QUALITY ASSURANCE - OPENING TO A COMPETITIVE MARKET

by

Nihal Samaranayake
BSc(Eng), MIE(SL), MIEAust., CPEng, MQSA

Quality Assurance is becoming the best management tool in the modern business, to be more competitive with their products or services

Most organisations - industrial, commercial or governmental - produce a product or service intended to satisfy a user's needs or requirements. Such requirements are often incorporated in "specifications". However, technical specifications may not in themselves guarantee that a customer's requirements will be consistently met, if there happen to be any deficiencies in the specifications or in the organisational system to design and produce the product or service. Consequently, this has led to the development of quality system standards and guidelines that complement relevant product or service requirements given in the technical specifications. (ISO 9000 - 1987)

What is Quality Assurance

Quality Assurance does appear daunting at first sight. However, all contractors/manufacturers, of whatever size, employ company procedures (ie, ways in which the company operates), all plan their work, all give work instructions (written or verbal), all inspect and test their work, all keep records and all check in some way that their company procedures are being obeyed.

The essential feature of quality assurance is that all these activities, whether under a system which conforms with an recognised standard or not, are carried out in a more formal and structured way.

Quality Assurance is defined in AS 1057 - 1985; Quality Assurance and Quality Control - Glossary of Terms. as "all those planned and systematic actions necessary to provide adequate confidence that goods and services will satisfy given requirements. "and implies the application of various management techniques.

Adoption of a quality system assures both the contractor/manufacturer and the customer that a product or service is fit for purpose when supplied, and that it will remain so for a stated period of time, under specified conditions of use and maintenance.

It requires the contractor / manufacturer to plan and control, by means of formal procedures, all the activities involved in supplying and commissioning a product.

Quality Assurance requires the total integration and control of all elements within a particular area of operation so that none is subservient to the other. These elements cover such aspects as administration, finance, sales, marketing, design, procurement, manufacture, installation, commissioning.

Formal procedures include written descriptions of work activities and the inspections necessary to check that these activities have been correctly carried out. It is not quality control but quality control may be a part of this process. Quality control is a cure and Quality Assurance is a prevention. Obviously prevention is better than cure. The procedures are themselves, at intervals, subject to independent checking or audit.

The end result is that, as required by the customer, the contractor can produce written evidence that all the planned actions have been carried out and that the product specification has been met.

Quality Assurance should be a means of approaching a project/production :

1. by planning, for the end result and best route to get there;

2. by ensuring the works / production are carried out and inspected systematically;

3. by producing documents to demonstrate that the specifications for materials and workmanship have been met;

4. by auditing the procedures to demonstrate that the planned approach has been observed and has been successful.

Concisely what is Quality Assurance ?

- It is cost-effective.
- It is an aid to productivity.
- It is a means of getting it right first time and every time.
- It is good management sense, and most importantly;
- It is the responsibility of everyone.

Quality Assurance is, therefore, a management function which cannot be delegated.

Why is Quality Assurance Necessary

For the customer Quality Assurance may be necessary for one or more of the following reasons.

1. to assure reliability or public safety by structured control of all stages of design and production;

2. to provide positive evidence that the quality produced by the contractor / manufacturer meets that specified;

3. to demonstrate prudent expenditure, particularly of public funds.

For the contractor / manufacturer, there are at least three reasons for offering quality assured products or services :

1. to remain competitive;

2. to enhance the reputation of the contractor;

3. to take advantage of the cost-benefit which accrues from better planning, reduced remedial work, and better relationships with customers.

Responsibility for Quality

Quality cannot be inspected into a product or project; it must be built-in

Responsibility for quality lies with those doing the work; the customer, the planner, the engineer, the contractor/manufacturer, the operatives; the materials supplied and the sub-contractors.

Quality Assurance requires that all involved should:

- **know what their responsibilities are:** have appropriate organisation structures, clear lines of responsibility and communication.
- **know what their duties are:** have clear definition and description of duties.
- **know what to do:** have correct specifications and drawings.
- **know how to do it:** have proper training, appropriate procedures, ready access to necessary instructions.
- **want to do it:** have proper motivation.
- **be able to do it:** have the right resources, plant and materials.
- **know what is to be done:** have appropriate checking, measurement or testing of products.
- **record that it has been done:** keep proper records, specified certificates.

Evidence of Quality

What is evidence of Quality? It is the written evidence of quality collected during the design, procurement, manufacture / construction and commissioning phases of a project / product.

Adherence to the quality procedures leads to quality, but the evidence of quality is provided by documentation, i.e. the generation and maintenance of records.

Degrees of Quality Assurance

The different degrees of assurance (ie. ISO 9001; 9002; 9003) do not imply higher or lower standards of materials, work procedures, or workmanship, since the basic procedures used on all parts of the contract should be common. Different degrees of quality assurance imply different amounts of supervision, inspection, testing and documentation, which, in each case are sufficient to assure the customer that the specification set had been met.

Quality Assurance Administrative Procedures

Most of the administrative procedures which affect product quality are mentioned in the various standards and include:

Tender & Contract Review	Handling, Storage & Packaging
Design Control	Records
Documentation	Nonconformance
Measuring & Testing Equipment	Corrective Action
Procurement	Customer-Supplied Products
Inspection, Testing	Statistical Techniques
Indentification & Traceability	Quality Audits
Process Control	Training

These administrative procedures have been formalised by the company Quality manager and the Managers of the functional departure concerned, based on the existing good practices of the company.

Quality System Standards

ISO 9000	- Quality System - Guide to selection and use
ISO 9001	- Quality System for Design/Development, Production, Installation and Servicing;
ISO 9002	- Quality Systems for Production and Installation.
ISO 9004.1	- Quality management and quality system elements.
ISO 9004.2	- Quality management and quality system elements - Guidelines for Services
AS 3905.2	- Quality system in the construction industry.

AS 3900-1987 series and BS 5750-1987 are identical with the ISO standards.

Benefits of Quality Assurance

The benefits of introducing Quality Assurance as a management technique into the construction / production process may be summarised as follows :

a) The customer receives assurance that the service/product he ordered has been constructed / manufactured in accordance with established work procedures, using materials of specified quality;

b) The contractor's / manufacturer's procedures become more efficient, wasteful practices are eliminated and the communications within the company improve because the responsibilities of people involved in construction / production are better defined;

c) Communications between the parties to the construction / production work improve through the use of more formal channels of communication;

d) More work is produced "right first time and every time in every level", and cost savings are made because less remedial work is required; ref: figure (a)

e) Less time is lost through poor material supply, and the cost of replacing rejected materials are reduced;

f) Project information, drawings, specifications etc. are supplied by the customer's representative more systematically. Specifications become clearer;

g) The contractor / manufacturer has a better chance of meeting his budget and completing the project / product in time. Any disputes which arise should be settled more easily by reference to the project / product quality records.

h) Where there is staff turnover on site, new incumbents find it easier to check that parts of the works completed before their arrival have been carried out correctly. Equally, young Engineers gain experience with greater confidence, since written procedures they are asked to apply have been prepared by Engineers more experienced than themselves;

i) The contractor / manufacturer obtains assurance through audits and corrective action that his project management is operating correctly.

Some expressed disadvantages of QA

a) Introduction of another management discipline;
b) Cost of developing and applying the Quality System;
c) Increased tendering costs;
d) Need for staff with Quality Assurance skills;

Costs and Savings

(A) Costs

The cost of Quality Assurance can be attributed to three items:

1. developing a quality system;
2. preparing a quality plan for specific projects;
3. putting the quality system into practice.

(B) Savings

The savings are impossible to quantify, because the same contract is not completed and costed, both with and without quality assurance. Possible areas of saving costs are:

1. less remedial work

2. less wastage of material

3. completion on times (lower overheads)

4. easier settlement of claims.

Conclusion

In general, it is the high-technology industries/contractors that have taken the lead in adopting these principles of quality assurance and not unnaturally expect and demand their suppliers to employ the same principles.

Manufacturers / contractors, in general, are slowly beginning to realise the benefits of quality assurance as discussed. Its importance is increasingly recognised at government level as many governments have introduced schemes for its promotion. A number of trends may be mentioned:

1. Many countries adopting national schemes and provide assistance to enable companies to obtain the services of QA consultants.

2. Product and services certification schemes are being developed.

3. Governments imposition of quality systems upon contractors is now the rule in certain industries and contractors in many countries.

4. Training in Quality Assurance systems application is now beginning to make some headway.

Reference :

1. Quality Assurance: The Route to Efficiency & Competitiveness by Lionel Stebbing

2. Stepping Stones by Standards Australia

3. ISO 9000 by B. Rothery

4. The Quality Audit: A Management Evaluation Tool by C.A. Mills

5. AS 3900 series by Standards Australia