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Performance evaluation of the environmental management system level of Moroccan enterprises

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ABSTRACT

Increasingly Moroccan companies choose to set up a “environmental management system”, that is to say an organization to measure and reduce the environmental impacts, then it certified according to ISO 14001.

The objective of this article is to provide a performance evaluation of EMS at Moroccan companies ISO 14001 based on a survey based on a questionnaire developed according to the different requirements of ISO 14001.

The analysis of the results reveals strong and weak points in terms of the requirements of the EMS elements: Performance of “implementation and operation” is better with a rate of 69.66%, an average performance at the planning (62%) and environmental policy is of the order of 51.44%, unsatisfactory performance in the control (46.81%) and management review (33.33%). We present the elements of assessment of EMS as well as key areas for improvement, and we offer objective recommendations to improve performance of EMS. © 2015 Trade Science Inc. - INDIA

KEYWORDS

Environmental management system;
Certification;
ISO 14001;
Moroccan enterprises.

INTRODUCTION

Systems Environmental Management offer a management for the integration of environmental concerns at all levels in the company, the objective is the improvement of environmental performance, defined as “measurable outcomes EMS in relation to the control by the organization’s environmental aspects on the basis of its environmental policy, objectives and environmental targets”^[1].

Since the introduction of ISO 14001, many companies have found a driver and a methodology for the

implementation of the Environmental Management System (EMS)^[2] thread.

The situation of the implementation of Environmental Management System in Morocco reflects nearly forty Moroccan companies are certified ISO 14001 in Morocco, or 3-5% of all certifications in Morocco^[3].

The Environmental Management System is a tool for compliance with the regulations on environmental protection, improved relations with regulatory authorities, prevention and control of pollution and improved image company. Official recognition of the EMS company through its certification^[4].

The purpose of this article is to study performance evaluation of EMS to detect strengths and weaknesses of such a system at the enterprise level Moroccan. This assessment, also known as gap analysis, its aim is to provide an as thorough as possible to identify a number of recommendations that can serve as a basis for drafting the action which its implementation will help Moroccan firms plane balance assess their EMS to keep this label acquired after several years of hard work and preparation requirements of ISO 14001.

To conduct this study, we used a questionnaire for comparing EMS Moroccan companies against the requirements of ISO 14001, This questionnaire was based on the different chapters and paragraphs of ISO 14001 Version 2004 and distributed to a sample of firms Moroccan ISO 14001 certified.

THE METHODOLOGY OF THE STUDY

The development of the questionnaire

Performance evaluation of the EMS at the Moroccan companies certified ISO 14001 will be subject to

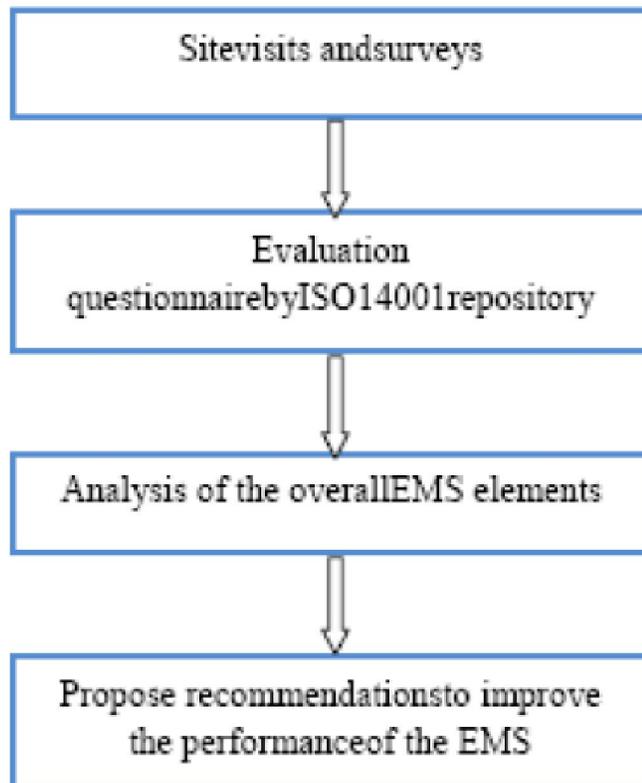


Figure 1 : Model of a global approach to critical performance study EMS at the enterprise level

this article. Thus, this study is based on a comprehensive approach to critical study of the performance of the EMS at the enterprise level, the model is represented in Figure 1 below:

We proposed to conduct an evaluation of the EMS against ISO 14001 standard, the study was initiated by an evaluation questionnaire EMS is presented with the same divisions as those of the standard, to facilitate correspondence between EMS established in business and the requirements of the international standard^[5].

Presentation of the sample

Our study involved a qualitative sample of ten companies Moroccan ISO 14001 selected from three Moroccan regions: Region of Kenitra, the Rabat and Casablanca region.

So that the data collected are reliable, we selected firms that had been certified for at least two years. Ultimately, ten companies of industries and of different sizes were selected for this study. For reasons of confidentiality, the names of these companies have been hidden.

Distribution of the questionnaire

After the selection of companies involved in the investigation, we carried out data collection using the structured interview as a method based on the questionnaire. Two sets of interviews were conducted with various stakeholders:

- (1) Members of the Environment (Quality & Environment Director, responsible environmental expert QSE) function;
- (2) operational managers (CEO, Plant Manager, Technical Director and purchase);

A total of 20 structured interviews were conducted (see TABLE 1).

Presentation of results

Sorting questionnaire for performance analysis EMS, we confirmed that the majority of companies have the same answers either in the "True" category or "False" with a minimum percentage representing abstinence (6%).

The interpretation of the trend of Moroccan companies certified according to ISO 14001 can be described as positive by positive responses (68%). Negative responses are evaluated (26%), which is not negli-

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TABLE 1 : Profile of the companies surveyed

Number	Field Certification	Validity Certificate	actors interviewed
1	Manufacture of billets, Manufacturing, marketing and associated rebars, son rolled machines and merchant services	October 22, 2014	- Quality / Environment / Risk Management - General manager Environmental Manager
2	Design, production and marketing of chemical products for the construction and Industry	March 1, 2015	- Technical Director and purchase Quality / Health / Safety / Environment Plant Manager
3	Reception, sorting, storage and delivery of sand dredging	June 3, 2015	Project environment General manager
4	Control and Coordination of Agrifood Exports	December 1, 2014	National Coordinator environment Plant Manager Environmental Manager
5	Production, Supply and marketing of veterinary products	Feb. 2, 2015	Technical Director and purchase Plant Manager Director Environment and hygiene Plant Manager
6	Purchases and sales of equipment and chemicals for water treatment, engineering and technical assistance	November 28, 2014	Expert Quality / Safety / Environment General manager Quality Director and environment Technical Director and Purchasing
7	Production and marketing of circuit breakers	August 18, 2014	
8	Design, Printing and finishing of books and all types of commercial and advertising work and OFFSET Rotary	March 21, 2015	
9	Trading, Manufacturing of products and solutions, studies and services related to the trades of electrical, power electronics and industrial automation	June 3, 2015	
10	Mining, packaging and shipping sugar	October 12, 2014	

gible. This is what is different brakes ISO 14001 certification we propose to detail thereafter.

The average positive responses (True) as percentages of the different requirements of the EMS at the Moroccan businesses surveyed and certified ISO 14001 est shown in the table below:

The result of the overall evaluation of the performance of the EMS is represented by the graph in Figure 3 below.

The results of this evaluation indicate that overall the best performance lies in the implementation and

TABLE 2 : Average real answers in% different requirements of the EMS

Part of ISO 14001	true %
Environmental policy	51.44%
planning	62%
Implementation and operation	69,66%
Control	46,81%
Management review	33.33%

operation of the EMS, an average performance at the planning and environmental policy, and unsatisfactory performance in the control and management review.

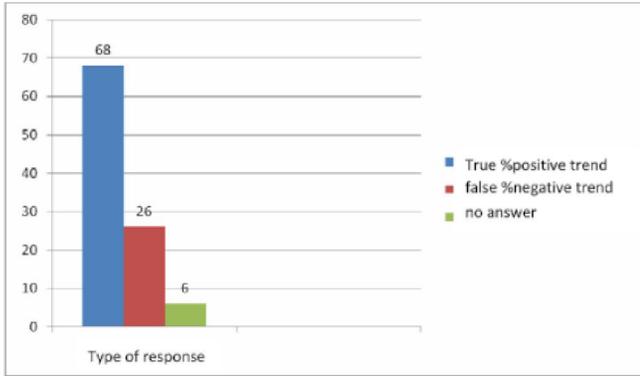


Figure 2 : Histogram of the overall sorting questionnaire

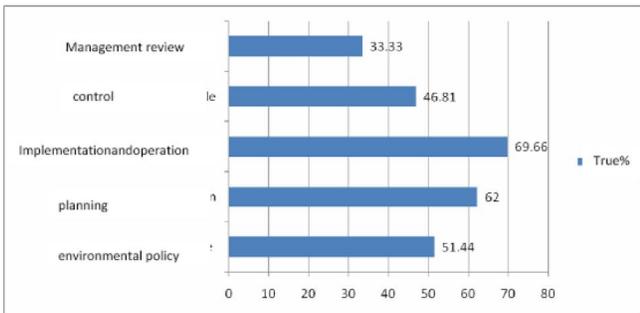


Figure 3 : General Graphical Overview of the evaluation of the performance of the EMS

Summary of the results of the evaluation of EMS

To give an overview of the results of the evaluation of the performance of the EMS at the enterprise level Moroccan ISO 14001 involved in our investigation, we propose to introduce a series of criteria for determining the EMS and the main axes improvement over the weak points detected at each element different requirements of ISO 14001.

Evaluation of elements of the requirements of the EMS

Evaluation of the “Environmental Policy”

A) Critical judgment

The performance evaluation of environmental policy rate is 51.44%, which is an average result, the criteria for assessing the environmental policies of Moroccan companies studied are:

- An environmental policy covered by the Branch, shows the commitment to the environment.
- Commitment is primarily focused on continuous improvement in the field of environmental protection.
- Environmental policy exists but is not well up-

dated and it is not very well communicated.

B) Suggestions for improvement

On the basis of the assessment, we propose some suggestions dismiss improvement over the weaknesses detected in environmental policy. Thus, at the next revision of the latter, we suggest the following changes:

- Update environmental policy and date update on environmental policy statement of each company.
- Develop a communication plan effective environmental policy.

Evaluation of the “Planning”

Environmental planning must begin with the identification of significant environmental aspects of each company according to its nature of business and its location. It is imperative that each company’s compliance with legal requirements and other requirements to establish its environmental objectives and targets to develop its programs^[6].

Thus, the planning results are presented in Figure 4 below:

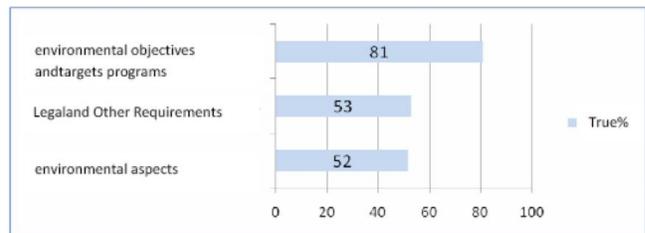


Figure 4 : Graphical overview of the evaluation of the “Planning”

The results of the evaluation of the “Planning” show that the best performance lies in the objectives, targets and environmental programs, an average performance level of “legal and other requirements” and environmental aspects.

A) Environmental Aspects

A.1) appreciation Elements

All the companies studied in our survey conducted a study of Environmental Impact Assessment (EIA) that identifies the most significant environmental aspects of each company. A review of the material flow is achieved at the EIA. An update of this study is essential for preparation of audited annual audit by certification bodies.

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By cons, there is no system to update the database as a result of significant changes in facilities, processes or changes in the receiving environment.

A.2) Suggestions for improvement

Companies should establish a (s) procedure (s) that allows:

- Identify permanently the environmental aspects of their activities, products and services within the area defined for the Environmental Management System,
- Identify areas that have significant impacts on the environment (Significant Environmental Aspects AES).
- Companies shall document this information and keep it up to date^[7].

B) Legal and other requirements

Every business needs to know the requirements of the regulations, industry codes, standards and permits that must be respected. Organizational systems are needed to ensure compliance and appropriate monitoring and possibly prepare reports^[8].

B.1) appreciation Elements

- The Moroccan companies surveyed have developed a list of the Moroccan legislation and regulations concerning the environment.
- Monitoring the application of these regulatory texts is not done routinely.

B.2) Suggestions for improvement

On the basis of the assessment, we propose the following improvements:

Companies should establish and maintain procedures for:

- Identify and access to legal requirements and other requirements related to its environmental aspects, which they have subscribed.
- Determine how these requirements apply to its environmental aspects.

C) Objectives, targets and environmental programs

C.1) Background information

In terms of objectives, targets and environmental programs, we can make the following observations:

- The companies surveyed have developed a set of environmental objectives and targets as part of their ISO 14001 certification, but these goals are not always measurable.
- A formal environmental program is obviously developed by each company according to its environmental objectives and targets.
- In terms of annual plan, we found the existence of an environmental plan with well-defined objectives.

C.2) Suggestions for improvement

To improve the performance of the element “Objectives, targets and environmental programs,” we offer companies identify key indicators for the implementation of monitoring and measuring the progress of environmental objectives.

Assessment “Implementation and Operation”

The evaluation of the implementation and operation is shown in Figure 5 below:

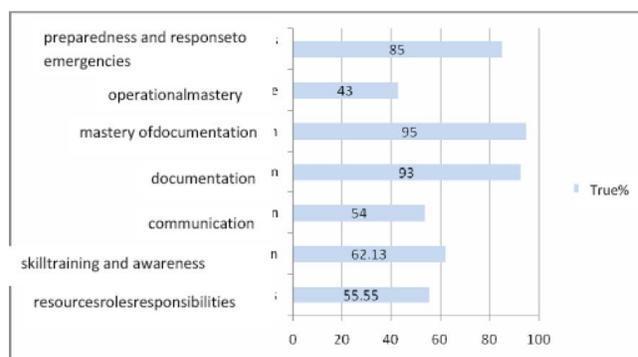


Figure 5 : Graphical Overview of the evaluation of the “Implementation and Operation.”

The results of the evaluation of the “Implementation and operation” show that the best performance lies in the “Document Control” and “Documentation” and “preparedness and response to emergencies,” an average performance at the “Competence, training and awareness” and “Resources, roles and responsibility” and “Communication”, and poor performance at the “operational control”.

A) Resources, Roles and Responsibilities

A.1) appreciation Elements

According to the responses of the selected companies in our survey, it was found that:

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- In environmental matters, responsibilities are known but not formalized.
- During our various interviews with company representatives, we have seen a pretty good awareness regarding environment, but its implementation remains somewhat limited.
- In general, a lack of resources for the implementation and improvement of the EMS.

A.2) Suggestions for improvement

The following suggestions are proposed for improving the item "Resources, Roles and Responsibilities"

- Management shall ensure the availability of essential resources to the company, the implementation, to maintenance and improvement of the EMS. Resources include human resources and specialized skills, organizational infrastructure, technology and financial resources.
- To facilitate effective EMS, roles, responsibilities and authorities shall be defined, documented and communicated

B) Competence, training and awareness

B.1) Appreciation elements

Assessments of competence, training and awareness are:

- Each company has a training plan. The latter was developed by Human Resources with the involvement of different departments.
- At the Environment Department, there is a training matrix that tracks the evolution of the training given to all staff of enterprises. There is a formal system for identifying training needs at all hierarchical levels in different departments.
- Currently, there is no evaluation system that can measure the effectiveness of training (No audit examinations of knowledge, no evaluation of the content).
- In addition to training, there is no systematic and formalized staff competence in business valuation.

B.2) Suggestions for improvement

We offer the following improvements:

- Improve the process of developing the training plan companies (set the framework for the iden-

tification of needs, make the difference between a necessary training and development training, communicate the objectives). This will also alleviate the frustrations of staff.

- Establish an evaluation of the effectiveness of the training system. (evaluation of the trainer, training and trained).
- Develop an assessment of the competence of personnel on the basis of predetermined skills matrix system and defines the standard by which the company must comply^[9].

C) Communication

C.1) Background information

The evidence of communication graded according to company responses to the questionnaire are:

- Although efforts are made, there is a fairly widespread tendency to consider that communication down to the dissemination of information.
- There is no formal campaign and regular environmental aspects of each company awareness.
- There is no formal system of recognition of staff efforts in the field of interest for the protection of the environment.

C.2) Suggestions for improvement

Based on the factors, we propose that:

- Companies must take a decision with regard to external communication and prove its formalization.
- They must put in place an effective system of communication that ensures that staff receives information about the EMS (policy, goals, training...)
- They must measure the effectiveness of communication about the EMS.
- Companies must be a point of reflection on the creation of a formal system of recognition of staff efforts in Environmental Matters.

D) Documentation

D.1) appreciation Elements

The assessment elements we noted during our visit at firms covered in this study are the following:

- These companies have a formal documentary structure type: manual, organizational proce-

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dures, technical procedures, instructions, registration

- The companies have a formal document management system describing the manner in which the documents are managed (who, how, frequency, ect...)
- The documentation relating to the environment is not available for all staff.

D.2) Suggestions for improvement

The performance level of documentation is very satisfying, but it is better to publish the documentation relating to the environment via the Intranet for companies it is not available for all staff.

E) Control of documents

E.1) appreciation Elements

According to the survey, the criteria for assessing the Document Control Moroccan companies studied are:

- Most business documents are archived in a way that facilitates their recovery and identification for future use.
- Data as, training procedure, procedure environmental advocacy and information on environmental regulations and other requirements have been recorded and documented.

E.2) Suggestions for improvement

The performance level of the Document Control for all companies surveyed is good, we recommend continuing with the same level.

F) Operational control

F.1) appreciation Elements

The evidence of the Operational control at Moroccan companies studied have a percentage performance evaluation of 43%, which is an average score overall but quite low compared to other elements of the requirement "implementation and operation. "Thus, we noted some findings are:

- companies identify and plan well enough operations associated with AES identified but consistent with their environmental policy objectives and targets remains somewhat low.
- Some differences between the environmental

policies of few companies with respect to the objectives and targets are reported by the companies surveyed.

- The operating criteria in the procedures are complete.

F.2) Suggestions for improvement

To improve the performance of the "Operational control", we offer businesses to identify and plan the operations that are associated with AES identified in line with their environmental policy and objectives and targets, to ensure that they are carried out under specified conditions.

G) Preparation and response to emergencies

G.1) Background information

In terms of "preparedness and response to emergencies," we can make the following observations:

- The companies studied during the investigation have a document written response to emergency situations, with clear objectives. This document is available to all staff (even the workers) through the Internet. But this document response to emergency situations is outdated.
- The response document to address real emergency scenarios and risk control plan on how to handle by an approach to effective planning.
- The roles and responsibilities are clear, concise and unambiguous in terms of response to emergency situations.
- All possible emergencies that may occur are considered in the backup plan.

G.2) Suggestions for improvement

Companies must periodically review and, where necessary, procedures for the preparation and response to emergencies, especially after the occurrence of accidents or emergency situations.

Evaluation of "Control"

The results of the evaluation phase of the "control" are shown in the graph of Figure 8 below.

The results of the evaluation of "Control" indicates that the best performance lies in the "Control of Records", an average performance level of "Conformity assessment" and an unsatisfactory performance at

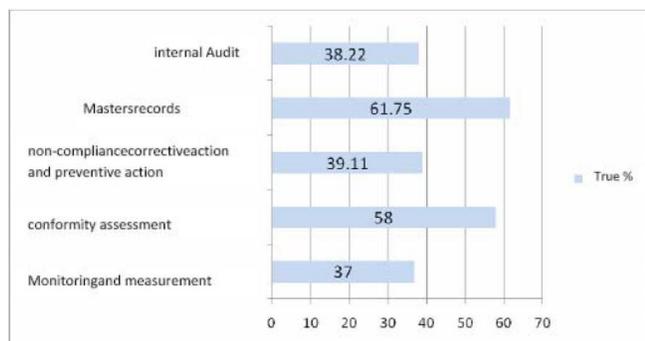


Figure 6 : Graphical overview of the evaluation of “Control”

the “Non-compliance, corrective and preventive action and internal Audit and Monitoring and measurement.

A) Monitoring and measurement

A.1) appreciation Elements

The assessment of monitoring and measurement and quite satisfactorily with a performance rate of 37%, but we can report the following findings:

- The companies do not regularly measure the key characteristics of its operations that can have a Significant Environmental Impact (IES).
- Checks monitoring equipment and measurement are not regularly calibrated or carefully checked and maintained retaining associated records.

A.2) Suggestions for improvement

- Companies should establish, implement and maintain procedures to regularly monitor and measure the key characteristics of its operations that can have an IES.
- These procedures shall include the documenting of information to monitor the performance of the applicable operational controls and compliance with environmental objectives and targets companies^[10].
- Companies must ensure that their monitoring equipment and measurement are calibrated or verified and are operated and maintained retaining associated records.

B) Assessment of compliance

B.1) appreciation Elements

According to the answers of companies surveyed, one can note the following comments:

- These companies with their commitment to comply have procedures for periodically evaluating compliance with applicable legal requirements.
- They keep records of the results of these evaluations periodic.
- However, companies do not combine this evaluation with the evaluation of regulatory compliance or establish separate procedures.

B.2) Suggestions for improvement

Companies should assess their compliance with the requirements to which they are subscribed by combining this evaluation with the evaluation of regulatory compliance or establish separate procedures.

C) Non-conformity, corrective action and preventive action

C.1) Background information

When analyzing the results of the questionnaire, it was noted:

- There is relatively little control procedures actual and potential nonconformities.
- Some procedures do not define how to identify and correct non-conformities in detail.

C.2) Suggestions for improvement

To improve the performance of the “Non-conformity, corrective action and preventive action” element, we offer companies:

- identify and correct non-conformities and taking actions to address their environmental impacts,
- scrutinize nonconformities, determine their causes and taking action to prevent them from occurring,
- recording the results of corrective actions and preventive actions implemented
- reviewing the effectiveness of corrective actions and preventive actions implemented^[11].

D) Control of records

D.1) appreciation Elements

Observations detected in our survey for the Control of records are:

- Companies surveyed identified their operations

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and activities with great attention to environmental aspects that must be controlled.

- The control of these operations and activities included in the most cases in the procedures that give step by step instructions of how tasks are completed.
- Most corporate procedures are written and normalized using a guide.
- procedures are communicated to stakeholders (employees and contractors).
- According to most officials of the companies studied, the procedures are well designed and are achievable.

D.2) Suggestions for improvement

Overall, some degree of control of records of transactions exist for some AES, through the recording engineering (controls provided in the design phase), through staff training or operational procedures and periodic inspections. But companies must generalize this control records for all AES could identify.

E) Internal audit

E.1) Appreciation elements

The evidence of Internal Audit Moroccan companies surveyed are:

- The companies have internal audit procedures.
- The companies do not perform internal EMS audits at planned intervals.
- The program of internal audits have not updated in a continuous manner.
- The selection of auditors is not formally justified.

E.2) Suggestions for improvement

To improve the performance of Internal Audit, we propose that:

- Companies must ensure that internal audits of the EMS are made planned to determine whether the EMS conforms to planned arrangements for environmental management intervals and has been properly implemented and maintained and provide the management with information on the results of audits.
- An audit program shall be planned, established, implemented and maintained by companies,

taking into consideration the environmental importance of the operation concerned and the results of previous audits.

- Site visits and surveys. Evaluation questionnaire by ISO14001 repository.
- Analysis of the overall EMS elements. Propose recommendations to improve performance Smele Selection of auditors and conduct of audits shall ensure objectivity and impartiality of the audit process.

Evaluation of the “Management Review”

A) Background information

assessment of the Management Review is quite low with a performance rate of 33.33%, in fact the elements of appreciation following were identified:

- Several types of meetings exist and progress reviews of certain projects and activities are in place. The management review process as defined in ISO 14001 standard is not in place for its development; EMS rarely reviewed by senior management of the companies studied.
- A self-assessment exercise is not often made.
- There is no plan for the implementation of self-assessment program in these companies.

B) Suggestions for improvement

Based on the investigation, the following suggestions are recommended:

- At scheduled intervals, management at the highest level should review the EMS company to ensure its continuing suitability, adequacy and effectiveness.
- Establish a review of the EMS, which must be consistent with the objectives of the annual plan and measure the effectiveness EMS, achievement of objectives and regulatory compliance aims.
- Perform conduct reviews of EMS at least once a year^[12].
- Ensure that the results of self-assessment program are communicated to all company employees.

Discussion and comprehensive interpretation of the results

Through the survey, the overall assessment of

the level of EMS ISO 14001 certified companies Moroccan and interviewed during our study reveals positive elements of assessment which are:

- An environmental policy exists.
- Training programs and education on environmental protection exist.
- Compliance with environmental regulations.

Monitoring tools

- action are implemented.
- Management of emergencies and crises.

One can enjoy the most important to improve and which are the following lines:

- Environmental policy exists but is not well updated and it is not very well communicated.
- The goals of environmental protection are not fully developed.
- Employee involvement in environmental issues is neither encouraged nor rewarded.
- Some differences between the environmental policies of some companies to the objectives and targets are noted.
- The program self-evaluation is not very often leads.
- The EMS audit is not conducted on a regular basis.
- Review the EMS by senior management companies Moroccan not well done.

Based on the results of the performance evaluation of the EMS, several practical recommendations are made and are as follows:

- Updating environmental policy and good communication.
- Development of appropriate environmental strategy to meet environmental objectives of national companies.
- Motivation of staff of enterprises for the implementation of the EMS.
- Companies must identify and plan operations that are associated with AES identified in line with their environmental policy and objectives and targets, to ensure that they are carried out under specified conditions.
- Preparation of an action plan to implement the audit recommendations developed and its implementation on the ground.

- regular and programmed by EMS company management review.
- At scheduled intervals, management at the highest level should review the EMS company to ensure its continuing suitability, adequacy and effectiveness.
- Establish a review of the EMS, which must be consistent with the objectives of the annual plan and measure the effectiveness EMS, achievement of objectives and regulatory compliance aims.

CONCLUSION

This research aimed to evaluate the performance of the EMS, the study of ten Moroccan companies ISO 14001 shows that all elements of the EMS are available and in place.

The results show that the performance requirements of the ISO 14001 standard varies from one element to another: The best performance of the EMS resident in the implementation and operation with a rate of 69.66%, an average performance level of planning (62%) and environmental policy (51.44%), unsatisfactory performance in the control (46.81%) and management review (33.33%).

Indeed, one can enjoy the most important to improve and which are the following lines:

- Environmental policy exists but is not well updated and it is not very well communicated.
- The goals of environmental protection are not fully developed.
- Some differences between the environmental policies of some companies to the objectives and targets are noted.
- The program self-evaluation is not very often leads.
- The EMS audit is not conducted on a regular basis.
- Review the EMS by senior management companies Moroccan not well done.

It will improve these areas, conform to the requirements of the standard complement and enhance other processes, therefore several practical recommendations are made.

All companies indicated in their responses to our survey, the desire to use simple systems management

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considering that the current management systems are increasingly complex and bureaucratic. This is not the ISO standard request all the heaviness that is observed in the certified companies, but an inadequate reading of the standard. It should be stated that the findings of this study cannot be generalized by transposition of the results to all Moroccan companies because it is only the study of ten cases developed in anticipation of further research.

ABBREVIATIONS

EMS: Environmental Management System

ISO: International Organization for Standardization

QSE Quality Safety and Environment

AES: Significant Environmental Aspects

EIA Study of Environmental Impact

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