THE ADVANTAGES OF CERTIFIED ORGANIZATION ON EXTERNAL ENVIRONMENTAL MANAGEMENT SYSTEM AUDITS

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ABSTRACT

The objectives of this survey research were to study the advantages of external Environmental Management System (EMS) audits and attitudes towards external EMS audits of certified organizations. The framework of this study was made up of EMS certified organizations and certification bodies. Two sets of validated questionnaire were used to collect data from EMS certified organizations and certification bodies. The descriptive statistics of percentage, mean and standard deviation were used for quantitative data analysis and the inferential statistic of chi-square was used for hypothesis testing.

The results showed that there were advantages in using external EMS audits in regards to the image of the organization, compliance with legal requirements, environmental problems, trust, release of wastes to the environment, continual improvement of the organization, lower risks to health and safety, documentation systems, awareness of employees of environmental policy and responsibility, sustainable development, communication, systematic administration, relationships between the government sector, the community and other organizations, efficient use of resources and re-use of wastes. The attitude towards external EMS audit was at a medium level. The characteristics of certified organizations were not related to attitude.

The findings of the study suggest that organizations should realize that external EMS audits checks operational organization in conformity with the requirements of ISO 14001. The benefits of the audit are as much abstract as concrete. The same time, the government should continuously support education about external EMS audits and promote the benefits of good management of resources such as water, electricity and material.

KEY WORDS: ENVIRONMENTAL MANAGEMENT SYSTEM / ENVIRONMENTAL AUDIT

127 pp.

ข้อได้เปรียบขององค์กรจากการตรวจประเมินระบบการจัดการสิ่งแวดล้อม
(THE ADVANTAGES OF CERTIFIED ORGANIZATION ON EXTERNAL ENVIRONMENTAL MANAGEMENT SYSTEM AUDITS)

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บทคัดย่อ

การวิจัยเชิงสำรวจนี้มีวัตถุประสงค์เพื่อ ศึกษาข้อได้เปรียบและทัศนคติขององค์กรต่อการตรวจประเมินระบบการจัดการสิ่งแวดล้อม โดยจัดทำแบบสอบถามขึ้น 2 ชุด เพื่อเก็บข้อมูลจากองค์กรที่ได้รับการรับรองระบบการจัดการสิ่งแวดล้อมและหน่วยงานให้การรับรอง การวิเคราะห์ข้อมูลได้ใช้สถิติพื้นฐาน ได้แก่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบสมมติฐานได้ใช้สถิติ Chi-square

ผลการศึกษาพบว่า การตรวจประเมินระบบการจัดการสิ่งแวดล้อมช่วยให้องค์กรได้เปรียบในด้านภาพพจน์ การปฏิบัติตามกฎหมายและข้อกำหนด ปัญหาสิ่งแวดล้อม ความน่าเชื่อถือ ของเสียที่ปล่อยออกสู่สิ่งแวดล้อม การพัฒนาอย่างต่อเนื่อง ความเสี่ยงต่อสุขภาพและความปลอดภัย ระบบเอกสาร ความตระหนักในเรื่องนโยบายสิ่งแวดล้อมและหน้าที่ความรับผิดชอบของพนักงาน การพัฒนาอย่างยั่งยืน การสื่อสาร การบริหารงานอย่างเป็นระบบ ความสัมพันธ์ระหว่างภาครัฐ ชุมชน และองค์กรอิสระ การใช้ทรัพยากรอย่างมีประสิทธิภาพและการนำของเสียกลับมาใช้ใหม่ สำหรับทัศนคติขององค์กรต่อการตรวจประเมินระบบการจัดการสิ่งแวดล้อมพบว่าอยู่ในระดับปานกลาง การวิเคราะห์ความสัมพันธ์ระหว่างลักษณะการดำเนินการขององค์กร พบว่า ไม่มีความสัมพันธ์กับทัศนคติต่อการตรวจประเมินระบบการจัดการสิ่งแวดล้อม

จากการวิจัยครั้งนี้ องค์กรควรจะตระหนักว่า การตรวจประเมินระบบการจัดการสิ่งแวดล้อมเป็นการตรวจสอบการดำเนินงานขององค์กรกับข้อกำหนดของมาตรฐาน ISO 14001 ซึ่งให้ประโยชน์กับองค์กรอย่างมากทั้งในด้านของรูปธรรมและนามธรรม และในขณะเดียวกัน ภาครัฐควรให้ความรู้กับองค์กรในเรื่องของการตรวจประเมินระบบการจัดการสิ่งแวดล้อม และประโยชน์ที่องค์กรจะได้จากการมีการจัดการสิ่งแวดล้อมที่ดี เช่น การใช้ทรัพยากรน้ำ ไฟฟ้า และทรัพยากรอื่นๆ

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CHAPTER I
INTRODUCTION

1.1 Background and significance of the problems

Nowadays, the industry was mattered of economic system concern and income generation into the country. Meanwhile, which is also the source of pollution. Ministry of Industry was the one of organization to be responsible to enhance and develop manufacture industry by focusing on importing and loss of natural resources. So that, industrial business must be come along with environmental conservation particularly manufacture standard, environmental management system and others. For this reason, Thai Industrial Standard Institute (TISI), which was the government section, was directly responsible to encourage environmental management system in order to advance domestic industry standard as international. Consequently, Environmental Management Standard, ISO 14001 has been announced on September 1st 1996. It can be used to be guidance for Environmental Management System (EMS) in terms of set up policy, objective, legal, and the others of environmental regulation including the issues, which might be affected to environmental for worthy natural resources consumption and the least of environmental impacts.

When the organizations have already set EMS, the certificate is always required. Now, certification body (CB) is responsible to audit activity of Environmental Management System (EMS auditing) by auditor with providing certificate. If the document system and operation are both in line with standard, CB will issue the certificate. In the other hands with negative result, CB will inform organization to improve their operation following to the requirements then CB will issue the certificate. Therefore, auditing process is very important and gives more advantages to organization because it is useful for checking operation in line with standard system of organization. If auditor has knowledge, well understanding in system and more experience in auditing , he will give such useful suggestion to

organization which help developing quality in operational environmental development both inside and outside working area, decrease in releasing the pollution to environment, improve systematic administration and increase knowledge and awareness of officers in organization. We often found that organizations did not get much advantages from this system because CB often employs new graduated auditor in cheap rate who has most impacted in development standard system as those auditors have new experiences with few skills, therefore they cannot give much suggestions and recommendations to organization because they only audit according to defined document.

Furthermore, development of EMS still depends on organization. The failure of system was influenced by many factors for example the neglect and the continuous attendance of executive board. From this cause, it makes problem in maintenance system including neglects importance of auditing. As mentioned before, audit is one method for checking operation system whether it is in line with the requirements of ISO 14001 or not. For organization which has intended and expected in advantages of standard system, has an important process as auditing to get high quality operation of organization. CB selection should be careful because organization often neglects in importance of auditing and employs low cost of CB for auditing. Moreover, almost of CB in Thailand was from foreign country. So, it was high competition for seeking clients and different cost for auditing. Some CB may acts as careless audit and easily giving out certificate which impacts to approve EMS and efficiency in operation of organization.

From this reason, researcher was interested in advantages of EMS audit by studying in the organization that has already got certificate ISO 14001 and CB. The point of the study is efficiency of audit and advantage in social, economic and environment by auditor. However, organization stimulation in attention to develop EMS and more conscious in audit is very important.

1.2 Objectives

1.2.1 To study the advantages of external EMS audits of certified organization

1.2.2 To study the attitude towards external EMS audits of certified organization

1.2.3 To study the factors affect attitude towards external EMS audits of certified organization

1.3 Conceptual Framework

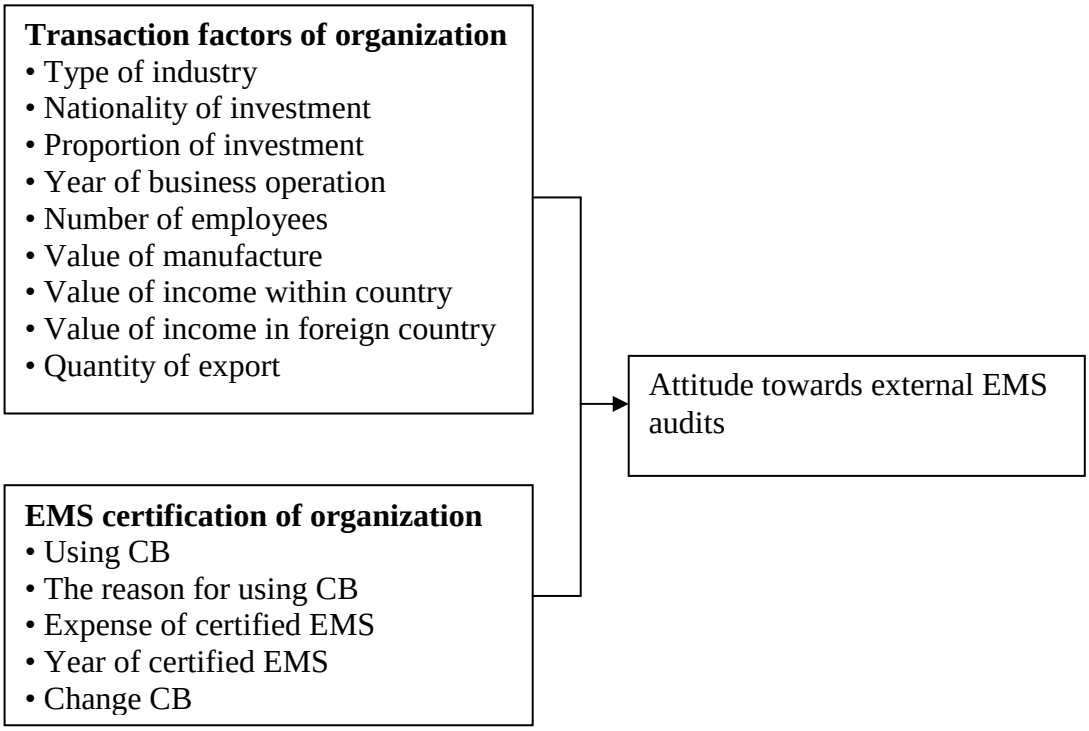


Figure 1-1 Conceptual Framework

1.4 Scope of the study

1.4.1 Populations and samples were EMS certified organizations and CB providing EMS certification.

1.4.2 Area study was in Thailand.

1.4.3 A content of this study was the attitude towards external EMS audits of certified organization.

1.5 Research Hypothesis

The characteristics of organization that were

1.5.1 Transaction factors of organization related to attitude towards external EMS audits.

1.5.2 EMS certification of organization related to attitude towards external EMS audits.

1.6 Definition of terms

1.6.1 Environmental Management System (EMS) means management system or environmental administration including structure, duty, responsibility, procedure, process and resources to do enough in order to reach objectives and environmental policy.

1.6.2 Environmental Management System Audit (EMS audit) means consideration progression environmental management and documented process systematic and independent for obtaining audit evidence and evaluate exactly. Then auditor have to report result of progression environmental management to audittee.

1.6.3 Auditor means person who audit Environmental Management System.

1.6.4 Audittee means the organizations are audited by auditor.

1.6.5 Organization means company, activity, private organization, government sector, institute or other organization have business unit and level of administration certainly. In this study means only certified EMS organization.

1.6.6 Certification body (CB) means local companies that are authorized to certify EMS certificate to organizations that qualify enough to certified. Anyhow CB must process EMS audit of that organization also.

1.6.7 Accreditation body (AB) means local companies capable to certify to CB. Anyhow AB must audit CB also.

1.6.8 CB accreditation means AB audit CB and if AB summarize CB have enough competency, AB will certify to CB. And CB can take AB's symbol show in CB's certificate for organization confident competency of CB.

1.6.9 Advantage means the incremental benefit be gained from an investment in operating the EMS which both are valuable and unable to appraise in term of money.

1.7 Abbreviation

1.7.1 Environmental Management System = EMS

1.7.2 External Environmental Management System audit = external EMS audit

1.7.3 Certification body = CB

1.7.4 Accreditation body = AB

1.7.5 International Organization for Standardization = ISO

1.7.6 National Accreditation Council = NAC

1.7.7 Management System Certification Institute (Thailand) = MASCI

1.7.8 AJA Registrars Ltd. = AJA

1.7.9 BSI Thailand Ltd. = BSI

1.7.10 Lloyd's Register Quality Assurance Ltd. = Lloyd

1.7.11 Moody International Thailand Ltd. = Moody

1.7.12 TUV NORD Thailand Limited = TUV

CHAPTER II
LITERATURE REVIEW

2.1 International Organization for Standardization (ISO)

ISO is an international organization founded having the main purpose to promote the conduction of standard. ISO is Non Government Organization (NGO) and it is not a part of United Nations. It comprises 130 member countries where each has their own national standards body as representative. Thailand also has Industrial Standard Institute of Ministry of Industry as representative. Total standard of ISO is voluntary. Health, safety or environment are important to standard and bring to role or guideline of each country. Major duty of ISO is set up technique requirement that called International Standard. Head office of ISO is in Geneva, Switzerland.

2.1.1 ISO members are composed of 3 types (Sayam Aroonsrimorakot, 2002)

(1) Member body or participating member get full voting rights, sharing opinion and participating in considering technical issue or policy and set up international standard include consider potential organization in country for help develop new international standard. Member of this type will pay subscription fee at due time. Thailand also joins this member type.

(2) Correspondent member or observing member is member organization as representative from each country that standard are not being seriously implemented. This member can sharing opinion in technical issue and policy but have not right to vote.

(3) Subscriber member or Laison member is member from small country that economic system is not large and unable to pay member fee. This member may communicate to ISO and share their opinions but have not right to vote.

2.1.2 Working of ISO

Working of ISO is disperse power divide to committees, sub-committees and working groups of approximately 2,850 groups from completely qualitative representative in related field by have working and equal right for share opinion and voting in order to produce standards that will be accepted worldwide. Administrative committee comprises professional from various bodies who duty is select secretary and appoint 1-2 persons to administer technical issue. Committees, sub-committees and working groups have duty to appoint president for help member to good co-conclusion.

Duty of secretary is administer in document and give suggestion in technical issue to committees include print and send draft standard that had checked to member for consider, vote, conclusion and print for working. (Sayam Aroonsrimorakot, 2002)

2.1.3 Subject relate to ISO

ISO relate to every field except the field of electronic and electrical. (Sayam Aroonsrimorakot, 2002)

2.1.4 Financial of ISO

Financial of ISO is disperse power. Most income from member fee approximately 80 percentages and sale publishing and standard approximately 20 percentages by calculated on Swiss France unit.(Sayam Aroonsrimorakot, 2002)

2.1.5 Training and suggestion service of ISO

ISO have service to give suggestion, training and seminar relate implementation of ISO especially members that developing country. They can request to set training project, meeting and particular suggestion.

ISO have service to give suggestion, training and seminar relate implementation of ISO especially members that developing country. They can request to set training project, meeting and particular suggestion. (Sayam Aroonsrimorakot, 2002)

2.2 Environmental Management System Standards ISO 14001

2.2.1 Environmental Management Standard ISO 14000 series

ISO 14000 series are Environmental Management System Standard that had been officially announced in 1996 by International Organization for Standardization (ISO) and developed from standard BS 7750 (British Standard for Environmental Management System) of the United Kingdom. Objectives of determination standard for hope business have aware importance of having efficient environmental management and consider factors and environmental impact from activities, products and services in the past, present and planning in the future for environmental conservation and natural resources include prevention of pollution along with growth in economic, trade and industry and try to continual improvement.

ISO 14000 consists of several standards but major standards use environmental management system consists of 2 sets (Sayam Aroonsrimorakot, 2002: 25-27)

1. Environmental Management System : EMS
2. Environmental Auditing : EA

1. Environmental Management System : EMS is standards for controlling environmental management of an organization on policy, planning, implementation, checking and reviewing to improve system. They are;

(1.1) ISO 14001 specifies requirement on Environmental Management System to the extent that an organization can request for the certificate.

(1.2) ISO 14004 provides guidance on principles and technique to implement Environmental Management System ISO 14001

2. Environmental Auditing : EA specifies procedures for conducting environmental audits, this is ISO 19011 : 2002, Guidelines for quality and/or environmental management systems auditing that are guidelines for audit, audit program management, audit activity, compliance and to estimate for auditor that every organization can use it for internal audit. This standard had been modified from Environmental Management System ISO 14010 : 1996, ISO 14011 : 1996 and ISO

14012 : 1996 and replace from Quality Management System ISO 10011-1 : 1990, ISO 10011-2 : 1991 and ISO 10011-3 : 1991

Except standard 2 sets above. It still have other standards in ISO 14000 series that can conclude in diagram down below

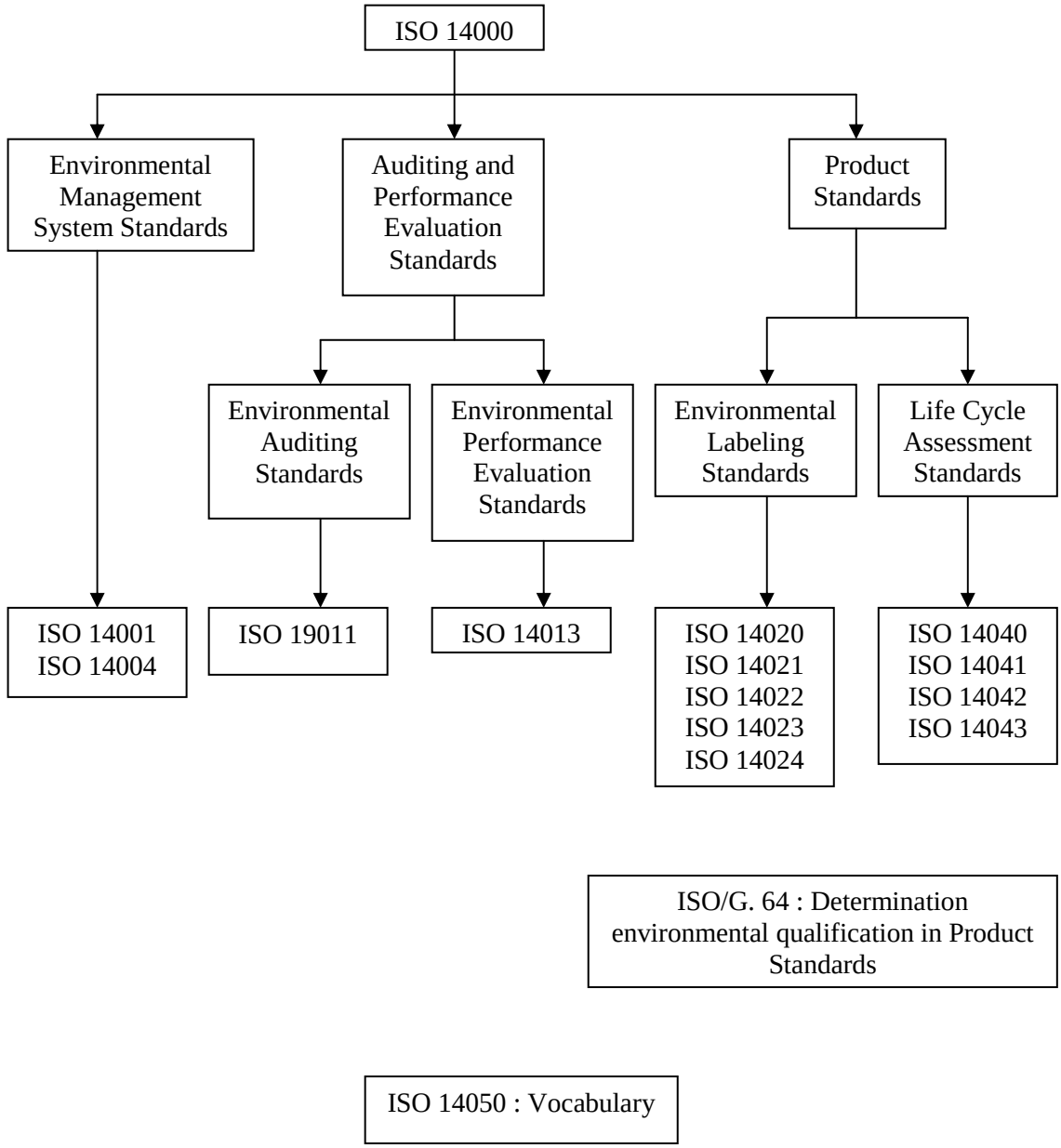


Figure 2-1 ISO 14000 series

Source : Sayam Aroonsrimorakot, 2002: 28

2.2.2 The content of Environmental Management System

Organization of all kinds have purpose to implementation ISO 14001 and certifies this standard. They must proceed and improve environmental management follow up to requirement of ISO 14001:2004 that is

1. General requirement

The organization shall establish, preserve and improve an environmental management system that include important content that is

2. Environmental Policy

Top management shall define the organization's environmental policy, scope, purpose and project that conform with size of activities, products and services of organization include commitment to continual improvement and prevention of pollution. The policy is documented and communicated to all persons working and is available to the public.

3. Planning

The organization shall plan for response to policy. The plan will be cover elements that is

3.1 Environmental aspects

The organization shall find and analyse environmental aspects and assess activities have significant impacts on the environment and set to purpose for improvement. In the same time the organization shall adjust information to conform with changed situation.

3.2 Legal and other requirements

The organization shall identify and access to the legal requirements and other requirements which related to its environmental aspects and determine how these requirements apply to its environmental aspects.

3.3 Objectives, targets and programme(s)

The organization shall establish documented objectives and targets that conform with environmental policy include prevention of pollution. The objectives

and targets shall be measurable. Furthermore the organization shall establish programme(s) that include;

1) Assignment duty and responsibility for achieving objectives and targets.

2) Determine procedure and time for achieving objectives and targets.

4. Implementation and Operation

4.1 Resources, roles, responsibility and authority

Top management shall provide essential resources for implement the environmental management system. Resources include human resources and specialized skills, technology and financial resources.

Roles, responsibility and authority shall be defined, documented and communicated in order to facilitate effective environmental management.

4.2 Competence, training and awareness

The organization shall establish procedure to make persons working aware of

1) The importance of implementation to conform with policy, procedure and other requirements of environmental management system.

2) The significant environmental aspects in actual or potential impact from activities and benefits of improve personal performance.

3) Roles and responsibility of their works to achieve policy, conform with procedure and requirements of environmental management system.

4) Effect of departure from specified procedures.

4.3 Communication

The organization shall implement procedure for internal communication among the various levels including receive and response information from external interested parties. Furthermore the organization shall establish methods for this external communication.

4.4 Documentation

The organization shall establish information and documentation for show requirements of environmental management system that include relation of document.

4.5 Control of documents

The organization will establish procedure control of documents which related to environmental management system for ensure that documents remain and review improve and update as necessary. Documents must specify obvious date and time, readily and available at point of use.

4.6 Operational control

The organization shall establish documented procedures that are associated with the identified significant environmental aspects of goods and services used by the organization. If official do not follow specified procedures that make to non-conform with policy and objectives.

4.7 Emergency preparedness and response

The organization shall establish procedures for response to actual emergency situations and accidents and prevent or mitigate associated adverse environmental impacts that include review and improve as necessary.

5. Checking

5.1 Monitoring and measurement

The organization shall establish documented procedure to monitor and measure activities that have significant environmental impacts. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the organization's environmental objectives and targets. Furthermore the organization shall ensure that calibrated monitoring and measurement equipment is used and maintained record.

5.2 Evaluation of compliance

The organization shall establish and remain procedure to evaluate compliance with legal requirements which related to environment of organization that include keep records of the results of the periodic evaluations. Furthermore the organization shall evaluate compliance with other requirements to which it subscribes and keep records of the results of the periodic evaluations.

5.3 Nonconformity, corrective action and preventive action

The organization shall establish procedure for cause with actual or potential nonconformity and taking corrective and preventive action. Furthermore the

organization shall ensure that any necessary changes are made to environmental management system documentation.

5.4 Control of records

The organization shall maintain and disposal records about environmental performance. Records include training, results of evaluation and review meeting. Records shall be legible, identification and traceable.

5.5 Internal audit

The organization shall plan arrangement for environmental management include the requirements and has been properly implemented and maintained and provide information on the results of audit to management.

6. Management review

Top management shall review the organization's environmental management system as suitable period for ensure that continual improvement by collected essential information and recorded management review. The outputs from management review shall include any decisions related to possible changes to environmental policy, objectives, targets and other elements of the environmental management system.

All of the above, researcher can conclude principle of environmental management system in diagram down below

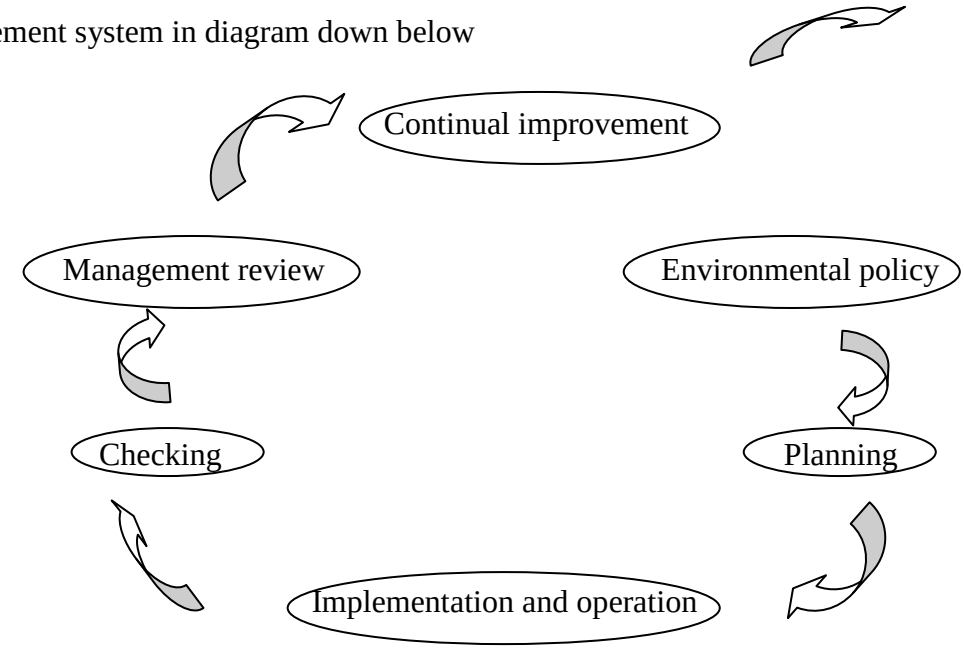


Figure 2-2 Principle of Environmental Management System

2.2.3 Necessity for organizations to implement environmental management system (Sayam Aroonsrimorakot, 2002: 17)

1. Vision of top management because of the fact that all parties concerning business involve with activities which affect environment such as for producers, during product process, other effects not required like noise, dust, waste, contaminated substances while in part of party providing service, effects may be in form of unworthy and inefficient utilizing of resources. If organizations can control these effects, top managements can use environmental management system for confirm their organizations conserve environment and friendly neighborhood.

2. The organizations efficient utilizing of resources because of no cost for disposal wastes and have projects for utilizing of resources save that can prove to highly economize.

3. To obviate obstacle and trade obstruction in free trade system such as the present consumer is not only end user but include assembly of consumer that maybe city, country or communication. They use environmental management system is trade obstruction by determine someone who import products to theirs as mentioned that had been certified ISO 14001 standard. Therefore it is necessary to follow and include supporting industry that produces goods to export products to theirs country. Once more reason is difference in investment, that is serious environmental legal country have cost for investment in the part of environmental management and disposal of pollution more than other country that environmental legal country not serious. Therefore the environmental management system is trade condition for environmental conservation that to hide unfair. Developed countrys usually trade with only certified organizations. So countrys refuse the environmental management system must lose trade opportunity.

4. Prevention of environmental impact to community and neighborhood. Environmental management will help reduce accidents, environmental impacts and enhance safety. If the organizations have well environmental management system, such problem will gradually be decrease and cause no adverse effects or damages.

2.2.4 Benefits from implementation Environmental Management System

A good environmental management system will promote capabilities of entities in the following; (Pranee Pantoomsinchai, 2001: 5)

1. To have appropriate environmental policies

2. To be able to identify environmental impacts from activities, products and services of the entities in the past, present and planning in the future in order to find major effects on environment

3. To be able to identify requirements of relevant laws and other requirements

4. To be able to set policies, objectives and targets in relation to environment

5. To be able to design framework and programme in response to policies and achieve the objectives and targets

6. To be able to set up plans, control, monitor, revise, audit and review policies to ensure that they will always obey the environmental management system

7. To be able to adjust the system to changing environment

Furthermore, a good Environmental Management System will also help entities manage environment in systematic manner enabling good working conditions, providing prevention and protection in case of accidents, creating good image to entities, reducing expenses due to appropriate environment management, e.g., resources management, waste management and enhancing competitive potentiality in marketing as well. (Janya Ngernmool, 2001: 63-64)

If the majority of entrepreneurs in Thailand receive certification of ISO 14000, environmental standard of the country will be raised and other countries cannot use environment as conditions to be excuse of trade barriers. After receiving certification of ISO 14000, entities will obtain several benefits as follows: (Sunaree Weerasawasdirak, 1997: 72-73)

1) Worthy use of resources with least environmental impacts and reducing capital funds

The understanding that investment in environment is wasteful enabling additional expenses with the same productivity is not right. In processes of production, trading and servicing, there will be both input and output that comprise both desirable and undesirable things. The latter ones are wastewater, residues of raw materials. All these things will have affect on the environment. However, should there be appropriate

management, it will enable efficiency in utilization of water, electricity, pulp and energy resulting in a smaller amount of expenses.

2) Risk mitigation from environmental damages and disasters, and environmental restoration as well as reduction in damages to community and insurance

3) Increase in marketing potentiality

It is possible that overseas countries will use environmental management issue as major condition in trading with our country. According to such condition, entities have to earlier receive ISO 14001 certification to ensure that production and servicing processes produce the least environmental impacts. More important, domestic trade is also likely to use Environmental Management System ISO 14001 as conditions or privileges in relation to taxation and others in the same manner as those of ISO 9000, which provide special privilege to traders who have ISO 9000 certification in accordance with Regulations of Office of the Prime Minister in relation to Supplies 2535. In case of ISO 14001, promotion of application of the standard will need more immediate attention, for it is beneficial to the whole public.

4) Reputation

Entities that adopt ISO 14001 for operation will publicly be recognized, obtain benefits both society and themselves. According to ISO 14001, entities are required to report to public on environmental issues that must be in compliance with all rules and regulation relevant. This will result in good reputation and effectual marketing.

5) Steady environmental improvement

Steady environmental improvement is used for measuring success of ISO 14001 adoption for operating Environmental Management System as problem prevention measures rather than correction measures as formerly practicing like waste treatment system which is costly.

Furthermore, Sayam Aroonsrimorakot (2000: 43-44) said that entities which adopt ISO 14001 for operation could request Certification Bodys to certify Environmental Management System, the certificate of which could be used in public relations in order to promote and support better image of the entities.

In summary, Environmental Management System helps an entity to reduce the costs in the long term since it takes into account worthy utilization of resources

enabling least environmental impacts, decreasing operating costs, increasing trading opportunity, facilitating trading negotiations resulting in maintenance of market shares, increasing future market expansion opportunity, creating good image and social recognition to entity resulted from its participation in environmental improvement for public, and more important, receiving certificate for Environmental Management System ISO 14001, which entity could use in public relations to promote and support better image of the entities. (Janya Ngernmool, 2001: 64-65)

2.3 Environmental Management System auditing (EMS auditing)

Environmental Management System auditing is a part of ISO 14001. It is important because make the system has continual improvement and efficiency that is process find deficient fact by compare plan, guideline, environmental policy and have always follow up and success or not.

2.3.1 Requirements of Environmental Management System auditing

The organizations must have internal by themselves for maintain the Environmental Management System is always good and find nonconformity before Certification Body audit for certificate. Audit can do by internal personnel or external personnel that they want. Personnel who audit must have training and have ability, fair and not bias to audit part. Requirement of Environmental Management System auditing as follows:

The organizations establish plan and procedure for Environmental Management System auditing periodicity

1. For audit management system that they have
    - Conformity with plan of management system including requirement of ISO 14001 or not
    - The system have always implement or not

2. For report the results of audit to administrative department

Plan of audit including schedule depend on importance of relate activity and result of audit in the past. For more clear, procedure of audit must include scope of audit, frequency, method, roles, responsibility, requirements of audit and report.

2.3.2 Types of Environmental Management System auditing

Environmental Management System auditing are composed of 3 types

(1) Internal audits are audit of the organization's management system by the management themselves or by a group of personnel authorized to act on behalf of the management or First Party Audit.

(2) Second Party audits are audit by supplier or client or vendor. In an environmental context they are audits carried out by a client on either a potential new supplier or an existing supplier in order to

- Determine the level of environmental management and risk attached to a potential new supplier before contracts are awarded
- Assess the level of conformance to client specified environmental management criteria to be implemented by the supplier during the performance of contracts

Second Party audits can be carried out by the client's personnel themselves or can be sub-contracted out to a professional audit organization for the audit to be carried out on behalf of the client's management.

(3) Third Party audits are that it provides independent validation of an organization's own claims of excellence in environmental management and this validation – Certificates – can be used by the organization:

- To provide the management of the organization with the confidence that their approaches reach internationally established minimum standards of adequacy and effectiveness
- To provide the organization's clients and other Interested Parties with an understanding and level of confidence in the standards of environmental management being practiced within that organization

2.3.3 Phases of Environmental Management System auditing

All audit types have the same 4 phases of audit: (AJA Registrars Ltd., 2006)

(1) Planning is the phase involved in establishing the scope of the audit. It involves basic information gathering about the remit and coverage of the audit being discussed and the estimation of:

- When the audit should occur
- How much time will be required for the audit to be completed
- What skills and knowledge will be required with in the auditors/team
- Which individual should be involved
- How much will the audit contract fee be (for commercial Third Party Audits only)

An EMS audit is mandated to assess 3 things

- Adequacy (of the EMS against the criteria)
- Effectiveness of the EMS implementation (against the defined goals)
- Compliance with legal requirements (being achieved by the EMS implementation)

Thorough and complete planning at least ensures that the audit to follow has the opportunity and valid basis to be able to accomplish these tasks.

(2) Preparation

In a Third Party audit situation, once contracts have been signed on conclusion of the planning phase preparation then takes place to examine and establish:

- Basic levels of theoretical adequacy of the to be audited organization' s documented EMS against base criteria. This ensures that on site auditing is focused on reviewing level of conformance of an organization's approach that at least should be capable of managing the environmental aspects of its operation and if inadequacies are identified, ensures that the organization understand where further development is still required before site auditing can be of value.
- A level of understanding, amongst the team of what to 'expect' during later on site auditing in terms of both the organization's structure and culture and in terms of the specific approaches and activities the organization have decided to adopt and implement.
- An audit plan for the on site auditing activity to come to ensure that both the auditor/team and the organization understand.
- "Who is doing what and when" to ensure that the on site audit visit

proceeds as smoothly as possible with relevant levels of support from all involved.

(3) Performance

The on site activities necessary to achieve the basic objectives of the audit – determine the levels of conformance to specific criteria. It involves

- Meeting with the organization's staff and management and assessing the relevant levels of commitment to, and understanding of, environmental management
- Sampling and assessing the levels of EMS requirement implementation through the review of records and physical activities
- Assessing and establishing overall levels of conformance to the audit criteria
- Communicating the results and conclusions of the audit to the organization's management

(4) Reporting, follow up and close out

The formalization of a detailed documented record of the audit activities and conclusion to provide the management of both the audited organization and the auditors organization (and relevant accreditation bodies) to understand and evaluate the overall audit process and its outcomes.

If non-conformances have been identified during the audit then organization's management are required to 'Follow up' on these to determine cause, effect and response to correct and prevent and then the auditor/team is required to 'Close out' such management follow up in whatever way is appropriate.

In this research, it involved only Third Party audits. Therefore researcher mention to content about only Third Party audits.

2.3.4 Third Party certification audit stages

Accreditation criteria for Environmental Management System auditing demands a 2 stage approach. The overall 'flow' of Certification audit stages in ISO 14001:1996 auditing is: (AJA Registrars Ltd., 2006)

- Stage 1 audits
- Stage 2 audits
- Surveillance audits

- **Stage 1 audits**

Stage 1 audits are based on the assumption that:

(1) Environmental management is a relatively new concept to the majority of organizations and therefore the skills and experiences in environmental management disciplines within these organizations may well be relatively weak. By mandating a stage 1 audits the Certification Body can in some ways – without offering consultancy – support the organization's team by, if necessary, identifying errors and weaknesses before final conformance auditing.

(2) The environment in practical terms within an individual site/organization can be a relatively complicated and complex situation. By mandating a stage 1 audit the Certification Body has the ability to ensure that the auditor/team can become familiar with the site specific issues to be managed and therefore plan for, and conduct, a comprehensive and effective stage 2 audit from the experiences gained in stage 1.

Stage 1 audits are not a conformance audit but are a mutual information gathering situation between auditors and the organization (auditees) and are an essential activity in order to allow detailed planning for the forthcoming Stage 2 audit which in turn will allow the Stage 2 audit to be focused on criteria EMS activities.

- **Stage 2 audits**

As the organization see it the pass or fail audit (not the situation but none the less this perception is common place). This is a full conformance audit and the event where the audit team examines levels of consistent implementation of the EMS requirements across all areas and activities of the declared company scope including levels of effectiveness of the outcomes of this implementation in terms of the achievement of policy, objectives and goals for the organization.

Stage 2 audits examine objective evidence that is people, paper and practice. And result in final recommendations and conclusions as to certification status. Stage 2 audits are not intended to result in certification, they are intended to result in

conclusions that may include the decision to recommend certification depending on the audit findings.

- **Surveillance audits**

Third Party certificates of conformance to ISO 14001:1996 are required to, and do, cover a specified period of validity at the conclusion of which a full re-audit is required. This has become established as being 3 years of date of stage 2 audits. However, during this 3 years period CB's are required, by accreditation criteria in Guide 66, to periodically revalidate the original certification decision by conducting surveillance audits. The minimum frequency of such surveillance audits are specified as being 1 time per year although each CB can establish an actual frequency with clients to suit their mutual needs as long as this minimum is complied with.

Surveillance audits focus on indicators of levels of achievements being made against established objectives for environmental performance improvement and on-going levels of legal compliance being achieved by the implementation of the EMS. Including on-going implementation of the EMS and the continuing evolution of the EMS against current organizational and site circumstances and defined (by Accreditation Body's and the CB's themselves) mandatory every visit reviews of the organization's use of, and claims concerning, certification status.

2.3.5 Initial audit team planning

To conform to accreditation criteria the auditor/audit team used on any EMS audit must contain (AJA Registrars Ltd., 2006)

- Lead auditor

Individual suitably experienced and approved as a Lead auditor to act as team leader with the experience and approval obviously covering detailed knowledge of the audit criteria (ISO 14001) and the audit discipline.

- Aspects specialist

Individual with appropriate knowledge and experience of the environmental aspects and processes to be attached to the declared scope of work of the organization.

- Legal specialist

Individual with appropriate knowledge and experience of the legislative framework and requirements that are to be expected to be applied to the organization's environmental performance (this is not a lawyer).

- Language skills

The auditor/team must contain appropriate language skills and appreciation of cultural constraints and requirements – particularly important where the CB would be involved in an audit using auditors who are not residents of the organization's country.

These skills and requirement may be found within an individual but more usually, they necessitate the use of an audit team and the choice of Lead auditor to act as team leader must also then consider known skills in team management and client communications.

2.3.6 Environmental Management System auditing preparation

The normal preparation activities are: (AJA Registrars Ltd., 2006)

- Document review
- Checklist preparation
- Itinerary preparation
- Team briefing (if necessary)

- **Document review**

The majority of the Document review has been completed on-site during the stage 1 audit. However (and usually) some revisions to the documented EMS may have been made as a result of stage 1 findings and the stage 2 preparation has to include a detailed review of these changes to ensure that the EMS is now completely adequate to the requirements of ISO 14001:1996 in the context of the organization's scope.

If any inadequacies within the revisions submitted are still identified these must be reported to the company in detail to allow them to re-revise and resubmit for adequacy review prior to stage 2 – a stage 2 on-site audit should not occur if known inadequacy exists.

- **Checklist preparation**

The stage 1 checklists were essentially 'ISO requirements'. The stage 2 checklists are now 'The organization's EMS requirements' – as these are the management activities defined by the organization themselves for their own operations.

A checklist is intended to be a 'Tool' for an auditor to ensure that all necessary and relevant areas of implementation are assessed during the on-site audit. As such a checklist must contain:

- 'Prompts' of what evidence of EMS conformance should be available if implementation is as required
- 'Information' regarding the exact definitions of responsibility for, and frequency of, activities as specified by the EMS
- 'Instruction' regarding the obvious 'physical' indicators of effectiveness of the implementation that should be available based on the EMS goals/objectives

A stage 2 checklist must be assembled directly from the EMS – not the words/opinions/ideas of the auditor and from the detailed knowledge of issues involved as identified by the stage 1 audit – as documented in the stage 1 report. The inclusion of these stage 1 items ensures the "close-out" of issues during the stage 2 audit.

Checklists must be:

- Legible/clear – all members of the audit team may be required to use a checklist that has been generated by one particular auditor as part of cross checking activities (checklists from one audit may also be used in future audits) and therefore understanding of what is required is essential.
- Cross-referenced to the specific element and sub-section of the EMS from which the requirement is taken for audit – necessary to ensure that if confusion in the reason for the audit focus is caused, or the auditee does not understand the question being asked, the auditor can immediately move to the EMS itself to confirm the basis of thequestion and understand the evidence that should be available.

The format of the checklist should allow not only the detailing of the issues to be audited but also provide the auditor with the ability to record the detailed evidence of implementation or non-implementation, effectiveness or non-effectiveness seen by the auditor at the time of the audit discussions

It is important to recognize that checklists, once used, are a record of audit that must demonstrate that the audit process was applied professionally and completely.

- **Itinerary preparation**

Itinerary must clearly identify the roles of each of the audit team members (with these roles being in line with the relevant skills and experience of each auditor) and clearly identify the flow of the audit and demonstrate that all of the activities and elements of the EMS are to be subject to audit within the planned man-day allowance for the stage 2 on-site audit. Furthermore, itinerary must clearly allow the organization to understand the requirements for management availability to ensure support for, and completion of the audit tasks involved.

Whilst the stage 1 audit will, necessarily, have been expressed in generic ISO 14001 terms, the stage 2 audit must be far more specific to the organizational structure and process activities of the organization.

- **Team briefings**

If the same team involved in stage 1 is being utilized on stage 2 then team briefings are rarely required – everyone has the same level of knowledge of the organization. If new team members are being used, or if there has been any significant change in the organization’s activities from stage 1 advised to the Team leader, then a briefing will be required to ensure everyone is familiar with the plan of action and site specific issues.

2.3.7 Environmental Management System auditing performance

As always the performance phase has 3 basic activities: (AJA Registrars Ltd., 2006)

- Opening meetings
- Audit activities
- Closing meetings

An EMS auditor must recognize that this now is a full conformance audit and in the eyes of the majority of organizations, is a pass or fail situation (in fact it is not – a non-conformance simply equates to delay in certification recommendation) and this perception normally creates a level of stress and tension within the auditees that may well, if not managed, create difficulties to a successful audit performance.

- ‘Success’ to an EMS auditor is not, at the conclusion of an audit, the ability to immediately recommend the company for certification – if non-conformance exists it must be reported.
- ‘Success’ to an EMS auditor is the completion of the audit without obstruction and without the organization seeing the need to resort to the Certification Body’s complaints process.

- **Opening meetings**

A very formal event in terms of having a defined agenda of topics and in terms of the audit team understanding the importance of the event to their being able to establish a level of support for the audit activities to follow.

Opening meetings are led by, mainly conducted by, and totally managed by the lead auditor/team leader. The agenda requires coverage of:

- The purpose of the Stage 2 audit
- The confirmation of the scope of the audit
- The definition of the methods to be used
- The roles of the individual audit team members
- The explanation and confirmation of the audit plan/itinerary
- The focus on determining the extent of conformance

- Confirming the levels of confidentiality to be practiced regarding audit evidence seen
- The existence of complaints procedure – identifying the definition of complaint
- All necessary administrative – audit recording – items

The team leader must control the opening meeting and must demonstrate this control by being thoroughly prepared against the agenda and specific organization audit details. The impression created by the audit team to the organization's management can be vital to the audit's successful performance – a well managed and well controlled opening meeting establishes the audit team's professionalism, a badly managed and badly controlled opening meeting establishes the impression of unprofessional and potentially less than competent auditors.

- **Audit activities**

An audit is conducted to determine the extent of conformance and the achievement of objectives as far as environmental performance is concerned. This extent of conformance and level of achievement are assessed by the review and evaluation of objective evidence.

In simple terms objective evidence of conformance can be:

- Paper – records, data, files etc recording the preceding period's implementation of defined actions
- Practice – physical activities demonstrating the current day-to-day implementation of defined actions and allowing in immediate understanding of levels of effectiveness being achieved
- People – evidence of levels of the effectiveness of training applied and the levels of awareness and competence of individuals involved in activities providing a level of confidence in the ability of the organization to sustain EMS approaches in the future

The conclusions of the audit are not the conclusions of each individual auditor. They are the consolidated conclusion of the team (managed by the team leader/lead

auditor). This requires constant and clear communication between all of the team members during an audit.

The team leader/lead auditor is responsible for not only managing the audited organization – dealing with obstruction, disagreements etc but also for managing the audit team to ensure the completion of the audit program and the conformance with CB procedures and audit requirements.

During on site auditing – this is achieved by the performance of "audit team meetings" at appropriate times throughout the audit.

- Interim team meetings – lunch time and end of day
- Final team meeting – on conclusion of the audit activity but prior to the closing meeting with the audited organization's management

- **Closing meetings**

Having completed the audit activities and having conducted the final audit team meeting the last act of performance is to tell the organization's management the results and conclusions.

As with the Opening Meeting there is, in a Third Party stage 2 audit, a formal agenda to be covered:

- Thanks the organization for their support
- Reconfirmation of confidentiality to reassure the management that nothing seen within the audit will be reported outside of the 2 organizations
- Recap of purpose and objectives of audit simply clarity
- Redefinition of the scope and criteria of the audit to ensure there is absolutely no confusion
- Recap of the methods used highlighting sampling
- General comments on site activities and EMS implementation positive reporting
- Detailed presentation and explanation of any non-conformances identified and reported to ensure understanding and acceptance of the findings being reported

- Explanation of requirements and time-scales to follow up of non-conformances by the organization and for close out by the auditors to ensure that further actions are recognized as necessary
- Overall conclusions and recommendations to be raised as a result of the audit to ensure the organization understand the current position
- Confirmation of the existence of complaints procedure to allow such actions if the organization feel the need

If handled well – completely prepared for and competently presented, with statements being based on factual evidence – the closing meeting, no matter what the recommendations arising should pass successfully. However, it is entirely possible that, if performed badly or if the audit findings are less than accurate or factual, the audit team may find that situations develop:

- Arguments with the team or between members of the management
- Denials of the facts presented or the classifications allocated and therefore the final recommendations

The team leader/lead auditor must be prepared to and capable of managing such confrontations – the fact that they exist at all probably raises questions against the overall success of the audit but if the information presented is accurate and factual then the situations must be dealt with calmly and professionally. An EMS auditor must never lose his/her temper in an audit situation. If resolution of disagreements cannot be reached in the closing meeting then the complaints procedure should be used.

Where time allows it is advisable for the team leader/lead auditor to generate on on-site interim or draft report of the audit in addition to any formal non-conformance reports. It should be understood that the overall audit is not complete until such time as any non-conformances have been followed up and close out hence the terms initial or draft report.

Follow up is the responsibility of the audited organization’s management, that is:

- Investigate the cause and extent of the non-conformance
- Put in place immediate corrective action to prevent on-going occurrences

- Put in place long term preventive action (if different from corrective action) to prevent future re-occurrence
- Notify the auditors of actions taken

Close out is the responsibility of the auditors, that is:

- Review responses provided by the organization to determine apparent adequacy, coverage and completeness of the notified actions
- Decide up on the timings and methods to be applied in closing out the actions as having been effective (depends on individual issues and classification of the original non-conformance)
- Notify the organization of the decisions and as necessary, arrange for further auditing visits
- Review and evaluate activities involved in response and close out the non-conformance

Once all non-conformance have been responded to and accepted and close out a formal and complete report of the audit activities is required. The report must cover:

- A brief mention of the stage 1 completion
- All 4 stages of the stage 2 audit
- A detail of the audit conclusion, recommendations and any findings leading to these
- Complete records and information on audit team members, roles and audit dates

Obviously the report provides the organization with a valuable record of the audit but from the EMS auditor's point of view the report

- Allows the team leaders recommendations and conclusions to be assessed and reviewed by the CB's senior management in order for them to be able to establish justification for certificate issue
- Allows the relevant AB to, at their on-going surveillance audits of the CB, to understand the professionalism and conformance of the CB activities
- Provides the basis for planning and preparation on the next scheduled audit or surveillance

2.4 National Accreditation Council (NAC)

The past ten years has seen dramatic change in the world economy. A number of economic groups have emerged in different regions with the objective of promoting and protecting their own trade interests. To reach their objective, they have developed their own measures that can also serve to bar entry of countries outside the groups**.**

The World Trade Organization (WTO) while seeking to ensure that measures so adopted by different economies, whether in the form of technical regulations or standards, do not create unnecessary obstacles to trade, also recognizes that international standards and conformity assessment systems can help facilitate the conduct of international trade. Hence, under the WTO agreement on Technical Barriers to trade, members in the preparation of their technical regulations and the recognition of the conformity assessment are recommended the following approaches:

- Harmonization of national standards with international standards
- Arrangement for mutual recognition (MRA) of conformity assessment procedures, which can be achieved through accreditation.

With this movement, Thailand sees the urgency of adjusting its standardization system to keep up with the international standardization development. It also recognizes the need to encourage the public and private sectors concerned with export to progress together in the same direction and in a more systematic and standardized fashion, to maintain competitivity in the world market. Hence, by the resolution of the Minister Council, NAC of Thailand has been established to administer the accreditation system of the country.

2.4.1 Thai Accreditation System (TAS)

Through the process of the TAS, NAC gives formal recognition that a conformity assessment body is competent to carry out specific function or task according to the relevant international requirement.

2.4.2 Multilateral Recognition Agreement (MLA)

The accreditation programs provided by NAC has been recognized as equivalent to the other national accreditation schemes through the peer evaluation process. Up to now, NAC has been the signatory to the following arrangement ;

(1) the Pacific Accreditaion Cooperation (PAC) Multilateral Recognition Agreement (MLA) : Quality Management System (QMS) since August 2000;

(2) the International Accreditaion Forum (IAF) Multilateral Recognition Agreement (MLA) : Quality Management System (QMS) since November 2000;

(3) the Pacific Accreditaion Cooperation (PAC) Multilateral Recognition Agreement (MLA) : Environmental Management System (EMS) since November 2003.

2.4.3 NAC and Accreditation Subcommittee structure

The structure of NAC enables the participation of those involved, and having interests, in the accreditation, from the government and the private sector including the representative from the Professional Institute, Conformity Assessment Bodies, Manufacturers/Suppliers and Users. The composition of NAC shall be balanced where no single interest predominates is achieved. NAC is chaired by the Ministry of Industry, with the permanent Secretary of Ministry of Industry. The Vice-chair and ONAC representative will serve as the secretarial NAC has main responsibility for providing national policy on accreditation in order to be recognized internationally as well as endorse accreditation to conformity assessment body. The Accreditation Subcommittee (ASC) is the subsidiary committee, appointed by NAC, which has the responsibility for recommend and give advice to NAC in particular area concerned. The ASC structure also enable the participation of all significantly concerned parties in line with NAC structure as described earlier

2.4.4 NAC Policy

NAC has as a policy to operate and coordinate systematically and impartially a single national accreditation system to meet international requirement. Accreditation operated by NAC covers 3 schemes, the service of which is open respectively for the following organizations :

- Quality system certification bodies
- Environmental management system certification bodies
- Inspection bodies

The following schemes are also planned to launch in the future

- Hazard analysis and critical control point system certification bodies
- Occupational health and safety management system certification bodies

In addition, since there are various laboratory accreditation bodies providing the service in Thailand, ONAC has the role to coordinate with the Laboratory Accreditation Bodies within the country aiming at the single national laboratory accreditation system which will be recognized internationally.

2.4.5 Accreditation process Environmental Management System certification

- **Scope**

Providing accreditation services to certification bodies operating according to the environmental management system standard and other supporting documents specified in the requirements.

- **Criteria**

Criteria for accreditation are specified in criteria for bodies operating assessment and certification of Environmental Management System.

- **The Assessment**
  - **Appointment of audit team**

The audit team to carry out accreditation assessment is appointed by the Office (ONAC) and in accordance with the specified criteria for ONAC auditors. The names of the appointed auditors are made known to and agreed by the applicant before the proceeding of the assessment.

- **Document assessment and audit plan preparation**

The audit team must examine all the correspondence between ONAC and the certification body including review the applicant's documentation. Furthermore, the audit team must prepare the checklist and the audit plan; the plan is to be forwarded to the certification body for agreement.

- **Auditing**
  - Opening meeting is to introduce the members of the audit team, explain the purpose of the assessment, review the agreed plan and confirm the date and availability of other administrative supports.
  - Auditing, which comprises divide into 2 stages, that is Stage 1 is
  - assessment of both the CB's head office and regional office, as applicable. The audit team will assess the effectiveness of its quality system, make an observation on non-compliance which may arise, and hold the interim closing meeting to review any non-compliance raised. Stage 2 is assessment of the CB's auditor carrying out audits on the suppliers. The audit team will accompany the CB's auditor for the entire audit and take note or examine documents or other items without asking questions or making comments until after the closing meeting between the CB's auditors and the suppliers.
  - Final closing meeting, in this part the lead auditor will present a summary of the audit result from both Stage 1 and Stage 2 as well as answer any questions raised on points of clarification, and note any corrective actions intended to be carried out with the specified time scale.

- **Reporting**

The audit team is responsible for preparing the audit report which will be forwarded to the Accreditation Review Panel and the Accreditation Sub-committee for consideration and recommendation to NAC to make decision on accreditation.

- **Surveillance**

Following accreditation, regular surveillance visits is carried out at least annually.

- **Re-assessment**

Re-assessment is conducted with a full assessment every 3 years.

2.4.6 The office of the National Accreditation Council of Thailand

The office of the National Accreditation Council of Thailand (ONAC) is a government agency under the office of the Permanent Secretary, Ministry of Industry. ONAC has been established to administer the accreditation system under policy of the NAC.

ONAC has policies to provide accreditation services to all certification bodies in a non-discriminatory maner regardless of size, activities, financial or other condition of certification bodies.

All operational expenses will be allocated from the government budget. All incomes will be treated as a Government incomes which shall be handed over to the Ministry of Finance according to relevant government rules and regulations.

2.5 Management System Certification Institute (Thailand)

Management System Certification Institute (Thailand) : MASCI was established by the Ministry of Industry under the Cabinet resolution on 10 September 1998. MASCI is an independent organization operating under the aegis of the Industrial Development Foundation. MASCI has management system of private sector in the form of board of directors of the Institute and Subcommittee which comprises of interested parties and high qualified individual from governmental and private sectors. Therefore, issuance of the certification by MASCI is impartial and non-discriminating which is in accordance with ISO/IEC Guide 62 and ISO/IEC Guide 66 International Standard Guidelines.

2.5.1 Quality Policy

MASCI provides management system certification services with quality, be accepted by the International level.

2.5.2 Finance

MASCI received financial support in terms of the establishment fund and operating budget from the government from 1999 to 2001 and earns revenue from certification services i.e. auditing fee, certificate fee, training fee etc.

2.5.3 Main Missions and Quality Services from MASCI

(1) To provide certification such as ISO 9001:2000, ISO 14001, TIS 18001 and OHSAS 18001, HACCP, GMP and combined audit.

(2) To provide training courses such as ISO 9001:2000 Lead Auditor/Auditor, ISO 9001:2000 Internal Auditor, EMS Auditor ISO 14001, Internal Auditor ISO 14001, OH&S Management System Auditor, Integrated System Internal Auditor : ISO 9001, ISO 14001& OHSAS 18001, ISO/TS 16949:2002, Food Safety Management Systems and other relevant matters.

(3) To coordinate the cooperation of industrial and government sectors in solving problems and restraints, both in technical and policy aspects, and to participate in development and improvement of guidelines, procedures, methods of certification and other relevant matters.

(4) To develop auditors to be fully qualified in accordance with international standards and to participate in certification activities.

(5) To provide seminars on management systems for customers and general public as well as news bulletins to provide knowledge and news of standard systems in order to fulfill customer’s need.

(6) To undertake other tasks related to management system standards or missions mandated by the Ministry for Industry or the Cabinet.

2.5.4 Partners of MASCI

MASCI provides joint auditing with international alliances in pursuit of international trade advantage. MASCI has signed bilateral agreement with international certification bodies such as;

- JACO of Japan which is accredited by JAB (Japan Accreditation Bureau) and UKAS (United Kingdom Accreditation System)
- DNV of Norway which is accredited by accreditation bodies from 36 countries such as JAB (Japan Accreditation Bureau) and UKAS (United Kingdom Accreditation System)
- BSMI of Taiwan which is the certification body of Taiwanese government, accredited by CNAB
- QMS of Australia, accredited by JAS-ANZ, operates its certifications services in Australia and Asian region such as ISO 9001, ISO 14001, HACCP and General Food Safety. One of benefits that MASCI's customer will receive from the joint auditing service with QMS is the privilege of gaining the accreditation mark from JAS-ANZ.

The cooperation with international alliances has ensure MASCI's credibility and recognition worldwide, eliminating trade barriers to promote Thai economy and industry as a whole. The joint auditing by MASCI and those international alliances also enables the certified organizations to use accreditation marks from 40 countries worldwide.

2.5.5 MASCI focuses on quality

- **Quality of personnel**

MASCI has teams of qualified auditors and trainers with wide range of experiences and qualifications complied with ISO 19011:2002 (Guidelines for quality and/or EMS auditing)

- **Quality of work**

MASCI's management operates in accordance with the ISO/IEC Guide 62 and ISO/IEC Guide 66 providing clients with certification that is recognized internationally by being accredited in the field of Quality and Environmental Management System Certification by NAC.

- **Quality of services**

MASCI emphasizes on understanding of customer businesses, efficiency and promptness at reasonable fees and provides services aiming for highest customer satisfaction.

2.5.6 Benefits from MASCI's services

Essentially, clients are assured to gain the following benefits from MASCI:

(1) The ISO 9001 clients certified by MASCI will have privilege in government bidding according to the "Procurement regulation of Office of Prime Minister B.E. 2535".

(2) The ISO 14001 clients certified by MASCI under the NAC accredited scope and the TIS 18001 clients certified by MASCI are exempted for the annual renewal fee of the Department of Industrial Work according to the Announcement of Ministry Regulation B.E.2547.

(3) The clients received investment promotion from the Board of Investment (BOI) and certified to ISO 9001 from MASCI will comply with Policies and Criteria for Investment Promotion due to recognition of MASCI to BOI.

2.5.7 Preparation for the application for the EMS certification

The ISO 14000 series is a set of standards concerning EMS including the activities of designing, producing,delivering and servicing. The concept of the standard is to enable the organization to continually develop and improve its EMS. Although the series comprises of many standards, the standard ISO 14001 is used as the direction for EMS certification.

- **Main steps of application for the EMS certification are as follows:**
    - Step 1 : study the standard ISO 14000 series.
    - Step 2 : assemble among the management levels to sustain the establishment of EMS.
    - Step 3 : appoint a steering committee to set up and monitor the system.
    - Step 4 : stipulate environmental policy, plan for the management system and establish the necessary operational manuals and instructions.
    - Step 5 : implement the specified EMS.
    - Step 6 : conduct the internal audit to ensure that the system is complied with the standard requirements, implemented and maintained effectively.
    - Step 7 : correct non-conformity found during internal audit and improve the efficiency of EMS.
    - Step 8 : contact the certification body.

2.5.8 Flowchart of EMS Certification

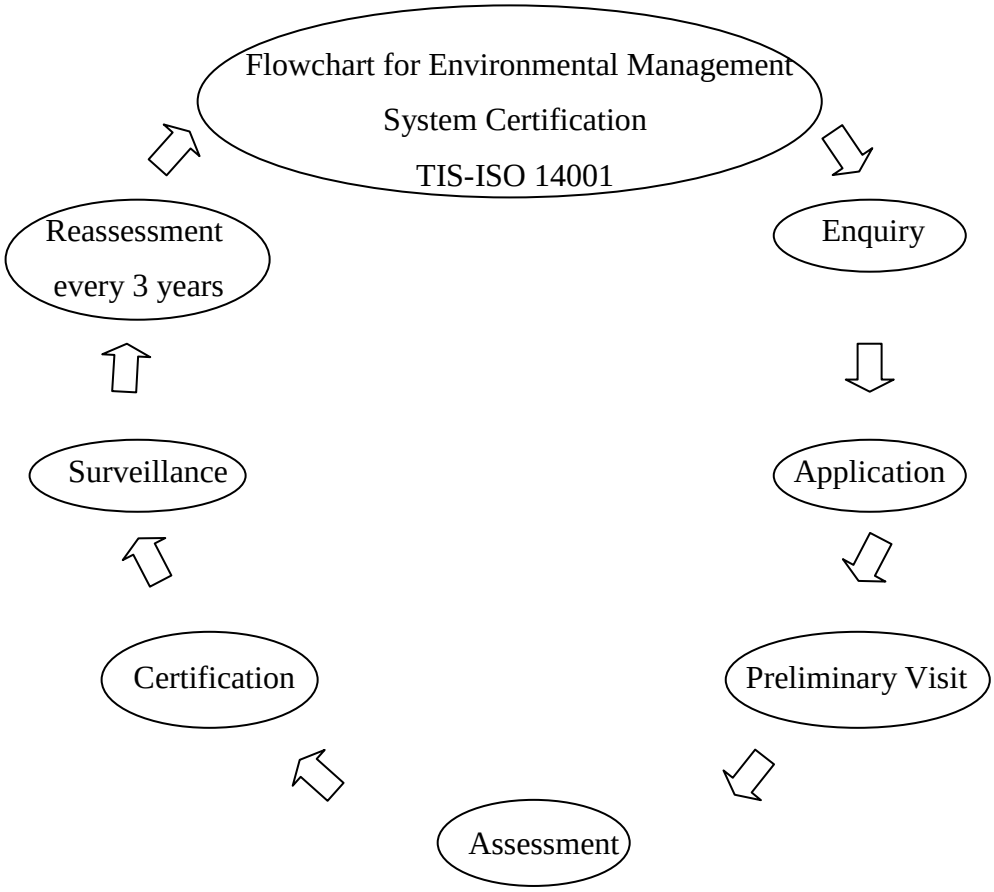


Figure 2-3 Flowchart of EMS certification

Source : http://www.tisi.go.th, 2006, 24 July.

2.6 Related Researches and Literatures

Gavine and et.al. (1996: abstract) studied implementation of EMS in growing aquatic animals industry. Results from the study that summarized EMS can use with several portion of industry in order to help organizations decrease environmental impacts, wastes and for advantage marketing. Report that suggested component should include with EMS for proceeding growing aquatic animals in The United Kingdom.

Murr and et.al. (1996: abstract) studied implementation of environmental ecology auditing system of Europe in paper industry by committee who control ecology audit of Europe. Results from the study found that activities environmental conscience and certified by environmental auditor that participate voluntary environmental ecology auditing. environmental main point is planning, environmental review, environmental policy, environmental objective, environmental project and environmental development.

Bernard Sinclair-Desgagné and H. Landis Gabel (1997: abstract) studied new international standards for environmental auditing are now being actively promoted by public authorities and adopted by private firms. One important feature of these standards is their emphasis on managerial systems and incentives that support a wiser use of environmental resources. This paper studied such a system, in which incentive compensation may be based in part on the results of an environmental audit. It was found that optimal wages after an environmental audit is performed should have a greater range than wages paid when no audit has occurred. It was also shown that the decision to conduct an environmental audit and the size of the expected wage in this case depend crucially on whether the agent's prudence (or precautionary motives) dominates his aversion to risk. It was finally found that the insertion of environmental audits within current management systems would certainly induce a manager to care more about the environment; although this may come at the expense of less concern for other activities, they found plausible circumstances in which properly designed environmental audits overcome such a tradeoff and increase the manager's attention to both environmental and traditional tasks. Some implications of the analysis for environmental public policy were also discussed briefly.

Kiti Pongmakapat and et.al. (1997) studied the attitude of Thai industrial entrepreneurs on Environmental Management System Standard ISO 14001. Results from the study found that the industrial entrepreneurs in Thailand had good attitude toward Environmental Management System Standard. They realized importance and benefit from had been certified ISO 14001 standard. Moreover they found policy of top management including better image were not lead to environmental problem.

Nikorn Boonvieng (1997: 168-171) studied environmental awareness of government and private sector for sustainable development : case study of ISO 14000 series. Results from the study found that problem of implementation ISO 14000 system in Thailand was lacking skillful person concerning the system. For the entrepreneurs, operational budget was high that is obstacle for implementation of ISO 14000 system. They suggested that government should support and motivate the organizations taking the system by offering tax privilege, capital privilege and technology for dissemination information concerning ISO 14000 system. Especially television could be useful media to enhance understanding.

Lilly Hunnangkul (1998: summary) studied on application of environmental auditing for Thailand. From the study found that the main conclusions are the principle factors limiting the adoption of environmental auditing in Thailand are lack of know-how, motivating factors and the perception of the nature and the role of auditing. Therefore government should have a significant role in promoting voluntary auditing by informing, motivating and increasing capability to adopt auditing. Finally, partnerships should be established between government, industry, environmental consultants, non-governmental organizations and academia to foster voluntary implementation.

Anek Daomanee (1999: abstract) studied environmental management of certified ISO 14001 organizations in Bangkok metropolitan and vicinity. From the study found that there is practical step on proceeding in good average, no obstacle on proceeding, the serious of problem is less to the least. The problem is giving environmental information to determine objective and environmental target, Lacking of personnel analyze environmental impact and internal auditors, collection consider legal and requirement, working party lack of responsibility and no attend including no follow the outcome from the meeting and no attention to ISO 14001, activities, training, control documents, appliances, comparing and measuring not enough. Benefits from environmental management that found mostly achieve objectives and targets, safety, management quality of waste water, air and noise also achieve objectives and environmental targets.

Bob Tanner (2000: abstract) studied independent, third-party, involvement can make a significant contribution towards achievement of improved food safety, and food law compliance. Accredited certification organizations, with wide experience and expertise, such as NSF international, were increasingly supporting food industry and regulators by providing alternative, cost-effective services. The key was true independence: Consultants cannot certify, and an effective "due diligence" defence can be based on a certificate of compliance from an organization without a conflict of interest in consultancy services. Regulators, too, were increasingly turning for help to accredited third-party organizations to achieve their objectives.

Walliya Niwartwong (2001: summary) studied on the economic and social factors of the factories in the Industrial Estate with the entrance for the standard of EMS. Results from the study found that independent factors relate acceptance the entrance ISO 14001 consist of nationality of investors, the number of labors, the registration fund, the amount of product selling in the country, the proportion of exports, the existence marketing of increased production, planning production increase, having air pollution management and training personnel concerning ISO 14001. Furthermore that found two factors influenced the acceptance of the ISO 14001 standard that is having idea that ISO 14001 is necessary for the factories and the occupational experience.

Chanakran Kaokhem (2002: summary) studied the potential of certified industries to maintain EMS. Results from the study found that industrial factories have the potential to maintain the Environmental management system ISO 14001, through the educational qualifications of environmental officers, the number of officers directly responsible for ISO 14001 and duties and responsibilities of Environmental Management Representative (EMR). On the part of adjustment of technology to solve environmental problems and budget support. It was found that there was support for the annual system examination and evaluation and an annual employee training budget. On the business side it was found that the system arrangement derived from the policies of high level administrators, and it was found that the trust in industrial factories increased. On the part of the conduct of the Environmental Management

System ISO 14001. At that time it was found that mostly industrial factories have fixed plans to examine and follow up on the system every 6 months. They found some defaults, in which the administration held yearly meetings to review the system ISO 14001.

Dong-Myung Kwon, Min-Seok Seo and Yong-Chil Seo (2002: abstract) studied the impact of ISO 14001 certification on the compliance with environmental regulations by Korean companies. The impact of ISO 14001 certification on the industry was studied through a questionnaire survey and the compliance of environmental regulations were investigated using government-released data. The motivation for an environment management system was a result of the current international situation and the need to maintain fair competition. ISO 14001 certification has been recognized as an essential strategy for industrial competition and to improve company/product recognition. The certified and non-certified companies' environmental regulation violation (ERV) rates were 3·5% and 11·6%, respectively, in 1997. In 1998, the ERV rate had an eight-time difference with 1·0% and 8·5% for certified and non-certified companies, respectively. Annual regulation violation rates were reduced from 3·5% in 1997 to 1·0% in 1998 with certified companies and from 11·6% in 1997 to 8·5% in 1998 with their non-certified counterparts, respectively. ISO 14001 certified companies showed more improvement than non-certified companies in regards to environmental performance.

Patarachit Glomchim (2002: abstract) studied the benefits and obstacles in maintaining, the necessity to maintain environmental management system ISO 14001 of industrial factories in Thailand. Results from the study found that benefits from have certified environmental management system ISO 14001 were improvement internal and all side environment and the organization became well-known. The obstacles to maintain the system were the expense to improving the physical structure within the organization. The results showed that sex, export of products, foreign investment and type of industry had no influence on the necessity and need to maintain the environmental management system ISO 14001.

Summers Raines (2002: abstract) studied the costs and benefits of ISO 14001 certification result in firms choosing this route as a tool for proactive environmental management, according to a survey of 131 companies across the world. The following paper examines the motivation to pursue ISO 14001 certification for companies in developed and developing countries. While the costs of ISO 14001 certification vary widely, almost all respondents report substantial cost savings as a result of implementation. This was especially the case in developing countries, where enthusiasm about the standard (among certified firms) was very high. Contrary to the concerns voiced by skeptics, many firms stated that they decided to implement an ISO 14001 in order to "be a good neighbor" and to raise their employee's level of environmental awareness. Surprisingly, very few respondents stated that their primary motivations for implementation were profit-related. The majority of firms appear to be using ISO 14001 as a tool for proactive environmental management, as its creators intended.

Vibharaj Prasertsook (2002: summary) studied the cost-benefit analysis and economic viability studied of the operation of Environmental management system ISO 14001 in secondary school and studied the level of environmental consciousness of staff and students and related factors. The data were collected from four secondary schools that is Nonsi Withaya School, Samsen Withayalai School, Satri Withaya School and Sara Withaya School. Results from the study showed that the operations of ISO 14001 in 3 out of 4 schools were economically unviable. There was only one school that clearly indicated economic viability, with project duration of ten years and 10% discount rate. The environmental consciousness of staff and students were found to be at a high level in all aspects including the family aspect, school aspect and social aspect. When consider each component, it was found that most of the staff had a high level of environmental awareness and behavioral response to the environment while most of the students had a high level of environmental awareness but a moderate level of behavioral response to the environment.

Nijchanun Sriwittaya (2005: summary) studied the factors influencing the decision to implement the Environmental management system ISO 14001 in small and medium enterprises (SMEs) by selecting examples from the automotive and electrical appliances and electrical industries. Results from the study showed that all factors influencing the decision to implement ISO 14001 were at an intermediate level, there were business types, necessities, obstacles and anticipated benefits while the average decision to implement ISO 14001 was not yet implemented ISO 14001, but planned to do so in the near future. Therefore it is recommended that SMEs be encouraged to be aware of the necessities of and anticipated benefits from ISO 14001, and reduce implementation obstacle on their own. Furthermore any promotions from governmental sectors will greatly contribute to more decisions by SMEs to implement ISO 14001.

Tan Raweesawat (2005: abstract) studied factors affect the implementation of environmental management system ISO 14001 and application to SMEs food industry in Bangkok Metropolitan and Vicinity. Results from the study showed that there were many factors that had effect on the implementation of Environmental management system ISO 14001. There were ages of entrepreneur, level of education, duration of undertaking food industry, entrepreneur's knowledge of ISO 14001, authorized capital, number of employees, property value, obligation from customer to implement ISO 14001, preparation to provide the system, the cost for implementation, other certified standard, attendance at training with meeting and seminars in ISO 14001 of entrepreneurs and officers, receiving news concerned ISO 14001 and exception of fees from government. All of them had relation with the recognition and implementation of the standard system ISO 14001. But there was one factor which had no relation that is the duration of work. Furthermore the study also showed that almost all of the entrepreneurs had low knowledge and understanding of the Environmental management system ISO 14001. Therefore should have a regulation to promote and develop entrepreneurs to have more knowledge of the standard system ISO 14001 and also to have a better way of distributing news concerning ISO 14001.

CHAPTER III
RESEARCH METHODOLOGY

The study of the advantages of certified organization on external EMS audits was done by survey research based on questionnaires that had procedures as follows:

3.1 Target populations and samplings

3.1.1 Target populations

The target populations of this survey were divided into 2 groups which were

a) EMS certified organizations (1,183 organizations)

Table 3.1 List of certified organizations in Thailand: ISO 14001

Industrial sectors	Number of certified organizations
Agriculture, Hunting and Forestry	42
Mining of coal	2
Extraction of crude petroleum and natural gas	15
Other mining and quarrying	4
Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats	28
Dairy products	2
Grain mill products, starches and prepared animal feeds	12
Other food products	20
Beverages	7
Tobacco products	2
Textiles	25

Table 3.1 List of certified organizations in Thailand: ISO 14001 (Cont.)

Industrial sectors	Number of certified organizations
Wearing apparel	9
Leather/footwear	26
Paper & paper products	27
Publishing/printing	6
Petroleum products	26
Basic chemicals	48
Other chemical products	42
Rubber products	20
Plastic products	51
Glass & glass products	2
Ceramic/clay products	6
Cement/concrete	31
Cutting, shaping and finishing of stone	1
Basic iron/steel	13
Precious/non ferrous metals	3
Casting of metals	3
Metal products	45
Office/accounting/computing machinery	10
Machinery and equipment	61
Electrical machinery	55
Radio, TV, communication equipment	113
Medical appliances	3
Instruments and appliance for measuring	5
Optical/photographic instruments	5
Watches & clocks	1
Motor vehicles/transport equipment	106
Furniture	7
Jewelry	2
Other manufacturing	5

Table 3.1 List of certified organizations in Thailand: ISO 14001 (Cont.)

Industrial sectors	**Number of certified organizations**
Recycling	12
Production of electricity	30
Manufacture of gas	20
Collection, purification and distribution of water	14
Maintenance and repair of motor vehicles	3
Retail sale of automotive fuel	1
Wholesale/retail trade	55
Hotels & accommodation	2
Transport & supporting activities	48
Telecommunications	1
Real estate activities	11
Computer & related activities	6
Architectural/engineering/technical consultancy	3
Technical testing & analysis	2
Investigation/security and other services	3
Packaging	1
Public administration	1
Education	36
Hospital	21
Sanitation and similar activities	20
Entertainment	1
Other service activities	1
Total	1,183

Source : http//www.tisi.go.th, 2006, 24 July.

b) Certification body

There were 32 certification bodies in Thailand in 2006.

Table 3.2 List of CB in Thailand

Name of CB	Certification
Advantage Co., Ltd.	QMS, EMS, HACCP, PSB CSA certification
AFAQ/Best CERT (Thailand) Co.,Ltd.	QMS, EMS
AJA Registrars Limited	QMS, EMS
BM Trada (Thailand) Ltd.	QMS, EMS, Product conformity certification,
BSI Certification Services (Thailand) Ltd.	QMS, EMS, QS-9000, ISO/TC 16949, ISO 17799/ BS7799, TL-9000, ESD, OHSAS18001, CE Mark, Kite Mark
BVQI (Thailand) Ltd.	QMS, EMS, OHSAS18001, TIS18001, SA8000, ISO/TS16949, TE9000, GMP, Thai FDA GMP, HACCP, BRC, IFS, Organics, Food Hygiene, AS9000, Tick IT, ISO17799, TL9000
Certification (Thailand) Co., Ltd.	QMS, EMS, ISO/TS 16949, OHSAS 18001, GMP, HACCP, BS 7799
Det Norske Veritas (Thailand) Co., Ltd.	QMS, EMS, QS 9000, OHSMS
ERMCVS-Thailand Branch	ISO 14001
European Quality Assurance	QMS, EMS, AS 9100, ISO/TS 16949, OHSAS 18001, GMP, HACCP, SA 8000
Global Certification	QMS; EMS
International Certifications Limited	QMS, EMS, QS 9000, HACCP
International Inspection Co., Ltd. (UL)	QMS, EMS, AS 9000, TE 9000, UL, DEMKO, CE, NOM, ANCE, ULC
Intertek Testing Services (Thailand) Ltd. (ITS)	QMS, EMS, QS 9000, CE, S-Mark, GS-Mark, WH-Mark, ETL, CETL

Table 3.2 List of CB in Thailand (Cont.)

Name of CB	Certification
ISOQAR (Thailand) Co., Ltd.	QMS; EMS; QS 9000
Japan Quality Assurance Organization (JQA) Through TQA Limited	ISO 9001:2000, EMS, QS 9000, ISO/TS 16949, OHSAS 18001, HACCP
Lloyd's Register Quality Assurance Ltd.	QMS, EMS, OHSAS 18001, QS 9000, ISO/TS 16949, HACCP, CE Marking
Management Cert Co., Ltd.	QMS, EMS
Management System Certification Institute (MASCI)	ISO 9000, EMS, TIS 18000
Moody International (Thailand) Ltd.	QMS, EMS, QS 9000, TS 16949, OHSAS 18001, SA 8000
NQA C.S. (Thailand) Co., Ltd.	QMS, EMS, TS 16949, OHSAS 18001
Office of Certification Body	QMS, EMS
Perry Johnson Registrars, Inc.	QMS; EMS; QS 9000
QCB Quality CertificatioBureau Inc.	QMS; EMS; QS 9000
SGS (Thailand) Ltd.	QMS; EMS; QS9000; ISO/TS16949; TL 9000; SA8000; OHSAS18001; TIS 18001; ISO 13488; 13485/EN 46000; FSC/Chain of Custody; GMP; HACCP; Food Hygiene; HCE; BRC; Organic; EUREPGAP
TISTR-OCB	QMS; EMS
TQA Co., Ltd.	QMS; EMS
TUV NORD (Thailand) Limited	QMS; EMS; OHSAS 18001; ISO/TS 16949; CDM;ISO 13485/ISO 13488;ISO 22000; HACCP;SA 8000/AVE/BSCI; GS Marking; Third Party Inspection
TUV Rheinland Thailand Ltd.	QMS; EMS; ISO 13485; ISO/IEC 17025; JISQ 9001:2000; HACCP; TL 9000; OHSAS; SA 8000; QS 9000

Table 3.2 List of CB in Thailand (Cont.)

Name of CB	Certification
United Registrar of Systems (Thailand) Limited	QMS; EMS; QS 9000
VTI (Bangkok) Ltd.	QMS; EMS; QS 9000; OHSAS 18000
Wit International Assessment (Thailand) Co., Ltd.	QMS; EMS; QS 9000; ISO/TS 16949; TL 9000; HACCP; CE; Organic Certificate and etc

Source : http//www.tisi.go.th, 2006, 24 July.

3.1.2 Samplings

a) EMS certified organizations

This research was done by the method of sampling collection from 1,183 target populations by post mail. Anyhow, it was found that in collecting data through distribution of questionnaires by post mail, there were several difficulties especially, a lot of questionnaires were not returned. However, there were still several advantage as well, e.g., ability to distribute the samples in wider range; samplings represent all populations; no necessity of field staff; rather low expenses per questionnaire; acquisition of answers with more disclosures to some kinds of questions like sexual matters; no interviewer bias; answer being the own expressions of persons responding to the questionnaires; having more time in making responses for doing in free time; and easier approaching to certain group of people. (Chinnawut Soontornseema, 1998:45)

To solve the aforesaid problem, it need complete samplings collection of all 1,183 target populations. Then taking all questionnaires returned as samples for doing research to find out statistical reliability based on Taro Yamane's as follows:

$$n = \frac{N}{1 + Ne^2}$$

Whereas n = Numbers of questionnaires returned

N = Total questionnaires distributed

e = Average acceptable deviations

Samples used for this research were 245 from total populations of 1,183. Substitutions were made as follows:

$$245 = \frac{1{,}183}{1 + 1{,}183e^2}$$

$$e = 0.056$$

Average acceptable deviation (e) was 0.056. In other words, numbers of samples used for this study had deviations of 5.6%.

b) Certification body

This research was done by sampling collection from 32 target populations by researcher. Unfortunately, it can be collected only 9 samples.

3.2 Research Instruments

The instrument that used to collect information was questionnaires which divide into 2 sets as follows:

3.2.1 Questionnaire for EMS certified organizations

To measure the attitude of certified organizations on external EMS audit, questionnaire was prepared with the following details:

Part 1 General information of entrepreneur

Part 2 General information of organization

Part 3 EMS certified of organization

Part 4 Attitude towards auditor

Part 5 Attitude towards external EMS audit

3.2.2 Questionnaire for CB

To collect general data and opinion about EMS certified of CB, questionnaire was prepared with the following details:

Part 1 General information of CB

Part 2 Qualification of auditor

Part 3 The opinion about CB in Thailand

3.3 Instrument verifications

After finished 2 sets of questionnaires and received the Commission on Controlling Thesis had been checked and corrected it, the questionnaires were pretested for 30 sets. The outcome was test reliability based on Cronbach Alpha Formula as follows: (Penkhae Sangkaew, 2001:7-5)

$$\alpha = \frac{N}{N-1}\left[1 - \frac{\Sigma S_i^2}{S_t^2}\right]$$

Whereas α = Coefficient Alpha

N = Number of questions

S_i^2 = Item variance

S_t^2 = Total test variance

The results of reliability, it found that attitude towards auditor test was 0.953 and attitude towards external EMS audit test was 0.938. Therefore, both of tests were acceptable level.

3.4 Data collection

The faculty of Environment and Resource Studies, Mahidol University provided the letter of recommendation asking for the cooperation from the target populations in answering the questionnaire. Researcher then sent out the questionnaire and the letter from the faculty of Environment and Resource studies, Mahidol University to the sample group by post mail, only questionnaires for EMS Certified organizations. Questionnaire was sent to the manager or director of the organizations

and returned by the person who answered them. The expectant duration in collecting information was in around 2 months. For questionnaires for CB, the researcher collected information.

3.5 Research variables

The analysis of variable relationship can be categorized as follows:

3.5.1 Independent variables

1. Independent variables on transaction factor of organization were type of industry, nationality of investment, proportion of investment, year of business operation, number of employees, value of manufacture, value of income within country, value of income in foreign country and percentage of quantity of export.

2. Independent variables on EMS certification of organization were using CB, the reason for using CB, expense of certified EMS, year of certified EMS and change CB.

3.5.2 Dependent variables or the attitude towards external EMS audit could be divided into 3 phases that was

Phase 1 Negative

Phase 2 Moderate

Phase 3 Positive

3.6 Data analysis

The information had been checked and coded to analyze by using statistics. The information analysis based on the statistic as follows:

3.6.1 General data analysis used descriptive statistics which were percentage, mean and standard deviation to analyze general information.

3.6.2 Estimate scale data analysis by evaluate one by one and determine points of each attitude as follow:

Attitudes	Points
very good, maximum	5
good, slightly high	4
fairly good, moderate	3
not good, minimum	2
bad, none	1

Basic statistics using mean and standard deviation show in summary data. Translation meaning of mean and determining standard showed how much mean and the meaning as follow:

Phase of mean	Translation meaning
4.51-5.00	very good, maximum
3.51-4.50	good, slightly high
2.51-3.50	fairly good, moderate
1.51-2.50	not good, minimum
1.00-1.50	bad, none

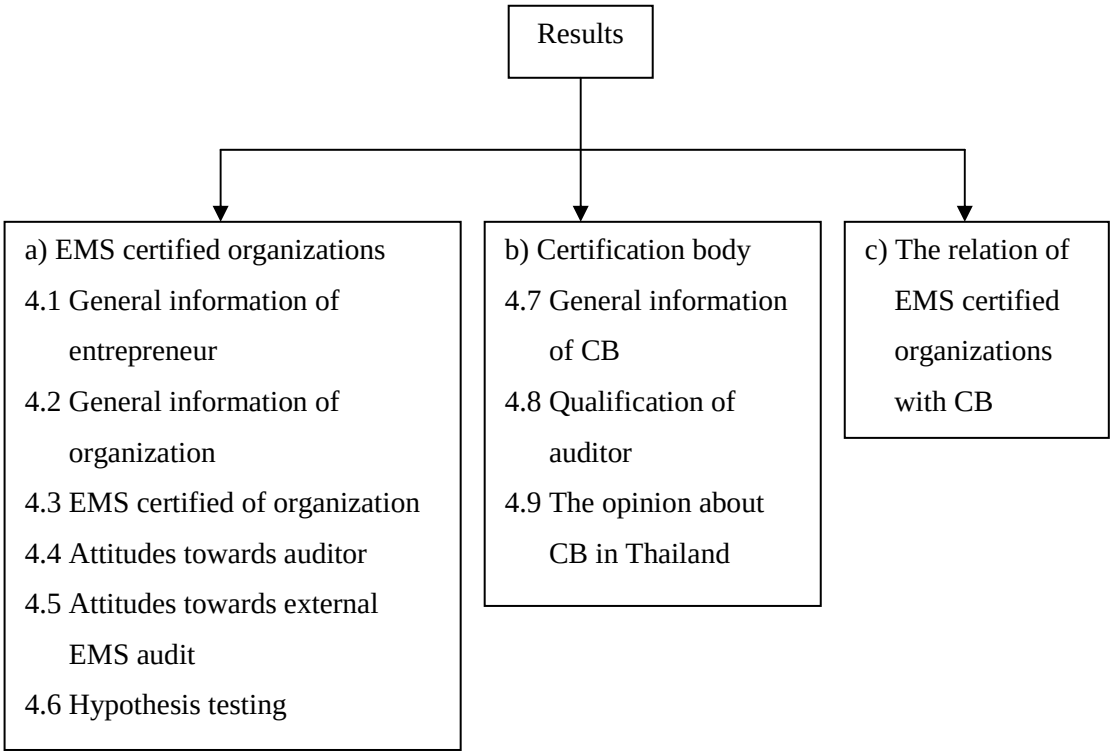
Source : Chusri Wongrattana, 1987: 85

3.6.3 Inferential statistic : chi-square was used for hypothesis testing

CHAPTER IV
RESULTS

From the study the advantages of certified organizations on external EMS audits was collected and complied from information done by the survey on various entrepreneur opinions. The total amount of entrepreneur was 245 organizations for EMS certified organizations and 9 companies for CB

The results can be concluded in diagram down below



a) EMS certified organizations

4.1 General information of entrepreneur

The main respondent of this study was male (62%). Almost were age group with 25-45 years and 37.58 years of average. Only 2.4% of respondents had age more than 55 years whereas 5.7% of them had age less than 25 years. Details were presented in table 4.1.

Almost of respondents had educational level with the bachelor's degree or equal to 64.9% and 29.4% of them with the master's degree. Only 0.4% of respondents had educational level less than or equal to secondary school. Details were presented in table 4.1.

Almost of respondents were in the position of manager and officer. Only 3.2% of respondents were in the position of director whereas 5.3% of them were in the position of engineer. Details were presented in table 4.1.

Almost of respondents had duration of working 0-5 years and 5.95 years of average. The next founding was duration of working 6-10 years or equal to 24.5%. Only 1.6% of respondents had duration of working more than 20 years whereas 4.5% of them had duration of working 16-20 years. Details were presented in table 4.1.

Almost of respondents had environmental working experience 0-5 years and 5.91 years of average. The next founding was environmental working experience 6-10 years or equal to 33.1%. Only 2.0% of respondents had environmental working experience 16-20 years whereas 6.1% of them had environmental working experience 11-15 years. Details were presented in table 4.1.

Table 4.1 General characteristics of entrepreneur

General characteristics	Number	Percentage	Mean
• Sex			-
- Male	152	62.0	
- Female	92	37.6	

Table 4.1 General characteristics of entrepreneur (Cont.)

General characteristics	Number	Percentage	Mean
• Age			37.58
- Less than 25 years	14	5.7	
- 25-35 years	96	39.2	
- 36-45 years	84	34.3	
- 46-55 years	40	16.3	
- More than 55 years	6	2.4	
• Educational level			-
- Less than or equal to secondary school	1	0.4	
- High school or vocation certificate program	3	1.2	
- High vocation certificate program	7	2.9	
- Bachelor's degree	159	64.9	
- Master's degree	72	29.4	
- Doctor's degree	3	1.2	
• Position			-
- Manager	102	41.6	
- Assistant manager	17	6.9	
- Director	8	3.2	
- Officer	98	40.0	
- Engineer	13	5.3	
• Duration of working			5.95
- 0-5 years	142	58.0	
- 6-10 years	60	24.5	
- 11-15 years	22	9.0	
- 16-20 years	11	4.5	
- More than 20 years	4	1.6	
• Environmental working experience			5.91
- 0-5 years	124	50.6	
- 6-10 years	81	33.1	
- 11-15 years	15	6.1	
- 16-20 years	5	2.0	

4.2 General information of organization

General information of organization from sampling group was categorized in the following items:

- Type of industry
- Nationality of investment
- Proportion of investment
- Year of business operation
- Number of employees
- Value of manufacture
- Value of income within country
- Value of income in foreign country
- Percentage of quantity of export
- The market to export

Type of industry

Almost of the organizations from sampling group was motor vehicles/transport equipment or equal to 11.4%. The next founding was electrical machinery and plastic product or equal to 10.6% and 7.3% respectively. (See detail as table 4.2)

Table 4.2 Type of industry of the organizations

Type of industry	Number	Percentage
Agriculture, Hunting and Forestry	1	0.4
Basic chemicals	1	0.4
Other chemical products	12	4.9
Plastic products	18	7.3
Cement/concrete	6	2.4
Metal products	12	4.9
Electrical machinery	26	10.6
Radio, TV, communication equipment	10	4.1
Motor vehicles/transport equipment	29	11.8
Education	6	2.4

Table 4.2 Type of industry of the organizations (Cont.)

Type of industry	Number	Percentage
Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats	10	4.1
Textiles	6	2.4
Leather/footwear	6	2.4
Paper & paper products	4	1.6
Petroleum products	12	4.9
Rubber products	6	2.4
Production of electricity	11	4.5
Manufacture of gas	1	0.4
Transport & supporting activities	1	0.4
Hospital	5	2.0
Basic iron/steel	6	2.4
Extraction of crude petroleum and natural gas	2	0.8
Publishing/printing	4	1.6
Ceramic/clay products	1	0.4
Precious/non ferrous metals	1	0.4
Office/accounting/computing machinery	1	0.4
Medical appliances	1	0.4
Collection, purification and distribution of water	1	0.4
Other food products	3	1.2
Recycling	2	0.8
Mining of coal	1	0.4
Beverages	1	0.4
Glass & glass products	2	0.8
Casting of metals	2	0.8
Furniture	2	0.8
Other manufacturing	10	4.1
Public administration	1	0.4
Other service activities	14	5.7
Total	245	100.0

Nationality of investment

Almost of the organizations from sampling group was invested by Thai that were 38.4%. The next founding was mutual investment that was 30.6% with Thai and Japanese were the highest amounts whereas 28.6% of them were invested by foreigners. (See detail as table 4.3)

Table 4.3 Nationality of investment of the organizations

Nationality of investment	Number	Percentage
The Thai	94	38.4
Foreigner	70	28.6
- German	2	2.9
- Canadian	2	2.9
- Taiwan	2	2.9
- Chinese	1	1.4
- Japanese	50	71.4
- French	1	1.4
- Swedish	2	2.9
- American	5	7.1
- English	4	5.7
- Hongkong	1	1.4
Mutual investment	75	30.6
- Thai and Korean	1	1.3
- Thai and Dutch	1	1.3
- Thai and Belgian	2	2.7
- Thai and Chinese	1	1.3
- Thai and Japanese	44	58.7
- Thai and Norwegian	1	1.3
- Thai and French	5	7.1
- Thai and Malaysian	1	1.3
- Thai and Swiss	2	2.7
- Thai and Singapore	2	2.7
- Thai and English	1	1.3

Table 4.3 Nationality of investment of the organizations (Cont.)

Nationality of investment	Number	Percentage
- Thai and Hongkong	2	2.7
- Missing	12	16.0
Total	239	97.6

Almost of the organizations from sampling group had proportion of investment more than 100 million baht that were 68.2%. Only 2.0% of them had proportion of investment less than 10 million baht. Details were presented in table 4.4.

Almost of the organizations had the year of business operation more than 10 years that were 82.0% whereas 15.9% of them had the year of business operation was between 5-10 years. Only 1.6% of them had the year of business operation less than 5 years. Details were presented in table 4.4.

Almost of the organizations had number of employees more than 500 persons that were 46.9%. The next founding was number of employee 201-500 persons and 50-200 persons or equal to 23.7% and 22.9%, move leeward. Only 6.5% of them had number of employees less than 50 persons. Details were presented in table 4.4.

Almost of the organizations had value of manufacture less than 1,000 million baht/year and 4,694 million baht/year of average. Only 4.1% of them had value of manufacture were between 3,001-5,000 million baht/year whereas 6.5% of them had value of manufacture more than 5,001 million baht/year. Details were presented in table 4.4.

Almost of the organizations had value of income within country less than 1,000 million baht/year and 3,542 million baht/year of average. Only 2.9% of them had value of income within country were between 3,001-5,000 million baht/year whereas 4.1% of them had value of income within country more than 5,001 million baht/year. Details were presented in table 4.4.

Almost of the organizations had value of income in foreign country less than 1,000 million baht/year and 1,588 million baht/year of average. Only 0.8% of them had value of income in foreign country were between 3,001-5,000 million baht/year whereas 2.9% of them had value of income in foreign country more than 5,001 million baht/year. Details were presented in table 4.4.

Almost of the organizations had percentage of quantity of export less than 20 and 41.97 of average. Only 4.5% of them had percentage of quantity of export were between 41-60 and 61-80 whereas 6.1% of them had percentage of quantity of export were between 21-40. Details were presented in table 4.4.

Table 4.4 General information of organization

General information	Number	Percentage	Mean
• Proportion of investment			-
- Less than 10 million baht	5	2.0	
- 10-50 million baht	43	17.6	
- 51-100 million baht	20	8.2	
- More than 100 million baht	167	68.2	
• Year of business operation			-
- Less than 5 years	4	1.6	
- 5-10 years	39	15.9	
- More than 10 years	201	82.0	
• Number of employees			-
- Less than 50 persons	16	6.5	
- 50-200 persons	56	22.9	
- 201-500 persons	58	23.7	
- More than 500 persons	115	46.9	
• Value of manufacture			4,694
- 0-1,000 million baht/year	61	24.9	
- 1,001-3,000 million baht/year	21	8.6	
- 3,001-5,000 million baht/year	10	4.1	
- More than 5,001 million baht/year	16	6.5	
• Value of income within country			3,542
- 0-1,000 million baht/year	64	26.1	
- 1,001-3,000 million baht/year	19	7.8	
- 3,001-5,000 million baht/year	7	2.9	
- More than 5,001 million baht/year	10	4.1	

Table 4.4 General information of organization (Cont.)

General information	Number	Percentage	Mean
• Value of income in foreign country			1,588
- 0-1,000 million baht/year	52	21.3	
- 1,001-3,000 million baht/year	14	5.7	
- 3,001-5,000 million baht/year	2	0.8	
- More than 5,001 million baht/year	7	2.9	
• Percentage of quantity of export			41.97
- 0-20	33	13.5	
- 21-40	15	6.1	
- 41-60	11	4.5	
- 61-80	11	4.5	
- 81-100	25	10.2	

The market to export

Almost of the organizations from sampling group had the market to export at Asia that were 49.8%. The next founding was Europe and North America that were 21.2% and 17.6% respectively whereas the organizations no export that were 22.4%. (See detail as table 4.5)

Table 4.5 The market to export of the organizations

The market to export	Number	Percentage
No export	55	22.4
Asia that is Japan, China, Malaysia, Indonesia, Singapore	122	49.8
North America that is USA, Canada	43	17.6
South America that is Brazil, Mexico	13	5.3
Europe that is England, France, Italy	52	21.2
Australia that is Australia	29	11.8
Africa that is Africa, Nigeria	11	4.5

Remark : More one answer, percentage was calculated from answerer 245 persons

4.3 EMS certified of organization

Almost of the organizations were certified from Management System Certification Institute (MASCI), BVQI (Thailand) Ltd. and AJA Registrars Ltd. that were 18.8%, 18.0% and 16.7% respectively. (See detail as table 4.6)

Table 4.6 Using CB of the organizations

CB	Number	Percentage
AJA Registrars Ltd.	41	16.7
BSI (Thailand) Ltd.	3	1.2
BVQI (Thailand) Ltd.	44	18.0
Certification (Thailand) Co., Ltd.	1	0.4
Det Norske Veritas (Thailand) Co., Ltd.	1	0.4
ERM Certification and Verification Services Limited	1	0.4
Japan Quality Assurance Organization through TQA Ltd.	8	3.3
LLoyd's Register Quality Assurance Ltd.	9	3.7
Management System Certification Institute (MASCI)	48	19.7
Moody International (Thailand)	15	6.1
NQA C.S. (Thailand) Co., Ltd.	1	0.4
SGS (Thailand) Ltd.	25	10.2
Thailand Institute of Scientific and Technological Research Office of Certification Body (TISTR-OCB)	4	1.6
TÜV NORD (Thailand) Ltd. (RWTÜV)	28	11.4
TÜV Rheinland Thailand Ltd.	1	0.4
Underwriters Laboratories Inc. International Inspection Co., Ltd.	1	0.4
United Registrar of System (Thailand) Ltd. (URS)	8	3.3
Other	6	2.4
Total	245	100.0

Almost of the organizations indicated that the reason for using CB that was reputation and trust of CB. (See detail as table 4.7)

Table 4.7 The reason for using CB of the organizations

The reason for using CB	**Number**			**Percentage**		
	First rank	**Second rank**	**Third rank**	**First rank**	**Second rank**	**Third rank**
Reputation	58	22	21	57.4	21.8	20.8
Need of the organizations	41	16	10	61.2	23.9	14.9
Low cost	23	24	16	36.5	38.1	25.4
Fast to certified	1	1	8	10.0	10.0	80.0
Acceptance in foreign country	28	41	24	30.1	44.1	25.8
High experiences	4	13	19	11.1	36.1	52.8
Trust of CB	55	64	39	34.8	40.5	24.7
Suggestion of consultant	6	4	4	42.9	28.6	28.6
Ever join working	13	9	17	33.3	23.1	43.6
Neutrality	3	7	5	20.0	46.7	33.3
Thai’s company	11	5	13	37.9	17.2	44.8
Total	245	245	245	33.3	33.3	33.3

The expense of certified EMS less than or equal to 100,000 baht were the highest amounts that were 35.5% and 162,365 baht of average. Only 5.3% of the organizations had the expense of certified EMS more than or equal to 300,001 baht whereas 22.9% of them had the expense of certified EMS were between 100,001-200,000 baht. Details were presented in table 4.8.

Almost of the organization was certified for 3-6 years and 4.84 years of average. Only 4.4% of them were certified for more than 8 years whereas 26.9% of them were certified for less than 3 years. Details were presented in table 4.8.

Almost of the organization never change CB. Only 13.9% of them have ever change CB and almost of them change 2 times. Details were presented in table 4.8.

Table 4.8 EMS certified information of organization

EMS certified	Number	Percentage	Mean
• The expense of certified EMS			162,365
- 0-100,000 baht	87	35.5	
- 100,001-200,000 baht	56	22.9	
- 200,001-300,000 baht	19	7.8	
- 300,001-400,000 baht	3	1.2	
- 400,001-500,000 baht	3	1.2	
- More than 500,001 baht	7	2.9	
• Year of certified EMS			4.84
- 0-1 year	13	5.3	
- More than 1-2 years	25	10.2	
- More than 2-3 years	28	11.4	
- More than 3-4 years	41	16.7	
- More than 4-5 years	39	15.9	
- More than 5-6 years	42	17.1	
- More than 6-7 years	23	9.4	
- More than 7-8 years	16	6.5	
- More than 8-9 years	5	2.0	
- More than 9-10 years	5	2.0	
- More than 10-11 years	0	0.0	
- More than 11-12 years	1	0.4	
• Change CB			-
- Never	211	86.1	
- Ever	34	13.9	
▪ 1 time	12	35.3	
▪ 2 times	21	61.8	
▪ 3 times	1	2.9	

4.4 Attitude towards auditor

Table 4.9 Attitude towards auditor

Topic	Attitudes					Mean
	Very good	Good	Fairly good	Not good	Bad	
1. Management time for audit or on time	63 (25.6)	162 (65.9)	20 (8.5)	0 (0.0)	0 (0.0)	4.17
2. Communication ability	53 (21.4)	162 (65.9)	30 (12.7)	0 (0.0)	0 (0.0)	4.09
3. Teamwork ability	50 (20.6)	169 (68.8)	24 (9.8)	2 (0.8)	0 (0.0)	4.09
4. Friendly characteristic	87 (35.2)	140 (57.5)	17 (6.9)	1 (0.4)	0 (0.0)	4.27
5. Perseverance, forbear and elastic	44 (18.1)	161 (65.6)	38 (15.5)	1 (0.4)	1 (0.4)	4.00
6. Discipline	58 (23.9)	165 (67.0)	21 (8.7)	1 (0.4)	0 (0.0)	4.14
7. Good attitude	45 (18.5)	172 (69.9)	27 (11.2)	1 (0.4)	0 (0.0)	4.06
8. Self confidence	50 (20.6)	172 (69.9)	21 (8.7)	2 (0.8)	0 (0.0)	4.10
9. Opportunity for audittee's question	86 (34.9)	141 (57.8)	17 (6.9)	1 (0.4)	0 (0.0)	4.27
10. Generosity and accept the opinion of audittee	71 (28.9)	148 (60.5)	24 (9.8)	2 (0.8)	0 (0.0)	4.17
11. Good preparation in auditing	55 (22.8)	155 (63.3)	35 (13.9)	0 (0.0)	0 (0.0)	4.09
12. Audit document completely in line with ISO 14001	62 (25.3)	152 (61.6)	30 (12.7)	1 (0.4)	0 (0.0)	4.12
13. Knowledge and understanding in operational organization	46 (19.2)	162 (65.9)	34 (13.7)	3 (1.2)	0 (0.0)	4.02
14. Knowledge and understanding in environment	94 (38.1)	139 (57.0)	11 (4.5)	1 (0.4)	0 (0.0)	4.33

Table 4.9 Attitude towards auditor (Cont.)

Topic	Attitudes					Mean
	Very good	Good	Fairly good	Not good	Bad	
15. Knowledge environmental legal and other requirements	90 (36.7)	139 (57.0)	16 (6.3)	0 (0.0)	0 (0.0)	4.30
16. Knowledge and understanding in ISO 14001	127 (51.8)	111 (45.3)	7 (2.9)	0 (0.0)	0 (0.0)	4.49
17. Good skill in audit	76 (31.3)	153 (62.4)	16 (6.3)	0 (0.0)	0 (0.0)	4.25
18. Cleverness and systematic analysis	53 (21.7)	163 (66.4)	29 (11.9)	0 (0.0)	0 (0.0)	4.10
19. Fair and no biased	46 (18.8)	175 (71.4)	19 (7.8)	5 (2.0)	0 (0.0)	4.08
20. Independence	65 (26.6)	163 (66.5)	15 (6.1)	2 (0.8)	0 (0.0)	4.20
21. Sagacity and mend immediate problem	39 (15.9)	183 (74.7)	21 (8.6)	2 (0.8)	0 (0.0)	4.06
22. Suggestion for finding faults	66 (26.9)	150 (61.3)	27 (11.0)	2 (0.8)	0 (0.0)	4.15
23. Explanation for finding faults	49 (20.0)	169 (69.0)	24 (9.8)	2 (0.8)	1 (0.4)	4.08
24. Discussion for finding faults	50 (20.6)	163 (66.5)	29 (11.7)	3 (1.2)	0 (0.0)	4.07
25. Proficiency in audit	62 (25.3)	163 (66.5)	20 (8.2)	0 (0.0)	0 (0.0)	4.17
Total						4.15

Remarks : The numbers were in bracket were percentage

Phase of mean was between 4.51-5.00 was very good

Phase of mean was between 3.51-4.50 was good

Phase of mean was between 2.51-3.50 was fairly good

Phase of mean was between 1.51-2.50 was not good

Phase of mean was between 1.00-1.50 was bad

From table 4.9, it showed that mean of attitude towards auditor was 4.15, therefore attitudes towards auditor was good.

Table 4.10 Mean and standard deviation of attitude towards auditor

Topic	Mean	Standard Deviation	Attitudes	Rank
1. Management time for audit or on time	4.17	0.55	Good	7
2. Communication ability	4.09	0.57	Good	12
3. Teamwork ability	4.09	0.57	Good	12
4. Friendly characteristic	4.27	0.60	Good	4
5. Perseverance, forbear and elastic	4.00	0.62	Good	17
6. Discipline	4.14	0.57	Good	9
7. Good attitude	4.06	0.55	Good	15
8. Self confidence	4.10	0.56	Good	11
9. Opportunity to audittee's question	4.27	0.60	Good	4
10. Generosity and accept the opinion of audittee	4.17	0.62	Good	7
11. Good preparation in auditing	4.09	0.60	Good	12
12. Audit document completely in line with ISO 14001	4.12	0.62	Good	10
13. Knowledge and understanding in operational organization	4.02	0.61	Good	16
14. Knowledge and understanding in environment	4.33	0.57	Good	2
15. Knowledge environmental legal and other requirements	4.30	0.59	Good	3
16. Knowledge and understanding in ISO 14001	4.49	0.55	Good	1
17. Good skill in audit	4.25	0.56	Good	5
18. Cleverness and systematic analysis	4.10	0.57	Good	11
19. Fair and no biased	4.08	0.57	Good	13
20. Independence	4.20	0.55	Good	6
21. Sagacity and mend immediate problem	4.06	0.51	Good	15
22. Suggestion for finding faults	4.15	0.61	Good	8
23. Explanation for finding faults	4.08	0.59	Good	13
24. Discussion for finding faults	4.07	0.59	Good	14
25. Proficiency in audit	4.17	0.55	Good	7

From table 4.10, it showed that all attitudes towards auditor were good. The highest mean was knowledge and understanding in ISO 14001 that was 4.49. The next founding was knowledge and understanding in environment and knowledge environmental legal and other requirements that were 4.33 and 4.30 respectively. Whereas the lowest mean was perseverance, forbear and elastic that was 4.00. The next founding was knowledge and understanding in operational organization and good attitude equal to sagacity and mend immediate problem that were 4.02 and 4.06 respectively.

4.5 Attitude towards external EMS audit

Table 4.11 Attitude towards external EMS audit

Topic	Attitudes					Mean
	Maxi-mum	Slightly High	Moderate	Mini-mum	None	
1. Using resources efficiency	40 (16.3)	119 (48.6)	81 (33.1)	4 (1.6)	1 (0.4)	3.79
2. Environmental problem decrease	62 (25.3)	140 (57.2)	39 (15.9)	4 (1.6)	0 (0.0)	4.06
3. Decreasing of released wastes to environment	59 (24.1)	133 (54.2)	46 (18.8)	7 (2.9)	0 (0.0)	4.00
4. Re-using wastes	35 (14.3)	90 (37.7)	96 (39.2)	23 (9.4)	1 (0.4)	3.55
5. Decreasing of risk to health and safety	52 (21.2)	140 (57.2)	50 (20.4)	3 (1.2)	0 (0.0)	3.98
6. Save of electric, water and other resources	53 (21.6)	107 (43.6)	79 (32.2)	6 (2.4)	0 (0.0)	3.84
7. Cost for disposal wastes decrease	25 (10.2)	81 (33.1)	102 (41.6)	30 (12.2)	7 (2.9)	3.35
8. Products have higher price	13 (5.3)	34 (13.9)	94 (38.4)	66 (26.9)	38 (15.5)	2.66
9. Production has lower cost	10 (3.8)	53 (21.6)	120 (49.1)	50 (20.9)	12 (4.6)	3.00
10. Higher profit because production has lower cost	4 (1.6)	54 (22.0)	118 (48.2)	57 (23.3)	12 (4.9)	2.91
11. Marketing ratio increase	17 (6.9)	48 (19.6)	107 (43.7)	48 (19.6)	25 (10.2)	2.93
12. Business opportunity increase	26 (10.6)	83 (33.9)	92 (37.5)	31 (12.7)	13 (5.3)	3.32
13. Increasing of income from sell wastes	14 (5.7)	47 (19.1)	93 (38.0)	69 (28.2)	22 (9.0)	2.84

Table 4.11 Attitude towards external EMS audit (Cont.)

Topic	Attitudes					Mean
	Maxi-mum	Slightly high	Moderate	Mini-mum	None	
14. New products from transform wastes	6 (2.4)	29 (11.8)	73 (29.8)	81 (33.1)	56 (22.9)	2.38
15. Medical treatment cost decrease	10 (4.1)	32 (13.1)	121 (49.2)	62 (25.3)	20 (8.3)	2.80
16. The organization comply with legal and requirements easy	68 (27.8)	132 (53.9)	40 (16.3)	3 (1.2)	2 (0.8)	4.07
17. Image of organization to society better	85 (34.7)	119 (48.6)	39 (15.9)	2 (0.8)	0 (0.0)	4.18
18. Product increase	16 (6.5)	41 (16.8)	119 (48.6)	51 (20.8)	18 (7.3)	2.93
19. Abroad marketing increase	14 (5.7)	51 (20.8)	86 (35.2)	53 (21.6)	41 (16.7)	2.75
20. Employees have good relationship	18 (7.3)	70 (28.6)	129 (52.7)	26 (10.6)	2 (0.8)	3.31
21. Systematic administration	41 (16.7)	131 (53.5)	68 (27.8)	4 (1.6)	1 (0.4)	3.84
22. Good relationship between government sector, community and free organization	44 (18.0)	122 (49.8)	68 (27.8)	10 (4.0)	1 (0.4)	3.81
23. Development technology to useful wastes	19 (7.7)	82 (33.5)	98 (40.0)	41 (16.8)	5 (2.0)	3.27
24. Trust of the organizations	67 (27.4)	126 (51.4)	49 (20.0)	3 (1.2)	0 (0.0)	4.05
25. Exchange information between factories easily	26 (10.6)	97 (39.6)	90 (36.7)	25 (10.2)	7 (2.9)	3.46

Table 4.11 Attitude towards external EMS audit (Cont.)

Topic	Attitudes					Mean
	Maxi-Mum	Slightly high	Moderate	Mini-mum	None	
26. Gain to compete with same business organization	40 (16.3)	81 (33.1)	84 (34.3)	27 (11.0)	13 (5.3)	3.44
27. Awareness of employees in environmental policy and responsibility	52 (21.2)	137 (55.9)	51 (20.8)	4 (1.6)	1 (0.4)	3.96
28. Communication is easy and clear	40 (16.3)	131 (53.5)	66 (26.9)	6 (2.4)	2 (0.8)	3.82
29. Document system is clear	54 (22.0)	138 (56.3)	48 (19.6)	4 (1.6)	1 (0.4)	3.98
30. Continual improvement	56 (22.9)	136 (55.5)	52 (21.2)	0 (0.0)	1 (0.4)	4.00
31. Sustainable development	57 (23.3)	124 (50.6)	60 (24.5)	3 (1.2)	1 (0.4)	3.95
32. Waste time for working	6 (2.4)	19 (7.8)	81 (33.1)	107 (43.7)	32 (13.1)	2.43
33. Personnel preparation is burden	4 (1.6)	20 (8.2)	105 (42.8)	92 (37.6)	24 (9.8)	2.54
34. Document preparation is burden	7 (2.9)	35 (14.3)	98 (40.0)	83 (33.9)	22 (9.0)	2.68
35. Place preparation is burden	3 (1.2)	23 (9.4)	86 (35.1)	104 (42.4)	29 (11.8)	2.46
36. Audit step is difficult and complicated	4 (1.6)	17 (6.9)	90 (36.7)	102 (41.6)	32 (13.1)	2.41
Total						3.35

Remarks : The numbers were in bracket were percentage
Phase of mean was between 4.51-5.00 was maximum
Phase of mean was between 3.51-4.50 was slightly high
Phase of mean was between 2.51-3.50 was moderate
Phase of mean was between 1.51-2.50 was minimum
Phase of mean was between 1.00-1.50 was none

From table 4.11, it showed that mean of attitude towards external EMS audit was 3.35, therefore attitude towards external EMS audit was moderate.

Table 4.12 Mean and standard deviation of attitude towards external EMS audit

Topic	Mean	Standard Deviation	Attitudes	Rank
1. Using resources efficiency	3.79	0.74	Slightly high	12
2. Environmental problem decrease	4.06	0.69	Slightly high	3
3. Decreasing of released wastes to environment	4.00	0.74	Slightly high	5
4. Re-using wastes	3.55	0.86	Slightly high	13
5. Decreasing of risk to health and safety	3.98	0.68	Slightly high	6
6. Save of electric, water and other resources	3.84	0.78	Slightly high	9
7. Decreasing cost for disposal wastes	3.35	0.92	Moderate	16
8. Products have higher price	2.66	1.07	Moderate	27
9. Production has lower cost	3.00	0.87	Moderate	20
10. Higher profit because production has lower cost	2.91	0.84	Moderate	22
11. Marketing ratio increase	2.93	1.05	Moderate	21
12. Increasing business opportunity	3.32	1.00	Moderate	17
13. Increasing income from sell wastes	2.84	1.02	Moderate	23
14. New products from transform wastes	2.38	1.04	Minimum	31
15. Medical treatment cost decrease	2.80	0.91	Moderate	24
16. The organization comply with legal and requirements easy	4.07	0.75	Slightly high	2

Table 4.12 Mean and standard deviation of attitude towards external EMS audit (Cont.)

Topic	Mean	Standard Deviation	Attitudes	Rank
17. Image of organization to society better	4.18	0.71	Slightly high	1
18. Product increase	2.93	0.97	Moderate	21
19. Abroad marketing increase	2.75	1.13	Moderate	25
20. Employees have good relationship	3.31	0.79	Moderate	18
21. Systematic administration	3.84	0.73	Slightly high	9
22. Good relationship between government sector, community and free organization	3.81	0.79	Slightly high	11
23. Development technology to useful wastes	3.27	0.90	Moderate	19
24. Trust of the organization	4.05	0.72	Slightly high	4
25. Exchange information between factories easily	3.46	0.91	Moderate	14
26. Gain to compete with same business organization	3.44	1.06	Moderate	15
27. Awareness of employees in environmental policy and responsibility	3.96	0.72	Slightly high	7
28. Communication is easy and clear	3.82	0.75	Slightly high	10
29. Document system is clear	3.98	0.72	Slightly high	6
30. Continual improvement	4.00	0.69	Slightly high	5
31. Sustainable development	3.95	0.75	Slightly high	8
32. Waste time for working	2.43	0.90	Minimum	30
33. Personnel preparation is burden	2.54	0.84	Moderate	28
34. Document preparation is burden	2.68	0.93	Moderate	26
35. Place preparation is burden	2.46	0.86	Minimum	29
36. Audit step is difficult and complicated	2.43	0.87	Minimum	30

From table 4.12, it showed that attitude towards external EMS audit was different and from table 4.12, if found mean of attitude towards external EMS audit was 3.35 therefore, it can be summarized that attitudes towards external EMS audit was moderate. The highest mean was image of organization to society better that was 4.18. The next founding was the organization complies with legal and requirements easy and environmental problem decrease that were 4.07 and 4.06 respectively. Whereas the lowest mean was new products from transform wastes that was 2.38. The next founding was products have higher price and abroad marketing increase that were 2.66 and 2.75 respectively.

Furthermore, it showed that disadvantage of external EMS audit as waste time for working, audit step is difficult and complicated, place preparation had attitudes was minimum. For personnel preparation and document preparation had attitude was moderate.

From the 245 questionnaires responses, 224 respondents indicated that they will use the same CB in the future whereas 16 of them will change CB.

4.6 Hypothesis testing

4.6.1 Transaction factors of organization

Table 4.13 The analysis on the relation of type of industry with attitude towards external EMS audit

Type of industry	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Heavy industry	7	10	14	31
Motor vehicles/transport	6	8	15	29
Food products and beverage	3	5	7	15
Iron/Metal products	3	5	10	18
Chemical/plastic products	5	12	13	30
Electrical machinery	8	12	17	37
Other manufacturing	5	14	20	39
Service activities	3	9	13	25
Total	40	75	109	224
χ^2 = 3.586 Significant = 0.997				

From table 4.13, the analysis relationship of chi-square at 3.586, it means the analysis on the relationship of type of industry with attitude towards external EMS audit had the non significant different level at 0.05.

Remarks

1. Type of industry was divided into 8 groups which were

1.1 Heavy industry consists of cement/concrete, petroleum products, extraction of crude petroleum and natural gas, manufacture of gas and mining of coal.

1.2 Motor vehicles/transport consists of motor vehicles/transport equipment and maintenance and repair of motor vehicles.

1.3 Food products and beverage consist of agriculture, hunting and forestry, production, processing and preservation of meat, fish, fruit, vegetables, oils and fats, other food products and beverages.

1.4 Iron/Metal products consist of metal products, basic iron/steel, precious/non ferrous metals and casting of metals.

1.5 Chemical/plastic products consist of basic chemicals, other chemical products and plastic products.

1.6 Electrical machinery consists of electrical machinery, production of electricity.

1.7 Other manufacturing consist of textiles, leather/footwear, paper products, rubber products, ceramic/clay products, recycling, glass products and furniture.

1.8 Service activities consist of radio, TV, communication equipment, education, transport & supporting activities, hospital, publishing/printing, office/accounting, medical appliances, collecting, purification and distribution of water and public administration.

2. Attitude was divided into 3 groups which were

2.1 Positive was maximum and slightly high

2.2 Moderate

2.3 Negative was minimum and none

Table 4.14 The analysis on the relation of nationality of investment with attitude towards external EMS audit

Nationality of investment	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Thai	19	32	43	94
Foreigner	15	23	33	71
Mutual investment	14	25	37	76
Total	48	80	113	241
χ^2 = 0.259 Significant = 0.992				

From table 4.14, the analysis relationship of chi-square at 0.259, it means the analysis on the relationship of nationality of investment with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.15 The analysis on the relation of proportion of investment with attitude towards external EMS audit

Proportion of investment	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Less than 50 million baht	10	16	22	48
50-100 million baht	4	8	8	20
More than 100 million baht	32	55	80	167
Total	46	79	110	235
χ^2 = 0.573 Significant = 0.966				

From table 4.15, the analysis relationship of chi-square at 0.573, it means the analysis on the relationship of proportion of investment with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.16 The analysis on the relation of year of business operation with attitude towards external EMS audit

Year of business operation	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Less than or equal to 10 years	8	14	21	43
More than 10 years	40	66	94	200
Total	48	80	115	243
χ^2 = 0.062 Significant = 0.969				

From table 4.16, the analysis relationship of chi-square at 0.062, it means the analysis on the relationship of year of business operation with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.17 The analysis on the relation of number of employees with attitude towards external EMS audit

Number of employees	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Less than 50 persons	4	4	8	16
50-200 persons	11	19	26	56
201-500 persons	10	21	27	58
More than 500 persons	23	37	54	114
Total	48	81	115	244
χ^2 = 0.969 Significant = 0.987				

From table 4.17, the analysis relationship of chi-square at 0.969, it means the analysis on the relationship of number of employees with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.18 The analysis on the relation of value of manufacture with attitude towards external EMS audit

Value of manufacture	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
0-1,000 million baht/year	12	25	24	61
1,001-3,000 million baht/year	3	6	11	20
More than 3,001 million baht/year	7	7	12	26
Total	22	38	47	107
χ^2 = 2.941 Significant = 0.568				

From table 4.18, the analysis relationship of chi-square at 2.941, it means the analysis on the relationship of value of manufacture with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.19 The analysis on the relation of value of income within country with attitude towards external EMS audit

Value of income within Country	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
0-1,000 million baht/year	11	25	28	64
1,001-3,000 million baht/year	4	5	10	19
More than 3,001 million baht/year	6	5	5	16
Total	21	35	43	99
χ^2 = 4.173 Significant = 0.383				

From table 4.19, the analysis relationship of chi-square at 4.173, it means the analysis on the relationship of value of income within country with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.20 The analysis on the relation of value of income in foreign country with attitude towards external EMS audit

Value of income in foreign country	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
0-1,000 million baht/year	10	20	22	52
1,001-3,000 million baht/year	3	4	7	14
More than 3,001 million baht/year	1	3	5	9
Total	14	27	34	75
χ^2 = 1.041 Significant = 0.904				

From table 4.20, the analysis relationship of chi-square at 1.041, it means the analysis on the relationship of value of income in foreign country with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.21 The analysis on the relation of percentage of quantity of export with attitude towards external EMS audit

Percentage of quantity of export	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
0-40	9	17	21	47
41-80	6	7	9	22
81-100	5	9	11	25
Total	20	33	41	94
χ^2 = 0.630 Significant = 0.960				

From table 4.21, the analysis relationship of chi-square at 0.630, it means the analysis on the relationship of percentage of quantity of export with attitude towards external EMS audit had the non significant different level at 0.05.

4.6.2 EMS certification of organization

Table 4.22 The analysis on the relation of using CB with attitude towards external EMS audit

Using CB	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Europe	33	56	77	166
Asia	13	23	36	72
Total	46	76	113	238
X^2 = 0.273 Significant = 0.872				

From table 4.22, the analysis relationship of chi-square at 0.273, it means the analysis on the relationship of using CB with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.23 The analysis on the relation of the reason for using CB with attitude towards external EMS audit

The reason for using CB	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Need of the organizations	11	19	29	59
Quality of CB	31	49	77	157
Low cost	4	11	7	22
Total	46	79	113	238
χ^2 = 3.371 Significant = 0.498				

From table 4.23, the analysis relationship of chi-square at 3.371, it means the analysis on the relationship of the reason for using CB with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.24 The analysis on the relation of expense of certified EMS with attitude towards external EMS audit

Expense of certified EMS	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
0-100,000 baht	17	29	40	86
100,001-200,000 baht	12	18	25	55
More than 200,001 baht	6	12	14	32
Total	35	59	79	173
χ^2 = 0.295 Significant = 0.990				

From table 4.24, the analysis relationship of chi-square at 0.295, it means the analysis on the relationship of expense of certified EMS with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.25 The analysis on the relation of year of certified EMS with attitude towards external EMS audit

Year of certified EMS	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
0-3 year	9	22	33	64
More than 3-6 years	26	39	56	121
More than 6 years	8	17	24	49
Total	43	78	113	234
χ^2 = 1.738 Significant = 0.784				

From table 4.25, the analysis relationship of chi-square at 1.738, it means the analysis on the relationship of year of certified EMS with attitude towards external EMS audit had the non significant different level at 0.05.

Table 4.26 The analysis on the relation of change CB with attitude towards external EMS audit

Change CB	**Attitudes**			**Total**
	Positive	**Moderate**	**Negative**	
Never	42	69	99	210
Ever	6	11	15	32
Total	48	80	114	242
χ^2 = 0.042 Significant = 0.979				

From table 4.26, the analysis relationship of chi-square at 0.042, it means the analysis on the relationship of change CB with attitude towards external EMS audit had the non significant different level at 0.05.

b) Certification body

4.7 General information of CB

This is the general information of CB that can be categorized:

Table 4.27 The establishment and years of business operation

CB	Establishment		Years of business operation (Years)
	Country	Ratio	
AJA Registrars Ltd.	Thai and English	50:50	10
AFAQ/Best CERT (Thailand) Co., Ltd.	Taiwan	100	5
BSI Certification Services (Thailand) Ltd.	English	100	5
Intertek Testing Services (Thailand) Ltd.	Thai	100	10
Lloyd's Register Quality Assurance Ltd.	English	100	20
Moody International (Thailand) Ltd.	English	100	10
TQA Ltd.	Japanese	100	5
TUV NORD (Thailand) Limited	German	100	10
Wit International Assessment (Thailand) Co., Ltd.	Chinese	100	6

Table 4.27 showed the establishment and the duration in business of CB that were used in this study. This sampling group can be described:

Almost of CB were found by foreigner except AJA Registrars Ltd. was found by Thai and foreign and Intertek Testing Services (Thailand) Ltd. was found by Thai.

Lloyd's Register Quality Assurance Ltd. had the longest duration in business that was 20 years whereas AJA Registrars Ltd., Intertek Testing Services (Thailand) Ltd., Moody International (Thailand) Ltd. and TUV NORD (Thailand) Limited had the duration in business for 10 years. Details were presented in table 4.27.

Table 4.28 The numbers of employees and number of certified EMS organizations were handled by their CB

CB	Number of employees (persons)	Number of Auditors (persons)			Number of certified EMS organizations (organizations)
		Full-Time	Part-time	Total	
AJA Registrars Ltd.	21	6	15	21	127
AFAQ/Best CERT (Thailand) Co., Ltd.	8	1	7	8	20
BSI Certification Services (Thailand) Ltd.	9	4	4	8	27
Intertek Testing Services (Thailand) Ltd.	15	5	7	12	50
Lloyd's Register Quality Assurance Ltd.	-	10	1	11	60
Moody International (Thailand) Ltd.	28	8	15	23	300
TQA Ltd.	13	7	-	7	30
TUV NORD (Thailand) Limited	38	27	-	27	120
Wit International Assessment (Thailand) Co., Ltd.	-	-	-	-	50

Table 4.28 showed number of employees and number of certified EMS organizations was handled by their CB that was used in this study. This sampling group can be described:

CB had the highest amounts of number of employees was TUV NORD (Thailand) Limited that was 38 persons by total auditors 27 persons with full-time whereas Moody International (Thailand) Ltd. had total auditors 23 persons, there was 8 persons were full-time and 15 persons were part-time. Details were presented in table 4.28.

Moody International (Thailand) Ltd. had the highest amounts of certified EMS organizations that were 300 organizations whereas AJA Registrars Ltd. and TUV NORD (Thailand) Limited, there were 127 organizations and 120 organizations respectively. Details were presented in table 4.28.

4.8 Qualification of auditor

Table 4.29 General characteristics of auditor

General characteristics	Number	Percentage	Mean
• Sex			-
- Male	18	58.1	
- Female	10	32.3	
• Age			40.16
- 25-35 years	7	22.6	
- 36-45 years	14	45.2	
- 46-55 years	3	9.7	
- More than 55 years	1	3.2	
• Educational level			-
- Bachelor's degree	17	54.8	
▪ Management degree	1	5.9	
▪ Engineer science	9	52.9	
▪ Science	7	41.2	
- Master's degree	9	29.0	
▪ Engineer science	5	55.5	
▪ Science	4	44.4	
- Doctor's degree	2	6.5	
▪ Science	2	100.0	
• Duration of working			
- 0-10 years	7	25.0	15.7
- 11-20 years	15	53.57	
- 21-30 years	5	17.86	
- 31-40 years	1	3.57	

Table 4.29 General characteristics of auditor (Cont.)

General characteristics	Number	Percentage	Mean
• Environmental working experiences			6.8
- 0-5 years	9	29.0	
- 6-10 years	13	42.0	
- 11-15 years	5	16.1	
• Audit experiences			2.0
- 0-5 years	15	48.4	
- 6-10 years	12	38.7	
- 11-15 years	1	3.2	
• Training courses			-
- As per 19011	5	16.1	
- As per food sector require	1	3.2	
- ISO 14001 Lead auditor	19	61.3	

From table 4.29, it found auditors were male more than female. Almost of auditors were age group with 36-45 years and 40.16 years of average. Only 3.2% of them had age more than 55 years whereas 9.7% of them had age 46-55 years.

Almost of auditors had educational level with the bachelor's degree or equal to 54.8% and 29.0% of them with the master's degree. Only 6.5% of auditors had educational level with doctor's degree.

Almost of auditors had duration of working 11-20 years and 15.7 years of average. Only 3.57% of auditors had duration of working more than 31 years whereas 17.86% of them had duration of working 21-30 years.

Almost of auditors had environmental working experience 6-10 years and 6.8 years of average. Only 16.1% of auditors had environmental working experience more than 11 years.

Almost of auditors had audit experience less than 5 years and 2.0 years of average. Only 3.2 % of auditors had environmental working experience more than 11 years whereas 38.7% of them had environmental working experience 6-10 years.

From the 9 questionnaires responses, the respondents indicated that almost of auditors were trained with ISO 14001 Lead auditor.

4.9 The opinion about CB in Thailand

From the 9 questionnaires responses, 5 respondents indicated that the number of CB at present was suitable (55.6%) whereas 4 respondents indicated that it was too much. (See detail in table 4.30)

Table 4.30 The suitability of CB at present

The suitability of CB	Number	Percentage
Yes	5	55.6
No	4	44.4
- Too few	0	0.0
- Too much	4	100.0
Total	9	100.0

The respondents indicated that the first of problem of CB at present was low cost and neglect importance of audit. The second rank and the third rank was neglect importance of audit. (See detail in table 4.31)

Table 4.31 The problems of CB at present

The problems of CB	Number			Total	Percentage		
	First rank	Second rank	Third rank		First rank	Second rank	Third rank
Easy to certified	1	2	2	5	20.0	40.0	40.0
Low cost	3	1	1	5	60.0	20.0	20.0
Competition (many CBs)	2	1	1	4	50.0	25.0	25.0
Employ new graduate auditor	0	2	2	4	0.0	50.0	50.0
Neglect importance of audit	3	3	3	9	33.3	33.3	33.3

Educational level

From the 9 questionnaires responses, 8 respondents indicated that educational level of auditors was suitable (88.9%) whereas 1 respondent indicated that it was too much. (See detail in table 4.32)

Working experiences

From the 9 questionnaires responses, 8 respondents indicated that working experiences of auditors was suitable (88.9%) whereas 1 respondent indicated that it was too much. (See detail in table 4.32)

Environmental working experiences

From the 9 questionnaires responses, 6 respondents indicated that environmental working experiences of auditors was suitable (66.7%) whereas 3 respondents indicated that it was too few. (See detail in table 4.32)

Training courses

From the 9 questionnaires responses, 8 respondents indicated that training courses of auditors was suitable (88.9%) whereas 1 respondent indicated that it was too few. (See detail in table 4.32)

Audit experiences

From the 9 questionnaires responses, 7 respondents indicated that audit experiences of auditors was suitable (77.8%) whereas 2 respondents indicated that it was too few. (See detail in table 4.32)

Table 4.32 Qualifications of auditor

Qualifications of auditor	Suitable	Percentage	Not suitable	Percentage	Total
Educational level	8	88.9	1	11.1	9
Working experiences	8	88.9	1	11.1	9
Environmental working experiences	6	66.7	3	33.3	9
Training courses	8	88.9	1	11.1	9
Audit experiences	7	77.8	2	22.2	9

The respondents indicated that the first of reason for using service of them was trust. The second rank was acceptance in foreign country and trust. And the third rank was need of the organizations, acceptance in foreign country and knowledge, ability and experiences. (See detail in table 4.33)

If we consider total 3 ranks, it found that the most reason was acceptance in foreign country and trust.

Table 4.33 The reasons for using their CB

The reasons for Using service	Number			Total	Percentage		
	First Rank	Second Rank	Third Rank		First rank	Second Rank	Third rank
Reputation	2	1	0	3	66.7	33.3	0.0
Need of the organizations	0	0	2	2	0.0	0.0	100.0
Low cost	1	1	1	3	33.3	33.3	33.3
Fast to certified	1	0	0	1	100.0	0.0	0.0
Acceptance in foreign country	2	2	2	6	33.3	33.3	33.3
Trust	3	2	1	6	50.0	33.3	16.7
Ever join working before	0	1	0	1	0.0	100.0	0.0
Neutrality	0	1	1	2	0.0	50.0	50.0
Knowledge, ability and experiences	0	1	2	3	0.0	33.3	66.7

The respondents indicated that the first of factors affect to select CB was strictness to certified. The second rank was CB accreditation and the third rank was the experience. (See detail in table 4.34)

Table 4.34 The factors affect to select CB

The factors	Number			Total	Percentage		
	First Rank	Second Rank	Third Rank		First rank	Second Rank	Third rank
Cost	2	1	0	3	66.7	33.3	0.0
The experience	2	2	3	7	28.6	28.6	42.8
Duration in business	0	0	1	1	0.0	0.0	100.0
Number of certified EMS organizations were handled by their CB	0	1	1	2	0.0	50.0	50.0
CB accreditation	0	4	1	5	0.0	80.0	20.0
Qualification of auditor	1	1	2	4	25.0	25.0	50.0
Strictness to certified	4	0	1	5	80.0	0.0	20.0

From the 9 questionnaires responses, all of respondents indicated that CB contribute to develop EMS because the organizations participate to environmental management and the entrepreneur know and prevent pollution that release to outside area. Furthermore CB will help improve EMS better because of it is outsider.

Furthermore, the respondents indicated that the suggestions for make decision to use CB that was the organizations should use service from good CB such as a good quality, trustworthy and reputation include suggestion and discussion all the time after have certification. Moreover, the organizations should realize importance of implementation the EMS.

C) The relation of EMS certified organizations with CB

This is the relation of EMS certified organizations with CB by use only CB that answered the questionnaire that was 9 companies but it had only 5 companies use in this analysis because of 4 companies were not service by the EMS certified organizations. The results can be categorized in the following items:

- Type of industry
- Nationality of investment
- Value of income within country
- Value of income in foreign country
- Percentage of quantity of export
- The reason for select CB
- The expense of certified EMS
- Using the same CB in the future

Table 4.35 The relation of type of industry with CB

Type of industry	**CB**					**Total**
	AJA	**BSI**	**Lloyd**	**Moody**	**TUV**	
Heavy industry	5	0	0	0	0	5
Motor vehicles	8	0	1	1	8	18
Food and beverage	2	0	2	1	4	9
Iron/Metal products	1	0	2	2	6	11
Chemical/plastic products	6	0	0	4	0	10
Electrical machinery	11	2	1	2	5	21
Other manufacturing	4	1	2	3	3	13
Service activities	3	0	1	1	2	7
Total	40	3	9	14	28	94

Table 4.35 showed that type of industry of electrical machinery had the most number of CB. The next founding was motor vehicles and other manufacturing respectively. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

Table 4.36 The relation of nationality of investment with CB

Nationality of Investment	CB					Total
	AJA	BSI	Lloyd	Moody	TUV	
Thai	13	1	4	6	6	30
Foreigner	11	2	3	2	11	29
Mutual investment	17	0	1	6	10	34
Total	41	3	8	14	21	93

Table 4.36 showed that mutual investment had the most number of CB. The next founding was investment by the Thai and foreigner respectively. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

Table 4.37 The relation of value of income within country with CB

Value of income within country	CB					Total
	AJA	BSI	Lloyd	Moody	TUV	
0-1,000 million baht/year	15	0	0	5	8	28
1,001-3,000 million baht/year	1	0	0	0	3	4
3,001-5,000 million baht/year	1	0	0	0	2	3
More than 5,001 million baht/year	3	0	1	0	1	5
Total	20	0	1	5	14	40

Table 4.37 showed that value of income within country less than 1,000 million baht/year had the most number of CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. did not has the number of organizations.

Table 4.38 The relation of value of income in foreign country with CB

Value of income in foreign country	CB					Total
	AJA	BSI	Lloyd	Moody	TUV	
0-1,000 million baht/year	9	0	0	5	9	23
1,001-3,000 million baht/year	4	0	0	1	2	7
3,001-5,000 million baht/year	0	0	0	0	1	1
More than 5,001 million baht/year	1	0	1	0	0	2
Total	14	0	1	6	12	33

Table 4.38 showed that value of income in foreign country less than 1,000 million baht/year had the most number of CB and value of income in foreign country was between 3,001-5,000 million baht/year had the least number of CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. did not has the number of organizations.

Table 4.39 The relation of percentage of quantity of export with CB

Percentage Of quantity of export	CB					Total
	AJA	BSI	Lloyd	Moody	TUV	
0-20	5	0	2	1	4	12
21-40	2	0	1	0	1	4
41-60	1	0	1	1	2	5
61-80	2	0	0	2	3	7
81-100	6	2	0	3	4	15
Total	16	2	4	7	14	43

Table 4.39 showed that percentage of quantity of export more than 80 had the most number of CB and percentage of quantity of export was between 21-40 had the least number of CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

Table 4.40 The relation of the reason for using CB with CB

The reason for select CB	CB					Total
	AJA	BSI	Lloyd	Moody	TUV	
Reputation	11	1	2	3	9	26
Need of their organizations	3	1	2	0	2	8
Low cost	6	0	0	6	1	13
Fast to certified	0	0	0	1	0	1
Acceptance in foreign country	5	1	1	0	3	10
High experiences	2	0	0	0	0	2
Trust of CB	6	0	3	3	11	23
Suggestion of consultant	3	0	0	1	0	4
Ever join working	3	0	0	1	1	5
Neutrality	2	0	1	0	0	3
Total	41	3	9	15	27	95

Table 4.40 showed that the reason for using CB that was reputation had the most number of CB. The next founding was trust of CB and low cost respectively. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

Table 4.41 The relation of the expense of certified EMS with CB

The expense of certified EMS	CB					Total
	AJA	BSI	Lloyd	Moody	TUV	
0-100,000 baht	20	1	6	4	6	37
100,001-200,000 baht	9	0	1	5	11	26
200,001-300,000 baht	5	0	0	2	5	12
300,001-400,000 baht	0	0	0	0	0	0
400,001-500,000 baht	0	1	0	0	1	2
More than 500,001 baht	1	1	0	0	0	2
Total	35	3	7	11	23	79

Table 4.41 showed that the expense of certified EMS less than or equal to 100,000 baht had the most number of CB. The next founding was the expense of certified EMS was between 100,001-200,000 baht and 200,001-300,000 baht respectively. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

Table 4.42 The relation of using the same CB in the future with CB

Using the same CB in the future	**CB**					**Total**
	AJA	**BSI**	**Lloyd**	**Moody**	**TUV**	
Yes	39	3	9	13	28	92
No	2	0	0	1	0	3
Total	41	3	9	15	28	95

Table 4.42 showed that the organizations that decided to use the same CB in the future had the most number of CB more than the organizations that decided to change CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

CHAPTER V
CONCLUSION AND RECOMMENDATION

The study the advantages of certified organization on external EMS audits was a research using questionnaire by mailing to the exemplary group that was EMS certified organizations for 1,183 set and collecting 245 set back and CB for 9 set by researcher for this study. All information was evaluated by statistics. The analytical statistic information was the percentage, mean and standard deviation. There was chi-square for the analysis relation and the results of the research are summarized as follow:

5.1 Conclusion

a) EMS certified organizations

1. General information of entrepreneur

The entrepreneurs were male more than female, male was 62% and female was 37.6% with 37.58 years of average. Almost of them graduated with bachelor's degree and working in position of manager with 5.95 years of average of working period and 5.91 years of average of environmental working experiences.

2. General information of organization

Major type of studied organization were motor vehicles/transport equipment business which invested by Thai agencies. Almost of them had proportion of investment more than 100 million baht or equal to 68.2% whereas 82% of them had year of business operation more than 10 years and 46.9% of them had employees more than 500 persons. The average of value of manufacture was 4,694 million baht/year and 3,542 million baht/year of value of income within country whereas the average of

value of income in foreign country was 1,588 million baht/year. The average of percentage of quantity of export was 41.97 of all products and exported to Asia as China, Malaysia, Indonesia and Singapore.

3. EMS certified of organization

Most of the organizations were certified from MASCI because it was reputed and trusty. The average of expense of certified EMS was 162,365 baht and duration in certified EMS was 4.84 years and almost of the organizations never change CB.

4. Attitude towards auditor

The average of attitude towards auditor was 4.15, therefore it can be assumed that attitude towards auditor was good.

5. Attitude towards external EMS audit

The average of attitude towards external EMS audit was 3.35, therefore it can be assumed that attitude towards external EMS audit was moderate.

6. Using the same CB in the future

Almost of the organizations that decided to use the same CB in the future.

7. The results of testing hypothesis

7.1 Transaction factors of organization

All of transaction factors that were type of industry, nationality of investment, proportion of investment, year of business operation, number of employees, value of manufacture, value of income within country, value of income in foreign country and percentage of quantity of export did not have relation with attitude towards external EMS audit.

7.2 EMS certification of organization

All of EMS certification of organization such as using CB, the reason for using CB, expense of certified EMS, year of certified EMS and change CB did not have relation with attitude towards external EMS audit.

b) Certification body

1. General information of CB

Almost of CB were found by foreigner or equal to 77.7 percent and 9 years of average of year of business operation. TUV NORD (Thailand) Limited had the most of employees and auditors whereas Moody International (Thailand) Ltd. had the most of certified EMS organizations that was 300 organizations.

2. Qualification of auditor

Auditors were male more than female, male was 58.1% and female was 32.3 %. Almost were age group with 36-45 years and 40.16 years of average. Almost of auditors graduated with bachelor's degree. The average of working period was 15.7 years and 6.8 years of environmental working experiences whereas the average of audit experiences was 2.0 years. Almost of auditors were trained with ISO 14001 lead auditor training course or equal to 61.3 %.

3. The opinion about CB in Thailand

3.1 Number of CB

From the 9 questionnaires responses, 5 respondents indicated that it was suitable (55.6%) whereas 4 respondents indicated that it was too much.

3.2 The problem of CB at present

The respondents indicated that the first of problem of CB was low cost and neglect importance of audit. The second rank and the third rank was neglect importance of audit.

3.3 Qualification of auditors

Almost of respondents indicated that qualification of auditors such as educational level, working experiences, environmental working experiences, training course and audit experiences were suitable.

3.4 The reason for using CB

The respondents indicated that the first of reason for using service of them was trust. The second rank was acceptance in foreign country and trust. And the third rank was need of the organizations, acceptance in foreign country and knowledge, ability and experiences.

3.5 The factors affect to select CB

The respondents indicated that the first of factors affect to select CB was strictness to certified. The second rank was CB accreditation and the third rank was the experience.

In addition, the respondents indicated that CB can improve EMS of the organizations better.

c) The relation of EMS certified organizations with CB

1. Type of industry

Type of industry of motor vehicles/ transport equipment had the most number of CB. The next founding was electrical machinery, production and preservation of meat, fruit, oils and fats and other service activities respectively. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

2. Nationality of investment

Mutual investment had the most number of CB. The next founding was investment by the Thai and foreigner respectively. Whereas AJA Registrars Ltd. had

the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

3. Value of income within country

Value of income within country less than 1,000 million baht/year had the most number of CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. did not has the number of organizations.

4. Value of income in foreign country

Value of income in foreign country less than 1,000 million baht/year had the most number of CB and value of income in foreign country was between 3,001-5,000 million baht/year had the least number of CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. did not has the number of organizations.

5. Percentage of quantity of export

Percentage of quantity of export more than 80 had the most number of CB and percentage of quantity of export was between 21-40 had the least number of CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

6. The reason for using CB

The reason for using CB that was reputation had the most number of CB. The next founding was trust and low cost respectively. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

7. The expense of certified EMS

The expense of certified EMS less than or equal to 100,000 baht had the most number of CB. The next founding was the expense of certified EMS was between 100,001-200,000 baht and 200,001-300,000 baht respectively. Whereas AJA

Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

8. Using the same CB in the future

The organizations that decided to use the same CB in the future had the most number of CB more than the organizations that decided to change CB. Whereas AJA Registrars Ltd. had the most number of organizations and BSI Thailand Ltd. had the least number of organizations.

5.2 Discussion of result

5.2.1 Attitude towards auditor

The result on the attitude towards auditors was good. The highest mean was knowledge and understanding in ISO 14001, knowledge and understanding in environment and knowledge environmental legal and other requirements respectively. Therefore, it can assume that almost of auditors realize the importance of knowledge and understanding in ISO 14001, environment, environmental legal and other requirements. The lowest mean was perseverance, forbear and elastic because almost of auditors were male. The next founding was knowledge and understanding in operational organization because auditors did not have enough environmental working experiences and audit experiences and results of study was shown that average of environmental working experiences of auditor was 4 years whereas average of audit experiences of auditor was 2 years. The next founding was good attitude equal to sagacity and solve immediate problem because auditors did not have enough auditing experiences and result of this study showed that average of auditing experiences of auditors was 2 years.

5.2.2 Attitude towards external EMS audit

Attitude towards external EMS audit was moderate. The researcher divided attitude to 2 types that were positive attitude or advantage and negative attitude or disadvantage can be summarized as follow:

1. Positive attitude or advantage. The results showed that the highest mean was image of organization to society better because EMS certified organizations show the responsibility of the organizations to environmental aspect and environmental management was efficient for prevent of pollution effect to outside area. The next founding was the organization comply with legal and requirements easy because the organizations had to follow the requirements of EMS was indicated that the organization shall identify and access to the legal requirements and other requirements which related to environmental aspects and determine how these requirements apply to environmental aspects. The next founding was environmental problem decrease because the organizations have to follow the requirements of EMS was indicated that the organization shall find and analyze environmental aspect and assess activities have significant impacts on the environment and set up purpose for improvement, therefore the organizations will know environmental aspect and environmental management to decrease environmental problem. Whereas the lowest mean was new products from transform wastes because some organizations might have few wastes or no personnel. The next founding was products have higher price because of it was not major factor of implementation of EMS of the organizations realized importance of environmental management. The next founding was abroad marketing increase because some organizations produce goods to dispense within country only and some type of industry was service activities, education or public administration.

2. Negative positive or disadvantages : The results showed that disadvantages of external EMS audit such as waste time for working, audit steps were difficult and complicated and place preparation have attitudes was minimum. For personnel preparation and document preparation have attitudes was moderate. It can be assumed that EMS audit was not complicated and difficult. Therefore, the organizations that were not certified EMS can use this study to inspire their decision to certify EMS.

5.2.3 Hypothesis

There was no relation of all of factors of organization with attitude towards external EMS audit and the results showed that attitude towards external EMS audit of organization was moderate. Therefore, it can be assumed that attitude towards external EMS audit of organization was not depended on the characteristics of organization or

internal factors but it may depended on those external factors such as transaction factors of CB and qualifications of auditor.

5.3 Recommendation

1. The organizations should realize that EMS audit is checking operational organization with requirements of ISO 14001. Therefore, the benefits of audit are not directly increasing of products or profit.

2. Government sector should promote the benefits of good resources management such as water usage, electrical usage and material usage. The cost of production will be decrease when good management is implemented.

5.4 Recommendation for further study

1. There should be the study on comparison of environmental management between certified organizations and non certified organizations.

2. There should be the study on external factors affect attitude towards external EMS audit.

3. There should be the study of attitude towards external EMS audit focus on the organization with the same business.

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APPENDIX

APPENDIX A

SURVEY QUESTION

53/97 ม.ดิเอมเมอรัลด์ การ์เดนท์ คลาสสิค
ถ.ขุนมหาดไทย ต.บางพลับ อ.ปากเกร็ด
จ.นนทบุรี 11120

4 กรกฎาคม 2549

เรื่อง ขอความอนุเคราะห์ตอบแบบสอบถาม
เรียน เจ้าของกิจการ ผู้จัดการหรือเทียบเท่า
สิ่งที่แนบมาด้วย

1. ซองจดหมายพร้อมติดแสตมป์สำหรับใส่แบบสอบถามส่งกลับ
2. แบบสอบถาม 1 ชุด

ด้วยดิฉัน นางสาวณัฐฑี สุงสุวรรณ เป็นนักศึกษาวิทยาศาสตรมหาบัณฑิต สาขาการวางแผนสิ่งแวดล้อมเพื่อพัฒนาชุมชนและชนบท คณะสิ่งแวดล้อมและทรัพยากรศาสตร์ มหาวิทยาลัยมหิดล ได้รับการอนุมัติจากมหาวิทยาลัยให้ทำการศึกษาวิจัย เรื่อง ข้อได้เปรียบขององค์กรจากการตรวจประเมินระบบการจัดการสิ่งแวดล้อม เพื่อเป็นวิทยานิพนธ์ ในการศึกษาครั้งนี้มีความจำเป็นอย่างยิ่งที่จะต้องมีการเก็บรวบรวมข้อมูลที่เกี่ยวข้องกับการวิจัยจากท่านโดยผ่านทางแบบสอบถาม จึงใคร่ขอความอนุเคราะห์จากท่าน ขอให้ท่านกรอกข้อมูลรายละเอียดลงในแบบสอบถาม และส่งกลับทางไปรษณีย์ภายใน 2 สัปดาห์ เพื่อที่จะนำมาใช้ประโยชน์ในงานวิจัยต่อไป

ดิฉันขอขอบคุณสำหรับความอนุเคราะห์ในการตอบแบบสอบและส่งกลับในครั้งนี้เป็นอย่างสูง และขอยืนยันว่าข้อมูลที่ได้จากแบบสอบถามจะนำมาใช้เพื่อการวิจัยเท่านั้น จึงหวังเป็นอย่างยิ่งว่าจะได้รับความอนุเคราะห์ข้อมูลจากท่าน

ขอแสดงความนับถือ

(นางสาวณัฐฑี สุงสุวรรณ)
นักศึกษาผู้วิจัย

หมายเลขโทรศัพท์ : 081-8370559, 02-9617104

แบบสอบถามเพื่อการวิจัย

เรื่อง ข้อได้เปรียบขององค์กรจากการตรวจประเมินระบบการจัดการสิ่งแวดล้อม

คำชี้แจง โปรดเติมข้อความลงในที่ว่างและทำเครื่องหมาย ✓ ลงใน ( ) หน้าข้อความที่ต้องการตอบ

ส่วนที่ 1 ข้อมูลทั่วไปของผู้ให้ข้อมูล

1. ผู้ให้ข้อมูล.....
   ตำแหน่ง.....
   ระยะเวลาในการดำรงตำแหน่ง.....ปี
2. เพศ ( ) ชาย ( ) หญิง
3. อายุ.....ปี
4. ระดับการศึกษาสูงสุด
   ( ) ม.3 หรือน้อยกว่า ( ) ม.6 หรือ ปวช.
   ( ) ปวส. ( ) ปริญญาตรี
   ( ) ปริญญาโท ( ) ปริญญาเอก.
5. ประสบการณ์การทำงานด้านสิ่งแวดล้อม.....ปี

ส่วนที่ 2 ข้อมูลทั่วไปขององค์กร

1. ประเภทของสาขาอุตสาหกรรม
   ( ) เกษตรกรรม การล่าสัตว์ และการป่าไม้ ( ) การผลิต แปรรูปและการถนอมอาหาร
   ( ) สารเคมีขั้นมูลฐาน ( ) สิ่งทอ
   ( ) ผลิตภัณฑ์เคมีภัณฑ์อื่นๆ ( ) ผลิตภัณฑ์หนัง/รองเท้า
   ( ) ผลิตภัณฑ์พลาสติก ( ) กระดาษและผลิตภัณฑ์กระดาษ
   ( ) ปูนซีเมนต์/คอนกรีต/ใยหิน ( ) ผลิตภัณฑ์ปิโตรเลียม
   ( ) ผลิตภัณฑ์โลหะ ( ) ผลิตภัณฑ์ยาง
   ( ) เครื่องจักรกลและอุปกรณ์ ( ) การผลิต/จ่ายไฟฟ้า
   ( ) เครื่องมือทางไฟฟ้าและอุปกรณ์ ( ) การผลิต/จ่ายก๊าซ
   ( ) วิทยุ/โทรทัศน์/อุปกรณ์โทรคมนาคม ( ) การขายส่ง/ปลีก
   ( ) ยานยนต์ อุปกรณ์ขนส่ง และการบำรุงรักษา ( ) การขนส่งและกิจกรรมสนับสนุน

( ) การศึกษา ( ) การรักษาพยาบาล

( ) การสุขาภิบาล ( ) เหล็ก/เหล็กกล้า

( ) การขุดเจาะน้ำมันและก๊าซธรรมชาติ ( ) ผลิตภัณฑ์อาหารอื่นๆ

( ) ผลิตภัณฑ์ที่ได้จากการโม่ สี อาหารสำเร็จรูป ( ) การนำกลับมาใช้ใหม่

( ) การทำเหมืองแร่อื่นๆ และเหมืองหิน ( ) การทำเหมืองถ่านหิน

( ) ผลิตภัณฑ์ที่ได้จากนม ( ) เครื่องดื่ม

( ) ยาสูบ ( ) เครื่องแต่งกาย

( ) สิ่งพิมพ์และการพิมพ์ ( ) แก้วและผลิตภัณฑ์จากแก้ว

( ) ผลิตภัณฑ์เซรามิกส์ ( ) การตัดแต่งหิน

( ) โลหะมีค่า ( ) การหล่อโลหะ

( ) เครื่องใช้สำนักงาน/บัญชี ( ) เครื่องมือวัด/ตรวจสอบ

( ) เครื่องมือและอุปกรณ์ทางการแพทย์ ( ) นาฬิกา

( ) เครื่องมือและอุปกรณ์ทางสายตา/ถ่ายภาพ ( ) เครื่องเรือน

( ) การบำรุงรักษาและการซ่อมแซมยานยนต์ ( ) เครื่องประดับ

( ) การขายปลีกเชื้อเพลิงรถยนต์ ( ) การผลิตอื่นๆ

( ) การเก็บกรองน้ำและจ่ายน้ำ ( ) โรงแรมและที่พัก

( ) คอมพิวเตอร์และกิจกรรมที่เกี่ยวข้อง ( ) การโทรคมนาคม

( ) บริษัทที่ปรึกษาทางสถาปัตยฯ/วิศวฯ/เทคนิค ( ) อสังหาริมทรัพย์

( ) บริการตรวจสอบและวิเคราะห์ทางเทคนิค ( ) การบรรจุหีบห่อ

( ) การรักษาความปลอดภัยและบริการอื่นๆ ( ) การบริหารราชการ

( ) กิจกรรมบันเทิง ( ) กิจกรรมบริการอื่นๆ

2. องค์กรของท่านเป็นการลงทุนโดย

( ) คนไทย ( ) ชาวต่างประเทศ (ระบุประเทศ).....

( ) ร่วมลงทุนระหว่างคนไทย.....% กับชาวต่างประเทศ.....%(ระบุประเทศ).....

3. ขนาดการลงทุนขององค์กร

( ) น้อยกว่า 10 ล้านบาท ( ) 10-50 ล้านบาท

( ) 51-100 ล้านบาท ( ) มากกว่า 100 ล้านบาท

4. ระยะเวลาดำเนินกิจการขององค์กร

( ) น้อยกว่า 5 ปี ( ) 5-10 ปี

( ) มากกว่า 10 ปี

5. จำนวนบุคลากรในองค์กร

( ) น้อยกว่า 50 คน ( ) 50-200 คน

( ) 201-500 คน ( ) มากกว่า 500 คน

6. มูลค่าการผลิตในรอบปีที่ผ่านมา.....บาท/ปี

มูลค่ายอดขายในประเทศ.....บาท/ปี

มูลค่ายอดขายในต่างประเทศ.....บาท/ปี

ปริมาณการส่งออกคิดเป็นร้อยละ.....ของปริมาณผลิตภัณฑ์รวม/ปี

โดยมีตลาดส่งออกที่ (ระบุได้มากกว่า 1 แห่ง)

( ) ไม่มีการส่งออก

( ) ทวีปเอเชีย ประเทศ.....

( ) ทวีปอเมริกาเหนือ ประเทศ.....

( ) ทวีปอเมริกาใต้ ประเทศ.....

( ) ทวีปยุโรป ประเทศ.....

( ) ทวีปออสเตรเลีย ประเทศ.....

( ) ทวีปแอฟริกา ประเทศ.....

ส่วนที่ 3 การรับรองระบบการจัดการสิ่งแวดล้อมขององค์กร

1. องค์กรของท่านได้รับการรับรองมาตรฐาน ISO 14001 จากหน่วยงานให้การรับรอง ใด

( ) Advantage Co., Ltd.

( ) AFAQ/Best CERT (Thailand) Co., Ltd.

( ) AJA Registrars Ltd.

( ) BM Trada (Thailand) Ltd.

( ) BSI (Thailand) Ltd.

( ) BVQI (Thailand) Ltd.

( ) Certification (Thailand) Co., Ltd.

( ) DAS Certification Co., Ltd.

( ) Det Norske Veritas (Thailand) Co., Ltd.

( ) ERM Certification and Verification Services Limited

( ) European Quality Assurance Co., Ltd.

( ) Global Certification (Thailand) Ltd.

( ) International Certification Co., Ltd.

( ) Intertek Testing Services (Thailand) Ltd.

( ) ISOQAR (Thailand) Co., Ltd.

( ) Japan Quality Assurance Organization (JQA) through TQA Ltd.

( ) Lioyd's Register Quality Assurance

( ) Management System Certification Institute (MASCI)

( ) Management Cert Co.,Ltd.

( ) Moody International (Thailand)

( ) NQA C.S. (Thailand) Co., Ltd.

( ) Office of Certification Body

( ) Perry Johnson Registrar Inc.

( ) QCB Quality Certification Bewro Co.,Ltd

( ) SGS (Thailand) Ltd.

( ) Thailand Institute of Scientific and Technological Research Office of Certification Body (TISTR-OCB)

( ) TÜV NORD (Thailand) Ltd. (RWTÜV)

( ) TÜV Rheinland Thailand Ltd.

( ) Underwriters Laboratories Inc. (UL) International Inspection Co., Ltd.

( ) United Registrar of System (Thailand) Ltd. (URS)

( ) Wit International Assessment (Thailand) Ltd.

( ) VTI (Bangkok) Co., Ltd.

( ) อื่นๆ (ระบุ).....

2. เหตุผลในการเลือกหน่วยงานให้การรับรอง (โปรดเรียงลำดับ 1,2,3 ; 1 = มากที่สุด)

( ) มีชื่อเสียง	( ) ความน่าเชื่อถือ
( ) เป็นความต้องการขององค์กรเอง	( ) บริษัทที่ปรึกษาแนะนำ
( ) ค่าใช้จ่ายไม่แพง	( ) เคยติดต่อประสานงานกันมาก่อน
( ) ได้รับการรับรองรวดเร็ว	( ) มีความเป็นกลาง
( ) เป็นที่ยอมรับในต่างประเทศ	( ) เป็นหน่วยงานของคนไทย
( ) รู้จักเป็นการส่วนตัว	( ) มีความรู้ ความสามารถ และประสบการณ์
( ) การติดต่อสะดวก	( ) มีความรู้ ความเข้าใจกฎหมายของไทย

3. ค่าใช้จ่ายในการขอรับการรับรอง.....บาท

4. องค์กรของท่านได้รับการรับรองมาตรฐาน ISO 14001 มาเป็นระยะเวลา……..ปี

5. องค์กรของท่านเคยเปลี่ยนหน่วยงานให้การรับรองหรือไม่

( ) ไม่เคย

( ) เคย ทั้งหมด.....ครั้ง เปลี่ยนทุกๆ.....ปี

ครั้งที่ 1 ได้รับการรับรองจาก.....

ครั้งที่ 2 ได้รับการรับรองจาก.....

ครั้งที่ 3 ได้รับการรับรองจาก.....

ส่วนที่ 4 แบบประเมินระดับความเห็นขององค์กรต่อผู้ตรวจประเมิน

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงในช่องระดับความเห็นตามความเห็นของท่าน

หัวข้อ	ระดับความเห็น				
	ดีมาก	ดี	พอใช้	ไม่ดี	ไม่ดีเลย
1. การตรงต่อเวลา					
2. ความสามารถในการสื่อสาร					
3. ความสามารถในการทำงานเป็นทีม					
4. มีท่าทีเป็นมิตร					
5. มีความอดทน อดกลั้น และยืดหยุ่น					
6. ความมีระเบียบวินัย					
7. มองโลกในแง่ดี					
8. ความเป็นตัวของตัวเอง/ความมั่นใจในตัวเอง					
9. เปิดโอกาสให้ผู้ถูกตรวจประเมินซักถาม					
10. ใจกว้างและรับฟังความคิดเห็นของผู้ถูกตรวจประเมิน					
11. ลักษณะการตรวจแสดงว่ามีการเตรียมการตรวจที่ดี					
12. มีการตรวจเอกสารครบถ้วนตามข้อกำหนด ISO 14001					
13. มีความรู้ ความเข้าใจในกระบวนการดำเนินงานขององค์กร					
14. มีความรู้ ความเข้าใจในเรื่องสิ่งแวดล้อม					
15. มีความรู้เกี่ยวกับกฎหมายสิ่งแวดล้อมและข้อกำหนด					
16. มีความรู้ ความเข้าใจในมาตรฐาน ISO 14001					
17. มีความรู้จริงและมีทักษะที่ดีในการตรวจประเมิน					
18. มีความเฉลียวฉลาด คิดและวิเคราะห์อย่างเป็นระบบ					

หัวข้อ	ระดับความเห็น				
	ดีมาก	ดี	พอใช้	ไม่ดี	ไม่ดีเลย
19. มีความเที่ยงตรง ไม่ลำเอียง					
20. มีความเป็นอิสระและไม่ถูกครอบงำโดยผู้ใด					
21. มีไหวพริบและสามารถแก้ปัญหาเฉพาะหน้าได้ดี					
22. การให้คำแนะนำในกรณีที่พบข้อบกพร่อง					
23. การให้คำอธิบาย/คำชี้แจงในกรณีมีปัญหาเกิดขึ้น					
24. การให้คำปรึกษาในกรณีที่พบปัญหา/ข้อบกพร่อง					
25. ความชำนาญ/ความเชี่ยวชาญในการตรวจประเมิน					

ส่วนที่ 5 ระดับความเห็นขององค์กรต่อการตรวจประเมินระบบการจัดการสิ่งแวดล้อม

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงในช่องระดับคะแนนตามความเห็นของท่าน

หัวข้อ	ระดับคะแนน				
	มาก	ค่อนข้างมาก	ปานกลาง	น้อย	ไม่มีเลย
1. การใช้ทรัพยากรอย่างมีประสิทธิภาพ					
2. ลดปัญหาที่ส่งผลกระทบต่อสิ่งแวดล้อม					
3. ลดของเสียที่ปล่อยออกสู่สิ่งแวดล้อม					
4. การนำของเสียกลับมาใช้ใหม่					
5. ลดความเสี่ยงที่อาจจะเกิดขึ้นต่อสุขภาพ ความปลอดภัยของพนักงาน					
6. ประหยัดทรัพยากรไฟฟ้า ทรัพยากรน้ำ และทรัพยากรอื่นๆในองค์กร					
7. ต้นทุนในการกำจัดของเสียลดลง					
8. ผลิตภัณฑ์มีราคาสูงขึ้น					
9. ต้นทุนการผลิตลดลง					
10. กำไรเพิ่มขึ้นเนื่องจากต้นทุนการผลิตลดลง					
11. สัดส่วนทางการตลาดเพิ่มขึ้น					
12. โอกาสทางธุรกิจขององค์กรเพิ่มขึ้น					
13. รายได้เพิ่มขึ้นจากการขายของเสีย					
14. เกิดผลิตภัณฑ์ใหม่ๆจากการแปรรูปของเสีย					
15. ค่ารักษาพยาบาล/ค่าดูแลสุขภาพลดลง					

หัวข้อ	ระดับคะแนน				
	มาก	ค่อนข้างมาก	ปานกลาง	น้อย	ไม่มีเลย
16. องค์กรสามารถปฏิบัติตามกฎหมายและกฎระเบียบที่เกี่ยวข้องได้อย่างสะดวก					
17. ภาพพจน์ขององค์กรต่อสังคมดีขึ้น					
18. ผลผลิตเพิ่มขึ้น					
19. การตลาดต่างประเทศเพิ่มขึ้น					
20. พนักงานมีความสัมพันธ์อันดีต่อกัน					
21. การบริหารงานอย่างเป็นระบบ					
22. ความสัมพันธ์ที่ดีระหว่างหน่วยงานราชการ ชุมชนรอบข้าง และกลุ่มองค์กรอิสระที่ดูแลเรื่องสิ่งแวดล้อม					
23. ความสร้างสรรค์ในการพัฒนาเทคโนโลยีในการนำของเสียมาใช้ให้เกิดประโยชน์					
24. ความน่าเชื่อถือหรือการยอมรับจากผู้ที่เกี่ยวข้อง					
25. การแลกเปลี่ยนข้อมูลข่าวสารระหว่างโรงงานง่ายขึ้น					
26. ได้เปรียบในการแข่งขันกับองค์กรอื่นที่ประกอบกิจการประเภทเดียวกัน					
27. บุคลากรมีความตระหนักถึงนโยบายและหน้าที่รับผิดชอบทางด้านสิ่งแวดล้อม					
28. การสื่อสารมีความสะดวกและชัดเจน					
29. ระบบเอกสารภายในองค์กรมีความชัดเจน					
30. การปรับปรุงภายในองค์กรอย่างต่อเนื่อง					
31. การพัฒนาอย่างยั่งยืน					
32. เสียเวลาในการทำงาน					
33. เป็นภาระในการจัดเตรียมบุคลากร					
34. เป็นภาระในการจัดเตรียมเอกสาร					
35. เป็นภาระในการจัดเตรียมสถานที่					
36. ขั้นตอนการตรวจยุ่งยาก ซับซ้อน					

ท่านคิดว่า จะใช้บริการของหน่วยงานให้การรับรองเดิมต่อหรือไม่?

( ) ต่อ ( ) ไม่ต่อ

เพราะเหตุใด

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APPENDIX B

SURVEY QUESTION

53/97 ม.ดิเอมเมอรัลด์ การ์เดนท์ คลาสสิค
ถ.ขุนมหาดไทย ต.บางพลับ อ.ปากเกร็ด
จ.นนทบุรี 11120

4 กรกฎาคม 2549

เรื่อง ขอความอนุเคราะห์ตอบแบบสอบถาม
เรียน เจ้าของกิจการ ผู้จัดการหรือเทียบเท่า

ด้วยดิฉัน นางสาวณัฐฑี สุงสุวรรณ เป็นนักศึกษาวิทยาศาสตรมหาบัณฑิต สาขาการวางแผนสิ่งแวดล้อมเพื่อพัฒนาชุมชนและชนบท คณะสิ่งแวดล้อมและทรัพยากรศาสตร์ มหาวิทยาลัยมหิดล ได้รับการอนุมัติจากมหาวิทยาลัยให้ทำการศึกษาวิจัย เรื่อง ข้อได้เปรียบขององค์กรจากการตรวจประเมินระบบการจัดการสิ่งแวดล้อม เพื่อเป็นวิทยานิพนธ์ ในการศึกษาครั้งนี้มีความจำเป็นอย่างยิ่งที่จะต้องมีการเก็บรวบรวมข้อมูลที่เกี่ยวข้องกับการวิจัยจากท่านโดยผ่านทางแบบสอบถาม จึงใคร่ขอความอนุเคราะห์จากท่าน ขอให้ท่านกรอกข้อมูลรายละเอียดลงในแบบสอบถาม เพื่อที่จะนำมาใช้ประโยชน์ในงานวิจัยต่อไป

ดิฉันขอขอบคุณสำหรับความอนุเคราะห์ในครั้งนี้เป็นอย่างสูง และขอยืนยันว่าข้อมูลที่ได้จากแบบสอบถามจะนำมาใช้เพื่อการวิจัยเท่านั้น จึงหวังเป็นอย่างยิ่งว่าจะได้รับความอนุเคราะห์ข้อมูลจากท่าน

ขอแสดงความนับถือ

(นางสาวณัฐฑี สุงสุวรรณ)
นักศึกษาผู้วิจัย

หมายเลขโทรศัพท์ : 081-8370559, 02-9617104

แบบสอบถามเพื่อการวิจัย

เรื่อง ข้อได้เปรียบขององค์กรจากการตรวจประเมินระบบการจัดการสิ่งแวดล้อม

คำชี้แจง แบบสอบถามแบ่งออกเป็น 3 ส่วน

โปรดเติมข้อความลงในที่ว่างและทำเครื่องหมาย ✓ ลงใน ( ) หน้าข้อความที่ต้องการตอบ

ส่วนที่ 1 ข้อมูลทั่วไปของหน่วยงาน

ชื่อหน่วยงาน.....

ผู้ให้ข้อมูล.....

ตำแหน่ง.....

1. หน่วยงานของท่านก่อตั้งโดย

( ) คนไทย ( ) ชาวต่างประเทศ (ระบุประเทศ).....

( ) ร่วมลงทุนระหว่างคนไทย.....% ชาวต่างประเทศ (ระบุประเทศ).....%

2. ระยะเวลาดำเนินกิจการของหน่วยงาน.....ปี

3. หน่วยงานของท่านมีบุคลากรทั้งหมด.....คน เป็นผู้ตรวจประเมินจำนวน.....คน แบ่งเป็น

- ผู้ตรวจประเมินประจำ.....คน
- ผู้ตรวจประเมินชั่วคราว.....คน

4. หน่วยงานของท่านได้รับการรับรองจาก AB ใด

(1) ..... เป็นระยะเวลา.....ปี

(2)..... เป็นระยะเวลา.....ปี

(3)..... เป็นระยะเวลา.....ปี

(4)..... เป็นระยะเวลา.....ปี

(5)..... เป็นระยะเวลา.....ปี

5. จำนวนองค์กรที่หน่วยงานท่านให้การรับรอง ISO 14001อยู่ในปัจจุบันทั้งหมด.....องค์กร (เฉพาะ ISO 14001 : 2004 เท่านั้น)

ส่วนที่ 2 คุณสมบัติของผู้ตรวจประเมิน

ลำดับ	เพศ	อายุ (ปี)	การศึกษาสูงสุด	ประสบการณ์ทำงาน (ปี)	ประสบการณ์ด้านสิ่งแวดล้อม (ปี)	Training Courses	ประสบการณ์การตรวจประเมิน (วัน)

ส่วนที่ 3 ความคิดเห็นเกี่ยวกับหน่วยงานให้การรับรองในประเทศไทย

1. ความเหมาะสมของจำนวนหน่วยงานให้การรับรองในปัจจุบัน

( ) เหมาะสม

( ) ไม่เหมาะสม เนื่องจาก

( ) น้อยไป

( ) มากไป

2. ปัญหาของหน่วยงานให้การรับรองในปัจจุบัน (โปรดเรียงลำดับ 1,2,3 ; 1 = มากที่สุด)

( ) ให้การรับรองง่าย

( ) ราคาถูก

( ) มีจำนวนมากเกินไป

( ) มักจ้างผู้ตรวจประเมินที่จบการศึกษาใหม่ๆ

( ) ไม่เห็นความสำคัญของการตรวจประเมิน

3. ท่านคิดว่าคุณสมบัติของผู้ตรวจประเมินในปัจจุบัน มีความเหมาะสมหรือไม่

3.1 การศึกษา

( ) เหมาะสม

( ) ไม่เหมาะสม และท่านมีข้อเสนอแนะอย่างไร

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3.2 ประสบการณ์ทำงาน

( ) เหมาะสม

( ) ไม่เหมาะสม และท่านมีข้อเสนอแนะอย่างไร

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3.3 ประสบการณ์ทำงานด้านสิ่งแวดล้อม

( ) เหมาะสม

( ) ไม่เหมาะสม และท่านมีข้อเสนอแนะอย่างไร

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3.4 การฝึกอบรม

( ) เหมาะสม

( ) ไม่เหมาะสม และท่านมีข้อเสนอแนะอย่างไร

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3.5 ประสบการณ์การตรวจประเมิน

( ) เหมาะสม

( ) ไม่เหมาะสม และท่านมีข้อเสนอแนะอย่างไร

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4. ท่านคิดว่า เพราะเหตุใดองค์กรต่างๆจึงเลือกใช้บริการจากหน่วยงานของท่าน (โปรดเรียงลำดับ 1,2,3 ; 1 = มากที่สุด)

( ) มีชื่อเสียง	( ) ความน่าเชื่อถือ
( ) เป็นความต้องการขององค์กรเอง	( ) บริษัทที่ปรึกษาแนะนำ
( ) ค่าใช้จ่ายไม่แพง	( ) เคยติดต่อประสานงานกันมาก่อน
( ) ได้รับการรับรองรวดเร็ว	( ) มีความเป็นกลาง
( ) เป็นที่ยอมรับในต่างประเทศ	( ) เป็นหน่วยงานของคนไทย
( ) รู้จักเป็นการส่วนตัว	( ) มีความรู้ ความสามารถ และประสบการณ์
( ) การติดต่อสะดวก	( ) มีความรู้ ความเข้าใจกฎหมายของไทย

5. ท่านคิดว่า องค์กรควรพิจารณาปัจจัยอะไรบ้างในการตัดสินใจเลือกใช้บริการจากหน่วยงานให้การรับรอง (โปรดเรียงลำดับ 1,2,3 ; 1 = มากที่สุด)

( ) ราคา

( ) ประสบการณ์

( ) ระยะเวลาดำเนินกิจการ

( ) จำนวนองค์กรที่หน่วยงานให้การรับรองนั้นๆดูแลอยู่

( ) การได้รับการรับรองจาก AB

( ) คุณสมบัติของผู้ตรวจประเมิน

( ) ความเข้มงวดในการออกใบรับรอง

( ) ความมีชื่อเสียง

6. ท่านมีข้อเสนอแนะต่อองค์กรอย่างไรบ้างในการตัดสินใจเลือกใช้บริการจากหน่วยงานให้การรับรอง

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7. ท่านคิดว่าหน่วยงานให้การรับรองมีส่วนช่วยในการพัฒนาระบบการจัดการสิ่งแวดล้อมหรือไม่?

( ) มีส่วน เพราะ.....

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( ) ไม่มีส่วน เพราะ.....

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BIOGRAPHY

NAME	Miss Nuttee Sugsuwan
DATE OF BIRTH	4th January, 1983
PLACE OF BIRTH	Bangkok, Thailand
INSTITUTIONS ATTENDED	Thammasat University, 1998-2002 Bachelor of Science (Environmental Science) Mahidol University, 2003-2007 Master of Science (Environmental Planning for Community and Rural Development)
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