

THE SEARCH FOR QUALITY - IMPROVING THE AUDIT

D W Cheetham

School of Architecture and Building Engineering, University of Liverpool, England.

Direction and control of employee activities is essential to all management systems. The audit of records within a company quality management system serves two distinct purposes. Not only does it provide a company's clients with certainty that a product or service will satisfy given requirements but it also provides the company management with a control tool on individuals' performance of tasks assigned. This paper both reviews previous studies by the author and the different types of audit. It describes actions taken by a regional contracting company to improve audit procedures.

Keywords: audit, control, management systems, quality.

AN UNCERTAIN INDUSTRY

Building is an uncertain industry. The demand for the skills of contracting firms fluctuates with the national economy and clients needs. It is difficult for construction firms to gain competitive advantage through product improvements for they rarely design the buildings they construct. The quality and extent of information available at the time of tendering can be extremely variable. Many designs are not completed until the building on site acquires a physical form. Most work is gained competitively through tender. The fortuitous coincidence of acceptance of tenders submitted can overstretch a firm's management skills and financing resources, lack of success in tender may result in the firm being unable to support the overheads costs of maintaining a head office.

The site is transitory. During the construction phase the skill requirements change, trades leave when their work is complete and new trades arrive. Unanticipated ground conditions and accidents may well disrupt planned programmes of work. Workers are exposed to the weather, dirt and dust. Casual employment is the norm. Operatives may well be employed by different specialist subcontractors or be employed directly in a subcontract capacity. Unnecessary movement of labour, viz labour turnover not related to work requirements, is high. The management team changes with phase of a project.

Contracting companies operate simultaneously on varying numbers of dispersed sites. They must, of necessity, operate using management information systems which are similar on all projects in order to allow head office support departments such as wages, purchasing and plant to support the production needs of the site and to allow senior management to exercise control. The system must allow effective communication between sites and offices and allow for receipt of instructions from consultants. Standard forms for reporting information encourage ease of comprehension by the recipient through familiarity and allow senior management to

quickly make comparisons of achievement between various sites. Standard procedures are employed to obtain certainty that everyone knows what to do, how and when to do it. This is especially important when introducing new individuals to the company, for providing a common basis for training in dispersed offices and sites, and for the providing a common basis of understanding as to how each individuals' duties contribute to the overall objectives of the company.

It is into this situation of short term, complex relationships in an uncertain market that quality management systems developed in the more stable situation of manufacturing industry (where the manufacturer often determines the products and their designs) have been adopted.

MANAGEMENT SYSTEMS

Just as the buildings created by the industry reflect the capabilities and needs of society, as society has developed and changed, so have contemporary perceptions of the nature of management. Leadership, direction and control exist in all societies. Some forms of social organisation place more emphasis on direction, others on individual responsibilities and self control. Fayol (1916) is credited with initiating management education by his establishment of the "Centre of Administrative Studies" and by adopting the definition "To manage is to forecast and plan, to organise and command, to co-ordinate and to control." Fayol's analysis of the nature of management activity still serves as a basis for the study and practice of management. Most studies by the pioneers of 'Scientific Management' were based in factories mass producing goods, but exceptionally Gilbreth started his career as a bricklayer and became a successful contractor before becoming a pioneer industrial engineering management consultant. Steel and Cheetham (1993). When accepting paid employment a person accepts the authority of the organisation and responsibilities placed upon them. Some people have authority, the power to issue instructions over others.

Concerns for personnel management, social and participative approaches to management have developed as a result of the application of the social sciences. Motivation, satisfaction and incentives have received attention from McGregor, Maslow and Herzberg. Improved managerial performance is seen as essential to the achievement of improved business performance. Training and development programmes have been devised with this intention. Drucker (1955) pioneered the concept of "Management by Objectives" (M.B.O.) which has been developed by Humble (1968) and others. Inherent in this is a system of control of junior managers by more senior managers when performance is reviewed. These proponents of MBO programmes believe that participation in assessment leads to understanding of the organisation's goals, to a co-ordinated application of the knowledge, skills and experience of employees, a more determined approach by each manager and greater job satisfaction for all concerned.

The reality can be different. During a study of the implementation of MBO to a contracting firm, Cheetham (1980) some seventeen years ago, the managers concerned did everything possible to frustrate the effective operation of the system. The major problems were lack of certainty of job definition and of delineation of responsibility. In particular, site managers regarded the review as a challenge to their self esteem, showed aggressive and anarchic behaviour, were preoccupied with short term problems and failed to prepare for review meetings. They resented providing their

superiors with information with which they could be controlled. Similar behaviour has been observed during the QA audits Cheetham (1993, 1996).

QUALITY MANAGEMENT IN CONSTRUCTION

The impetus for the construction industry to adopt quality management has been client led. Major clients have insisted that quality systems and procedures are applied to the construction projects they commission. The need for quality assurance - planned systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements - was promoted by government and a strategy adopted in 1978 "to facilitate the implementation and assessment of modern quality management systems" Anon (1978). This reflected the philosophical viewpoint that the primary responsibility for quality must lie with those doing the work. The responsibility of the management of an enterprise is to establish a system for verification of work and to educate the work force in its use. These innovatory concepts, resulted in various parts of British Standard BS 5750 (1979) and their international equivalent ISO 9000 series. The standards relating to auditing were developed later by British Standards (1991) while the primary standards were revised in 1994. British Standards (1994).

The firm must critically examine its procedures and methods of working. Lines of authority and communication must be clearly established. General and specific responsibilities of all members of the organisation identified and clarified. The management must critically examine and record procedures to be followed for all managerial and clerical activities and Inspection and Test Plans specific to the process being undertaken on site. Written statements of procedures for activities enable both managers and those managed to ensure that reliable and proven methods are used. Writing down and reviewing procedures provides an opportunity for considering if there are better or more effective ways of performing a task. This ought to both reduce the number of errors and the time taken to perform operations. Records are maintained of all activities, in particular inspections and tests, customer complaints and technical data available for use by employees. The discipline of good record keeping ought to enable problems to be traced and provide feedback for improvement. Once laid down the systems create certainty (assurance) that everyone in the organisation knows what to do and how to do it.

Quality assurance achieves this certainty by audit of records maintained by employees who are required to perform tasks in accordance with formal, recorded, procedures. The audit ensures that the various processes that make up the total system are being correctly implemented. Audit, by definition, is not a continuous process so it is necessary for the auditor to take a sample from the records maintained by those performing tasks. These records and the auditors reports on compliance or otherwise with company procedures, both administrative and of site working practices, provide the company senior management with the certainty the methods and procedures that they have determined or approved are being undertaken in the approved manner. Figure 1 summarizes the steps necessary for establishing a quality management system.

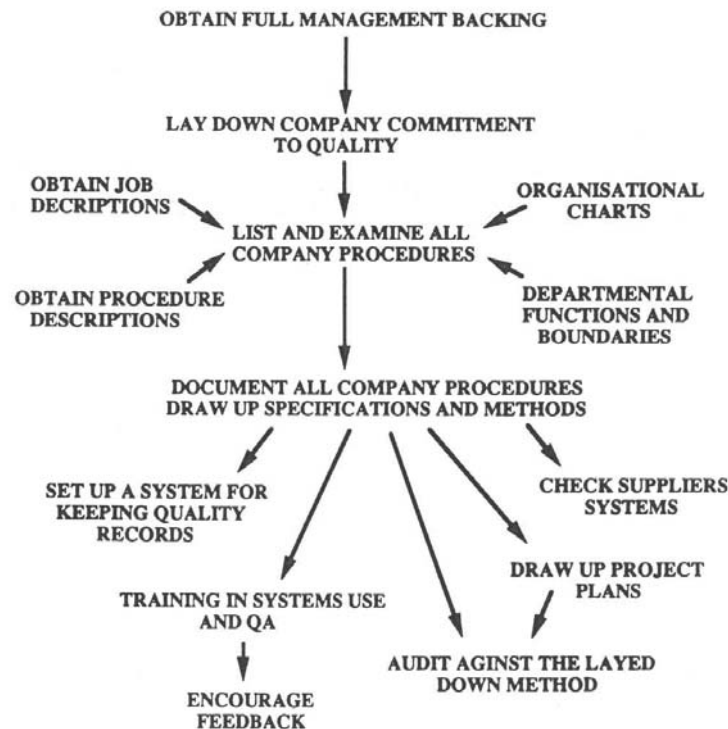


Figure 1. Methods for achieving quality management

This approach to control of the activities of a company's personnel is considered by the many proponents of quality management as being innovatory and superior to more traditional methods. It empowers the workers! A more direct, but seldom recognised, impact on the firm is that the control function is delegated by managers (at all levels) to the Quality Manager who conducts the audits.

PROJECT QUALITY PLANS

Construction on site is a dynamic process and the project quality plan ought to be the key site document. A general plan is prepared prior to the commencement of work on site at the pre-construction (mobilisation) stage and revised at intervals during construction as further information, instructions and drawings are received and subcontractors are appointed. See Cheetham and Lewis (1993).

It contains a complete schedule of the drawings, specifications and contract documents and allocates specific responsibilities for matters such as the procedures to be followed for receiving instructions and responsibility for maintaining records to named individuals. The plans are prepared to help the site managers firstly define and subsequently control the requirement of the projects. The preparation of quality plans requires planning and programming the works, recording proposed methods in method statements and analysis of the requirements of the project documentation such as requirements to submit test certificates and to obtain architect's approval of samples. Hold points, where checks on site works by consultants and/or local authorities are needed, are identified on work programmes. Quality plans identify which of the company standard inspection and test plans are to be used and procedures, both administrative and site work, which are specific to the particular project. Sub-contractors quality plans are included and a master file kept in the site offices.

TYPES OF AUDIT

An audit is a systematic, planned and documented examination to determine whether procedures, plans, documents and activities comply with requirements and are effectively implemented.

The audit objective is to provide an independent review of each element to establish:

- Whether the management system meets the requirements of the quality standards.
- That the system has been effectively implemented.
- That all documented activities and controls are being adhered to.

There are two types of audit - system and compliance.

A System audit is used to assess both the adequacy of the total system against the requirements of the appropriate BS Quality Standard and the extent to which it is followed in practice. This type of assessment is comprehensive in extent, is time consuming and therefore costly to conduct. System assessments are normally carried out by third party assessment bodies. They provide recognition of achievement of a standard of management against an external bench mark.

Compliance audits are more narrow in scope and are used to determine solely whether procedures, instructions and controls are adhered to in practice. Normally compliance audits are conducted internally, although some purchasing organisations may also carry them out as part of an overall assessment activity of major suppliers and sub-contractors.

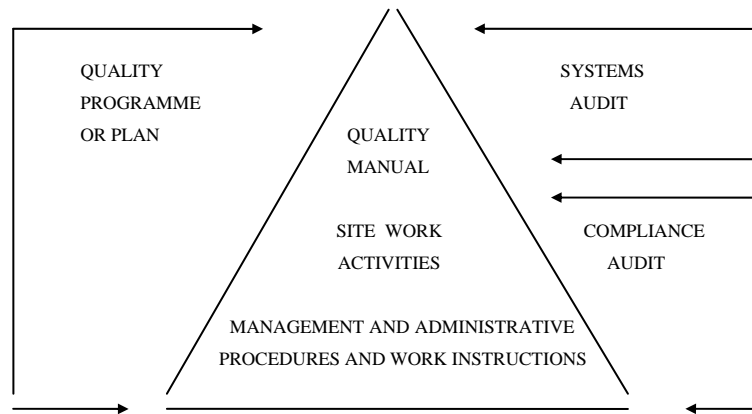


Figure 2 Scope of Audit

It is also possible to categorise audits by the persons undertaking them.

- Internal: by a company of its own performance.
- External: by a company on its own suppliers.
- 2nd Party: by customers on the company.
- 3rd Party: assessment of the company by an independent accreditation body.

PREVIOUS RESEARCH

Previous studies have suggested that the continuous changes associated with building site work and lack of continuity of employment for individuals prevent the effective implementation of compliance audits. Cheetham (1996: 364-378). Another problem has been variability in application of QA principles between divisions of the same firm. The extent of delegation by Senior Management of their control function to Quality Assurance Managers may be regarded as excessive. In general, Quality Managers are individually, pleasant, well intentioned men who have been moved from line management positions to a staff role. Some are constantly “fighting a war” others are regarded as “well intentioned do gooders” whose reporting procedures can be circumvented when production needs dominate. [Cheetham and Carter (1993).] Examples of ignorance of QA principles and procedures by sub-contractors can be found. Cheetham and Lewis (1993).

Their study of subcontractors quality plans revealed considerable ignorance of the requirements of quality plans by subcontractors and described some very poor site workmanship practices. Only the Mechanical and Electrical subcontractor produced a satisfactory quality plan. Very long chains of employee/employer were identified often ending with a labour agency. Operatives accepted the industry with its tradition of casual employment and were not concerned with record keeping or traceability. These operatives, chargehands and subcontract foremen knew they would probably not be on site if and when problems with their work might be identified. Even some of the main contractors site staff, site engineers and junior foremen doubted the likelihood of their continued employment. The workmen did not regard each other as ‘internal customers’.

To overcome these problems, found in many contracting firms, a regional contracting firm developed an extensive training programme in quality management principles and sought to share responsibility for compliance audit among many staff, each undertaking audits for a brief period each month, along with their regular duties. One of the aims was to encourage the view that audits are a regular commitment and that to be audited is simply a routine business function, not a slur on the character of an individual whose performance is considered inadequate. A description of these workshops follows.

THE TRAINING WORKSHOPS

The training workshops occupied a working day and were repeated over several months as various head office staff, site surveyors, site managers and foremen were able to attend. By mixing personnel from different departments and sites of varying job title the firm promoted interchange of use on company procedures in a way not anticipated. The day was divided into a number of sessions.

1. Introduction to company commitment from Managing Director.
2. Introduction to ISO 9000 Series of Standards.
 - Quality Management and Assurance Philosophy
 - Definitions
 - Requirements of Constituent Parts of ISO 9002
 - Documentation Required

3. How company had achieved third party certification.

Relationship of documents in company quality management system

Changes made to previously used standing orders, procedures manuals and site record forms.

4. Audit Requirements.

5. Role Playing Exercises

Questioning Skills

Listening Skills

Listening Problems

Audit Reports

6. Compiling

Follow-up Audit

Non conformance Reports

Many opinions were expressed and the trainers worked hard to ensure that discussion focused on topics such as the ideal qualities to be possessed by an auditor, the psychology of the auditee and how to deal with persons who might be nervous, defensive, irritated, hostile, bored or even totally disinterested. The company adopted standard procedures : the audit was conducted in three main stages:

PREPARATION

The audit date agreed with those concerned, reports on previous audits studied, and an audit plan identified the following:-

- the scope and itinerary, specific activities and areas to be examined during the audit;
- development of check lists;
- the reasons for carrying out audits (eg. Organisational changes, reported deficiencies, routine checks and surveys);
- procedures for reporting audit findings, conclusions and recommendations;

THE AUDIT

On the agreed date the auditor meets the auditee and arranges a timetable. Audit interviews seek to ensure objective evaluations of quality system elements and may include the following:-

- organisational structures;
- administrative and operational procedures;
- personnel, equipment and material resources;
- work areas, operations and processes;
- site inspections to establish degree of conformance to standards and specifications in project quality plans;

- review of documentation, reports, record-keeping in order to check compliance with the various company procedures manuals.

The auditor is looking for:-

- Definition and understanding of responsibilities;
- Existence of records;
- Knowledge and understanding of procedures used to create records;
- Correct application of controls techniques on site;
- Effectiveness of controls when correctly applied;
- Planning and co-ordination between functions;
- Equipment and facilities available to persons performing tasks.

It is important that the auditor personally selects the record sample(s) to be examined, for it is not practicable in the time available to examine all the evidence. Any non conformances identified should be formally recorded and, where possible, agreed with the auditee at the time of interview. A closing meeting reports the results of the audit to the members of staff and identifies matters requiring further attention.

REPORT AND FOLLOW UP

An initial audit report, findings, conclusions and recommendations as to the action taken to correct problems is submitted for consideration by appropriate persons. The following items are normally included:

- Specific examples of non-compliance or deficiencies;
- Possible reasons for such deficiencies, where evident.
- Appropriate corrective actions suggested.
- Assessment of implementation and effectiveness of corrective actions from previous audits.

The follow-up of the audit should:-

- Verify that corrective actions are complete;
- Verify that corrective actions are effective;
- Verify that corrective actions prevent re-occurrence;
- Identify corrective actions not carried out or ineffective;
- Arrange further follow up or close out audit findings;
- Report.

A full audit report is then issued to senior management and copied to head office department or site. This may be followed up by a further visit to ensure that the agreed action is being taken if problems remain. A final completion report is then issued. The auditor must be skilled at taking notes throughout interviews. Provision on check-lists for notes can simplify the task. Whilst effective communication is important reports must be supported by the gathering of objective evidence if the findings of the audit are to be accepted. An audit cannot be based solely on verbal exchanges; evidence must be examined to confirm or otherwise that what has been

said is true. Documentary and/or physical evidence must be gathered. Alternatively a notebook can be used. Whenever possible photocopies of documentary evidence should be obtained. These can be particularly useful at final meetings where findings may be challenged.

CHARACTERISTICS OF HELPFUL NON CONFORMANCE REPORTS

- i. Concise reporting using the words of the assessment standard to define the deviation, supportive up by specific evidence.

e.g. There is evidence of a lack of document control in respect of the Quality Manual, for example:-

- no distribution list;
 - superseded issue (issue 3) held by the Site Quantity Surveyor;
 - two different issues (3 and 4) held by the Commercial Manager;
 - Uncontrolled copy held by the foreman bricklayer.
- ii. Corrective actions should be recorded and agreed by both auditor and auditee, including a timescale for completion. Often it is not possible to agree a time scale at the audit but a formal deadline for agreement of appropriate corrective actions should be set.
 - iii. A proposed follow-up action to confirm the satisfactory implementation of the agreed corrective action.

PARTICIPANT RESPONSES

The workshops were well received by those seconded from site and granted time away from their normal jobs to reflect upon the important features of audits. Exercises in listening and questioning, role plays, were a novelty for many concerned. Some observed that they were constantly in role play situations depending upon their current situation. They adopted different styles of speech to clients than to sub-contractors. At times the consultant trainers, hired to support the company quality manager, had difficulties in ensuring that the groups focused on the principles of quality assurance.

CONCLUSIONS

The basic idea of involving many personnel in the auditor function not only reduced pressure on the quality manager but also seemed to be leading to greater acceptance of the audit as an every day, commonplace, activity. This in turn led to greater awareness of the need for record keeping. Unfortunately a financial problem elsewhere in the group led to insolvency and the collapse of the contracting firm shortly after the company introduced the devolved auditing system. The question remains as to whether or not the directors and senior managers were exerting sufficient control over the activities of employees or whether the owners of the group (which had taken over the well established regional family based contractor) were involved in financial engineering of a sophisticated if not illegal character.

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