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The Effects Concerning the Integrated Management System Development and Application in Constructions

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Abstract

An effective integrated management system (IMS) for construction companies consists of three key subsystems: quality management system according to ISO 9001:2008, environmental management system according to ISO 14000:2004 and health and safety management according to OHSAS 18001:2008..There is described in my contribution model of IMS and basic principles and processes concerning this integrated system. Implementation of IMS leads to quality production improving, safety of all employees of construction company, application of all national and international standards concerning the environmental aspects and finally to customer satisfaction.

Introduction

One of the most important factor for construction company to be successful on market is assuring :

- the quality and reliability of buildings,
- health and safety of all employees,
- the quality of environment on site and in region, where building is construct.

The key for effective management of all these aspects is development and implementation of effective Integrated Management System (IMS) in construction company. More and more construction companies in Slovakia have interest to work at this system. A lot of legislation requirements and standards concerning the quality, environment, health and safety lead the management of building companies to find the ways, how to manage it. IMS consists of three management systems:

- Quality Management System (QMS) according to ISO 9001:2008,

- Environment Management system (EMS) according to ISO 14001: 2004,
- Health and Safety Management System (HSMS) according to OHSAS (Occupational Health Safety Assessment Series) 18001:2008..

1. Development of IMS

During the process of IMS development is useful start with QMS according to requirement of ISO 9001, because most of the documents required by this standard is possible implement also for next two management systems: EMS and HSMS. The basic processes of IMS are in table 1.

The whole process of IMS development starts by input audit of existing company system. This audit can be provided by trained employee in all three management systems, or by external qualified expert. The result of this input audit is level of confidence of existing management system of construction company to requirements of ISO 9001, ISO 14001 and OHSAS 18001.

The key person in whole process of IMS development and implementation has director of construction company [1]. This person is responsible for vision of his company defined in IMS by:

- quality policy,
- environmental policy,
- health and safety policy.

All employees of construction company must be inform about these policies and try to keep it in practice.

Director of company determines one person of top management for function: manager of IMS. This person is responsible for development, implementation and improvement of IMS. Manager of IMS must be trained in all three management system before starting his or her work at this very important function.

During the process of IMS planning is useful start with QMS and analyse of all processes according to ISO 9001, create interaction of these processes, approve quality documents and forms of future records (see table 2). The most important steps concerning the development of EMS are :

- design of register of environmental aspects and impacts in all important areas of company: administrative building, machine park, buildings etc. (example of

| N. | Basic processes of IMS | SUBPROCESSES | | |
|-----|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | QMS (ISO 9001:2008) | EMS (ISO 14001:2004) | HSMS (OHSAS 18001:2008) |
| 01. | Construction company vision | Quality Policy | Environmental Policy | Health and safety Policy |
| 02. | IMS Planning | <ol style="list-style-type: none"> 1. QMS processes analysis 2. Interaction of QMS processes 3. Legislation 4. Quality targets 5. Quality Plans | <ol style="list-style-type: none"> 1. Analysis of environmental aspects and impacts 2. Registration of law and other requirements 3. Risk evaluation 4. Environmental objectives and targets 5. Environmental programme | <ol style="list-style-type: none"> 1. Identification of dangers and threatens 2. Registration of law and other requirements 3. Risk evaluation 4. Health and safety objectives and targets 5. Health and safety Programme |
| 03. | Implementation and operating | <ol style="list-style-type: none"> 1. Resources, roles, responsibility and authority of employees 2. Competence, training and awareness of employees 3. Communication 4. Documentation 5. Control of documents 6. Operational (building) control 7. Emergency preparedness and response | | |
| 04. | Checking, corrective and preventive action | <ol style="list-style-type: none"> 1. Monitoring and measurement 2. Evaluation of compliance 3. Nonconformity, corrective action and preventive action 4. Control of records 5. Internal audit of IMS | | |
| 05. | Management review | Management review of IMS | | |
| 06. | Improving of IMS | Continually improvement of IMS due to its analysis | | |

QMS - Quality Management System
 EMS - Environmental Management System
 HSMS- Health and Safety Management system
 IMS - Integrated Management System

Table 1 Model of IMS

environmental aspects – emissions to air, releases to water and land,, waste and by products etc.)

- determination of environmental aspects and impacts with high and middle level of risk,
- setting of environmental targets for aspects with high and middle level of risk,
- determination of programme, how to meet environmental targets.

During the process of HSMS we can go by similar way:

- design of register of dangers and threatens in all important areas of company: administrative building, machine park, buildings etc. (example of dangers and threatens - mechanical, physical, chemical, biological etc.)
- determination of dangers and threatens with high and middle level of risk,
- setting of health and safety targets for dangers and threatens with high and middle level of risk,
- determination of programme, how to health and safety targets fulfil.

2. IMS documentation

The basic document of effective integrated management system is manual of IMS, in which are described these information:

- profile and basic information about construction company,
- organization vision including quality, environmental, health and safety policy ,
- organizational structure with presentation of all key employees including representative person for IMS,
- brief description and interaction of QMS processes with reference to related documents (procedures, internal instructions, QMS documents and records etc.)
- brief description of elements and processes of EMS and HSMS with reference to related documents (procedures, internal instructions, EMS and HSMS documents and records etc.)

In organizational instruction are except of organizational structure said competences (responsibilities and authority) of all company members in area of all three management systems.

All, by ISO 9001 required work procedures, like control of documents and records, internal audit, control of nonconformity, corrective and preventive actions, can be implemented for all management systems. In table 2 there is list of documents and records required by ISO 9001:2000. Those documents and records, which can be used also for next two management systems, are signposted by symbol IMS.

For EMS are useful except of IMS manual procedures concerning the environmental aspects related to building processes and site conditions. For HSMS is useful health and safety building manual, in which are described necessary health and safety preventive actions for building employees.

The basic documents concerning the quality, environment, health and safety monitoring on building is *inspection and test plan*, in which are described these information:

- brief description of quality, environment , health and safety tests,
- quality, environment , health and safety criterion (legislation, law, notices, European and state standards),
- the result of tests (conformity or non-conformity to criterion)
- name, datum and signature of persons responsible and competent for test realization and evaluation.

3. IMS implementation and operation

Before IMS implementation and operation there is necessary to assurance training of top and middle management of construction company in all three management systems to better understand requirements of ISO 9001, ISO 14001 and OHSAS 18001. The trained members of top and middle management in IMS through internal training process give necessary information to other employees. There is important during the IMS implementation and operation to understand IMS documentation in all function of organization and managing and keeping of all required records through the year. IMS must be implemented and operate in all buildings and plants. Another important feature during the implementation and operating of IMS is fulfilling of IMS programme, which

arise front out of determination of aims of all three management systems. The requirement of EMS and HSMS is to prepare employees of company to possible emergency situation.

| N. | Document or record | Document or record description | Responsible person |
|-----|--------------------|---------------------------------------------------------|-------------------------------------|
| 01. | D –IMS 4.01 | List of documents and records | IMS MANAGER |
| 02. | D 4.02 | Interaction of QMS processes | IMS MANAGER |
| 03. | R –IMS 4.03 | Distribution list of documents and | IMS MANAGER |
| 04. | R – IMS 4.04 | Declaration about document study | IMS MANAGER |
| 05. | D- IMS 4.05 | List of internal and external operating documents | IMS MANAGER |
| 06. | D – IMS 4.06 | Overview of organization readings | IMS MANAGER |
| 07. | R – IMS 4.07 | Document remark | IMS MANAGER |
| 08. | R – IMS 4.08 | Overview of document changes and revision | IMS MANAGER |
| 09. | D 5.01 | Strategy of quality management and improvement | Director, IMS MANAGER |
| 10. | D–IMS 5.02 | Quality, environmental, health and safety policy | Director, IMS MANAGER |
| 11. | D–IMS 5.03 | Quality, environmental, health and safety targets | IMS MANAGER |
| 12. | D –IMS 5.04 | Decree (certificate) for IMS manager | IMS MANAGER |
| 13. | R –IMS 5.05 | Records of management consultation | IMS MANAGER |
| 14. | R –IMS 5.06 | IMS management review | IMS MANAGER |
| 15. | D –IMS 6.01 | Competences of organization employees | Personnel manager |
| 16. | D–IMS 6.02 | Plan of employee training | Personnel manager |
| 17. | R–IMS 6.03 | List of trained people | Personnel manager |
| 18. | R–IMS 6.04 | Evaluation of training process effectiveness | Personnel manager |
| 19. | R–IMS 6.05 | Records from internal training process | Department manager |
| 20. | D–IMS 6.06 | Infrastructure of organization | Economist Director |
| 21. | R–IMS 7.01 | Contract review | Director |
| 22. | R 7.02 | List of material needs | Site manager |
| 23. | R–IMS 7.03 | Selection and evaluation of material and work suppliers | Purchaser |
| 24. | R–IMS 7.04 | Evidence list of monitoring and measuring devices | Person responsible for metrology |
| 25. | R–IMS 7.05 | Evaluation of software topicality | Employee working with software |
| 26. | R–IMS 7.06 | Inspection and test plan | Site manager |
| 27. | R–IMS 7.07 | Building evaluation | Site manager |
| 28. | R–IMS 8.01 | Timetable of IMS internal audit | IMS MANAGER |
| 29. | R–IMS 8.02 | Report from internal audit | IMS MANAGER |
| 30. | R–IMS 8.03 | Corrective action | IMS MANAGER |
| 31. | D–IMS 8.04 | Preventive action | IMS MANAGER |
| 32. | D–IMS 8.05 | Monitoring a measurement of IMS processes | Department manager |
| 33. | R–IMS 8.06 | Evaluation of organization by customer | IMS MANAGER |
| 34. | R–IMS 8.07 | Records concerning the complaints, environmental | IMS MANAGER |

| | | | |
|-----|--------------------|----------------------------|-------------|
| | | problems and work injuries | |
| 35. | R-IMS 8.08 | Analysis of IMS readings | IMS MANAGER |
| | <i>D -document</i> | <i>R - record</i> | |

TAB 2 List of IMS documents and records [2]

4. Internal audit of IMS

After some time of IMS implementation and operating (min. 3 months) is necessary before external audit by certification body to do internal audit of IMS according to ISO 19011:2002 “Guidelines for quality and/or environmental management systems auditing”.

Construction company shall ensure that internal audits of IMS are conducted at planned intervals to:

- determine whether IMS conforms to requirements of ISO 9001, ISO 14001 and OHSAS 18001 and has been properly implemented and is maintained,
- provide information on the results of audits to management.

Internal audit of IMS can be done by trained internal auditors in all three management systems or by external qualified auditor. For nonconformity finding out by internal audit must be receive corrective actions.

The last step before certification process of IMS is its management review. The top management of company shall review of IMS at planned intervals (min. once a year) to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the needs for changes to IMS including the quality, environmental, health and safety policy, objectives and targets.

Conclusion

Development, implementation and improvement of effective integrated management system (IMS) in construction companies can lead to quality production improving, safety of all employees of construction company, application of all national and international standards concerning the environmental aspects and finally to customer satisfaction. It is essential, that IMS must be understand and implement by all employees. IMS is not aim, but way to satisfaction of construction company clients, better work conditions of company employees, success on market and reputation in own country and abroad.

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