The British Government adopted BS5750 as international standard called ISO 9000, a generic quality management system standard [2, 3]. ISO is a network of the national standards institutes of 162 countries, on the basis of one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system. ISO standards contribute to making the development, manufacturing and supply of products and services more efficient, repeatability quality, product compliance to the specification, safer and cleaner. They make trade between countries easier and fairer. ISO standards are technical agreements which provide the framework for compatible technology worldwide.

Since ISO 9000 was introduction in 1987, it has been revised in 1994, 2000 and become ISO 9001:2008 or version 2008. However, the ISO 9001 was diversified in many fields of management systems in term of very different functions and operating activities, such as

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environmental management was ISO 14001 and occupatinal hazard prevention was OHSAS 18001 for occupational health and safety management. The ISO 14001 standard, environmental management system, was published in September 1996 and revised in November 2004. The ISO 14001 was developed by the enforcement of market mechanism, sustainable development, pollution prevention and compliance assurance [4]. The standard is a part of an organization's management system that used to develop and implement the environmental policy and manage the environmental aspects. ISO 18000 in the namely of OHSAS 18001 standard, was an international occupational health and safety management system published in 1999. According to the higher specification of OHSAS 18001, ISO had dropped the developed process to set up ISO 18000. OHSAS 18001 was developed to be compatible with ISO 9000:1994 and ISO 14001:1996 in order to facilitate the integration of quality environment as well as occupational health and safety management systems. Thailand had launched the TIS 18001 standard similar to OHSAS 18001 standard.

## 2. DEVELOPMENT OF INTERNATIONAL STANDARDS

In the early of 20<sup>th</sup> century, the rapid growth of the western economies and the successive of dissemination of management standard in globalization enhance the growth of business infrastructure in Asia countries. It made the outsource business expansion from the multinational companies. The key success factors of those companies are the international standard system, policy and procedure from the corporate enterprises. The ISO standards are the most contribution to the success of technology transfer from the western to Asia countries. A development journey of ISO has developed the first ISO 9001 system in 1987. It was a Quality management tool designed to help an organization achieves its Total Quality Management (TQM) goals. ISO 9001:2008, the more recent version of ISO 9000 family, consists of a series of quality management standards aimed to standardize working processes and encouraged quality production throughout a variety of industries. ISO 9001:2008 regularly analyzes conformance to customer requirements, characteristics of planning, construction implementation processes, and supplier performance data. ISO 9001:2008 is the set of organized tools and methods that may work in conjunction with a TQM approach to achieve quality milestones.

An environmental management system (EMS) is the system by which a company controls the activities, products and processes that cause or could cause environmental impacts and in doing so minimizes the environmental impacts of its operations. This approach is based on the management of "cause and effect", where company's activities, products and processes are the causes or "aspects" and their resulting effects, or potential effects, on the environment are "impacts". Aspects would be things within company's control that directly or indirectly cause those impacts. Environmental systems such as an internal waste reduction program can be perform or can be formal and standardized, such as ISO 14001. ISO 14000 is a series of international standards for environmental management. It is the first series of standards that allow organizations from around the world to pursue environmental efforts and measure performance according to internationally accepted criteria. ISO 14001 applies to any organization that wishes to improve and demonstrate its environmental performance to others through the presence of a certified EMS [5].

An Occupational Health and Safety Management System (OHSMS) provides a framework for managing Occupational Health and Safety (OH&S) activities, procedures and processes so they become more efficient and a more integrated part of the overall business operations. An OH&S management system also provides a formal structure for identifying and managing significant OH&S hazards and risks. OH&S Management System is based on standards which specify a process for achieving improved OH&S performance and comply with the local regulations. Similar to the quality management process, there are safety standards available to assist in the construction safety management process. The Occupational Health and Safety Assessment Series (OHSAS) 18001, is an international specification standard created to address a variety of job-site health and safety issues commonly encountered in the construction and manufacturing sectors. The OSHAS 18001 is a documentation intensive system that can be altered and customized to cater organizations particular needs. The primary rationale behind OSHAS 18001 is to continuously minimize occupational hazard risk in the workplace, which in turn improves company profitability [6]. Quality, the environment, health and safety are all unified by the concept of risk. Using three separate management systems within one organization is clearly time-consuming expensive and inefficient. According to the integrated management systems, the organization can minimize duplication documents and work load, align objectives and reduce costs.

An integrated management system (IMS) describes several previously separate management systems grouped together to form a single system. For example, it could combine ISO 9001:2000 (quality) certification with ISO 14001 (environment) certification. A management system is integrated when at least two out of three possible systems (quality, environment and health and safety) are integrated as shown in Fig.1. The different possibilities are:

- Quality + Environment,
- Quality + Health & Safety,
- Environment + Health & Safety,

Quality + Environment + Health & Safety.



Fig.1 Integrated management system concept.

The aim of IMS is to streamline processes even further and avoid duplication procedures and working process. However, just because a system is integrated does not mean less attention is paid to auditing individual systems. The system must conform to the requirements of the individual standards, in order to maintain a high level of credibility and effectiveness [7, 8] A comparison of the specific requirements of ISO 9001, ISO 14001 and OHSAS 18001 is shown in Figure 2 and 3 [9].

### 3. ISO DEVELOPING IN THAILAND

In 1968, Ministry of Industry promulgated the Thai Industrial Standard Act to establish the Thai Industrial Standards Institute as national standards body responsible for standardization activities in Thailand. In 1981, ISO 9000 was introduced to Thailand. In 1991, the institute announced an adoption of TIS/ISO9000 series as National Standard for Quality Systems. In every aspect, it is similar to the ISO 9000 series established by the International Organization for Standardization and to the European Standards EN 29000. Thai industry can be more competitive in the international market through this international standardization. In 1985, ISO14000 was promulgated to standardize environmental protection issues. Then other standards were launched mainly in the industries such as OHSAS18001.



Fig. 3. The integration standard procedure of ISO 9001, ISO 14001 and OHSAS 18001.



Fig.2 Integrated Implementation cycle for ISO 9001, ISO 14001 and OHSAS 18001.



Fig. 4. The details of designated factories by TSIC.



Fig.5. The certified ISO of designated factories in Thailand.

Thai Standard Industrial Classification (TSIC) had classified designated factories in 9 categories and 3,292 factories had registration as the designated factories in Thailand. The classification of designated factories is shown in Figure 4. In this paper, the classification of TSIC is used to study the ISO certified factories in Thailand.

The classified type of designated factories in Thailand is as follow:

TSIC	Description of factories
TSIC 31xxx	Food, beverage & tobacco
TSIC 32xxx	Textiles & leather products

TSIC 33xxx	Wood and wood products
TSIC 34xxx	Paper and paper products
TSIC 35xxx	Chemical and rubber
TSIC 36xxx	Non metallic mineral
TSIC 37xxx	Basic material
TSIC 38xxx	Fabricated metals
TSIC 39xxx	Other manufacturing

Figure 5 shows the details of certified ISO standard for designated factories in Thailand and Figure 6 is presented a distribution of certified ISO 19001, ISO 14001 and OHSAS 18001 by TSIC, which three highest rank of certified ISO standard in figure 6 are TSIC 38, TSIC 35 and TSIC 31 respectively.

According to above data, the TSIC 38 is the fabricated metals, parts, equipment and electronic components category. This TSIC has 850 designated factories and most of the factory had business with multinational company. The ISO is able to support this group to eliminate barriers of communication, technical specification and requirements. In fact, it make this TSIC 38 had highest certified ISO in Thailand. The second rank is TSIC 35, petrochemical, chemical and rubber products. The companies in this TSIC are most of the large enterprises and management with multinational employees and culture. The international standard is very important to standardization of clear vision, policy, working procedure, environmental at work place, safety in work place and society network. Most of large enterprises in this TSIC are certified to ISO 9001, ISO 14001 and OHSAS 18001 and compliance to local regulation. The third rank is TSIC 31 food, beverage and tobacco. This TSIC is the important for Thai people, because of the Thai culture in agriculture society with the support of government to driving Thailand to be a food products manufacturer for the world market. The communication to international world treading markets, the international standard and requirement are very important for TSIC 31.



Fig.6. The result of survey in 2009, the number of designated factories with certified ISO by TSIC.

The most driving factors for designated factories in Thailand to certified ISO are global economy from the multinational companies. While the government officers and government policy, are encourage all designated factories in Thailand to be certified the international standard at least the ISO 9001. The other benefits of implement international standard at work place are the management integrity, national standard and standard working procedure. The company is improved working condition, review business risk, preventive actions, improve products quality and service mind to achieved customer satisfaction goals, improve the working environment, energy conservative, safety and social awareness.

#### 4. CASE STUDY OF ISO

In larger enterprises, the enterprises are still focused on developing their management and manufacturing practices. At present, all companies are surveying and refurbishing several of their factories in anticipation of undertaking the ISO 14001 and OHSAS 18001 certifications. The companies plan to accredit all of their factories with ISO 9001, ISO 14001 and OHSAS18001 in the near future.

PTT is determined to be a good Thai business entity with a vision of being a Thai Premier Multinational Energy Company, using local strength for competing in the international arena. The company is committed to a mission that stresses responsibility to all stakeholders.

The ISO 9001, ISO 14001 and OHSAS18001 support its business of PTT to reach the goals as stipulated by the policy. These standards are shown in table 3 [10]. From the survey results of TSIC 35 petrochemical, chemical and rubber. All the large enterprises namely PTT PLC, Esso (Thailand) PCL, Star Petroleum Refining company limited and The Shell company of Thailand LTD are certified for both ISO 9001 and ISO 14001 and plan to compliance to OHSAS 18001 in near future. Only Thai Petrochemical Industrial PLC are certified all three ISO 9001, ISO 14001 and OHSAS 18001.

The other interested information from TSIC 38 fabrication metal parts, equipment and electronic components category. This sector most of the company is the multinational company and most of the company had head quarter outside Thailand. This section had highest ISO certification sections, because of the demand from the business model require all companies to certified ISO standard. In the study found most of companies had certified ISO 9001, ISO 14001 and OHSAS 18001, and other standard as per business partner requirement, the ISO 13485 for medial components, ISO/TS 16949 for automotive business and component parts to supplied both domestic and oversea markets. These groups of components business enterprises are driving and encourage the local partnership companies, small and medium enterprises (SMEs) to compliance with at least ISO 9001. TSIC 31 is also driving companies to certified ISO standard more over than ISO 9001, ISO 14001 and OHSAS 18001. TSIC 31 needs certified GMP (Good Manufacturing Practice) and compliance to HACCP (Hazards Analysis and Critical Control Points) under the regulation of Thai FDA (Food and Drug Administration Thailand).

Standard	Description	Application in The Organization
ISO <b>9001</b> Quality Management System	As one of the international standards adopted by business entities worldwide, ISO 9001 stresses quality excellence and organization efficiency.	FIT has adopted international standards for quality, safety, occupational health, and environmental management, applying them as tools for the improvement of the company's management and operations. In 2008, all target sites were certified with ISO/TIS 9001, ISO/TIS 14001, and TIS 18001/OHSAS 18001, as Table 2 below.
ISO 14001 Environmental Management System	ISO 14001 is a globally accepted Environmental management system, which requires a defining of organizational structure and responsibilities in order to accomplish the set environmental goals and targets	Percentage of ISO/TIS 9001, ISO/TIS 14001 and TIS 18001/0HSAS 18001 certified sites % of target elies 90 80 70 60 60
TIS 18001/OHSAS 18001 Occupational Health and Safety Management System	TIS 18001/OHSAS 18001 is a set of standards for the management of occupational health and safety, accepted in Thailand and internationally. TIS 18001/OHSAS 18001 focuses on the reduction of risks from injury, illness, and loss of properties. The standards correspond with ISO 9001 and ISO 14001.	60 40 30 20 10 1997 1996 1999 2000 201 202 2003 2004 205 2006 2017 2006 150/TIS 9001 (39 target sites) 150/TIS 9001 (30 target sites) 151 18001/OHSAS 18001 (28 target sites)

Table 3. Application of the ISO 9001, ISO 14001 and OHSAS18001 of PTT.

### 5. CONCLUSION

All standards are really advocating the management of risk, whether the risk is delivering poor quality, causing environmental damage or injuring people, each standard is aimed at driving companies to put in place the processes and procedures, they need to control that risk and enhanced their owns business and revenue. So many companies have generated a Quality Manual and the consequence supporting procedures to meet ISO 9001 requirement, then a little while later, had to do the same thing for ISO 14001 and the environment, and so on.

So perhaps, if the company is approaching the issue of certification for the first time, developing a risk assessment process first, then systems to address the significant areas of risk may be a cost effective alternative to the traditional systems, and could still lead to an ISO certificate. Taking this approach would be fixing a problem that needs fixing, and must be easier to sell to a senior management team. A risk based approach leads to viewing the problems of Quality, Environment and Information Security etc. in a similar manner, with similar importance. All of the ISO standards have been developed around a standard template intended to fit together, and share a significant proportion of requirements. For instance, a Document and Data Control procedure which meets the requirements of ISO 9001 will also meet the requirements of ISO 14001 and OHSAS 18001 and the other standards.

The successive implement ISO 9001, ISO 14001 and OHSAS 18001 for large enterprises in Thailand was driving by TSIC 38, TSI 35 and TSIC 31 respectively. Of cause the driving successive of implement ISO standard in Thailand become three majorities factors. The first factor is globe economic transfer from western countries or multinational companies had encourage companies in TSIC 38 and TSIC 31 to certified and fully implement ISO standard and organization to support from customers driving. More over than the ISO 9001, ISO 14001 and OHSAS 18001 in both TSIC are aggressive drive to implement other ISO standards as per business category. And the implementation of ISO is not stop at their facilities, but driving the ISO standard requirement scheme to other domestic suppliers. The second factor driving companies in TSIC 35 to certified ISO standard and implementation are working environment and multinational companies. This TSIC 35 will implement just a necessary system requirement for integrity management, organization and environmental conservative. The third factor is the government policy to encourage all designated factories to certified ISO standard and implementation to their organization, products and servicing. The benefits of implementation ISO standard for large enterprises include SMEs are the efficiency or quality management policy, flexibility to support customers requirement under the repeatable products specification and proactive of servicing mind set to achieve customer satisfaction goals, environment, safety and health of all employees. The increasing of opportunity to implementation ISO standards for designated factories in Thailand is a great opportunity

and the successive implementation of ISO 9001, ISO 14001 and OHSAS 18001 of the large enterprises are driving the whole supply chain of business partners to certify and implementation of ISO standards in the next decades.

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