Paper No. 160

Quality Control in Pakistan Industries - Present Situation

ENGR. ANWAR SALEEM
Dy. CME Pak. Railways

QUALITY CONTROL IN PAKISTANI INDUSTRIES
PRESENT SITUATION

By

Engr. Anwar Saleem*

SYNOPSIS

What is Quality Control

The term "Quality Control" has often been misunderstood as "stricter inspection". The word "Quality" in this term does not mean "the best" in any absolute sense. To industry it means "best for certain customer conditions". Industrially, control means meeting of standards; quality according to specification; delivery according to schedules, expenses according to budget.

Total Quality Control

Production quality is created with the co-operations of many departments in an organization viz. merchandise planning, designing, procurement, production, inspection, marketing etc. The efforts made by each of these departments and their co-ordination on a company wide basis is called "Total Quality Control" or "Company-wide Quality Control"

American Vs Japanese Approach Towards T.Q.C.

In America and most other Western countries the Q.C. job is handled only by the specialists in the field. This methodology is based on the Taylor's principle which envisages that thinking should only be done by the educated engineers while workers, who mostly have a low education levels, should only follow the norms set by the engineers.

On the other hand Japanese believe in weak specialization. They are of the opinion that best quality control results can be obtained by educating the workers of each department in quality control techniques and then making them responsible for quality control in their own departments.

Quality Control Organization Types

There are three basis types;

i. Inspection type. (most common)
ii. Advisory type. (less common)
iii. Full authority for quality type (rare)

No tailor made T.Q.C. system is univeral. It is, therefore, important for each corporate body to first indentify its culture so as to develop its own quality management system. The middle management plays a vital role in such a system.

Present Situation

Application of T.Q.C. in Pakistan is still in infancy stage. Most of the small industrial units neither appreciate its significance nor practice it. Other large units (including public sector) mostly practice it to the extent of adding on inspecting wing to their organisations, without implementing

T.Q.C. in the real sense of the word. T.Q.C. in the real sence, is being practised by very few organisations like P.I.A. and some other foreign-based process industries.

Reasons For Lack of T.Q.C. in Pakistan

1. Lack of awareness on the part of top management.
2. Low education level of workers and supervisors.
3. Lack of interest on the part of professional engineers.
4. Lack of motivation and adequate human relations.
5. Lack of Q.C. on the part of vendors.
6. Lack of enforcement of national standards.
7. Absence of labour policy conducive to quality control.
8. Monopolistic situations especially in public sector.
9. Lack of adequate infra-structure.
10. Absence of quality control associations to exchange information.

Conclusions and Recommendations

For a resource-deficit country like Pakistan, it is imperative that we make all out efforts to increase productivity and curtail production costs in order to increase our exports and improve the balance of payments. As a first step, we must create awareness for "Quality Management" at all levels starting from the top management level. Some of the steps that need to be taken in the opinion of the author are:–

i) Engineering Congress and other similar professional bodies create awareness for "Quality Management" especially amongst the top management, through more frequent seminars and other possible means.

ii) The government should have all industrial units surveyed through a professional commission to identify exact status of implementation of Q.C. in this country, the reasons for its lack of application and such a commission should recommended both short and long-terms methodology for its implementation.

iii) Establishment of Engineering Academy is expedited to train today's middle managers and future top managers to create awareness for quality management.

iv) Monopoly of certain industries (especially those in the public sector) should be gradually reduced.

v) Adequate incentive be provided to attract educated technicians and workers.

vi) More engineers be employed on shop floor level.

vii) "Quality medals" be instituted on the pattern of "Export Performance Medals".

viii) Foreign Exchange and other export restrictions should be imposed on concernes not having any quality control.

ix) The labour policy which is under preparation should be such as to promote healthy layout environment conducive to quality control.

QUALITY CONTROL IN PAKISTAN INDUSTRIES
PRESENT SITUATION

By
Mr. Anwar Saleem*

Historiacal Back Ground

The term "Quality Control" has had a short but lively history. In the beginning many thought that by enforcing stricter inspection, one could improve the quality. Later, it was relised that inspection does prevent certain defective products but the process which produces the defects, needs more than mere inspection, to improve quality in the real sense. During 1940s and 1950s, there was a wave of enthusiasm for the use of statistical methods in quality control which coined the phrase "Statistical Quality Control (SQC)" which was publicised so widely that many managers gained the impression that quality control consisted of use of statistical methods alone.

In the late 1950s, there arose a countermovement in America which aimed at de-emphasizing the limited approach of SQC and restoring the concept, that a broad collection of tools is needed for quality regulation, of which statistical method is but one. The most popular phrases coined by this movement was "Total Quality Control". It is this councept which is now being practicised by most advanced countries of the world with slight variations to suit particular conditions. This will be discussed in greater detail in succeeding paras.

What is Quality Control

In the phrase "Quality Control" the word does not have the popular meaning of "the best" in any absolute sense. To industry, it means "best for certain customer conditions". So quality can be defined as:

"the totality of features an characteristics of a product or service that bear on its ability to satisfy the needs of the customer".

Industrially control means meeting of standards; quality according to specification; delivery according to schedules, expenses according to budget. The process through which we establish and meet standards is commonly called "Control".

Quality Costs

The main objective of any quality control programme is to produce the required quality at minimal cost. If we spend too much on improving quality without proportionate increase in the selling price, the investment in quality improvement is not worth it. In the present competitive market, we find that selling price has a ceiling and therefore, if our quality costs are higher than they need to be, our profits are correspondingly reduced. A typical relationship between quality of the product and various quality costs is depicted in Annexure 'A'.

Quality Control Activities. (Ref: Annexure 'B','C' & 'D')

Any quality control programme can be broken down into five basic activities:

1. Setting quality standards required by the customer in terms of;
   - Cost.
   - Performance.

*Deputy Chief Mechanical Engineer, Pakistan Railways

- Reliability.

2- Plan to achieve the required quality. This will involve;
   - Planning methods.
   - Planning equipment.
   - Procuring the right material.
   - Selecting and training operators.
   - Planning inspection at various stages and shop-floor quality control.
3- Undertake manufacture according to standards.
4- Record measurements, compare with standards and correct the quality short-comings.
5- Planning for improvement.

Total Quality Control

Production quality is created with the co-operation of many different departments in any organization viz. merchandise planning, designing, material procurement, production, ispection, marketing and after-sales service. High quality is required to be created by each of the departments in thesystem working in close co-ordination with the other. The efforts thus made to improve the quality of work on a company-wide basis as well as to improve the quality of the product itself are called "Total Quality Control (T.Q.C.)", or"Company-wide Quality Control (C.W.Q.C.)". For successful implementation of any T.Q.C., the quality required from each of the departments must first be defined and a quantitative system set up to evaluate progress.

American vs.japanese Approach Towards T.Q.C.

In America and most other Wistern Contries, the Q.C. job is handled by the specialist in the field. In their T.Q.C. system, Q.C. is exercised by all the departments and what is done in each department is the job of the Q.C. specialist. This system is based on Taylor's principle, put forward in the earlier part of this century, which envisages that the thinking should only be done by the educated engineer and workers (who are usually lowly-educated) should only follow the norms set by the engineers.

Japanese believe in weak specialization. There jobs are rotated between different departments, so thay if one works in design, then Q.C. for design is the designers responsibility, and if one works in production, the Q.C. for production is production worker's responsibility. They believe that basically human nature is good and the best Q.C. results can be obtained by properly educating the person ivolved in the job adnd then making him responsible for quality control. The Japanese have been successful with this approach mainly because of such peculiar features of their society as universal education (99% of their population is elementry school qualified and 93% are higher secondary school gualified), life-time employment of workers in one company, company labour unions instead of trade unious etc. etc. It is difficult to apply the Japanese T.Q.C. system in our conditions directly, in view of vastly different social and industrial conditions. So it is a great challenge for our professional engineers to work out T.Q.C. systems suited to the conditions of the organizations they are working in.

Quality Control Organization. (Ref: Annexure 'E', 'F', 'G' & 'H')

We have by now established that everybody in the company has some contributions to make to quality, therefore, "Quality is everybody's business". Unfortunately, if the responsibility for quality is so wide, there is every risk that practically it will be "nobody's business". To avoid this, overall responsibility for co-ordirating the company quality effort must be given to some body.

As quality concerns everybody, the only person who is logically responsible for overall quality

is the very top man, but he can seldom spare the necessary time. Therefore, responsibility for quality is usually delegated in our of the following manners:

Chief Inspector Type

Responsibility for quality co-ordination is delegated to a Chief Inspector, who controls the inspection organization. His approval is necessary before anyting is despatched from the factory to the customer, and very often he must also approve work before it can leave one department for another. His authority over the production department is usually indirect. He cannot stop them for producing defective work but he can stop them from despatching these to other departments or to the customer. He tries do verything he can to assist the production department to make products "right first time".

Advisory Type

The quality manager in this type of set up has a purely advisory role. He helps to solve its quality problems. For this system to be successful, departments must be prepared to accept the advice of the quality manager.

Full Authority for Quality

In this type of set-up, the quality manager is of the rank of a director or equivalent and has such authoritative control as being able to stop any process or machine producing defective products.

Of the three types of quality management organizations discussed, type (1) is the most common and type (3) is presently rare in Pakistan.

Quality Control Organization in Railway Mechanical Workshops and sheds. (Ref: Annexure 'H')

Pakistan Railways workshops and sheds have two distinct type of quality control organization – one for its manufacturing activity and the other for the repair. Railways being a service industry, no single type of set-up fulfills its requirements completely. So a compromise system has been developed which is primarily an inspection – oriented system but some features of control engineering from the other two systems have also been retained. The procurement department also runs a purely inspection type system to ensure satisfactory quality of the components and materials purchased from vendors.

On the production side, Works Managers are usually responsible for production while quality aspect is looked after by the Production Engineer under whom works the Chief Inspector of Production (CIP). The C.I.P. has a network of senior and junior inspectors spread over all the important stages of different production shops. Sampling varies from 10 to 100% depending upon the volume of production. Products cannot move to the next stage without having been passed by the inspector. The inspector has full authority to stop production in case the defects exceed beyond an acceptable limit and the matter is then reported to the Shop Manager as well as to the Production Engineer for taking corrective action. Extent of defects in each shop are regularly discussed between Works Managers concerned, the Production Engineer and the Chief Chemist and Metallurgist to assess the level of quality and taking corrective action necessary on the shop floor such as defective machines toolsor training of operator etc. Cases of sub-standard material procurement are reported to Chief Controller of Punchase and those of defective design are reported to the Chief Mechanical Engineer for remedical action. The Chief Mechanical Engineer's office exercises overall technical control for material specification, design and manufacturing

of engineers in this country leak proficiency in the language of the top management partly due to inadequacy of our engineering education and partly because of lack of adequate training during service. There is need to make up this defficiency. The proposed Engineering Academy may be able to solve this problem to a greater extent.

Present Situation in Pakistan

Although most of the industrial units and service industries in Pakistan do have some kind of quality control system but in most cases it is nothing beyond a routine inspection check. In some of the better organized corporations, these inspections are also carried out in the vital stages while in other cases (mostly small private engineering units – some of them also engaged in export) the inspections is carried out only at the final stage. Mostly people think that Q.C. system is an overhead with no ultimate usefulness. Large public sector organizations like Railways, Telephone Department, State-rum-production units and the defence industries do have better organized Q.C. systems but without a proper control engineering element. T.Q.C. in the real sense is being practiced in very few organizations like PIA & some other foreign bases process industries.

Reasons for Lack of Q.C. in Pakistan

Reasons for lack of Q.C. applications in Pakistan are many but most prominent amongst these are;

1. Lack of Awareness on the part of top management
   The most prominent of these reasons in the lack of top management awareness, of needs and opportunities inherent in good quality control.

2. Low Education Level
   Education level of the workers and supervisors (in terms of Q.C. awareness) is very low and there are very few opportnities available to them to improve it during service. Companies are reluctant to invest in this direction due to high labour turn out and job-changing tendencies.

3. Lack of interest on the part of Professional Engineers
   Engineers who possess some level of management and Q.C. know-how prefer to remain on white-collar assignments. Those in production, either lack Q.C. awareness or co-operation from ignorant top management.

4. Lack of motivation and adequate human relations. Motivation to workers and shop-supervisors for improving quality is lacking. Workers do not have adeguate confidence in top management workers think that they will not get any benefit, if they improve quality. Trade unions also do not play a positive role in this regard.

5. Lack of Q.C. on the part of vendors and subcontractors due to such factors as lack of proper specification, lack of inspection, enforcement, curruption amongst inspecting staff etc.

6. Lack of enforcement of national standards.

7. Absence of a Labour policy conducive to quality control.

8. Monopolistic situations especially in government controlled industries.

process.

On the repair stide, each Works Manager (W.M.) and Divisional Mechanical Engineer (LME) exercise their quality control function through Chief Inspector of Repairs(CIR) who has a net-work of senior and junior inspectors under him deployed over various vital stages of repair. Various repaired components cannot move from one stage of repair to the other without having been passed by the authorised inspectors. The "CIR" is only responsible for quality and has no other responsiblities. He reports directly to the Divisional officers concerned for all quality matters. He has full authority to reject a component if it does not fulfill the laid down quality standards. Analysis of major component failures during service is regularly made at the shop/shed level for taking remedial action. Cases of serious nature are reported to a "Standing Failure Committee" in the Mohalpura Workshops which consists of Works Manager Loco, Chief Chemist and Metallurist and the Production Engineer. This committee analyses each major component failure in detail after examining the failed component and making necessary physical tests to pinpoint the cause of failure an suggest alternations in material specification, design or manufacturing process if necessary. Recommendations of the Material Fa failure Committee are than considered in the Chief Mechanical Engineer's office to see if any alteration in the existing design or preventive maintenance schedules is required or not.

Creating Corporate Culture Through T.Q.C. (Ref: Annexure '1'

No tailor-made T.Q.C. system is univerasl. Application of a tried-out system in one organization may not suit the other and may at times result in disaster. It is therefore important for any corporate body desirous of implementsing T.Q.C. to first identify its culture so as to develop its own quality management system. The linkage between corporate culture and strategy is very crucial. There are two asspects of culture – "Guiding Beliefs" and "daily Beliefs". While the former is the philosophical foundation of the corporation, the later is the rules and fellings about everybody behaviour. Guiding beliefs are invariable set at the top and transmitted down through the ranks.

Introducing Q.C. is not enough, it is only a part of the T.Q.C. Introducing T.Q.C. without establishing the relationship between guiding beliefs an daily beliefs, organization structure, its system and people, will not bring a long time improvement. Management of corporate culture while introducing T.Q.C. is, therefore, of vital importance.

The Role of Middle Management

At the bottom level of the company (i.e. technicians and formen) the language is in terms of things. Any one who wishes to communicate with these levels must talk in terms of tons, metters, kilowatts, mon-hours, units of production etc.

Many top managers have little understanding of technology. Their common language is money (i.e. sales, profits, investments, return of investment etc.) Only through such a common language are the top managers able to make useful and timely decisions about alternative courses of action.

In such a state of affairs, the middle manager (mostly professionals) must be bilingual. They must be able to talk to the people at the bottom in the langauage of "things". They must also be able to talk to the top management in the language of "money". It is this pivotal status which assigns the professional engineer the key role in a quality circle. Unfortunately, a large number

9. Lack of adequate infra-structure.

10. Absence of quality control associations to exchange information and improve quality.

Conclusions and Recommendations

Pakistan is one of the leading fast developing countries. The present regime is also committed to industrilisation. We are a reasource-deficit country. We still import 70% of our oil requirements and a large number of raw materials. Under these compelling circumstances, it is very important that we make every effort to increase productivity, curtail production costs and improve quality of our products so that we are able to increase our exports, to improve our balance of payments. At the same time we also hav a plus factore in our labour element which only needs to be exploited in a positive manner by taking the right steps. For achieving these objectives, major break through can be achieved by reating the awareness for "Quality Control" at all levels, which at present is badly lacking some of the steps which are required to be taken are summarised as under:–

1. The Engneering Congress and other such professional bodies should take immediate steps to create the awareness for total quality control amongst top management of industrial units. Holding of such seminars more frequently will go a long way in achieveing this objective.

2. A survey of the major industrial units needs to be carried out to determine the present status of Q.C. application. The Federal Ministry of Industries should take initiative in this regard with the help of such institutions as Experts Advisory Cell, Special Technical Cell, Pakistan Standard Institution, Engineering Congress etc. Such a commission should also draft a policy for introductions of "Quality Control" for various categories. The recommendations of this commission can then be discussed at a suitable professional forum to arrive at a unified policy.

3. There has been a lot of talk about the proposed "Engineering Academy" but noting concrete has taken shape so far. Establishment of this academy will go a long was in training our future managers in modern quality management systems.

4. The much-awaited labour policy should be expedited. The policy should aimat a healthy labour environment suited to developing countries.

5. Monopolistic status of certain industrial units, especially government-controlled service industries should be gradually withdrawn so that these are made to compete against free market forces by adopting modern methods of quality management.

6. Built-in incentive should be provided in the service conditions of the industrial workers so that educated worders are attracted and encouraged to create an environment receptive to quality control amongst the labour.

7. The system of direct employment of graduate engineers as managers (prevailing more in government controlled industries) need to be looked afresh. As number of graduate engineers will increase on the shop floor there will be an automatic change in the attitudes and quality conciousness.

8. Institution of "Quality Medals" on the pattern of "Export Performance medals".

9. Enforcement to foreign exchange and export restrictions on such units who do not apply some minimum level of Q.C.

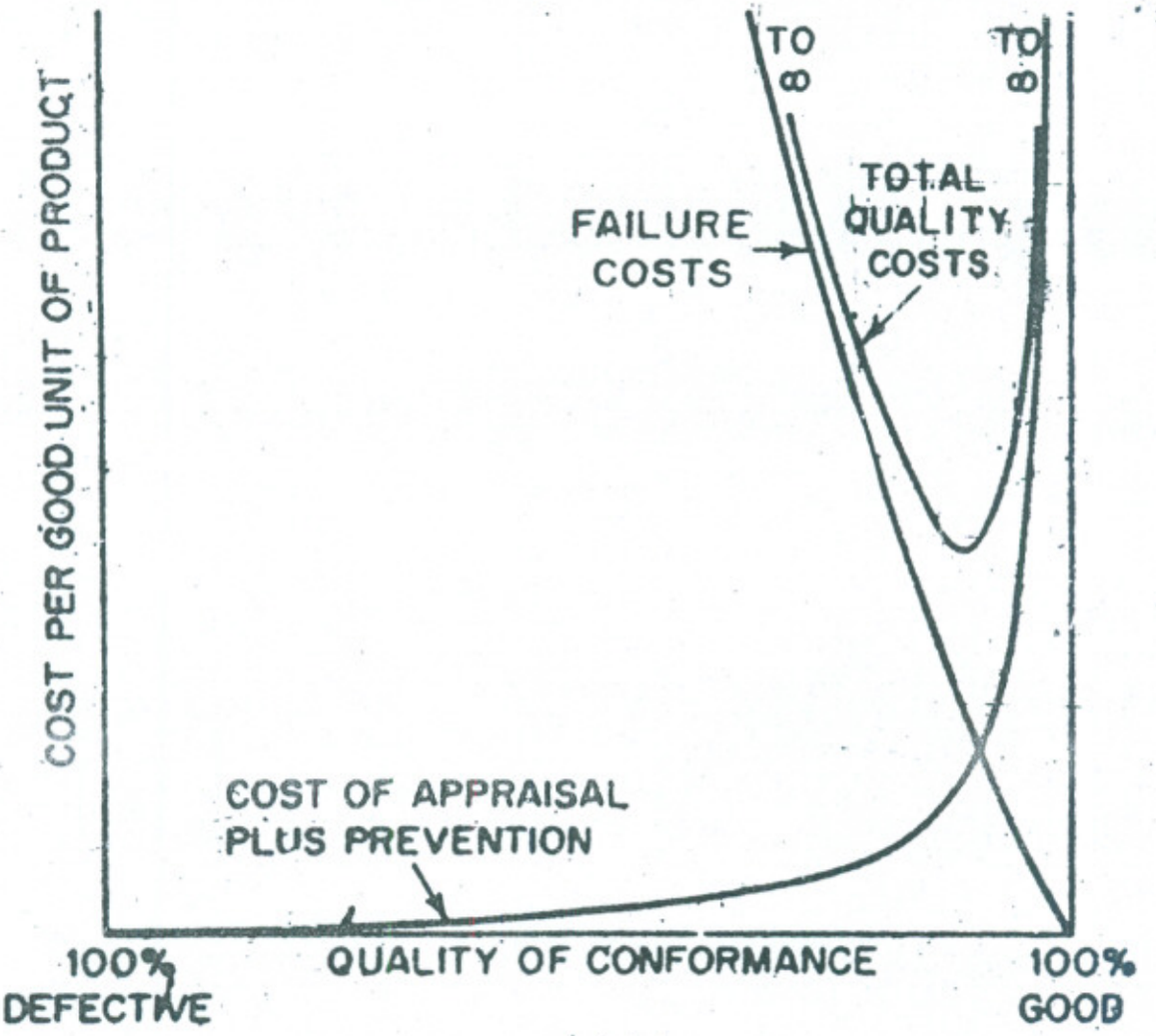


Fig. 5-2 Model for optimum quality costs.

ANNEXURE-B

Paper No. 160

QUALITY CONTROL ACTIVITIES DURING THE PRODUCTION CYCLE

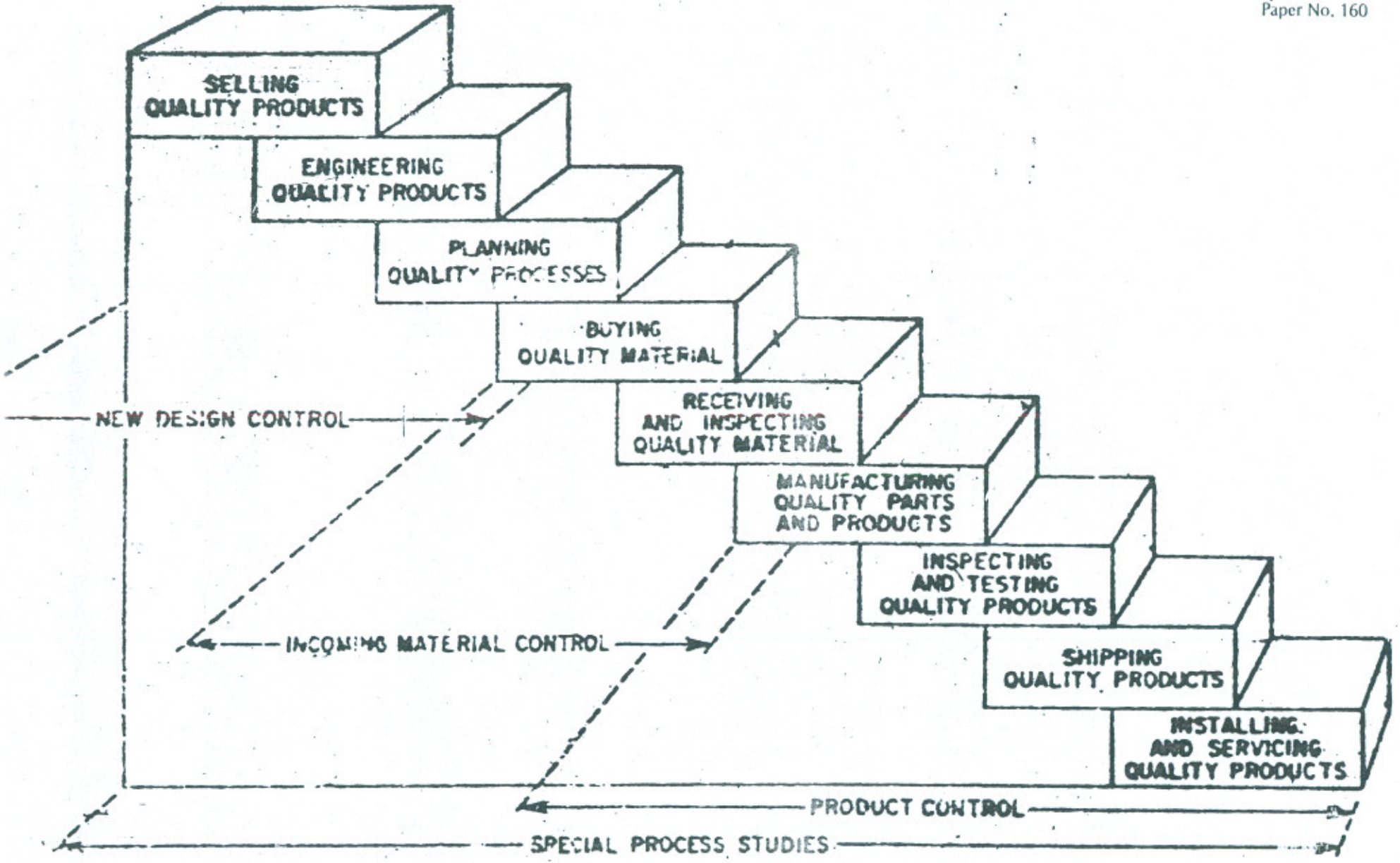


FIG. 11.

ANNEXURE–C

Paper No. 160

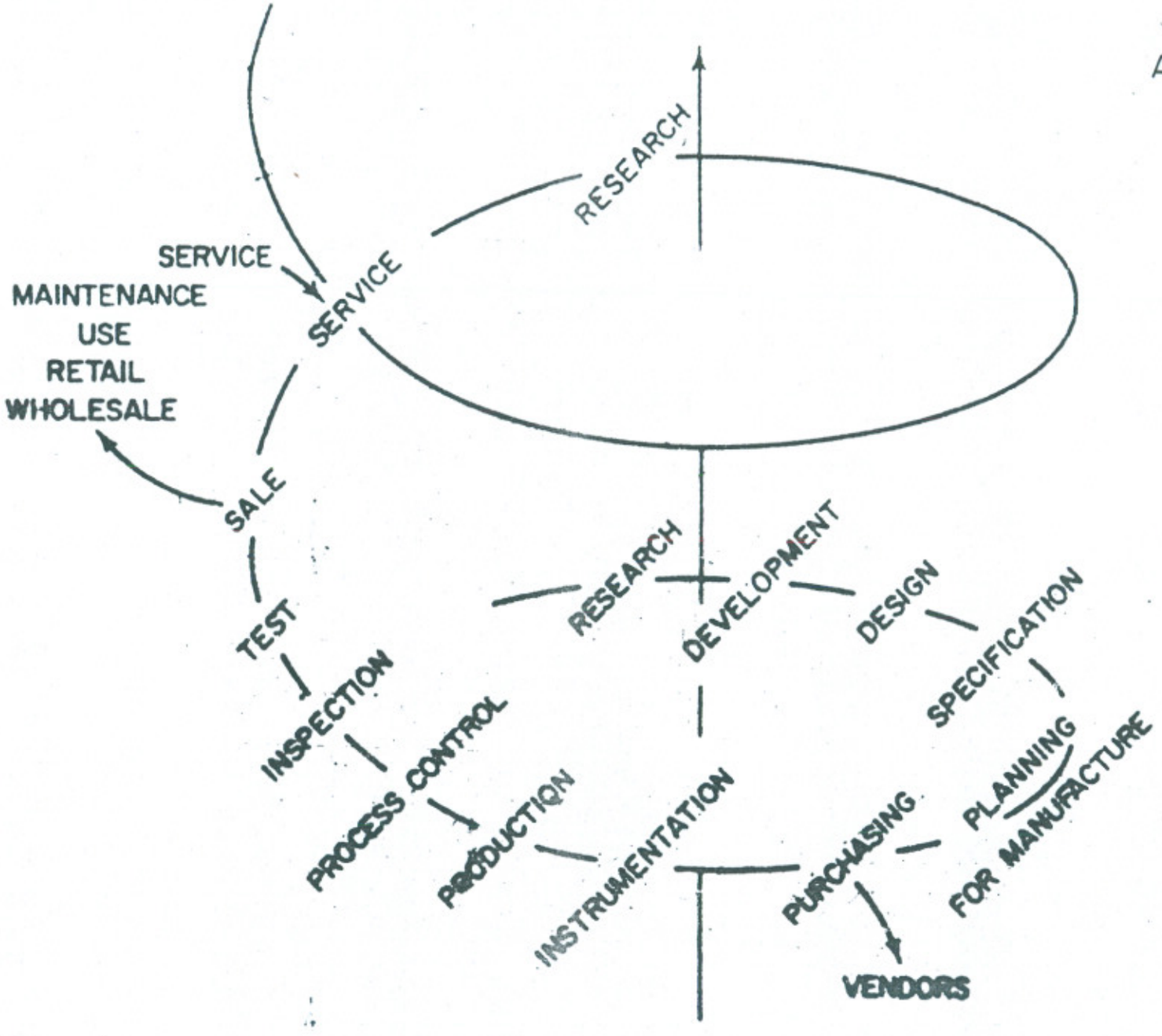
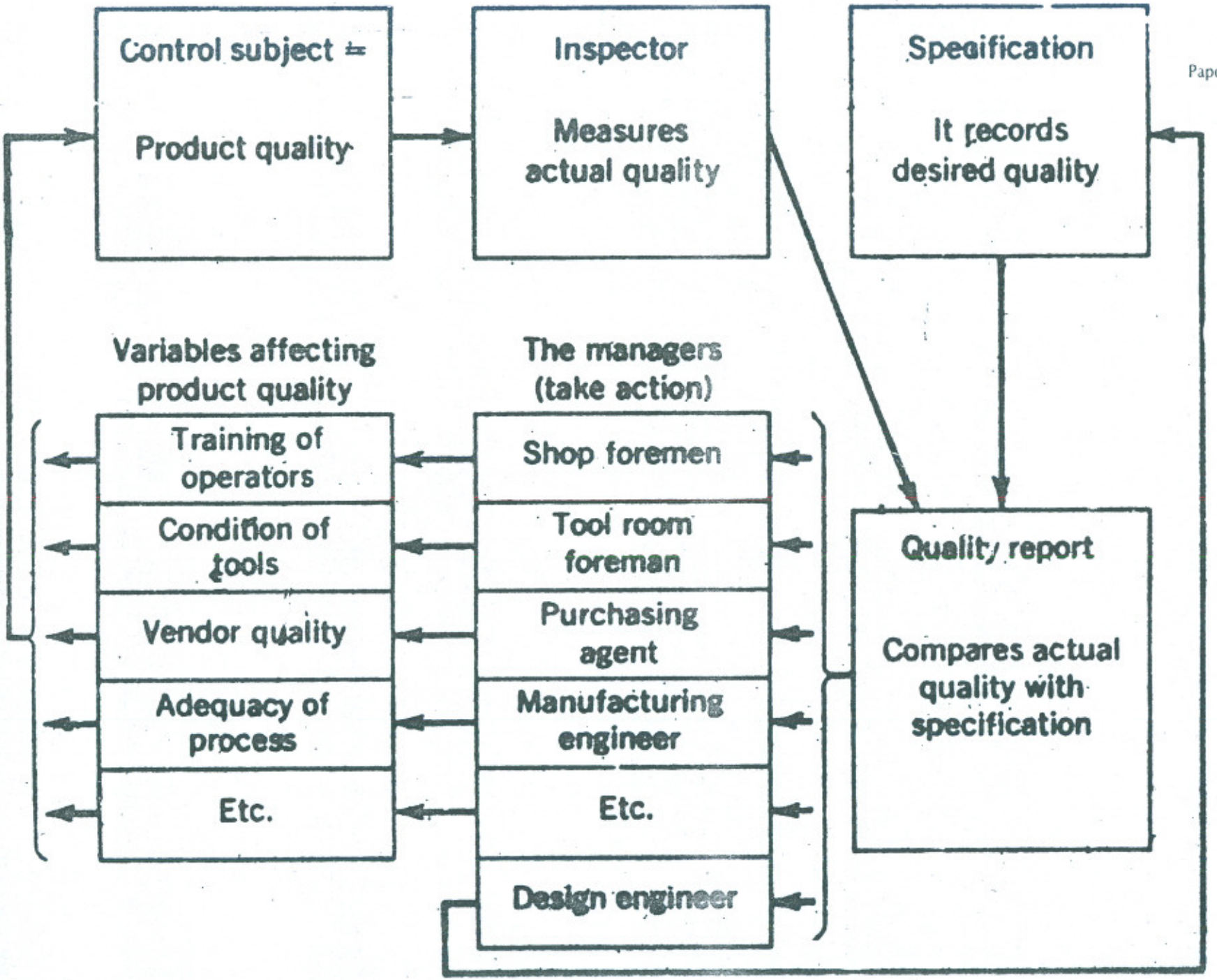


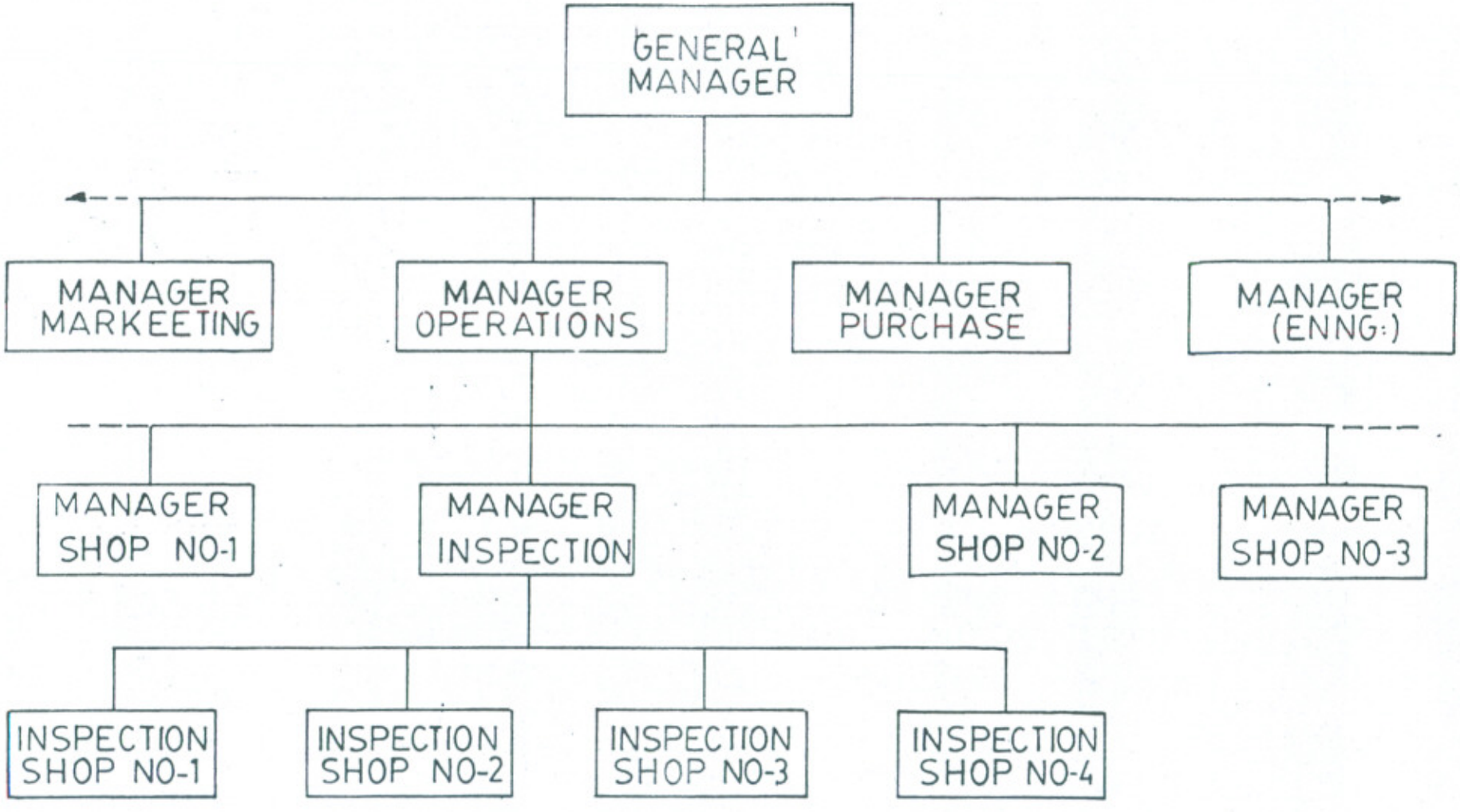
Fig. 2.2 The spiral of progress in quality.


Control subject
Product quality
Inspector
Measures actual quality
Specification
It records desired quality
Variables affecting product quality
The managers (take action)
Training of operators
Condition of tools
Vendor quality
Adequacy of process
Etc.
Shop foremen
Tool room foreman
Purchasing agent
Manufacturing engineer
Etc.
Design engineer
Quality report
Compares actual quality with specification

ANNEXURE–E

INSPECTION TYPE Q.C ORGANIZATION

Paper No. 160



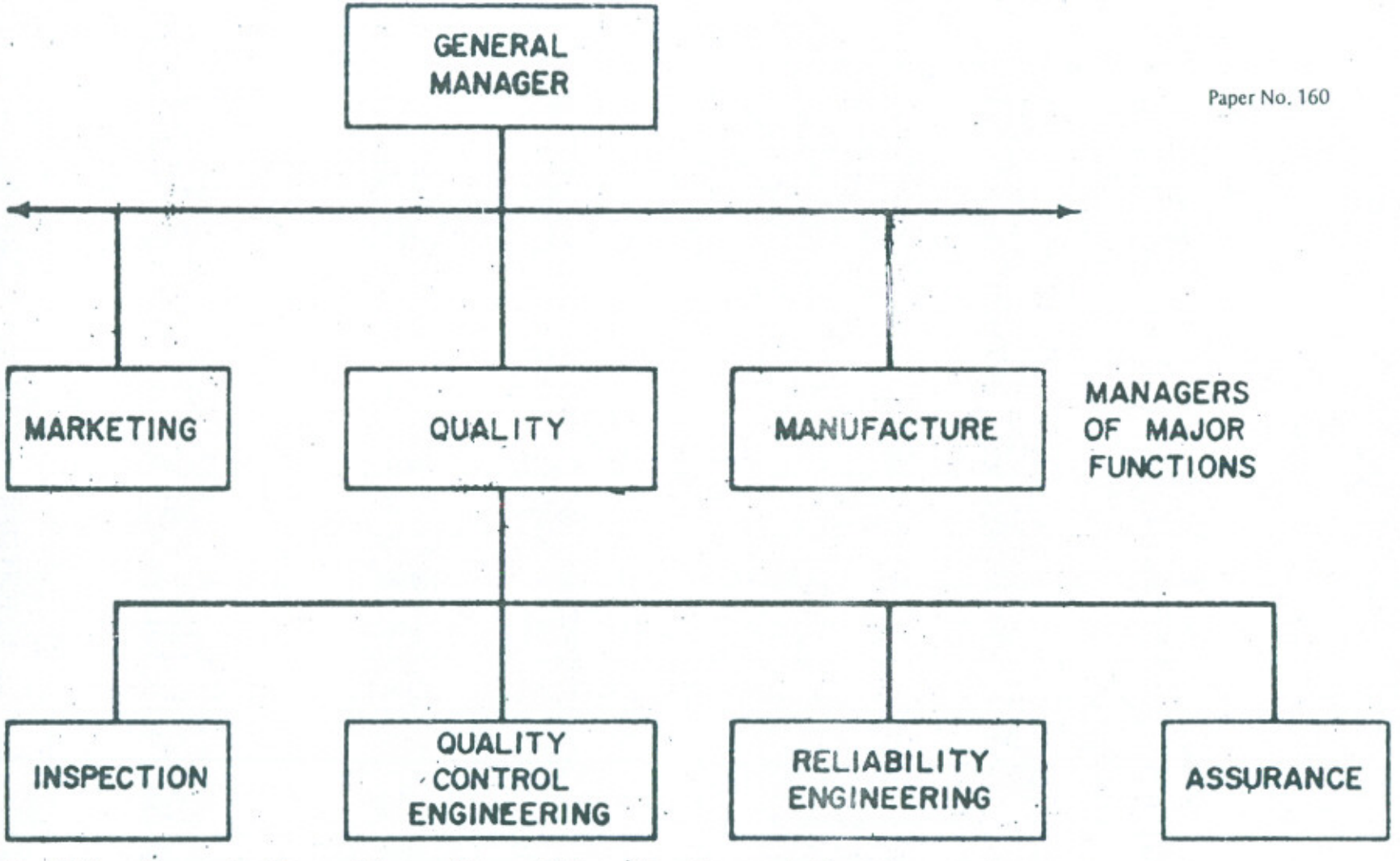


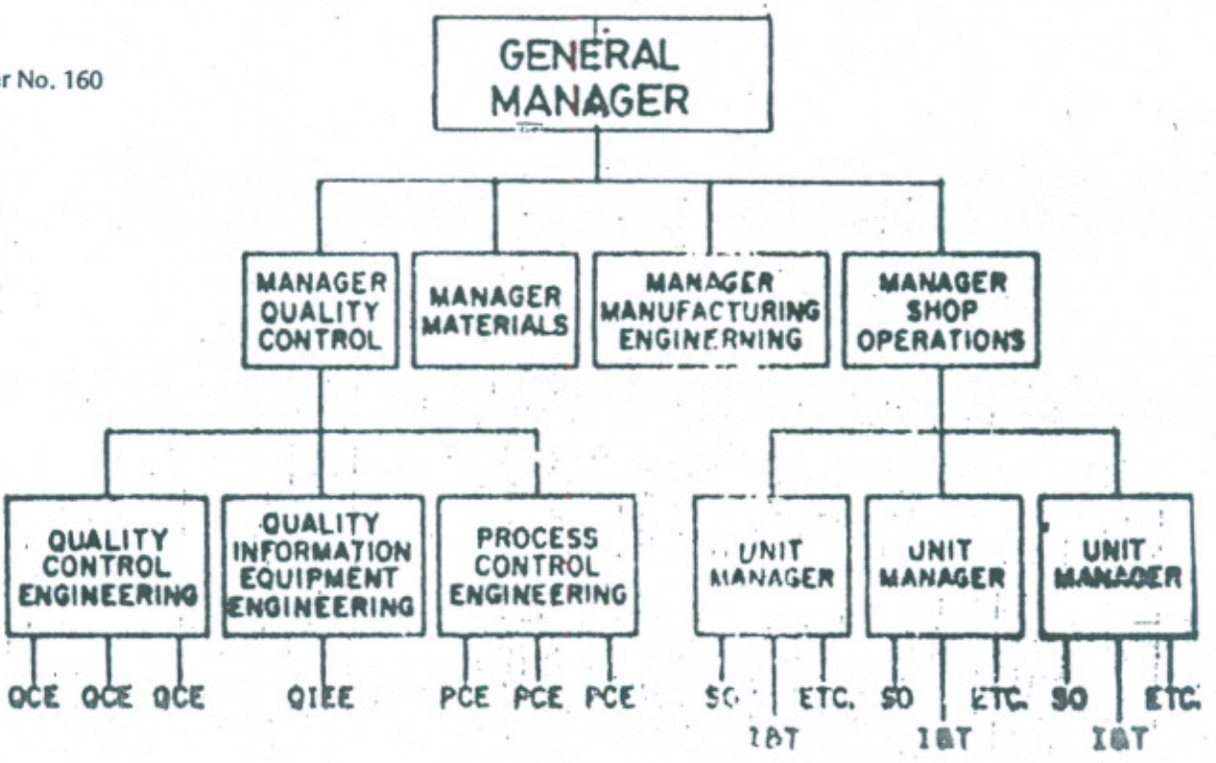
Fig. 7.6 Organization of broad-based Quality Control Department.

(FULL AUTHORITY FOR QUALITY)

ANNEXURE-G

FULL AUTHORITY TYPE Q.C ORGANIZATION

Paper No. 160

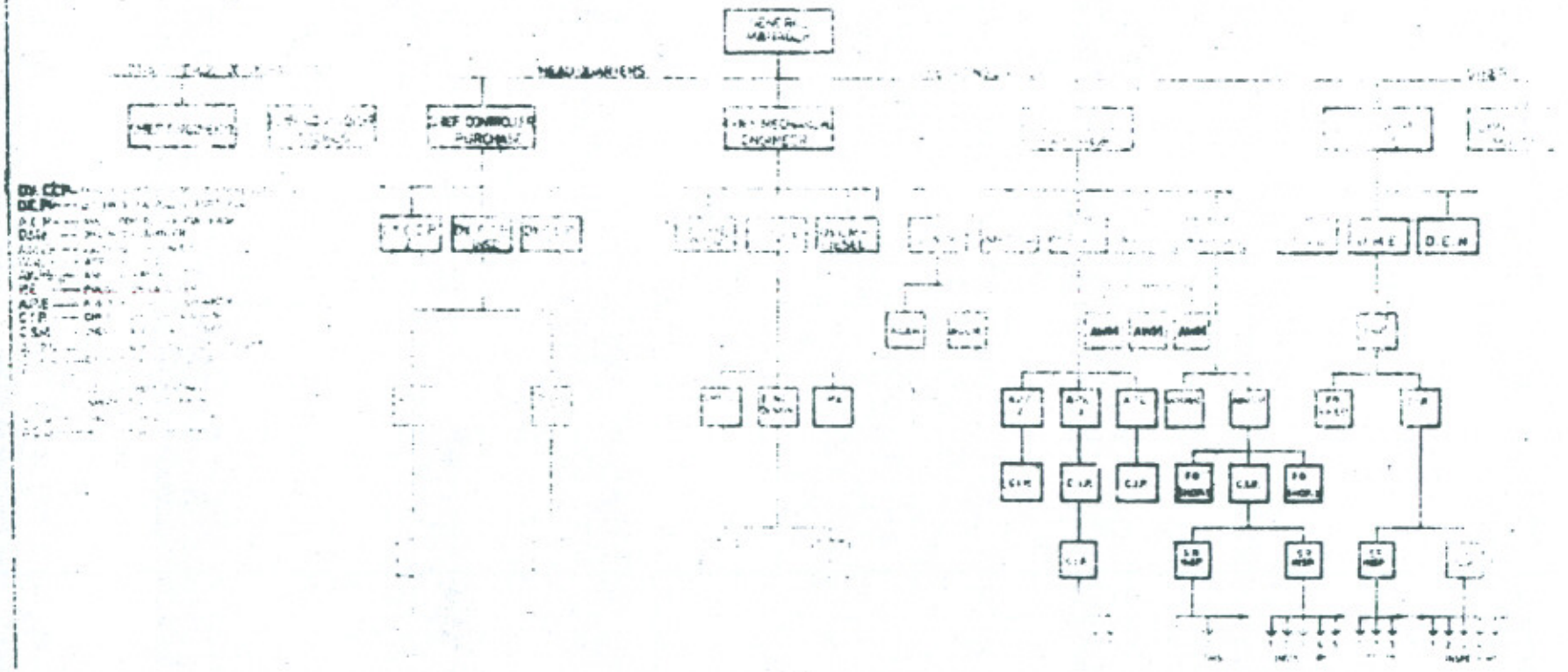


QCE • QUALITY CONTROL ENGINEER
QIEE • QUALITY INFORMATION EQUIPMENT ENGINEER
PCE • PROCESS CONTROL ENGINEER
SO • SHOP OPERATOR
IBT • INSPECTOR AND TESTER

FIG. 4.7.

ANNEX-A

QUALITY CONTROL ORGANIZATION IN MECH DEPTT OF PAKISTAN RAILWAYS



ANNEXURE–I

Paper No. 160

