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CASE STUDY REGARDING QUALITY MANAGEMENT SYSTEM AND NEED FOR INTERNAL QUALITY AUDIT IN THE CIVIL ENGINEERING INDUSTRY

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ABSTRACT

The Quality Management System (QMC) is defined as a management system an organization is oriented and controlled in terms of quality(SR EN ISO 9000 :2006,Quality Management Systems, Principles and wording). The same standard (SR EN ISO 9000:2006) provides a more comprehensive definition: "The quality management system is that part of the management system of the organization, oriented toward obtaining results in respect of quality objectives, in order to meet the needs, expectations and requirements of the concerned party, as applicable". A more elaborate definition is enounced in the Quality Encyclopedia (2005), Bucharest, Documentary Information Office Publishing House for Industry, Research, Management.

The Business Dictionary.comdictionary includes the following definition: "Collective plans, practices and supporting infrastructure by which an organizations aims to reduce and, possibly, eliminate lack of conformity with the specifications, standards and expectations of clients in the most effective way, in terms of cost, and as efficiently as possible."(Business Dictionary.com. Quality management system (QMS) definition).

Key words: quality management, audit, quality control, performance, efficiency, corrective measures, elimination of deficiencies;

1. INTRODUCTION

The quality audit procedure establishes the manner in which the quality management system is regularly examined within the organization, in all areas of activity. The procedure serves as an evaluation basis for sub-suppliers, when provided in contracts or in situations when the client requests the evaluation of the subcontractors of certain works.

The audit is defined pursuant to SR EN ISO 9000:2008, as a systematic, independent and documented process for the purpose of procuring audit evidence and for their evaluation with a view to determining the extent to which the audit criteria are met.

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The internal audit, occasionally referred as first-part audit, may constitute an organization's basis for its sworn statement regarding the fulfillment of a requirement.. The internal quality audit concerns all elements of the quality management system, as such are exposed in the ISO 9000 group of standards.

2. DESCRIPTION OF THE PROCEDURE

2.1 The Internal audit is conducted by taking into consideration the ISO 19011:2002 standard.

2.1.1 Scheduling of internal audits:

a. Depending on the importance of processes and areas to be audited, in January, the representative of the management on quality issues prepares the yearly internal audit schedule of the Quality Management System corresponding to the current year. The schedule is prepared on the form elaborated in accordance with the standard requirements.
b. Each process is audited at least once a year, and, depending on the auditors' findings, follow-up audits or unscheduled additional audits may be conducted.
c. The annual internal audit schedule is distributed to all executives.

The internal audit is conducted by one person, acting as chief auditor, or by a team consisting of the chief auditor and one or several auditors. The management representative appoints the chief auditor, taking into consideration:

a. his independence in respect of the audited department;
b. training and experience required in order to ensure the team's credibility.

2.1.2 Audit planning

The audit planning entails the elaboration of the audit plan which shall contain the following:

a. Audit purpose and objectives;
b. Reference documents (audit criteria);
c. Audit period and name of the audited department;
d. Audit team (Chief Auditor, Auditors);
e. Audit timeline;
f. Representatives of the audited compartment.

2.1.3 2.1.3.Reference Documents

Depending on the audited area, the reference documents are the following:

a. SR EN ISO 9001:2008;
b. Legal provisions and regulations;
c. Quality Handbook;
d. System, operational and technical procedures;
e. Operating instructions.

2.1.4 Audit Training

a. The audit training is achieved by examining the reference documents applicable to the audited area, the observations of prior audits and the execution of the corrective and preventive actions, as well as the measures for continuous improvement;
b. The preparing of the audit questionnaire shall be done according to the provisions of the applicable reference documents:
   - All checking that needs to be performed shall be described in detail;
   - Constitutes the prior training of the auditors;
   - Allows activities to be split out among the members of the audit team;
   - Enables the registration of the audit stages.
c. The audited entity is informed 5 days prior to the commencement of the audit by transmitting one counterpart of the audit plan (the Department Manager shall sign the original counterpart).

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2.1.5 Conducting the Audit

2.1.5.1 Opening meeting

The opening meeting shall be attended by the Manager of the Audited Department and the personnel under his subordination. During the meeting a presentation shall be made of the audit team, of the audit objectives, of the manner in which the audit will be conducted and the time of the audit of the closing meeting.

2.1.5.2 Examination

Every auditor shall examine the objective audit proof using the following techniques:

a. Interviews;
b. Document examination or recording;
c. On-site visits to the production area.

2.1.5.3 The actual auditing implies:

a. Practical examination of each Q.M.S. element and of the manner in which it is applied;
b. Verifying the proper and complete application of the last valid editions of the procedures;
c. Evaluation of the degree to which the personnel knows and complies with the standard requirements and applicable regulations;
d. Verifying the performance of the corrective and preventive actions that were proposed following prior audits;
e. Examining nonconformities in terms of frequency criteria and their importance to the quality management system;
f. Establishing the degree to which the audited personnel is aware of the quality policy and objectives and of their responsibilities under MQ and the procedures;
g. neconformităţile sunt înregistrate şi examinate de echipa de audit, şi în acelaşi timp sunt comunicate auditatului pentru confirmarea existenţei acestora.

2.1.5.4 Audit Closing Meeting:

a. The audit team shall prepare the audit conclusions with focus on nonconformities that require corrective actions;
b. The closing meeting shall be chaired by the Chief Auditor who shall consider the following aspects:
    - participation of the process manager, authorized to undertake corrective actions;
    - presentation of conclusions, so that the department personnel understands the audit outcome;
    - clarification of misunderstandings or different interpretations;
    - presentation of the findings of the audit team, that refer to the efficiency of the quality management system;
    - establishing the date on which the audit report shall be submitted.
c. After discussing the findings of the audit together with the manager of the audited department, solely those issues that could not be solved during the audit shall be deemed nonconformities. Nonconformity reports shall be prepared with relation thereto, and shall be attached to the audit report (Postavaru et al.2014).

3. THE AUDIT REPORT

Upon the conclusion of the audit, the Chief Auditor together with the members of the audit team shall draft the audit report. Such report shall be dated and signed by the Chief Auditor and shall comprise the following information:

- Audited department or section;
- Purpose and objectives of the audit;
- Members of the audit team;
- Audit date;
- Representatives of the audit department;
- Reference documents (audit criteria);
- Presentation of nonconformities;
- Examination of the degree of conformity with the applicable standards;
- Proposed corrective/preventive actions;
- Distribution list of the audit report.

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3.1 The audit report shall be distributed by the Chief Auditor within 5 days.

The distribution list shall include at least:

a) The Manager of the Department;
b) The Coordinating Manager.

If nonconformities result from the audit, the auditor shall fill out one or several Nonconformity Reports which he shall distribute together with the audit report to the department involved. The first stage of the audit shall end at the time the audit report is distributed to the audit management.

3.1.1 Follow-up and Implementation of Corrective and Preventive Actions

The executive of the audited department and the executives of the departments involved in solving the nonconformities ascertained during the audit shall take the following measures:

a. Decide on the corrective and preventive actions required and fill out the nonconformity reports, to be transmitted in copy to the management representative; in order to determine the terms for the remedy of the nonconformities, the Department managers shall be consulted so that such terms are appropriate for the respective actions;
b. Initiate and follow-up on the implementation of the actions undertaken for the correction of the nonconformities ascertained during the audit
c. The audit follow-up term is determined by the Chief Auditor together with the Manager of the audited Department;
d. The Chief Auditor or one of the members of the audit team shall follow-up on the application and results of each corrective action performed;
e. Fills out the date on which the completion of the corrective and preventive actions was verified and whether such actions were performed fully or in part. In case of partial execution, a new term shall be set for the completion of the actions;
f. Any disputes that may arise shall be settled by the Management Representative and by the General Manager (Postavaru et al. 2014).

3.1.2 Concluding the Audit

A record of the Nonconformity Reports shall be kept in the Nonconformity Registry, initiated by the Management Representative.

Once the corrective and preventive actions are properly completed, the Chief Auditor shall fill out the registry and then shall insert the I.R. in the brief.

The audit shall be deemed concluded after all corrective and preventive actions performed have been completed and checked.

3.1.3 Unscheduled Audits

The General Manager may order the initiation of unscheduled audits in the following situations:

a. Following the signing of a contract, in order to check the effectiveness of the Q.M.S. implementation;
b. When changes of the organizational structure or procedures have been made;
c. When the Q.M.S. reference documents are amended;
d. With a view to preparing an audit conducted by the beneficiary or by the certification body;
e. When new technologies are introduced;
f. In order to obtain objective information required for management analysis..

4. METHODOLOGY AND TECHNICAL-PRACTICAL APPROACH

The International Standardization Organization (ISO)has been developing standards for QMS since 1987, in the form of a series of ISO 9000:1987 standards. They have been revised a number of times and the last major review occurred in 2000, when the series ISO 9000:2000 was created. ISO approved a minor review, ISO 9001:2008, on October 14th, 2008, including, in particular, grammar modifications to facilitate the translation of the standard into other languages.(Business Dictionary.com. Quality management system (QMS) definition)

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Following the reviews of 2000 and 2006, the main standards in the ISO 9000 group, adopted by Romania through The Standardization Association of Romania (SAR) are the following:

- SR EN ISO 9000:2006- Quality management systems. Quality Principles. Fundamental Principles and Vocabulary
- SR EN ISO 9001:2008- Quality management systems. Requirements
- SR EN ISO 9004:2001 –Quality management systems. Guidelines for performance improvement.

For the implementation of a QMS based on the ISO 9000 group of standards it is necessary to use other standards as well in certain complementary activities, for example:

- SR EN ISO 19011:2003 – Guidelines for the auditing of Quality and/or Environment Management Systems;
- SR EN ISO/TR 10013:2003 –Guidelines for the documentation of the quality management system;
- SR EN ISO 10015:2000- Quality Management. Guidelines on training.
- Because the ISO 9001 standards, respectively SR EN ISO 9001 are generalized and abstract standards, over time various industrial sectors wished to standardize their own interpretations of some specific requirements. Here are a few examples:
- AS9000 – basic standard for quality system in the aerospace industry; it is based on ISO 9000, with 27 additional requirements that are unique for this industry.
- ISO/TS 16949:2009, Quality management systems - Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations; it is an interpretation agreed upon by major American and European car manufactures.

5. CASE STUDY

5.1 Nonconformity report No. 08/16.06.2016

A verification was conducted in a PVC joinery workshop, with focus on the manner in which it was being made:

Examples of conformity products manufactured by the company subject to examination, respectively PVC windows with 5 sound-isolation chambers and PVC windows with wood imitation:

- PVC windows with 5 sound-isolation chambers, product code F -08/2016;
- PVC window models with wood imitation, manufactured by the company especially for export; Product code according to colorfrom FL -01 to FL 10;

For all types of flaws ascertained, we developed a nonconformity report as in the model presented below:

<table>
<tr><td colspan="2">C Company name

Constructia SA

Giurgiu</td><td colspan="3">NONCONFORMITY REPORT</td><td colspan="2">Code RN 017.01

Date: June 16th, 2016
Reg. no. 08</td></tr>
<tr><td rowspan="2">Reference document</td><td rowspan="2">Ascertained nonconformities</td><td colspan="2">Type of nonconformity</td><td rowspan="2">Corrective/preventive actions</td><td rowspan="2">Term</td></tr>
<tr><td>Minor</td><td>Major</td></tr>
<tr><td>Review 44/2016</td><td>PVC structure with 4 chambers instead of 5</td><td></td><td>YES</td><td>Checking schedule</td><td>Permanently</td></tr>
</table>

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	Diameter of tube 12 cm instead of 14 cm		DA		
Audit Team	**Chief Auditor**	**Auditor**	**Auditor**	**Audited personnel**	
Signatures					

5.2 Audit report

REVIEW : Production Mode of PVC Windows

Company name Constructia SA Giurgiu	AUDIT REPORT				**CODE** **RA 16.02** **Date**Aug. 15th, 2016
	Audit plan		CODE PA 13.01	56/ 30.08.2016	Reg. no.
Reference documents	**Ascertained nonconformities**		**Corrective/ preventive actions**	**Term**	**Person in charge**
	Minor nonconformities	Major nonconformities			
Minutes	Adjustment of the finishing installation		Existence of an endorsement service		G.M.
Minutes		Adjustment of cutting apparatus	Existence of an endorsement service		G.M.

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Minutes	Maintenance operation of the automatic window cutting line			Permanently	
Minutes	There is no head of section responsible for quality		Urgent employment		
Audit Team	**Chief auditor**		**Auditor**	**Auditor**	**Audited Department**
	Surname and first name		Surname and first name	Surname and first name	Surname and first name

6. CONCLUSIONS

The main purpose of the quality audit is to evaluate the corrective actions required in order to eliminate deficiencies and possibilities of improving the quality system of the company, of its processes, of the products and services it offers.

As previously mentioned, loss of product quality can result in loss of the entity itself.

In the end, as a motto, it is safe to say that loss of quality means loss of sales market, loss of profit, loss of trust and, why not, loss of the entity itself.

The development and implementation of the quality management system includes the establishing of the policy on quality and quality objectives, quality planning, quality control, quality assurance and quality improvement. The key concepts of the QMS are approaching activities as processes and keeping control of the organization in the field of quality.

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