

## THE IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEMS IN QUANTITY SURVEYING OFFICES

JH Cruywagen

*Department of Construction Economics, University of Pretoria*

### Abstract

It recently became compulsory for all members of the South African Association of Consulting Engineers to introduce a quality management system in their organisations. The purpose of this paper was to determine whether it would be possible for quantity surveying firms to adopt similar quality management systems in their offices and what would be expected from them in order to do so. The conclusion is that it is possible for quantity surveying firms to comply with the requirements of the ISO 9001: 2000 quality principles.

JEL M11, M14

### 1 Introduction

At the annual general meeting of the South African Association of Consulting Engineers (SAACE) in November 2002, it was proposed and unanimously agreed that the concept of quality management be included in the code of conduct of that organisation (SAACE: 2004). Members were given until 1 January 2006 to provide documentary evidence that their quality management system complies with the requirements of ISO 9001: 2000 and that they are ready for third-party certification. In practice, this meant that it was a condition of membership of SAACE for member firms to implement and maintain a quality management system in their practices.

### 2 The quantity surveying profession

The Association of South African Quantity Surveyors (ASAQS) does not currently make any mention of compulsory quality management systems for their members (Association of South African Quantity Surveyors: 2003). As far as could be determined by this research, only two quantity surveying

firms in South Africa are currently officially accredited; one firm with 9 branch offices throughout the country (all accredited) and one office of another firm. This is in comparison with approximately 20 engineering firms that are currently ISO 9001 accredited (Newman: 2004).

The question that can be asked is if the South African Council for the Quantity Surveying Profession decides to embark on a similar exercise as their engineering counterparts regarding mandatory quality management systems, will it be possible for quantity surveying firms to become accredited and what aspects will be of importance?

### 3 Quality and quality management systems

Before looking at how quantity surveying firms can benefit from quality management, one must first determine what these terms mean.

Quality has been defined by many people and organisations. The South African Quality Institute (SAQI) (2003: 1) refers to it as "fitness for purpose", "meeting customer requirements" or "conformance to customer specifications". They also mention that there is a growing

acceptance of the fact that quality should be seen as “consistently exceeding customer expectations”. A quality management system, therefore, is a common sense documentation of the processes that are implemented by firms or organizations at the various stages of their product/service delivery process in order to satisfy customer expectations.

#### 4 ISO 9001:2000

SAACE (2004) describes ISO 9001:2000 as “a comprehensive, internationally recognized common sense approach for managing and controlling a consulting company in order to ensure customer satisfaction and the delivery of a quality product and service”. It is the latest version of a quality management standard that has been in existence for a number of years and has been implemented by numerous organisations world-wide.

According to the *Federation Internationale des Ingenieurs-Consiliels* (FIDIC) (2001: 5), ISO 9001:2000 stresses the importance for an organisation to identify, implement, manage and continually improve the effectiveness of the process that is necessary for the quality management system, and to manage the interactions of the process in order to achieve the organisation’s objectives.

The ISO 9000 family of standards has been developed to assist organisations to implement and operate effective quality management systems. The following three primary documents are applicable to professional offices (South African Bureau of Standards, 2000: v):

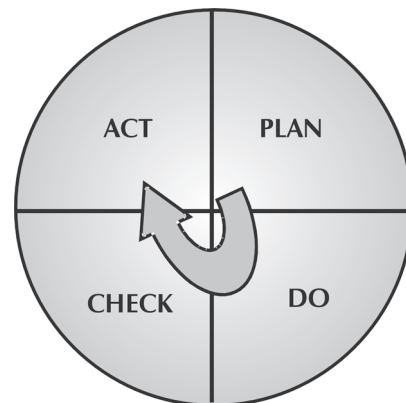
- ISO 9000: describes fundamentals of quality management systems and specifies the terminology for quality management systems.
- ISO 9001: specifies requirements for a quality management system
- ISO 9004: guidance to performance improvement.

By implementing a quality management system based on the ISO 9001:2000 standard in an organization, third party certification can be obtained.

#### 5 Overview of the standard

According to FIDIC (2001: 6) a desired result is achieved more effectively when activities and resources are managed as a process, and therefore an organisation must implement, manage and continually improve the effectiveness of the processes that are necessary for the quality management system. Within the context of ISO 9001:2000 the process approach applies to all processes of the quality management system and can be managed by using the “Plan-Do-Check-Act” (PDCA) concept. PDCA is a dynamic cycle that can be deployed within the organisation’s processes and to the system of processes (see Figure 1).

**Figure 1**  
The PDCA cycle. (FIDIC, 2003: 6)



Clause 0.2 of ISO 9001:2000 explains the PDCA cycle as follows (South African National Standards,2000: vi):

- Plan: establish the objectives and processes necessary to deliver results in accordance with customer requirements and the organisation’s policies.
- Do: implement the processes.
- Check: monitor and measure processes and product against policies, objectives and requirements for the product and report the results.
- Act: take action to continually improve process performance.

According to the Association of British Certification Bodies (ABCB) ISO 9001:2000 contains five requirement sections, each dealing with one fundamental aspect required by any process (ABCB, 2000: 6):

### **5.1 Quality management system**

Certain general requirements as well as the documentation requirements form the basis of the management system. The general requirements lay down the processes of the management system, how they interact with each other, which resources are needed to run the process and how these processes will be measured and monitored. The second part, documentation, sets out the requirements for the documentation needed to operate the system effectively and how it should be controlled.

### **5.2 Management responsibility**

ISO 9000:2000 defines “top management” as the person (or group of people) who directs and controls an organisation at the highest level (saqi, 2003: 3). The management of the system is the responsibility of such top management. In order to do this, top management must know customers’ requirements and develop strategies and policies to ensure that the organisation will comply with customer’s requirements on how these policies will be met, ensure that there are clear levels of communication and review the management system regularly.

### **5.3 Resource management**

To carry out the processes, people should be competent to carry out their tasks with adequate physical resources in a suitable work environment.

### **5.4 Product/service realisation**

These are the processes necessary to produce the product or provide the service. For a service organisation like a quantity surveying firm, this may be the process of providing an estimate of a building or producing a contract document for a project.

### **5.5 Measurement, analysis and improvement**

These are measurements to enable the systems to be monitored. The aim is to gather information on how the systems are performing with respect to the customer, the management system itself through internal audits, the process and the product. Analysing these will provide valuable information to improve the system and product and detect any defects and shortfalls in performance.

## **6**

### **Quality manual**

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When implementing a quality management system in a quantity surveyor’s office, the requirements of the standard should be described in a quality manual. According to FIDIC (2001: 13) the quality manual is the main document of the quality management system and should describe how the requirements of the standard are addressed. According to the ABCB (2000: 9) the standard allows flexibility in respect of the structure of a quality manual. Although it is up to individual firms or organisations to describe the procedures and processes followed in their organisations as they see fit, the ABCB (2000: 9) warns against over-documentation and mentions that it is unnecessary to give a detailed description of every activity.

A typical quality manual in a quantity surveying office could be structured under the following headings:

- **General**

This section gives information of a general nature, such as company profile, general company policies regarding quality, company objectives, organisational structure (especially with bigger firms where there are several branch offices) etc. It is especially important to point out which people in the organisation will take responsibility for quality such as the management representative for quality and the quality assurance manager (in smaller firms this can be one person).

- Management responsibility (clause 5 of the standard).

Apart from the stated commitment by management, this section can also contain aspects like client focus, adherence to quality policies and objectives, internal communication channels, management review of quality etc.

The above can either be relatively brief statements on the various aspects, or it can be a complete sub-section, i.e. "Quality procedure for the management review of the quality system," where the complete scope, definitions, procedure, responsibility matrix, etc. of the procedure are spelled out.

- Resource management (clause 6).

In this section the policy towards human resources will be described. Aspects such as the principles for hiring new employees, job descriptions for various positions within the organisation, competency assessment policy, training and induction processes for new employees should be covered.

Regarding infrastructure and the work environment, the organisation's philosophy towards the provision of facilities and equipment to ensure that all employees carry out their duties in circumstances that optimise their effectiveness should be spelled out. Specific items such as work space, equipment (hardware and software), maintenance, support services (office cleaning, security), work methods, etc. can be mentioned.

- Product/service realisation (clause 7).

This section describes the processes required to realise the general services necessary for conducting business successfully. These can be customer-related processes that will apply to all actions taken to negotiate appointments with clients, internal project management procedures that will provide assurance that projects will be managed under controlled conditions and even purchase procedures to provide assurance that all purchased products procured for use in providing

services to clients, will conform to specified requirements.

- Measurement, analysis and improvement (clause 8)

This section provides assurance that the quality system will be audited regularly to determine its effectiveness and to verify compliance with the requirements of ISO 9001:2000.

Internal audits (clause 8.2) are conducted by the quality assurance manager with the aid of an audit checklist on a regular basis, i.e. twice a year. The results are used to create an internal quality audit report that is kept by the management representative for quality and is used as input information for the annual management review of the quality system.

Nonconformities can be picked up during such an internal audit. An example of nonconformity (described in clause 8.3 as a "deviation from a quality standard or requirement") in a quantity surveyor's office is when items shown on drawings are omitted when preparing a tender document. Another example is when an incorrect scale is used when taking quantities off drawings. Corrective action covers all the steps taken after the problem has been detected, i.e. investigating the problem, taking the necessary steps to prevent it from recurring and completing all nonconformity and corrective action records. Preventive action may also incorporate further training and/or disciplinary action.

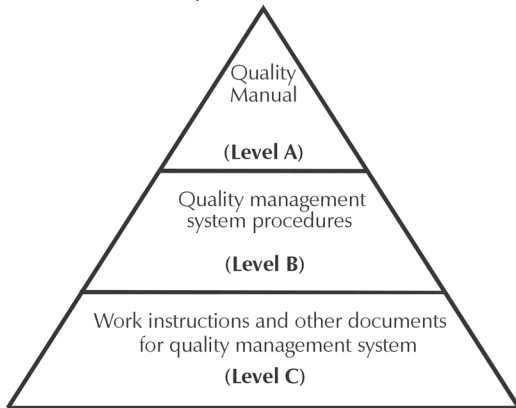
In connection with continuous improvement (clause 8.5), steps to bring about such improvement should be identified, i.e. investigating new ideas or concepts, reviewing and upgrading existing technology, removing chronic problems of quality and productivity as well as staff training.

## 7

### Pratice manual

SANS (2003: 11) describes a typical quality management system documentation hierarchy in Figure 2.

**Figure 2**  
Quality management system documentation hierarchy (SANS, 2003: 11)



Level A is the quality manual as discussed before, while levels B and C can both be contained in an organisation's practice manual. In broad terms, level B documentation should describe the interrelated processes and activities required to implement the quality management system and level C should consist of detailed work documents. The principal aim of a practice manual is to ensure consistency throughout a firm and set out the standards to which people operate in the firm.

The contents of a typical practice manual in a quantity surveying office could appear in the following format, although it can vary from firm to firm or appear in different order:

**Table 1**  
Example of the contents of a typical practice manual

Section no	Section/Document
1	<u>Contents</u>
2	<u>Introduction</u> <ul style="list-style-type: none"> <li>• Introduction to practice manual</li> <li>• Mission statement and policy objectives</li> </ul>
3	<u>General</u> <ul style="list-style-type: none"> <li>• Basic rules and procedures</li> <li>• Filing requirements</li> <li>• Archiving</li> <li>• Photocopying record schedule</li> <li>• Drawing register form</li> </ul>
4	<u>Estimates and viability studies</u> <ul style="list-style-type: none"> <li>• Brief from client: check list</li> <li>• Estimating: practice notes</li> <li>• Estimate: check list</li> <li>• Pro-forma estimate</li> </ul>
5	<u>Conditions of contract</u> <ul style="list-style-type: none"> <li>• Standard preliminaries: practice notes</li> <li>• Standard preliminaries (principle contract): check list</li> <li>• Standard preliminaries (sub-contract): check list</li> <li>• Principle building agreement: practice notes</li> </ul>
6	<u>Bills of quantities</u> <ul style="list-style-type: none"> <li>• Bill preparation: check list</li> <li>• Measurement: practice notes</li> <li>• Measuring: check list</li> <li>• Standard query sheet</li> <li>• Technical quantity check</li> </ul>
7	<u>Tenders and adjudication</u> <ul style="list-style-type: none"> <li>• Pre-tender qualification: practice notes</li> <li>• Tender results record form</li> <li>• Arithmetical check of bills of quantities record form</li> <li>• Tender adjudication and recommendation: practice notes</li> <li>• Tender adjudication and report: pro forma</li> </ul>

8	<u>Financial administration of contract</u> <ul style="list-style-type: none"> <li>• Procedural check list</li> <li>• Standard payment certificate documentation</li> <li>• Financial reporting: practice notes</li> <li>• Financial review: pro forma</li> </ul>
9	<u>Final account</u> <ul style="list-style-type: none"> <li>• Procedural check list</li> <li>• Practice notes</li> </ul>
10	<u>Quality management</u> <ul style="list-style-type: none"> <li>• Corrective action records: practice notes</li> <li>• Corrective action records: pro forma</li> <li>• Quality planning: practice notes</li> </ul>
11	<u>Correspondence</u> <ul style="list-style-type: none"> <li>• Procedural notes</li> <li>• Standard letters</li> </ul>

The table shows the items in the practice manual to consist mainly of practice- or procedural notes and pro formas. This is to ensure, as stated before, that every person in the firm follows the same procedures and adheres to the same standards.

## 8

### **Benefits and disadvantages of a quality management system**

Before implementing a quality management system in any organisation, the benefits of having such a system should be clear. SANS (2003: 3) lists a number of purposes and benefits of having quality management system documentation in an organisation. The following are some that are mostly applicable to a quantity surveying office:

- Describing the quality management system of the organisation.
- Communicating management's commitment to quality to employees.
- Stating how things are to be done in order to achieve specified requirements.
- Providing a clear, efficient framework for operation.
- Providing a basis for training employees and periodic re-training of current employees.
- Providing a basis for continual improvement.

- Providing customer confidence based on documented systems.
- Providing a basis for auditing the quality management system.

There are obviously also disadvantages to implementing the system, such as the cost involved in initially setting up the system. (It is difficult to quantify such costs because it depends on the involvement of external consultants, time taken to implement, size of firm, extent of documentation, etc. and will differ from organisation to organisation). Another stumbling block can be the attitude of the staff, who might initially see it as "just more paper to shuffle" or as a "checking" mechanism by top management.

## 9

### **Research**

Where very little research has been done on quality management in quantity surveying offices in South Africa, Munting (2005) conducted a study on quality management in South African architectural practices. Because of the similarity between South African quantity surveying and architectural practices, the majority being small practices with a low annual turnover and also only two architectural practices having been ISO 9001:2000 accredited, some of the findings of the study listed below will be applicable to quantity surveying practices.

To the question to what extent they agreed that there is a need for improved quality management in South African architectural practices.

75 per cent of the respondents either strongly agreed or merely agreed that there is a need for such an improvement.

To the question to what extent they agreed that mandatory ISO 9001 certification would be beneficial to South African architectural practices.

Only 23,3 per cent of the respondents either strongly agreed or agreed with this statement, while 42,2 per cent were unsure.

To the question to what extent they agreed that mandatory ISO 9001 certification would cost more than it would benefit South African architectural practices.

54,4 per cent of the respondents strongly agreed or agreed and 40 per cent were unsure, indicating that cost of certification is a major concern.

To the question to what extent they agreed that ISO 9001 certification is not an appropriate requirement for architectural practices in South Africa the majority of which constitute small and medium sized organisations.

69,7 per cent of the respondents strongly agreed or agreed with this statement.

To the question to what they thought the primary advantages of ISO 9001 certification is/would be for their practices.

The two main advantages mentioned were (1) improved service quality/customer satisfaction and (2) improved management systems.

In the discussion of the findings of the survey, Munting (2005: 60) mentions that it is evident from the responses that the majority of practices are not inclined towards implementing systematic and documented procedures for managing quality. It is further stated that the presence of an "informal" approach to the management of quality is disconcerting and begs the question of whether such an approach is in fact effective, whether it can still be considered to be quality management at all, or whether

"informal" is actually analogous with "not at all".

## 10 Summary

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Quality management can only work when:

- Management and personnel commit themselves to the success of the system.
- The firm has a defined and documented policy for quality which is understood at all levels.
- There are documented procedures that cover all matters relevant to quality and that are implemented effectively.
- Adequate staff training exists.
- Regular review of the system takes place by executing both internal and third-party auditing.

There is currently not enough evidence available from South African quantity surveying offices to quantify the benefits of a quality management system in local offices. Overseas experience though, has shown that obtaining certification adds value to procedures and documentation and therefore to the service given to their clients. According to Lip (2002), quality management has come to stay in Singapore, but achieving quality certification is only the beginning in the continuous search for improvement in all areas of work.

## 11 Recommendations

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Although quality management is an important aspect for quantity surveyors as well as all built environment professionals, the approach to it should not, as stated by Munting (2005: 60), be imposed on a reluctant industry, but a culture of quality should rather be nurtured. In this regard, the governing body of the quantity surveying profession in South Africa, the South African Council for the Quantity Surveying Profession, should take the leading role. The following is also recommended:

- Cooperation with quality bodies such as the South African Quality Institute, as well as quality experts.
- Education in the principles and implementation processes of quality management could be done through continuing professional development programmes.
- Research should be done into the cost of implementing ISO 9001:2000 certification and whether the government, through the Construction Education and Training Authority (CETA), can assist in sponsoring practices embarking on such certification programmes.
- Incentives in the form of rebates on professional indemnity insurance, improved ratings with client bodies, etc for certified practices should be bargained for.
- Preparation of guideline practice and procedure manuals by the Association of South African Quantity Surveyors to assist practices in preparing their own documentation.
- A survey should be conducted among quantity surveyors to determine whether they have similar responses as architects to the various quality issues as stated in Munting's research (2005).

## 12 Conclusion

What will happen in South Africa? Although still not mandatory, quantity surveyors need to decide for themselves whether they are willing to spend the time, effort and money to gain the value of having a quality management system in place.

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