ADOPTABILITY OF ISO – 9002 TO ARMY REPAIR WORKSHOPS

A DISSERTATION

Submitted in partial fulfilment of the requirements for the award of the degree of

MASTER OF TECHNOLOGY

in

MECHANICAL ENGINEERING

(With Specialization in Production & Industrial Systems Engineering)

By

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CANDIDATE'S DECLARATION

I hereby certify that this work, which is being presented in thesis, entitled "Adoptability of ISO – 9002 to Army Repair Workshops" in partial fulfillment of the requirements for the award of MASTER OF ENGINEERING in PRODUCTION & INDUSTRIAL SYSTEMS ENGINEERING submitted in the Mechanical and Industrial Engineering Department, IIT, Roorkee is an authentic record of my own work carried out during the period from May 2001 to February 2002 under the guidance of Dr. H.S. SHAN, Professor, Mechanical and Industrial Engineering Department, IIT, Roorkee.

I have not submitted the matter embodied in this document for the award of any other degree.

(ARUN SEHGAL)

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Dated: 25 February, 2002

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At last but not the least sincere thanks are also due to all my friends for their help and cooperation.

(ARUN SEHGAL)

ABSTRACT

Customer satisfaction, profitability and market leadership are driven in large parts by delivering quality products and services to customers. For an organization to survive and flourish in the present day competitive world, quality has to be given top priority. All over the world, realization has come that achievement of quality cannot be ensured through inspection and test alone. Every department and individual has a contribution to make in achievement of quality. Systems and procedures must exist to make such a contribution possible. This, in essence, is the concept of ISO-9000 series of standards.

In India with the liberalization of the economy accomplished by reduction in import duties, there will be more competition from global players. With the decision of European Economic Community Market to make ISO-9000 compliance compulsory for exporters into their market countries after 1993, has made ISO-9000 certificate a necessity in Indian industries.

The ISO-9000 guidelines, as issued by the International organizations for standardization, form the basis for certifying the quality management system of an organization. While it has three models, the intent of ISO-9000 is that a company must be self-accountable for its stated quality goals and procedures. In order to gain accreditation, a company must be able to prove ISO-9000 adherence to a group of outside auditors.

Under ISO-9000, there has to be a set of documents and procedures for each handling cycle of the products : Marketing, R&D, Production, Purchase, Personnel, Quality Assurance, Planning, Sales and dispatch. No company can gain accreditations unless these records are properly kept and any major slip can mean loss of accreditation. Thus, documentation

plays an important role in registration. Developing such documentation takes time and money. Normally a certificate has validity for a period of 3 years and a surveillance mechanism is exercised over the certificate holder to ensure consistent operation of the installed system.

I have done this thesis work by studying various workshops providing repair cover to diverse eqpt of Army. After going through system existing in both field and peace workshops it was found that ISO-9002 standards are more adoptable to Equipment Depot Workshops and Army Base Workshops of Electronics and Mechanical Engineers (EME). I have identified procedures and wrote quality manual and procedures for Equipment Depot Workshop at Agra for implementation of ISO-9002 standards in Army Repair workshops. I found for Army workshops ISO-9002 is more suitable and can be implemented easily with excellent results.

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CHAPTER – 1

INTRODUCTION

Evolution of standards pertaining to Quality Management Systems is one of the most important steps in the Quality arena of World Trade. Its objective is to promote development of standardization to facilitate international exchange of goods and services and develop cooperation in the sphere of intellectual, scientific, technological and economic activity.

ISO 9000 is actually a set of standards created by the 91-nation International Organization for standardization (ISO) to define the basics of a quality system for manufacturing, including documentation but certification is granted on a site-by-site basis, not at the corporate level. These are Quality Assurance System related standards.

A quality system is a series of links or stages in the organization through which a product/service has to travel before it reaches in the hands of a customer. Hence the system approach to quality begins with the basic principle that customer satisfaction cannot be achieved by concentrating upon any particular area of activity, say Inspection and Testing in the Organization.

International Organization for standardization (ISO) has brought out six standards on quality management Systems of which one is on standards Terminology (ISO 8402) and remaining five standards (known as ISO-9000 series) clarify the relationship between different quality concepts and present three models for quality assurance systems (Fig 1.1). The ISO-9000 standards are a statement of purpose and serve as a guide for the use of three quality assurance models namely ISO 9001, ISO 9002 and ISO 9003.

91 countries have adopted the ISO series of standard as their national standards. In India, Bureau of Indian standards has adopted these standards and brought them out as IS-14000 series of Indian standards. It is Q90 is US, BS5750 in UK, EN29000 in the European Community. With the emergence of the expanded European Economic Community Market, demand for ISO-9000 certification has become a necessity in Indian Industries. About 60 to 70 companies have already obtained ISO-9000 certification and may are seriously working for it. The real driving force behind ISO-9000, however, is the private sector. Few companies now require suppliers to be ISO-9000 complaint, but many are moving in that direction.

Certification is the mechanism by which a customer can have confidence in a company and is most effective when it is carried out by a neutral internationally accredited body. At home and in international business, third party quality assessment and certification is becoming a prerequisite for doing business. Certification demonstrates that a company has implemented an adequate quality system for its products or services it offers. This leads to better international commitment and enhanced customer confidence. Normally a certificate has validity for a period of 3 years and a surveillance mechanism is exercised over the certification holder to ensure consistent operation of the installed system.

In India, with the liberalization of the Economy accompanied by reduction in import duties, there will be more competition from global players. Never in the past has the role of the Quality Management in India been as crucial and exciting as now.

The ISO-9000 series of standards requires that the manufacturers and suppliers must establish and maintain a conformance to specified requirements. It is not enough to produce quality products, but an organization should be able to demonstrate to the customer 'how it is

being ensured'. Therefore, documentation assumes a significant role in achieving quality system capability.

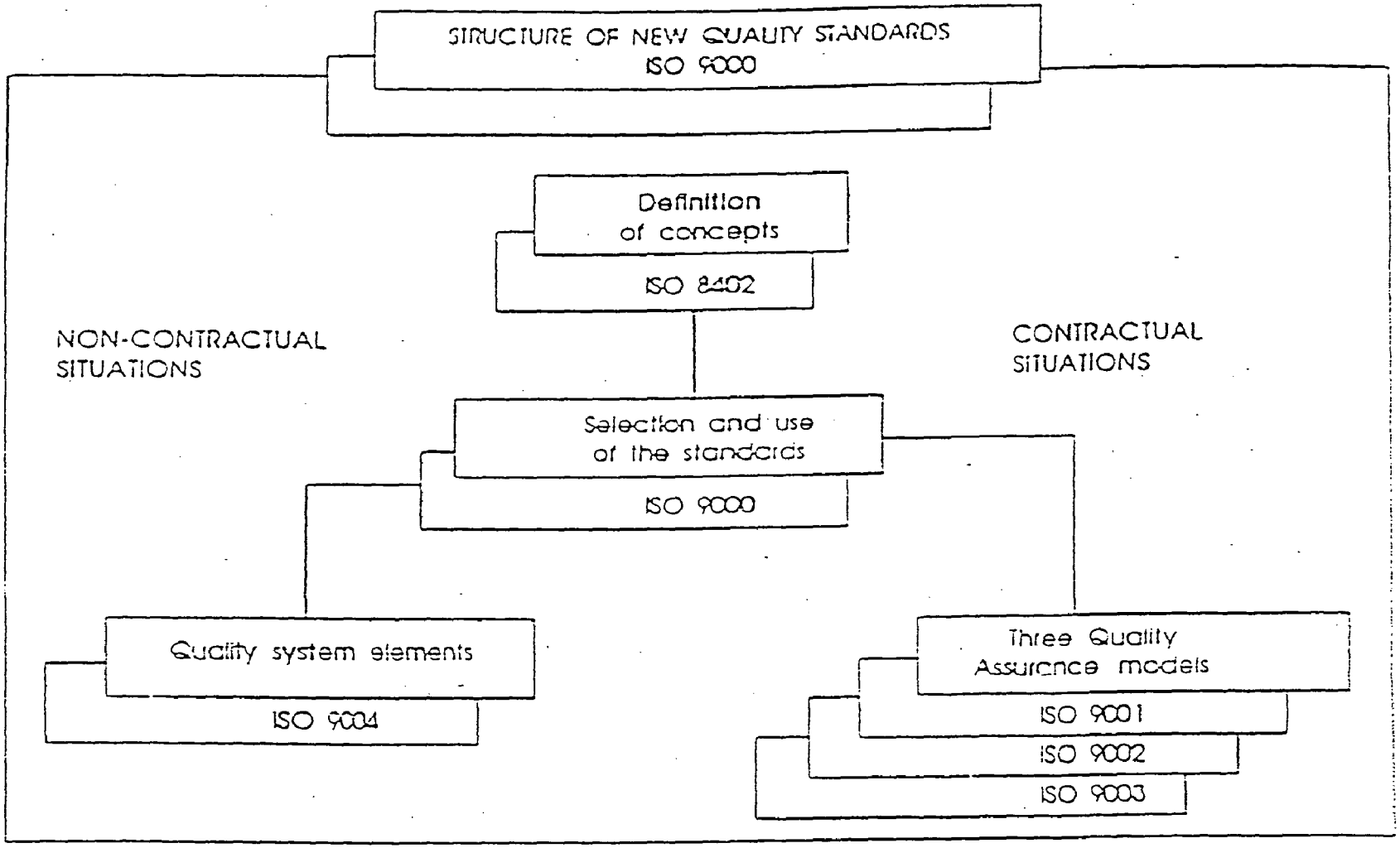


Fig. 1.1 Structure of Quality Standards

AN OVERVIEW OF ISO –9000 SERIES

The ISO-9000 standards are a statement of purpose and serve as a series for the use of three quality assurance models namely ISO-9000, ISO-9002 and ISO-9003.

These three models are used under situations where a contract, specially requires, design effort, manufacturing, installation and customer service depending upon the activities of the manufacturers or suppliers. Table 2.1 provides a cross-reference table for comparison between the three models. ISO-9001 is the most stringent and covers the entire range of activities, while ISO-9003 covers only the final inspection and testing systems. ISO-9002 is some where in between and does not include design control. ISO-9004 is a non-contractual standard providing guidelines on elements of quality management system and is used for internal quality improvement.

2.1 ISO 9000 QUALITY MANAGEMENT AND QUALITY ASSURANCE STANDARDS - GUIDELINES FOR SELECTION AND USE

ISO 9000 and ISO 9004 will assist us in drawing up our internal quality Management systems and in selecting the specific model from 9001, 9002, 9003 and 9004 part 2 (services).

The contents of ISO 9000 are rather wooly. The most useful piece of information in the standard is a table in the Annex cross-referencing quality systems elements (namely control of production) to each of the three models.

2.2.1 ISO 9004 QUALITY MANAGEMENT AND QUALITY SYSTEM ELEMENTS - GUIDELINES

ISO 9004 is the most comprehensive statement of what the standard constitutes. One could say that given a basic system conforming to the guidelines of 9004, one could then make adjustments to expand into 9001, 9002 and 9003.

Here are the basic elements of the system and policy recommended by ISO 9004.

- Policy and objectives.
- Organization and responsibility.
- Marketing and product brief.
- Design.
- Procurement.
- Production.
- Equipment control.
- Documentation.
- Verification.

2.3 ISO 9001 QUALITY SYSTEMS – MODEL FOR QUALITY ASSURANCE IN DESIGN/DEVELOPMENT, PRODUCTION, INSTALLATION AND SERVICING

This is the 'top' standard, although ISO probably would not like such a qualitative judgment. It is for the company wishing to assure its customers of conformance to specified requirements throughout all stages, which may include design, development, production, installation and servicing.

After the usual preamble about policy, responsibility and some general statements about the system, the special elements of ISO 9001 are given. One element is the notion of contract, the resolution of differences from tender, and the assessment of the supplier's ability (that is the company seeking ISO 9000 as distinct from a supplier of that company) to meet the contractual requirements.

Another element is control of design, which involves planning, assignment of activities, organization of interfaces, inputs and outputs and design verification. It also covers design changes, document approval and issue, and control of document changes and modification.

The rest is fairly routine, including purchasing, product identification and Traceability, production control, inspection and testing. Inspection and measuring and calibration of both testing and measuring equipment itself is included, as is control of non-conforming products. Handling, storage, packaging and delivery are also included as are quality records, audits and training.

2.4 ISO 9002 QUALITY SYSTEMS – MODELS FOR QUALITY ASSURANCE IN PRODUCTION AND INSTALLATION

This is the more common standard for manufacturers and applies where there is already an established design or specification which constitutes the specified requirements of the product. It is also assumed that the system demonstrates that the supplier can continue to products to produce the product to conformance.

Once again there is a preamble covering policy and organization. There is also ademand that each contract should be reviewed and that documents should be controlled. With the standard is similar to ISO 9001.

2.5 ISO 9003 QUALITY SYSTEMS – MODEL FOR QUALITY ASSURANCE IN FINAL INSPECTION AND TEST

The following sentence summarizes the content of ISO 9003:

If you are in a contractual situation where you wish to demonstrate. that your capabilities for inspecting and testing products are satisfactory, apart from the usual requirement for policy and organization, you will need a system that includes document control, product identification and marking, control of products that do not pass specified tests, a handling and storage system, statistical techniques where appropriate, and training.

2.1 CROSS REFERENCE LIST OF QUALITY SYSTEM ELEMENTS

Clause (or subclause) No. in ISO 9004	Title	Corresponding clause (or sub-clause) Nos. in		
		ISO 9001	ISO 9002	ISO 9003
4.	Management responsibility	4.1*	4.1#	4.1+
5.	Quality system principles	4.2*	4.2*	4.2#
5.4.	Auditing the quality system (Internal)	4.17*	4.16#	-
6.	Economic quality related cost considerations	-	-	-
7.	Quality in marketing	4.3*	4.3*	-
8.	Quality in specification and design (Design control)	4.4*	-	-
9.	Quality in procurement (Purchasing)	4.6*	4.5*	-
10.	Quality in production (Process control)	4.9*	4.8*	-
11.	Control of production	4.9*	4.8*	-
11.2	Material control and traceability (Production identification and traceability)	4.8*	4.7*	4.4#
11.7	Control of verification status (Inspection and testing)	4.12*	4.11*	4.7#
12.	Product verification (inspection and testing)	4.10*	4.9*	4.5#
13.	Control of measuring and test equipments (Inspection, measuring and test equipment)	4.1*	4.10*	4.6#
14.	Non conformity (Control of non conforming product)	4.13*	4.12*	4.8#
15.	Corrective actions	4.14*	4.13*	-
16.	Handling and post production functions (handling, storage, packing and delivery)	4.15*	4.14*	4.09#
16.2	After sales servicing	4.19*	-	-
17.	Quality documentation and records (Document control)	4.5*	4.4*	4.3#
17.3	Quality records	4.16*	4.15*	4.10#
18.	Personnel (Training)	4.18	4.17	4.11
19.	Product safety and liability	-	-	-
20.	Use of statistical methods (Statistical techniques)	4.20	4.18	4.12
	Purchaser supplied product	4.7	4.6	-

*Full requirement # Less stringent than ISO – 9001
+Less stringent than ISO-9002 - Element not present

SYSTEM FOR QUALITY

3.1 CONCEPTS OF QUALITY

There are five key terms of quality, which are defined here.

3.1.1 Quality Policy The overall quality intentions and direction of an organization as regards quality, as formally expressed by top management. The quality policy forms one element of the corporate policy and is authorized by top management.

3.1.2 Quality Management The aspect of the overall management function that determines and implements the quality policy. The attainment of desired quality requires the commitment and participation of all members of the organization whereas the responsibility for quality management belongs to top management. Quality management includes strategic planning, allocation of resources and other systematic activities for quality, such as quality planning, operations and evaluations.

3.1.3 Quality System *It is an assembly of components such as the* organizational structure, responsibilities, procedures, processes and resources for implementing quality management. It is all planned decisions and activities that jointly aim to attain the desired quality of products and services. It is also called as "Quality Management System". The quality system should only be as comprehensive as needed to meet the quality objectives.

3.1.4 Quality Control The operational techniques and activities that are used to fulfill requirements for quality. It involves operational techniques and activities aimed both at monitoring a process and at eliminating causes of unsatisfactory performance at relevant stages of the quality loop in order to result in economic effectiveness.

3.1.5 Quality Assurance All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. Within an organization, quality assurance serves as a management tool. In contractual situations, quality assurance also serves to provide confidence in the supplier. For effectiveness, quality assurance usually requires continuing evaluation of factors that affect the adequacy of the design or specification for intended applications as well as verifications and audits of production, installation and inspecting operations. Providing confidence may involve producing evidence.

The relationship of above five concepts is shown in Fig. 3.1. Activities aimed at providing confidence to the management of an organization that the intended quality is being achieved are often called "internal quality assurance". Activities aimed at providing confidence to the purchaser that the supplier's quality system will provide a product or service that will satisfy the purchaser's stated quality requirements are often called "external quality assurance".

3.2 PRINCIPAL CONCEPTS

An organization should seek to accomplish the following three objectives with regard to quality:

(a) The organization should achieve and sustain the quality of the product or services produced so as to meet continually the purchaser's stated or implied needs.

(b) The organization should provide confidence to its own management that the intended quality is being achieved and sustained.

(c) The organization should provide confidence to the purchaser that the intended quality is being, or will be, achieved in the

delivered product or service provided. When contractually required, this provision of confidence may involve agreed demonstration requirements.

3.3 DESIGN OF QUALITY SYSTEM

It is basically a responsibility of the management to develop, establish and implement a quality system as the means by which stated policies and objectives might be accomplished. The quality system should be structured and adapted to the company's particular type of business and should take into account the appropriate elements outlined in the standard.

A quality system applies to and interacts with, all activities pertaining to the quality of product or services. It involves all phases from initial identification to final satisfaction of requirements and customer expectations. These phases include (Ref. Fig. 3.2):

(a) Marketing and market research:
(b) Design/specification engineering and product development:
(c) Procurement:
(d) Process planning and development:
(e) Production:
(f) Inspection, testing and examination:
(g) Packaging and storage:
(h) Sales and distribution:
(i) Installation and operation:
(j) Technical assistance and maintenance:
(k) Disposal after use.

The goal of satisfying customers with product and service quality and quality assurance leads to numerous tasks and responsibilities. In the following subjections the major tasks of each organizational unit level of management are listed.

3.3.1 TOP MANAGEMENT

The responsibilities of top management in a quality assurance program are as follows:

1) Setting explicit quality objectives.
2) Formulating a quality assurance policy.
3) Initiating and supervising a quality assurance program.
4) Conducting audits of the compliance with standards and effectiveness of the quality assurance program.
5) Providing resources to implement the quality assurance program.

3.3.2 MARKETING

The responsibilities of marketing in the quality assurance program are as follows:

1) Conducting quality related market research and analysis.
2) Determining product specifications and associated services.
3) Establishing price and quality relationship.
4) Preparing advertisements and other documents emphasizing the quality aspects of the company's products and services.
5) Surveying the quality and quality assurance of competitors.
6) Training sales personal and distributors in all aspects of the quality assurance program.
7) Providing customer services.

3.3.3 DESIGN ENGINEERING

The responsibilities of design engineers in a quality assurance program are as follows:

1) Researching quality aspects and requirements for each of the company's products.
2) Developing the technical details (quality characteristics) of products and services.
3) Preparing quality specifications and resources requirements.
4) Complying with legal and safety requirements.
5) Standardizing the products and parts design.
6) Testing and verifying quality requirements.
7) Documenting final design.
8) Initiating design reviews.

3.3.4 PROCUREMENT

The responsibilities of procurement department in a quality assurance program are as follows:

1) Clarifying requisitions.
2) Selecting and negotiating with qualified suppliers.
3) Determining quality assurance requirements and conducting supplier surveys and audits.
4) Verifying the quality deliveries.
5) Maintaining a product's quality during the transporting, storing and handling of the product or contracting for such arrangements.
6) Assessing and recording supplier performance.

3.3.5 PRODUCTION

The responsibilities of the production department in a quality assurance program are as follows:

1) Clarifying quality aspects of design.
2) Preparing the production plan and the associated inspection/test plan.
3) Determining the requirements for and providing adequate technical and human resources.
4) Setting workmanship standards (Job/work instructions).
5) Determining the requirements for handling and storage facilities.
6) Conducting test runs.
7) Assessing and establishing the process capability.
8) Instituting production controls and inspections.
9) Analyzing nonconformance and correcting their causes.
10) Ensuring proper shipping and transporting.

3.3.6 QUALITY ASSURANCE

The responsibilities of the quality assurance department a quality assurance are as follows:

1) Preparing the quality assurance program and quality manual.
2) Initiating and coordinating quality improvement.
3) Preparing inspections and test plans.
4) Verifying and process capability.
5) Conducting workshops.
6) Reviewing and auditing quality assurance.

3.3.7 HUMAN RESOURCES

The responsibilities of the human resources department in a quality Assurance program is as follows:

1) Determining staff requirements and qualifications.
2) Preparing job descriptions including quality assurance responsibilities.
3) Providing conditions conductive to good workmanship.
4) Training, educating and motivating the personnel to achieve the company's quality goal.
5) Recognizing and rewarding outstanding performances.

Quality assurance activities are organized in the individual departments and are carried out for the various products, contracts, orders of the company. Procedures will be prepared for the design, procurement, and preparation. Production and delivery phases, in general, and again for each item and unit of production. Quality assurance is realized in the individual production systems and projects. Just assigning quality assurance responsibilities to department does not suffice. Standards for rather than a hierarchical organizational and assignments of jobs.

The ISO-9000 series attempts to address the overall quality management system to improve and maintain the quality of products and services. It recognizes that the quality improvement process involves all the departments and functions of the organizations. Everyone has a role to play in assuring quality. Consequently, it emphasizes a documented discipline approach in:

- Clearly identifying management policies and commitment.
- Identifying roles, responsibilities and authority.
- Establishing clear set of instructions to all personnel affecting quality.

- Developing precise procedures and instructions in all areas of operational activity to ensure consistency and uniformity.

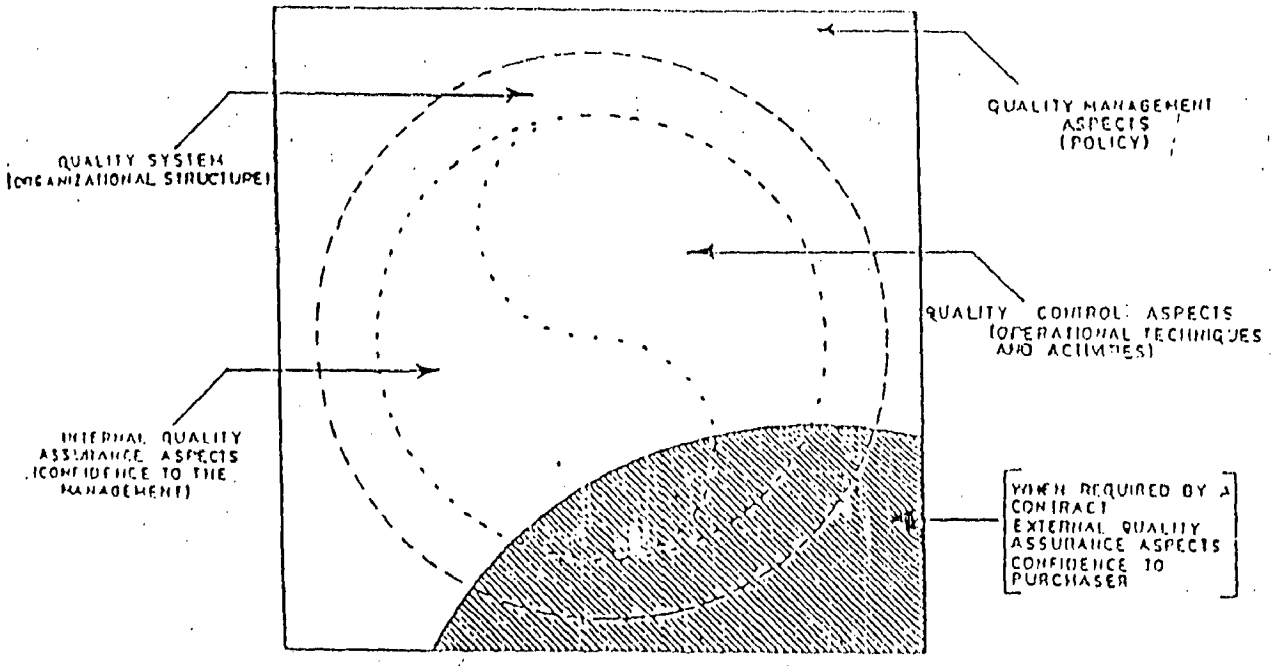


Fig. 3.1 Relationship of Various Quality Concepts.

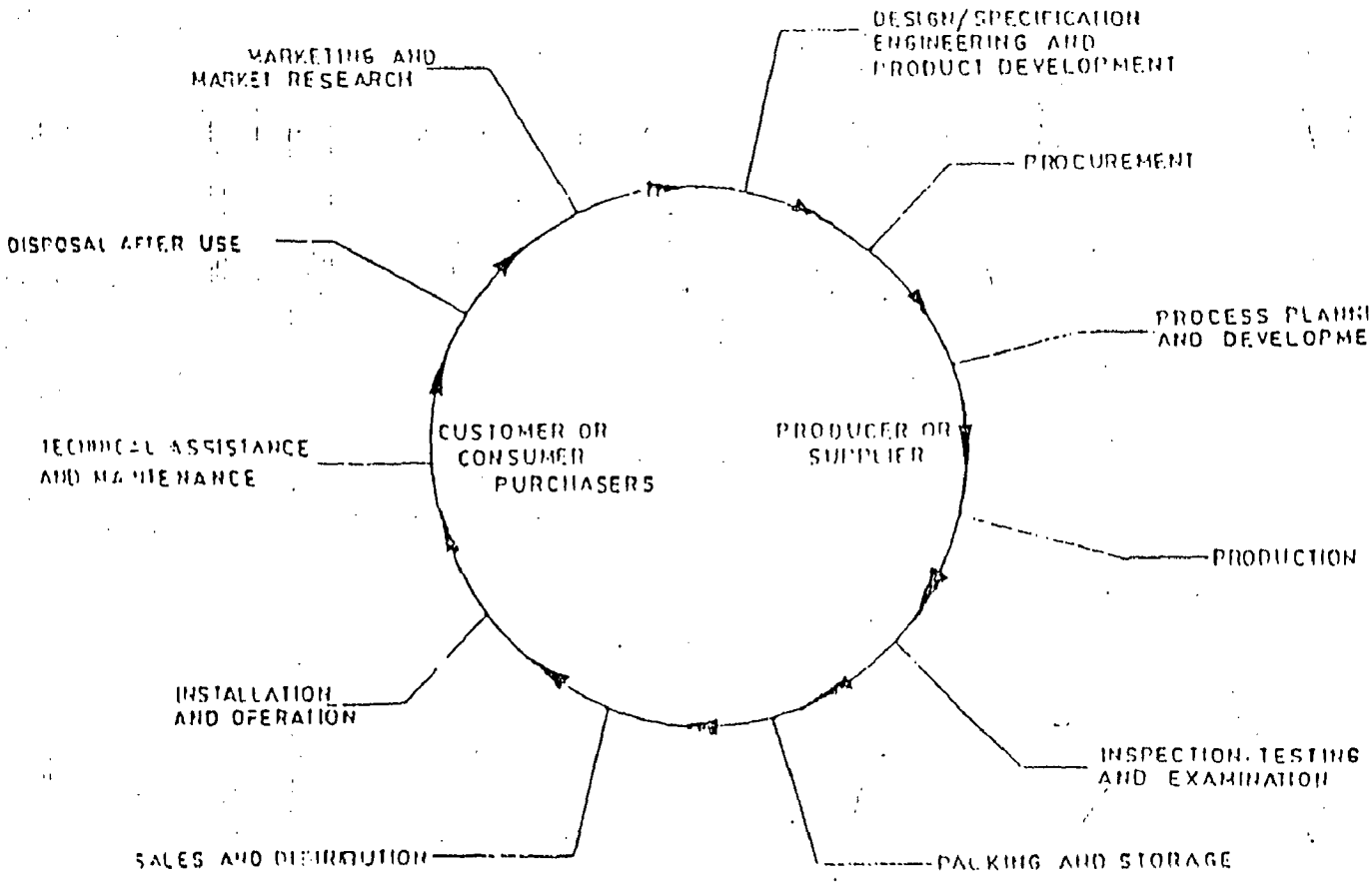


Fig. 3.2 Schematic Representation of Phases of Quality System

CHAPTER – 4

QUALITY SYSTEM DOCUMENTATION

All the elements, requirements and provisions adopted by the company for its quality management system should be documented in a systematic and orderly manner in the form of written policies and procedures. Such documentation should ensure a common understanding of quality policies and procedures.

4.1 WHY A DOCUMENTED SYSTEM IS REQUIRED

A documented system is required :

1) To provide a permanent reference for implementation and maintenance of quality system.
2) To provide the 'operator' with consistency and satisfaction in terms of work methods, materials and equipment. It ensures orderliness in operations.
3) To avoid differing descriptions of functions and giving precise details of each activity.
4) To convince customers about company's activities and capabilities to meet quality needs. Objective evidence is provided in the form of information and data.
5) It is powerful aid to train personnel. The training of new employees is made
   easy as all their responsibilities, activities are already written and procedures to accomplish them are also written.
6) The loss of employees working for several years does not cause any more a catastrophic loss of valuable know-how, since a large portion of knowledge is now fixed in written form.

7) A job rotation within the undertaking, which becomes necessary due to illness or vacation is possible with less uncertainties, since for every place of work there exists a valid specification.

8) By means of a documented system the management can periodically find out whether,

- the people are operating according to the documented system – a system audit;
- the quality still meets the requirements – a system review.

9) To facilitate the introduction of changes. Changes are a perpetual process in an organization. Unless there is written description of each task functions, it will be difficult to make any reasoned evaluation of any proposed change or its outcome.

10) To guide suppliers. Relevant contents of the documented system can be very useful for suppliers. It can guide them in accordance with the requirements set out by the customer company.

The total documentation for a comprehensive quality system comprises four primary elements :

- Quality Manual
- Quality Procedures
- Work Instructions
- Forms – Records – Other Documents

It is also necessary to understand the interrelationship and purpose of each of these elements. Fig. 4.1 shows how the documentation of an organization may be structured to meet the requirements of ISO-9001 or 9002. The activities listed along the base of the triangle are representative only and would, in fact, be arranged as best suited to the organization. There will be general four divisions of an organization's documentation. Quality manual is four top management and takes the organization as a whole and information is in just outlined or summarized

form. Quality procedure is for departmental managers/supervisors and are more detailed. The elements of documentation may be administrative, technical or operational practices and for different functions.

In large organization there may be several layers of procedural manuals. For the system documentation to be full effective there must be bridge in the form of references, listings or indices from each layer to the one below it.

4.2 QUALITY MANUAL

It is a written description of the quality policies, quality objectives, and procedures that the organization has adopted in order to satisfy business and customer quality requirements. It plays a major role in promoting and encouraging quality throughout the organization.

The primary purpose of this document is to communicate the quality policy and objectives of the board of management company to its staff and customers. Within the concept of ISO-9000 series, it explains the manner in which the company intends to comply with the requirements of the standard. The expansion is by direction, by listing responsibilities and authorities and by documenting the activities undertaken to ensure a consistent approach in the achievement of the specified objectives. The explanation is in the form of series of simple statements of what is actually done, and it refers to where detailed procedures may be found, if necessary. A good quality manual should be no longer than 25 to 30 pages. There is no standard form for writing a quality manual since each one must describe the particular policies and system to which it refers, and this must be the system which is actually operated, not the one the quality manager would like to see operating.

The quality manual provides:

(i) A reference base for quality policies and procedures, together with any information necessary to ensure a complete understanding of the quality philosophy adopted by the organization.

(ii) Documented quality polices and procedures, against which regular audits and improvements can be made.

(iii) A reference manual for training all personnel.

(iv) A basis for management decision-making on issues affecting quality, as the quality manual reflects current policies and procedures.

(v) A communication document to demonstrate and provide information on the organization's quality to customers and suppliers.

4.2.1 What to include in a Quality Manual

At the very least this manual must address the material required by the organization clause of ISO-9001 or ISO-9002 and a list of index of the procedures raised to comply with the quality system clause of those standards. More frequently the manual will also contain sections related to the other clauses of ISO-9002 stating the company's policy and objectives to those requirements and stating who has the responsibility for achieving them. The quality manual does not contain any organizational secrets or confidential material. It Is often used as a marketing aid, and contain information on the company's product range, services it provides, its premises and its resources.

4.2.2 Quality Manual Contents

The following are the suggested contents of the quality manual. These contents may vary depending on the organization:-

1. Introduction :
    - purpose of quality manual.
    - Structure of quality manual.

2. Organizational policy :
    - organization quality policy.
    - Organization quality objectives and aims.

3. Organizational structures
    - hierarchy
    - quality office
    - functional responsibilities.

4. Product and service policies :

Policy covering the management of product and service delivery within the organization should be stated and the scope to which the policy applies. Responsibility for policy should be defined.

Each entry should also reference the practices and processes that underpin the policy and any supporting documentation.

The twenty clauses within ISO-9000 are often used as the format for documenting product and services policy. Use of the standard also provides a cross reference between the standard, and products and services. This demonstrates the application of the standard within the organization.

5. Organization – wide procedures.

The list of organization-wide procedures consists of short descriptions and references to the respective procedure manuals. Organization-wide practices and procedures are documented fully in procedure manuals or quality procedures or simply procedures.

6. Overview of Product and services :

This usually contains a short description of the services and products.

7. Approval Signature block :

For each product or service, the responsibility for final acceptance within the organization should be defined. This will vary depending on delegated authority levels.

8. Quality Manual Control:

- amendment, revision control and distribution methods
- change authorization
- confidentiality

9. Glossary of Terms :

These are terms used in quality manual and quality system documentation.

4.3 QUALITY PROCEDURES

Quality procedures are the core of the quality system documentation. The procedures are intended to instruct the work force in broad terms how the polices and objectives expressed in the quality system manual are to be addressed and achieved. In simple words a procedure is a specified way to perform an activity. Procedures are company confidential.

4.3.1 Need for Procedures

Unlike computers, the human being is neither well suited to the exact repetition of methods nor to the application of the consistent standards when dealing with measurement or other criteria. It is therefore necessary to provide written standards and procedures if a quality system is to work effectively.

Written procedures are a snapshot of the actual activities taking place in a company at a particular in time. They should therefore evolve and be subjected to review and change to meet the changing needs of the business. Proper documentations control, including the use of the issue numbers, is as necessary for quality procedural documents as it is for all the other drawing and specifications used by the company.

4.3.2 Contents

The procedures must address each requirement of the relevant clause of the appropriate standard and collectively they will define the organization's operation from receiving an enquire to delivering a complete product or service. A written documented procedure usually contains :

(i) purpose and scope of activity

(ii) what shall be done and by whom.

(iii) What materials, equipment and documents shall be used.

(iv) . How it shall be controlled and recorded

Wherever required, quality procedures must detail those activities for which records are to be maintained. This is best achieved by cross reference to an individual procedure, set-up for the purpose, which details all records kept and their retention times. Personnel responsible for the activity concerned should write the procedures.

A common format for all procedures should be established and ensure that this is adhered to throughout. Similarly a numbering system should be established and applied consistently. The procedures should have front sheet, which identifies in addition to the identity of the document, the originator and the approver of the document.

4.3.3 Flow charting the Procedures

One popular but not necessarily universal method to document procedures is to flow chart them. One of the advantages of flow-charting is that it forces a group of people (hopeful, the procedure owners) to describe or brainstorm their conception of the procedure. Once a consensus has been reached on the procedure flow, opportunities to improve can and should be suggested. Documentation should be dynamic and allow for continuous improvement in procedure effectiveness. There are basically seven symbols used to depict various actions.

4.3.4 Procedure distribution

The procedures are instruction documents and should therefore be available at the work place to which they relate. One should determine a system of control of these documents and there should be a central point controlling the allocation of numbers to avoid duplication. The distribution should also be controlled to facilitate updating.

4.4 WORK INSTRUCTIONS

Work instructions are required where their absence would adversely affect quality. Work instructions are intended to cater for those activities requiring detail beyond that included in the authorized procedure. In a manufacturing environment, engineering drawings, work operations sheets or flow charts or photographs are in this category. For services industries the need is often identified and covered by the use of checklists for specific activities. Verbal instructions even under training can also be considered as work instructions provided no confusion results.

4.4.1 Contents

Work instructions should describe in detail, how a specific activity is to be undertaken and define the standards of acceptability for the product or services. Since these are to be used by the operator level personnel, the contents should be simple to understand and follow.

A written documented work instructions usually counts :

(i) What has to be done;

(ii) The correct sequence of activities;

(iii) What materials/equipment must be used;

(iv) Any special environmental conditions as temperature, humidity, cleanliness;

(v) Reference standards/codes of practice, which must be compiled with.

4.5 FORMS – RECORDS – OTHER DOCUMENTS

This section applies to the mass of supporting documents used by companies to record and distribute information. In addition it includes the library of standards and trade literature applicable to the business activity.

This category of an organization's documentation serves to demonstrate that the product or service provided has been developed and produced in accordance with the specified requirements. It also proves that the quality system is operating effectively.

4.5.1 *Contents*

This stratum of documentation is generally loosely structured and contains all the items required to support the other levels and to demonstrate the achievement of the organizations objectives.

Three main groups of documents are :

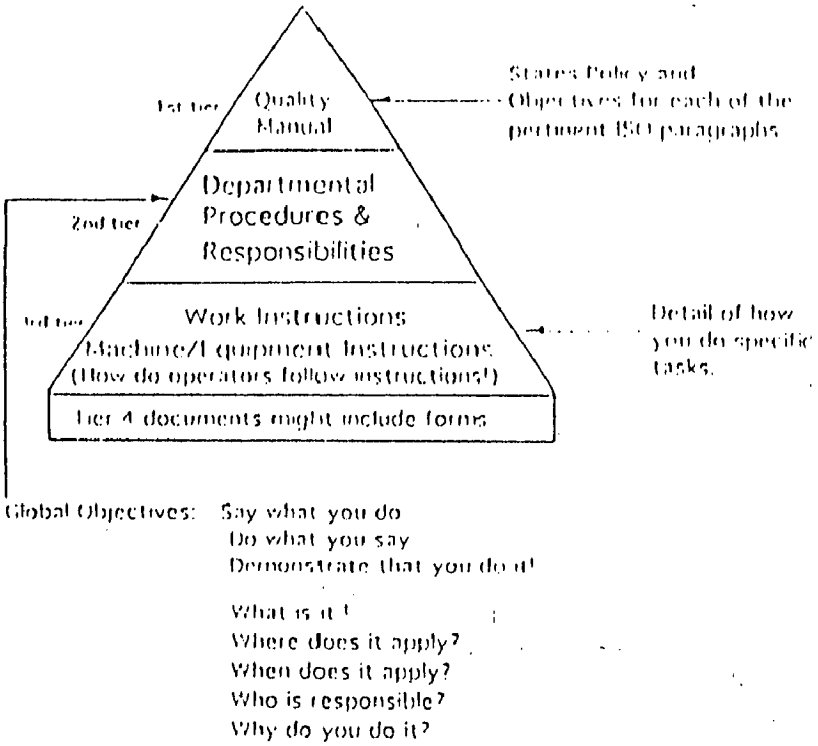
(i) Forms of all kinds that are used for such purposes as purchasing, audit reports, calibration, recording, etc.

(ii) The records of activities that are required by ISO-9001 or ISO-9002, together with relevant subcontractor's records such as certificates of conformity.

(iii) Any material used as input to products or services such as standards, codes or practices, regulations.

4.6 DOCUMENT CONTROL

All the documents relating to quality relating to quality should be controlled to ensure that only the most up-to-date issues are used and referred to at the various locations. Clearly, this will require records of who holds the documents, and a written procedure for the issue of amendments and for reissues, together with some form of acknowledgement of receipt. In industries where continuous innovations, redesign and improvements are a major feature, good documents change control is vital. The supplier should establish a continuing mechanism for controlling changes is implemented to assess the effect of the change on other parts of the organization of the change may be an important factor, particularly when several changes of documentations are to be considered.



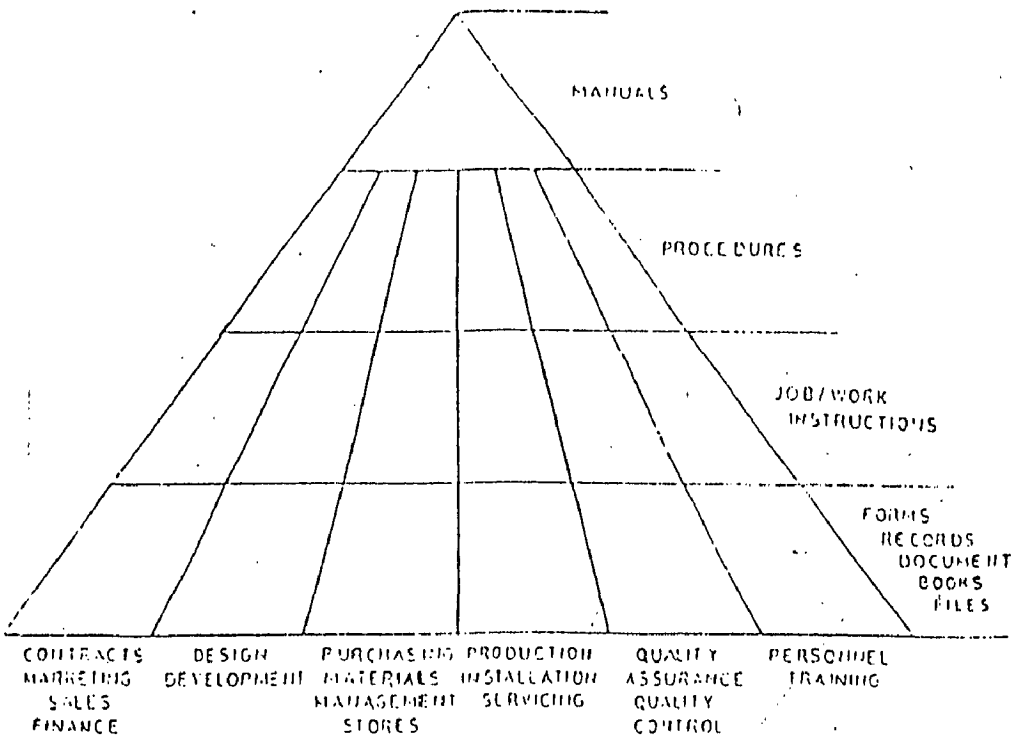


Fig. 4.1 Quality System Documentation

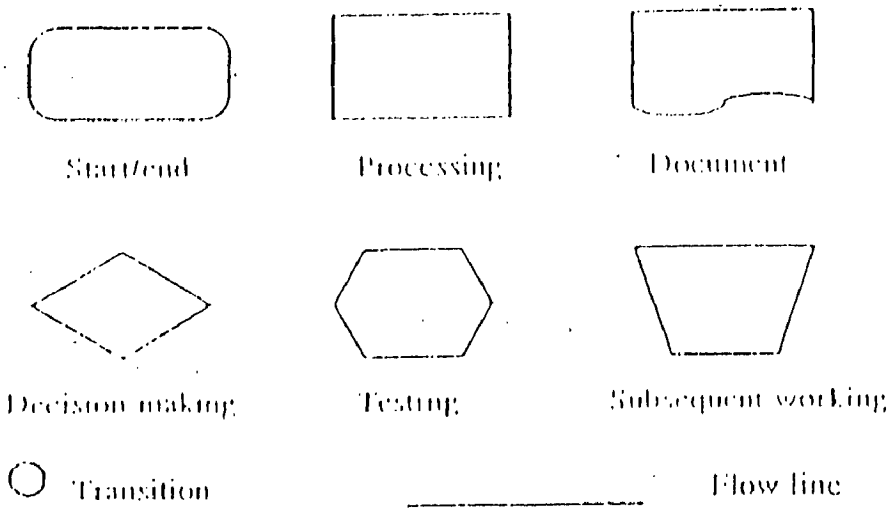


Fig. 4.2 Flow chart Symbols

DOCUMENT	RESPONSIBILITY	FUNCTION
MANUAL	STRATEGIC	MANAGEMENT
PROCEDURES	TACTICAL	DEPT. HEADS
JOB/WORK-INSTRUCTIONS	OPERATIONAL	SUPERVISORS

Table 4.1 Quality System Documentation

CHAPTER – 5

PREPARING FOR REGISTRATION

A company's goal should be to establish a suitable and effective quality system for getting registration. The design of the system should be such that its maintenance should also be easy. Establishing an effective quality system sometimes means reviewing and improving an existing system, other times, one has to start from scratch.

5.1 PRE-REQUISITES FOR DESIGNING AND IMPLEMENTING A QUALITY SYSTEM

(i) Strong commitment and zeal of Top Management.

(ii) Ability to allocate resources such as Manpower, Managerial time, and Finance for expert assistance.

(iii) Good labor relations, Patience and Perseverance.

(iv) In order to successfully implement a quality system, organizations must recognize that quality policy, quality management and quality systems are fully transparent and symbiotically linked in a logical hierarchical network.

5.2 ESTABLISHMENT OF QUALITY SYSTEM – ACTION PLAN

The action plan describes and initiates approaches and projects for the establishment of a quality system.

1) Appreciation by Top Management, Quality as vital element of business.

2) Deliberation and commitment of resources.

3) Appoint a program coordinator/management representative and establish a steering committee.
4) Discussion with senior managers and selection of quality system model.
5) Consultations with unions or workers representatives.
6) Training and orientation of managers.
7) Quality programme committee of all functional heads under CEO.
8) Formation of a full time quality system task force.
9) Prepare and conduct a company wide survey existing quality assurance practices and procedures and analyze the information/data.
10) Determine the need for organizational, technical, economical and procedural improvement of quality system.
11) Prepare and conduct a management form to establish goals, policies and strategies. Document the results in a quality manual.
11) Initiate, support and coordinate procedure writing or review projects.

(a) determine principles and layout for procedures.
(b) Prepare a first draft.
(c) Conduct a workshop on procedure writing.
(d) Determine, assign, and support procedure writing. (Use project management technologies).
(e) Review drafted procedures and incorporate those approved, into the quality manual.
(f) Audit implementation of procedures.
(g) Recognize successful procedure writing project terms.

13) Compile work instructions.

14) Train staff in standard methods and procedures.

15) Arrange wide discussion of new organization system and procedures at all levels.

16) Issue new policy and direction on implementation of quality system.

17) After trail period carry out internal audit for compliance.

18) Take corrective actions for non-conformities.

19) Repeat internal quality audit till system is operational and then submit a report to Top Management.

20) Arrange preliminary audit by external agency.

21) Take corrective action.

22) Apply for registration.

CHAPTER – 6

ROLE OF ARMY REPAIR WORKSHOPS AND NEED FOR ISO-9002 CERTIFICATION

6.1 Introduction

Due to rapid advancement of science and technology large numbers of sophisticated equipments have been introduced in the Army. These equipments like tanks, guns, radars, radio sets, missiles, computers, simulators and aviation poses increasing challenges for repair and maintenance. In Army Corps of EME called Electronics and Mechanical Engineers has been entrusted with the repair, overhaul and servicing of all equipments so that they can remain battle worthy all times.

Army units are divided into two distinct organizations called Field units and Peace units depending on their operational role. To meet these diverse requirements EME has also been divided into Field & Peace types of units to meet the task of providing repair cover.

6.2 EME Field Units

6.2.1 Unit Repair Organization (URO) – A small detachment integral to an Infantry Battalions

6.2.2 Light Repair Workshop (LRW) – A small workshop for carrying out light repairs of Signal Regt, Arty Regt, Engr Regt. Generally consists of 1 Officer/JCO and 25-30 craftsmen, which is integral to user unit.

6.2.3 Field Workshop – This Wksp provides light & field repair cover to units of an Infantry Brigade in Field/Exercise/Operation/Peace. It consists of 2 officers and about 80-100 craftsmen.

6.2.4 EME Bn – This provides repair cover to an Infantry/ Armored/ Mountain Division. It consists of five field workshops for Infantry Brigades and other units of the formation. Total strength about 500 –600 men including officers.

6.2.5 Zonal Workshops – This workshop provides major repairs like overhaul and medium repair of tanks etc to all Wksps of a Army formation allotted to it.

6.2.6 Specialist Workshops – These are special workshops for Air Defence Regts, Engineer Units and Missile Regiments etc.

6.3 EME Peace Units

6.3.1 Station Workshops – These workshops are static units, which provide repair cover to peacetime units of Army in a station.

6.3.2 Equipment Depot Workshops – Army Ordnance Depots issues equipments like Radio, Radars, Vehicles, Tanks, Guns, etc to army units. These Wksps provide one to one repairs to the equipment being issued or kept in reserve for subsequent issue.

6.3.3 Army Base Workshops – These are major EME workshops commanded by Brigadier and have about 500 combatants and 1500 – 2000 civilians. There are eight Base Wksps, which are providing major repairs, servicing & overhaul to all types of equipment of army. Each has a specific targets allotted to them. In addition Army Headquarters can allot jobs of specialist nature of any type on as and when required basis.

6.3.4 Maintenance Advisory Group (MAGs) – These are located with major PSUs to provide maintenance and engineering support advice.

6.3.5 HQ Technical Group (HQTG) – EME has a organization called HQ

6.3.6 Technical Group at New Delhi which publishes permissible Repair

6.3.7 Schedules (PRS), Maintenance Scales (MS) for authorization of spares to be stocked and EME Regulations for technical advice on each equipment called EMER. Time to time repair policy is revised and forwarded to concerned EME units.

6.3.8 HQ Base Wksp Group – This is located at Meerut and controls all Army Base Wksps and Equipment Depot Wksps.

6.4 Need for ISO-9002 Certification

The focus of ISO : 9002 certification is on customer and there is a need for this requirement for excellence and competitiveness. This recognition also improves quality of output by EME Repair workshopstowards excellence.

6.5 Advantages of ISO-9002 Certification

6.5.1 It inspires confidence among customers and enables EME to achieve customer satisfaction cost effectively.

6.5.2 It enables Workshop to identify plan and perform tasks to yield right results in the shortest possible time and in cost effective manner.

6.5.3 It provides effective means for Identification, prevention and corrections of the problems thereby achieving consistency in production quality.

6.5.4 The generation of data and internal quality audits help to assess performance level of processes and product for continuous improvement.

6.5.5 The certification lends credibility and authenticity to the genuineness of quality work being performed.

6.5.6 It bestows recognition, which has the added advantages of attracting potential customers.

6.5.7 The external audit by the certifying body ensures implementation and maintenance of stringent quality assurance measures

6.5.8 The ISO – 9000 quality system provides a strong base on which an establishment can build a TQM culture with a focus on customer involving continuous improvement. The establishments are also motivated to strive for continuous improvement through innovativeness and pro-activeness.

6.5.8 Therefore relevance and applicability of ISO-9000 standards is universal & adaptable to each and every sphere of activity being performed by the Army. Effective quality will give many advantages toArmy Workshops with valuable recognition.

6.6 Present System of Repairs in Field & Peace EME units

6.6.1 Present system of repairs in field units - Officer Commanding of EME workshops functions as the chief inspector/sole authority to certify the quality and reliability of repair. Firstly the defective equipment like Vehicles, Tanks, Guns, Dozers etc are brought to field workshops by user unit with work order. A person who has done a diploma in equipment of particular type carries out technical inspection called 'In-Inspection'. These inspectors in EME are called Tech 'A' Vehs, Tech 'B' Vehs, Tech 'C; Vehs, Tech (Gun) as per their specialization and so on. Inspection form called EO-3 is filled and defects, which are to be rectified, are noted and equipment is forwarded to concerned section for repair. Section in charge carries out repairs with his mechanics and draws the stores/spares required from Technical Store Section (TSS) in the workshop. Item declared Not Available (NA) is procured from market. After repairs are completed and section in charge is satisfied, equipment is sent for Out – Inspection. After satisfactory testing equipment is sent back to concerned user units. In case of

any doubt matter is referred to Officer Commanding for direction and further action.

6.6.2 Present system of repairs in peace units - In peace units like station Wksps and Static Wksps repair procedure as explained above is followed. For carrying out repairs and certifying the same CO/OC of that EME workshop is sole authority. While undertaking such repairs, preventive maintenance if required is also kept in mind. Equipments & vehicles does not come in bulk, they come only when if become defective or periodic servicing is required

6.6.3 Army Base workshops (ABW) of EME are given specific targets for basic repairs/overhaul of different types of equipments in service with Army Equipments declared Beyond Economical Repair (BER)/Beyond Local Repair (BLR) are also forwarded through ordnance depots to Army Base Workshops for overhaul so that they can be re-issued for further use.

6.6.4 Equipment Depot Workshops are one to one workshops for major CODs issuing new equipments to all units of Army. All eqpts are received from PSUs/ imported as per Army HQ requirements with MOD approval. They are received by COD and inspected by Det BWG– 14 at COD, Agra. Serviceable eqpts is kept ready for issue to units but eqpts found repairable are forwarded to PSU if within warranty or otherwise they are forwarded to Eqpt Depot Wksp (EDW) Agra Cantt for repairs. After repairs by EDW they are inspected again by Det BWG – 14 and merged with Depot stocks if found serviceable. In addition to this COD also carries out routine inspection held with them and fwd defective eqpts to EDW for repairs. Servicing and overhaul of eqpt deposited with COD Agra is also undertaken by EDW on as and when required basis..

6.6.5 It can be seen from system of repairs outlined above there is no scope of adopting ISO 9002 standards in Field Wksps, therefore these standards can only be applied in Peacetime Wksps like Station Wksp, Eqpt Depot Wksps and Army Base Wksps.

6.6.6 In order to adopt ISO 9002 standards Eqpt Depot Wksp, Agra which is providing repair cover to COD, Agra is found to be suitable and hence selected for further work on this thesis.

6.7 Status Report of Quality System in EDW, Agra.

6.7.1 There is no well defined quality policy, only departmental rocedure is followed. There is no MR for ISO – 9002.

6.7.2 Quality System

- There is no documented quality system only inspection by Det BWG –14 is considered sufficient after Out-Inspection by Wksp.
- There are no quality manual, work procedures and work instructions

6.7.3 Document Control is not well centralized.

6.7.4 Purchasing – Not properly organized/defined & no vendor rating.

6.7.5 Inspection and_Testing

- All the incoming inspection, in process inspection , final inspection are done by concerned inspectors.
- No planned calibration of instruments/equipments.

6.7.6 Internal Quality Audits

- No Quality audits, as there is no implemented system.

PROPOSED SYSTEM AS PER ISO - 9002 FOR EQUIPMENT DEPOT WORKSHOP, AGRA

7.1 Workshop Description

7.1.1 Eqpt Depot Wksp (EDW), Agra Cantt is established in 1951 as small detachment for COD, Agra. From 1967 it has been re-organized into full flagged repair wksp commanded by a full colonel.

7.2 Role

7.2.1 Role of Eqpt Depot Wksp is to provide one to one repair cover to COD, Agra.

7.3 Customers

7.3.1 COD Agra is the only customer of Eqpt Depot Wksp. This depot is responsible for receipt stock and issue of all types of electronic and electrical equipment like Radio Sets, Line Eqpts, Radars, Optical Eqpts, Generating Sets, Test Eqpts to all units of Army. This task itself gives a major and important responsibility to COD, Agra that can only be fulfilled by active cooperation of EDW. COD Agra is commanded by Brigadier and has a work force of about two thousand.

7.4 Designing and Documenting A Proposed Quality System

7.4.1 Proposed system for ISO – 9002 needs full dedication of management, increase in manpower & resources, establishing quality system in line with these standards.

7.4.2 Detailed discussions were held with senior officers of COD and EME so as how to implement these standards in Eqpt Depot Wksp. With deliberations ISO – 9002 model was selected to be implemented and CO, EDW was also involved fully in the discussion.

7.4.3 Then a team was formed and quality system manual was prepared. Quality system was finalized for one type of eqpt mainly Radio eqpt of Telecom Section. This can be further extended to cover all other gps like Optical, Telecom, Radar, Instruments, and Gen Sets & Vehs.

7.4.4 The EDW is to be re-organized and CO is re-designated as CO & MD and different function heads for ease of implementation of quality system. Some changes in designation and re-allocation of manpower in gps is considered inescapable. The proposed organizational structure with new appointments and gps has been included in Quality Manual.

7.4.5 The documented quality system and procedures are made and included in the thesis. These can be implemented in consultation with superiors of CO EDW.

7.4.6 Implementation of ISO – 9002 standards in EDW will go a long way in building up confidence of users and quality of repairs.

7.5 QUALITY SYSTEM MANUAL

EQUIPMENT DEPOT WORKSHOP, AGRA CANTT

QUALITY MANAGEMENT SYSTEM MANUAL
(Based on ISO-9002)

Copy No :
Issue No :
Date :

24.	4.17		Training
25.	4.18		Servicing
26.	4.19		Statistical techniques
27.	5.1	Annx-1	Organization Structure
28.	5.2	Annx-2	Responsibilities & Authorities of Key Personnel
29.	5.3	Annx-3	Responsibility Matrix
30.	5.4	Annx-4	MR Appointment

1.1.0 SCOPE

1. This Quality System Manual consists of Quality policy organization structure & policy statements relating to all 19 clauses of ISO 9002 : 1994 standards.
2. The procedures have been covered in Quality System Procedures. Refs of these procedures have been indicated in Quality System Manual. Ref of work Instructions have been made in relevant Quality System Procedures.
3. The scope of certification is :-
   (a) Repair & Overhaul of Radio Systems used in Army.

1.1.1 CONTROL PROCEDURE FOR QUALITY SYSTEM MANUAL

(a) This Quality System Manual (QSM) is used as an authorized reference for implementation and maintenance of the quality system.

(b) This QSM is authorized for implementation & issue by CO and controlled & issued by Management Representative (MR).

(c) All amendments to this QSM are authorized by CO and issued by MR. Details of amendments are recorded on RECORD OF AMENDMENT sheet in section 1.2 of this QSM.

(d) Amendments are not implemented until the same have been formally authorized and issued, as defined in Para (c) above.

(e) On receipt of an amendment, the recipient acknowledges by way of returning the outdated section to MR, who disposes off the same.

(f) Controlled copies of QSM are numbered and issued as per the distribution list, given in section 1.1 of this QSM.

(g) Distribution of this QSM is strictly controlled and maintained as confidential document.

(h) Controlled copies of QSM are updated, in case of any amendment.

1.1.2 DISTRIBUTION LIST OF QUALITY SYSTEM MANUAL (QSM)

(a) Controlled copies of this QSM are numbered and issued as given below

COPY NO	ISSUED TO
01	CO
02	GM(P)/MR
03	OIC (WORKS)
04	OIC (ADM)
05	R&I
06	P&P
07	MCO
08	WSG
09	IN Gp
10	RI DET BWG-14
11	TECH STORE SECTION
12	TELECOM SECTION
13	COD
14	CERTIFICATION BODY

(b) Controlled copies of QSM are stamped " CONTROLLED COPY NO ___" in red which indicates the originality of the document.

1.1.3 RECORD OF AMENDMENTS

S.No Date	Section No	Brief Description of Change	Rev No

1.1.4 ABREVATIONS AND DEFINITION

1.1.4.1 ABREVIATIONS

Army Base Workshop	ABW
Army Repair and Calibration Cell	ARCC
Army Headquarters	AHQ
Ancillary	ANCY
Assembly	ASSY
CO and Managing Director	CO & MD
Central Ordnance Depot	COD
Equipment Depot Workshop	EDW
Deputy General Manager	DGM
Department	Dept
Equipment	Eqpt
Electrical & Mechanical Engineers Regulation	EMER
General Manager	GM
Headquarters Base Workshop Group EME	HQ BWG
Headquarters Technical Group EME	HQTG
EME	
General Staff	GS
Instrument Group	IN GP
Laser Based Instruments	LBIs
Local Purchase Officer	LPO
Material Control Organization	MCO
Material	Mtrl
Material Provisioning Officer	MPO

Manager	Mgr
Methods Engineering	ME
Manufacturing and Reclamation	M&R
Technical Stores Section	TSS
Officer in Charge	OIC
Production	Prod
Production and Planning	P&P
Personnel and Administration	Pers & Adm
Passive Night Vision Devices	PNVDs
Quality System Manual	QSM
Quality System Procedures	QSP
Quality Assurance Procedure	QAP
Quality Assurance	QA
Receipt and Issue	R&I
Receipt Voucher	RV
Resident Inspector	RI
Standard Operating Procedure	SOP
Training	Trg
Technical	Tech
Workshop	Wksp
Work Plan Instructions	WPI
Workshop Completion Notice	WCN
Tele Communication Group	TCG
Management Representative	MR

1.1.4.2 Definitions

1.1.4.2.1 User : User is the customer who provides product for repairs/overhaul. It is synonym to "Customer" as given in ISO 9002 : 1994 parlance.

1.1.4.2.2 Overhaul : Complete stripping and then building up with new/reclaimed or old but serviceable parts, components, sub assemblies and assemblies.

1.1.4.2.3 Serviceable : Parts, sub assemblies, assemblies and components within laid down specifications.

1.1.4.2.4 **Product**: Product means Radio& Line Equipment held on charge of the user & fwd to the wksp for repair and overhaul in meeting the requirements of the contract.

1.1.4.2.5 **Customer** : Our customer is COD Agra Cantt.

1.1.4.2.6 **Unit** : Equipment Depot Wksp

1.1.4.2.7 **Contract**: Eqpt Forwarded by COD Agra Cantt for repairs & servicing as per their issue plan.

1.1.4.2.8 **Defect** : It is taken as Nonconformity.

1.1.4.2.9 **Servicing**: Maintenance and Field repairs carried out by EME FD Wksp in Field Army.

1.1.4.2.10 **Introduction, Installation and Servicing Process**: It is used to imply overhaul and repair to Eqpt Depot Wksp.

1.1.4.2.11 **ISR** : Inter Section Requirements is used within the Wksp for obtaining the services of a section other than the one on which the main work order is placed IS(EME) W-27 is used for this purpose. These are initiated against a work order.

1.1.4.2.12 **Purchase/Local Purchase:** Stores/spares, which are not available through normal source of supply and are purchased by the wksp to meet production requirements.

1.1.4.2.13 **Out Inspection** : The out inspection refers to the final inspection of eqpt on completion of the repairs in EDW before the eqpt is handed over to Depot/User.

1.1.4.2.14 **Reclamation:** Reclamation refers to extensive and specialized repairs by process like glass polishing, metal deposition, welding, soldering on components or assemblies, which are otherwise sentenced as unserviceable.

1.1.4.2.15 **Record** : A collection of related items of data treated as unit.

1.1.4.2.16 **Repair Programme** : These are formulated by AHQ and issued by HQ BWG (EME) based on GS requirements. Separate programmes are issued for different equipment,

which include definite quantities to be overhauled in specified period ranging from one to five years.

1.1.4.2.17 **Route Card** : This is a document that is tagged on the job requiring work in more than one section. The route/sequence of the processes involved are recorded on it.

1.1.4.2.18 **Stage Inspection** : Stage Inspection refers to the process inspection of Equipment undergoing repairs/overhaul at the end of each stage/operation.

1.1.4.2.19 **Work Content** : Effort required to do a job converted into man-hours by trade is the work content.

1.1.4.2.20 **Work Order**: It is the document (IAFO-1370) authorizing a work to be undertaken in the EDW. Competent authority approves it.

1.1.4.2.21 **Workshop Completion Notice (WCN)** : WCN refers to the intimation by ABW to the originators of work order on completion of job and for its collection. The notice also serves as an issue document, which is receipted by RV number issued by the originator after the repaired equipment, is collected.

1.1.4.2.22 **WPI**: Work-planning instruction is a self contained and comprehensive document issue in three parts. PART I gives advance notification of the commitments and particulars of the anticipated stores, equipments and services. Part II gives details of layout, allocation of floor space, minor works and other services. Part III contains schedules of works, operation and personnel required to undertake and carry out the commitment.

1.1.4.2.23 **Procurement** : Implies items/spares obtained from service sources.

1.1.4.2.24 **Army Headquarters** : Corporate Headquarters.

1.1.4.2.25 **Headquarters Base Workshop Group EME** : Controlling Headquarters.

1.1.4.2.26 **In Inspection** : In inspection refers to receipt inspection of equipment received for overhaul/repair by the EDW.

2.0 CERTIFICATE

It is certified that this Quality System Manual describes adequately and accurately the procedures and documents at EQPT DEPOT WORKSHOP and the same is hereby duly approved and authorized by the undersigned.

CO & MD

3.0 COMPANY PROFILE

3.1 **Background** : Eqpt Depot Wksp Agra is one-to-one wksp for COD which issues are electronic eqpts to Army. It was established as a Det in 1951 and upgraded to full-fledged wksp in 1967.

3.2 **Growth**: The wksp over the years has graduated from low technology electronic to overhaul/repair of the state of art weapon systems such as Radar Systems, Laser Based Instruments, Telecommunication Eqpts, Generating Sets and Passive Night Vision Devices. It is repairing all Electronic Equipment issued by COD Agra.

3.3 **Capacity** : The wksp has a work force of 03 officers, 125 combatants & 74 civilians. Adequate plant, machinery & tools are held for undertaking repairs to all types of Telecommunication, Laser and Optical eqpt, Radars, Instruments, & Generators of the Indian Army being issued by COD, Agra.

3.4 **Product Profile**: The workshop undertakes Repairs/Overhaul to the following category of eqpts: -

(a) Radars

(b) Telecommunication Eqpt

(c) Instruments

(d) Generators

(e) Vehs

3.5 **Customer Profile**: The workshop undertakes repairs/overhaul of various eqpts as mentioned above issued by COD, Agra for Indian Army.

3.6 **Future Plans**: The Wksp is preparing itself for getting ISO-9002 certification.

4.1 MANAGEMENT RESPONSIBILITY

4.1.1 Quality Policy

4.1.1.1 The Eqpt Depot Wksp has defined and documented its policy for Quality including objectives for quality and its commitment to quality. Quality Policy is notified at all levels of employees. The Management ensures that the Quality Policy is understood, implemented and maintained by all employees in the organization.

Quality Policy

We at EDW, Agra Cantt aim to :

Provide repair, maintenance and overhaul to Army electronic eqpts with consistent quality & their provision to the Army to their complete satisfaction.

We follow a complete system of continuous feedback & strive for continuous improvement in quality to enhance efficiency and productivity.

CO & MD

4.1.1.2 Quality Objectives

Quality Policy is relevant to the company's organizational goals and expectations and needs of its customers. Quality Policy is supported by the following quality objectives:

- To standardize, maintain & improve upon the quality system in operation, in conformity with the International standards : ISO 9002 : 1994.
- To ensure that quality system is integrated both vertically & horizontally.
- To create an environment that encourages the employees to prevent defects, thus achieving excellence in work through continuous improvement in quality.
- To ensure maintenance of high safety standards.
- To strive for exceeding the expectations of the users.
- To ensure increased productivity and enhanced efficiency on a continuous basis.
- To promote quality practice at all level through educational programmes & by displaying it at relevant places.

4.1.2 Organizations

4.1.2.1.1 Responsibility and Authority

4.1.2.1.1 Management of the company is directed by CO & MD and assisted by various functional heads. The company's organizational structure showing inter-relationship of various functional heads is defined in Chapter 5.1 (Annexure-1) of this QSM.

4.1.2.1.2 Responsibilities and authorities of key personnel, who manage, perform and verify work-affecting quality, are defined in Chapter 5.2 & 5.3 (Annexure-2&3) of this QSM. These personnel have authority to :

(a) initiate action to prevent re-occurrence of any Non conformities relating to the product, process and Quality System.

(b) Identify and record any problem relating to the product, process and Quality System.

(c) Initiate, recommend or provide relating to the product, process and Quality System.

(d) Verify implementation of the solutions.

(e) Control further processing, delivery or installation of Non-conforming product until the required corrective action has been taken.

4.1.2.2 Resources

4.1.2.2.1 The Management identifies and provides adequate resources including trained personnel required for management, performance of work and verification activities including Internal Quality Audits.

4.1.2.2.2 Based on known technology, machines and equipment are procured to meet special requirements, if any, to upgrade the technology and quality of the product.

4.1.2.2.3 Proper training is provided to operators involved in manufacturing process.

4.1.2.2.4 Required inspection, measuring and test equipmcnt are provided for verification/inspection at various stages. Personnel involved in these activities are qualified and trained.

4.1.2.2.5 Management Representative (M.R)

GM (Prod.) has been appointed, in addition to his normal responsibilities, as Management Representative who has responsibilities and authorities

to :-

(a) Ensure establishment, implementation, maintenance and verification of the Documented Quality System in accordance with the International Quality System Standard : ISO 9002 : 1994.

(b) Report on the performance of Quality System to CO for review and improvement.

(c) Coordinate with the external agencies for verification arrangements.

4.1.3 Management Review

4.1.3.1 The Quality System, adopted to satisfy the requirements of the International Quality System Standard and company's stated Quality Policy and objectives, is reviewed by the Management Review Committee (MRC), chaired by CO once in 6 months to ensure its continuing suitability and effectiveness. A review may be carried out earlier also, if required.

4.1.3.2 M.R. co-ordinates for Management Review, composition of MRC is as defined in the procedure for "MANAGEMENT REVIEW".

4.1.3.3 Following inputs make the agenda for each Management Review.

(a) Minutes of the last review meeting and action pending.
(b) Effectiveness of the Quality Policy and objectives.
(c) Corrective & preventive action taken and their effectiveness.
(d) Internal Quality audit reports.
(e) Customer complaints.
(f) External quality audit report, whenever applicable.
(g) Development activities.
(h) Resource Allocation.

4.1.3.4 Minutes of Management Review are recorded and maintained by M.R.

4.1.4 Reference

Procedure for "MANAGEMENT REVIEW" No: QSP/01

4.2 QUALITY SYSTEM

4.2.1 General

EDW has established and implemented a documented Quality System conforming to the requirements of the International Quality System Standard ISO 9002 : 1994. The Quality System shows that the operations are in

accordance with the Quality Policy and organizational structure.

The Quality System is documented in 4-tier structure, given below :-

Level -I: Quality System Manual (QSM)

Level -II: Quality System Procedures (QSP)

Level -III: Work Instructions (WI)

Level- IV: Records, National/International Standards, Codes & Specifications and Drawings/External Documents (EMERs, TM)

4.2.2 Quality System

4.2.2.1 Quality System Manual (QSM)

QSM elaborates the Quality Policy, Quality Objectives, Responsibility & authority of key personnel, organizational structure and policies of the company regarding compliance of the requirements of ISO 9002 : 1994 Quality System Standard.

4.2.2.2 Quality System Procedures(QSP):

QSP/QSP(ME) are documented to the adequate level for ease of implementation of the policies stated in QSM.

4.2.2.3 Work Instructions (WI):

Work Instructions are documented, required at the operational level to ensure that the activities are done as per the requirements. These Work Instructions are based on the applicable codes/contracts/standard practices/specifications/product quality requirements/EMERs.

4.2.2.4 Records/ Standards/ Specifications/ Drawing/ External documents :

Efficacy of the Quality System is demonstrated through establishment and maintenance of quality records, as referred in QSP. National / International Standards, codes, drawings, specifications & customer/ vendor supplied

documents shall also constitute records of the Quality System. External documents like Technical manual, EMERs are included in level 4 documents.

4.2.3 **Reference**

NIL

4.3 **CONTRACT REVIEW :**

4.3.1 **General** : EDW has established documented procedure for contract review and co-ordination of associated activities.

4.3.2 **Review** : Before the acceptance of a contract or order (statement of requirements) the contract or order is reviewed by the management to ensure that :

(a) The requirements are adequately defined and documented.

(b) Any difference between the contract or order requirements are resolved prior to the acceptance of the order and reviewed every six months.

(c) The organization has the capability to meet the contract or order requirements.

4.3.3 **Amendment to a contract** : Eqpt Depot Wksp has identified procedure for amendment to contract order and for communicating these to concerned personnel within the organization.

4.3.4 **Records** : Records of the contract review are maintained in the R&I department.

4.3.5 Reference:

Procedure for "CONTRACT REVIEW" No: QSP/02

4.4 **DOCUMENT AND DATA CONTROL**

4.4.1 EDW has established and maintains a documented procedure to control all document s and data related to the requirements of this International Standard and Quality

System including documents of external origin such as National/International standards and customer/vendor drawings/specifications, to the extent possible.

4.4.2 Document and Data Control

4.4.2.1 All documents and data are reviewed for their adequacy and approved by the authorized personnel prior to issue.

4.4.2.2 Master list of all the controlled documents, identifying their current revision status, is maintained and readily available to preclude use of invalid/ obsolete documents.

4.4.2.3 Master copy of all the controlled documents is maintained by M.R/the concerned issuing authority.

4.4.2.4 Distribution record of QSM, Procedures, Work Instructions, Drawings and Standards/specifications is maintained.

4.4.2.5 All controlled documents bear a relevant document control number.

4.4.2.6 Issuing authorities of the controlled documents ensure that :-

(a) The pertinent issues of the appropriate documents are available at all locations, wherever required for effective functioning of operations.

(b) Invalid/ obsolete documents are promptly removed/ withdrawn from all points of issue or use and only the master copy of such documents is retained for a specified period before it is mutilated.

(c) Any obsolete document retained for legal or knowledge preservation purpose is suitability identified.

4.4.3 Document and Data changes

4.4.3.1 Changes/ Amendments to all the controlled documents are reviewed and approved/ authorized, before issue, by the same functions/ authorities that performed the review and approval/ authorization of the original document.

4.4.3.2 Nature of change/ amendment to a document is identified, processed and recorded as defined in the procedure for "Document and Data Control".

4.4.3.3 A master list of all the controlled documents, identifying their current revision status, is maintained as defined in Para 4.5.2.2 & 4.5.2.3 of this section of QSM.

4.4.3.4 In case of any amendment, fresh revision of the amended document is issued.

4.4.3.5 Fresh issue of the document is issued, whenever required.

4.4.4 **Reference**

Procedure for "Document and Data Control" No: QSP/03

4.5 **PURCHASING**

4.5.1.0 **General** : A large number of spare parts, expendable items and raw materials are generally required for overhaul of Eqpt. Majority of relevant spare parts, expendable items, raw materials are procured from service source for which the procedure has been detailed in procedure number – QSP/04.

4.5.1.1 Spare parts, expendable items and raw materials which are NOT available, constituting a very small percentage are locally purchased as per the procedure laid down vide procedure for Purchasing No QSP/05.

4.5.2 **Evaluation of sub-contractors (Vendors)**

Raw material and other critical items are purchased from the approved vendors to ensure their conformance to the specified requirements. Job work, outside, is also carried out by the approved sub-contractors.

4.5.2.1 Prospective vendors/ sub contractors are selected and approved. Approved vendors/ sub-contractors are listed for placement of orders.

4.5.2.2 Approved vendors are evaluated and rated, once a year, for their performance in respect of quality, delivery and price as laid down in procedure QSP/ 06.

4.5.2.3 Approved vendors' list is reviewed and updated based on the performance rating results of the vendors/ sub-contractors, once a year, or whenever a new vendor/ sub-contractor is to be included.

4.5.2.4 Vendors/Sub-contractors are approved and evaluated/ rated as defined in the procedure for vendor rating.

4.5.2.5 Purchasing activities covering procurement of items through service stores is done by DGM(M) as per procedure QSP/05 ; QSP/ME/05 for provisioning. Local purchasing is done by LPO & DGM (WSG) as per procedure for local purchasing. QSP/05.

4.5.3 Purchasing Data

4.5.3.1 Purchasing documents contain data clearly describing the complete details of the items ordered or job to be carried out, where required material specifications, drawings, process instructions & relevant technical data are provided.

4.5.3.2 Purchasing/ sub-contraction documents are reviewed and approved, prior to issue, for their adequacy of the requirements.

4.5.3.3 EDW has implemented a documented procedure for Purchasing vide QSP/05.

4.5.4 Verification of purchased product

4.5.4.1 Purchased items are verified/inspected, before use by Quality Assurance Quality Control / user deptt., as defined in the procedure for purchasing QSP/05.

4.5.4.2 Whenever, the wksp intends to verify the item at the vendor's/ sub-contractors premises, the Wksp specifies the system for verification and release of the item in the purchasing documents.

4.5.4.3 Where specified/ agreed in the contract, the wksp allows its customer or his representative to verify the item/ job at its vendors premises. Such verification is not used by the wksp as an evidence of effective control of quality by the vendor.

4.5.5 **Reference :**

(a) Procedure for Provisioning	QSP/04
(b) Procedure for Local purchase	QSP/05
(c) Procedure for Vendor Rating	QSP/05

4.6 CONTROL OF CUSTOMER SUPPLIED PRODUCT

4.6.1 **General** : COD supplied product is assembly/ sub assembly or complete equipment which is received by EDW for overhaul/ repairs. All components of such products may not be new after the Repairs. Receipt inspection is carried out for two purposes :-

(a) Defects

(b) Deficiency.

4.6.2 Defects found therein give an idea of the repair work to be performed. However deficiencies are considered as Non conformities and are reported to the user for resolution.

4.6.3 Procedure for control of verification, storage and maintenance of COD supplied product is defined in the procedure. QSP/07.

4.6.4 Relevant documents are maintained to signify the supply of items by customer for incorporation in the overhauling process or for related activities.

4.6.5 Relevant documents are maintained and customer or customer representative informed regarding any customer supplied product that is lost, damaged or is otherwise unsuitable for use.

4.6.6 Should any equipment brought by user be deficient, then the user shall be contracted to agree to complete the same.

4.6.7 Reference :

(a) Procedure for control of customer supplied product QSP/08

4.7 PRODUCT IDENTIFICATION AND TRACEABILITY

4.7.1 EDW has procedure for identification of the product & also for traceability of spares fitted and verification status in respect of all eqpts from receipt, and during all stages of overhaul and delivery.

4.7.2 Whenever required and to find out the cause of Non conformance, it is traced back to man, material, machine and method to the extent possible.

4.7.3 The wksp has established and implemented a documented procedure for PRODUCT IDENTIFICATION AND TRACEABILITY.

4.7.4 Reference:

Procedure for " Product Identification No: QSP/08

And Traceability

4.8 PROCESS CONTROL

4.8.1 The base repair of eqpt is carried out under planned and controlled conditions. It is ensured that the repair procedures are carried out with appropriate on line process control and also that the semi finished and completed items meet the specified quality parameters. Procedures for control of process operations are covered in QSP/10.

4.8.2 Responsibilities of production personnel are identified to ensure an efficient on line process control in their respective areas of work and thereby build quality into the product.

4.8.3 Production personnel are adequately trained to carry out the process in different section according to the specified jobbing Performa's/work instructions.

4.8.4 Production and where applicable, installation process which directly affect quality are planned and carried out under controlled conditions. Documented work instructions to facilitate overhaul/repair/assembly are available and extensively referred to by the tradesmen.

4.8.5 Process and product characteristics are monitored and controlled during overhaul/repair.

4.8.6 Preventive maintenance activities to ensure continuous process capability are carried out by maintenance personnel as per QSP/11.

4.8.7 Servicing when called for by customers, is adequately provided by the workshop.

4.8.8 Special processes are not followed for the activities covered under the scope of application and it is documented.

4.8.9 Reference:

(a) Procedure for process controls No: QSP/10

(b) Procedure for "Maintenance of Plant and Machinery No: QSP/11

4.9 INSPECTING AND TESTING

4.9.1 EDW ensures that the material/ product conforms to the specified requirements by conducting inspection and testing at every stage. These activities are carried out as defined in the procedure for INSPECTION AND TESTING.

4.9.2 Receiving Inspection and Testing

4.9.2.1 Incoming materials/ item is inspected by the Quality Control/ user deptt as per the specifications/ requirements. Appropriate measures are taken to control the supplies/ items received.

4.9.2.2 Only the conforming material is used or processed, except in emergency.

4.9.2.3 In emergency the materials, which do not affect the quality of the final product, may be used or processed without inspection after being duly authorized, identified and recorded.

4.9.2.4 Inspection /test status of the material. I.e. whether pending for inspection or conforming or non conforming, is identified as defined in the section No 4.12 of this QSM and the procedure for INSPECTION AND TEST STATUS.

4.9.2.5 In case of any rework or segregation (either by the vendor or by the company) of material, required at receiving stage, the reworked/segregated material is re-inspected before use.

4.9.2.6 The nature of receiving inspection is determined giving due consideration to the control/ inspection exercised at source having an evidence of quality conformance.

4.9.2.7 Nonconformance material is handled as defined in the procedure for CONTROL OF NON CONFORMING PRODUCT.

4.9.3 In-Process Inspection and Testing

4.9.3.1 Semi-finished product is inspected and tested at various stages of the process to ensure its conformance to the requirements/ specifications.

4.9.3.2 Process control parameters are monitored and controlled to ensure the product's conformance to the specified requirements.

4.9.3.3 Product is held-up till the required inspection/ tests are completed.

4.9.3.4 Nonconforming product is identified and handled as defined in the procedure for CONTROL OF NON CONFORMING PRODUCT.

4.9.4 Final Inspection and Testing

4.9.4.1 Final inspection and testing of the finished product is carried out to ensure its conformance to the specified requirements/ standards.

4.9.4.2 Only the conforming product is delivered after ensuring that all the inspection and testing activities have been completed.

4.9.4.3 Nonconforming product or lot is handled as defined in the proportion for CONTROL OF NONCONFORMING PRODUCT.

4.9.5 Inspection and Test Records

Records are maintained of all the inspection/ testing/ verification activities.

4.9.6 Reference

(a) Procedure for "Inspection and Testing" No QSP/12

(b) Procedure for "Inspection and Test Status" No QSP/14

(c) Procedure for "Control of Nonconforming Product" No QSP/15

4.10 CONTROL OF INSPECTION, MEASURING AND TEST EQUIPMENTS

4.10.1 **General** : EDW has established and maintains procedures to control, calibrate and maintain inspections, measuring and test equipments used to demonstrate the conformance of the product to the specified requirements.

4.10.1.1 Comparative references such as test hardware are also checked at established frequency to prove that they are capable of verifying the acceptability of product, prior to release for use during production. Record of verification of reference test hardware is maintained.

4.10.2 Calibration Control

4.10.2.1 EDW has

(a) Determined the measurements to be made and the accuracy required and selected the appropriate inspection, measuring test equipment that are capable of necessary accuracy and precision.

(b) Identified all inspection, measuring and test equipment that can affect product quality and calibrated and adjusted them at prescribed intervals or prior to use against certified equipment recognized standard.

(c) Defined the process employed for the calibration of inspection, measuring and test equipment, including details of the equipment type, unique identification such as registered No, location frequency of checks, check method, acceptance criteria and the action to be taken when the results are unsatisfactory

(d) Identified inspection, measuring and test equipment, which is suitable indicator or approved identification record to show the calibration status.

(e) Maintained calibration records for inspection, measuring and test equipment

(f) Assessed and documented the validity of previous inspection and test results when inspection, measuring and test equipment is found to be out of calibration.

(g) Ensured that the environmental conditions are suitable for the calibration & inspection, measurements and test being carried out.

(h) Ensured that the handling, preservation and storage of inspections, measuring and test

equipment is such that the accuracy and fitness for use are maintained.

(i) Safe guard inspection, measuring and test facilities, including both test software and hardware from adjustments would in validate the calibration setting.

4.10.3 Reference :

27 (a) Procedure for "Control of Inspection, No: QSP/13 Measuring and Test Equipment"

4.11 INSPECTION AND TEST STATUS

4.11.1 Inspection and test status of the material/ product is identified and indicated at all stages of the process i.e. receiving/ incoming stage, in- process stage and final (finished product) stage.

4.11.2 Inspection and test status indicates whether the material/ product is pending for inspection or conforming or Nonconforming with regard to the inspection/ test performed.

4.11.3 Inspection and test status is indicated to ensure that only the conforming material/ product or released under authorized concession/ deviation is used for processing or delivered.

4.11.3.1 Inspection and test status is identified as appropriate either by physical location or by using authorized stamps, tags, labels, route card, etc.

4.11.4 Inspection and test status is maintained as defined in the procedure for INSPECTION AND TEST STATUS.

4.11.5 Reference:

Procedure for "Inspection and Test Status" No: QSP/14

4.12 CONTROL OF NONCONFORMING PRODUCT

4.12.1 General

4.12.1.1 The material/ product, which is deviating from its specifications/ requirements, is termed as a Nonconforming material/ product. It is controlled by proper identification, documentation, review, evaluation, segregation (if possible), disposition and Notification to all the concerned functions as defined in the procedure for CONTROL OF NONCONFORMING PRODUCT.

4.12.1.2 Nonconformities are identified by inspection/ testing and recorded at all the stages of inspection i.e. receiving, during process and finished product.

4.12.1.3 Nonconforming material/ product is not used/ further processed/ delivered.

4.12.2 Review and disposal of Nonconforming product

4.12.2.1 Nonconforming material/ product is recorded, reviewed and disposed off, by the designated authorities at all stages of inspection i.e. receiving (incoming), during process and finished product.

4.12.2.2 After review of the Nonconforming material/ product, a decision is taken for its disposal by the designated authorities, which may be :

(a) Segregated/ re-worked to meet the specified requirements, or

(b) Accepted after segregation/ re-worked, or

(c) Accepted with or without segregation/ repair/ re-worked by concession, or

(d) Regarded for alternate use/ application, or

(e) Rejected and returned or scrapped.

4.12.3 Reference

28 Procedure for "Control of Nonconforming product" No. QSP/15

4.13 CORRECTIVE AND PREVENTIVE ACTION

4.13.1 General

EDW has established and maintains documented procedure as QSP/16 for implementing effective Corrective and Preventive Actions eliminating causes of actual or potential Nonconformities.

4.13.1.1 Nonconformities may be basically of the following types :

- system/ document related Nonconformity.
- Material related Nonconformities.
- Process related Nonconformities.
- Product Nonconformities.
- Customer feedback/ complaints.

4.13.1.2 Corrective action taken is appropriate to with the magnitude of the problem and is commensurate with the risks encountered.

4.13.1.3 Any changes/ amendments to the documented procedures/ work instructions/ records, resulting from corrective and preventive actions taken, are recorded.

4.13.1.4 The Management Review Committee reviews corrective and preventive actions taken.

4.13.2 Corrective action

4.13.2.1 Inspection reports and test results of incoming material/ spares, intermediate stages of production process and finished product highlight the stages where the Nonconformance was observed.

4.13.2.2 Internal quality audit highlight Non conformances of the system.

4.13.2.3 Customer feedback/ complaints highlight Non conformances of the product.

4.13.2.4 Based on the nature of Non conformance, its cause is investigated. Results of investigation are recorded.

4.13.2.5 Customer feedback/ complaints are handled effectively and promptly, as defined in the procedure for HANDLING OF CUSTOMER COMPLAINT

4.13.2.6 Based on the nature of Non conformance, its corrective action is identified and implemented to eliminate the cause of Non conformance, as defined in the procedure for CORRECTIVE AND PREVENTIVE ACTION.

4.13.2.7 The Management Review Committee reviews corrective actions taken.

4.13.3 **Preventive action**

4.13.3.1 Potential causes of Non conformities are detected and analyzed using appropriate sources of information such as process and work operations, concessions, audit results, quality records, customer feedback/ service reports etc, which may affect the product quality.

4.13.3.2 Preventive action is decided and implemented to eliminate the potential cause of Non conformance, as defined in the procedure for CORRECTIVE AND PREVENTIVE ACTION. Responsibility for taking the preventive action is also decided.

4.13.3.3 MR ensures effective implementation of the preventive action decided.

4.13.4 Changes/ amendments to a document, if any, resulting from the corrective or preventive action, are recorded and implemented as defined in the procedure for DOCUMENT AND DATA CONTROL.

4.13.5 Record of the corrective and preventive actions, is maintained.

4.13.6 Reference:

(a) Procedure for "Corrective and Preventive action" No QSP/16

(b) Procedure for "Document and data control" No QSP/03

4.14 HANDLING STORAGE, PACKAGING, PRESERVATION AND DELIVERY

4.14.1 General

4.14.1.1 EDW has established and maintaining procedures to ensure proper handling, packaging, preservation, storage and delivery of product so as to prevent deterioration and damages, accidents and loss to the product.

4.14.2 Handling

4.14.2.1 Handling methods employed are such as to prevent damages and deterioration to the product.

4.14.2.2 Adequate facilities, resources and training (if required) are provided to the work force for proper handling of the material/ product.

4.14.2.3 Special handling eqpt are identified and concerned people use appropriate handling eqpt.

4.14.3 Storage

4.14.3.1 Material/ product, pending for use, is stored in a secured area to prevent its damage/ deterioration/ loss.

4.14.3.2 Proper control is maintained to avoid unauthorized issue of the material/ product.

4.14.3.3 Raw material or any other article received by the store is checked for quality and conformance to the specifications.

4.14.3.4 Conditions of items in stores are periodically checked (with special reference on items with shelf life) and suitable actions are initiated.

4.14.4 Packaging

4.14.4.1 Packaging methods employed are such that they ensure adequate preservation/protection to the item and to ensure conformance to the requirements.

4.14.5 Preservation

4.14.5.1 Appropriate precautions for preservation of the material/ product are applied when it is under control of the workshop.

4.14.5.2 Condition of the material/ product, in stock, is assessed and monitored at appropriate intervals to detect its deterioration and necessary corrective measures are taken.

4.14.5.3 Environmental factors, if required, are also taken care of during storage, packaging and delivery.

4.14.6 Delivery

4.14.6.1 Products that have successfully undergone final inspection and testing are delivered to the R&I section/ customer.

4.14.7 Reference

(a) Procedure for "Handling and Storage, Packing & delivery of material" No QSP/17

4.15 CONTROL OF QUALITY RECORDS

4.15.1 EDW has the documented procedure, which provides evidence that Quality System elements falling within the requirements of ISO – 9002 have been implemented.

4.15.2 QUALITY RECORDS

4.15.2.1 Documented procedures have been established and are maintained to ensure proper identification, collection, indexing, access, filing, maintenance and disposal of quality records.

4.15.2.2 Quality records are maintained to demonstrate conformance to specified requirements and the effective operation of the quality system.

4.15.2.3 It is ensured that the quality records are legible, stored, indexed and maintained in such a way that they are easily accessible, retrievable and prevented from damage/ deterioration/ loss.

4.15.3 Reference

Procedure for "Control of Quality Records" No QSP/18

4.16 INTERNAL QUALITY AUDITS

4.16.1 Internal Quality Audits are conducted to determine whether various elements/ functions of the quality system are effective in achieving the stated quality policy and objectives of the organization.

4.16.2 Internal Quality Audits are carried out at least once in three months to :-

(a) Verify whether quality activities and related results comply with the planned arrangements i.e. requirements of the International Quality system Standard ISO : 9002 : 1994, documented procedures, work instructions, quality plans and standards /specifications.

(b) Determine effectiveness of the Quality System.

(c) Detect Non conformities and ensure effective implementation of the corrective and prevcntive actions to avoid re-occurrence of the Non conformances in future.

4.16.3 The trained personnel who are independent and not having direct responsibility for the activity/ area to be audited carry out internal Quality Audits.

4.16.4 Audits are conducted as defined in the procedure for INTERNAL QUALITY AUDITS.

4.16.5 Audit results are recorded and maintained which the Management Review Committee reviews.

4.16.6 **Reference:**

29 Procedure for "Internal Quality Audits" No QSP/19

4.17 TRAINING

4.17.0 General

4.17.1 EDW has established procedure for identification of trg needs and conduct of trg for management, performance of work and verification activities affecting quality.

4.17.2 Training

Documented procedure has been established and maintained as per QSP/09. For identification of training needs and to cater for the training of all personnel forming activities that affect quality.

4.17.3 Personnel, performing specific assigned tasks/special process, are qualified on the basis of their education/ training/ experience required for that task/ process.

4.17.4 Training records are maintained.

4.17.5 Reference:

Procedure for "Training" No QSP/20

4.18 SERVICING

4.18.0 General

In the existing engineering support system of army, since repair and maintenance of the equipment is done by other agencies in the field, the cause of servicing is not the direct responsibility of EDW.

4.19 STATISTICAL TECHNIQUES

4.19.1 The organization has identified the needs and areas/ functions where statistical techniques are to be maintained.

4.19.2 These statistical techniques are used to analyze and verify process capability and product characteristics.

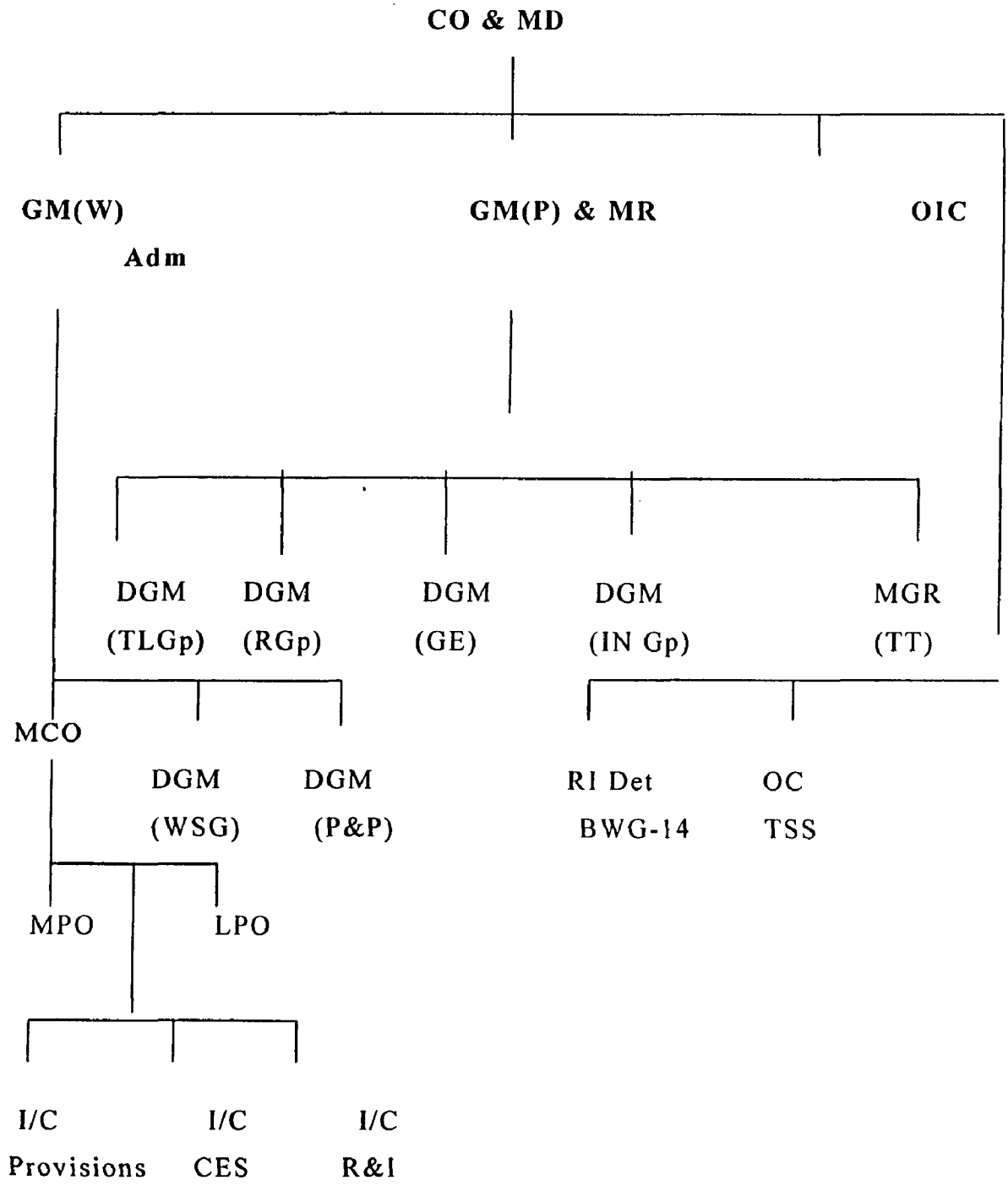
4.19.3 The Management takes appropriate corrective and preventive action, based on the analysis of the statistical data, for further improvement and to maintain effectiveness of the Quality System.

4.19.4 The organization has established and implemented a procedure for STATISTICAL TECHNIQUES.

4.19.5 Reference:

NIL

5.1 PROPROSED ORGANIZATIONAL STRUCTURE EDW, AGRA



5.2 RESPONSIBILITIES AND AUTHORITIES OF KEY PERSONNEL

5.2.1 Generic responsibility of management level I is as under :-

(a) Direction, co-ordination and control of all Gp and sections working under him.

(b) Ensuring that the output of the Gp & section working under him is of the requisite quality.

(c) Ensuring layout of the Gp & sections working under him.

(d) Ensuring jobs are undertaken as per authorized work orders & priorities laid there of.

(e) Control of local purchase of stores & spares.

(f) Ensuring by constant supervision & periodical inspection that all the holders of the main appointments working under him are fully conversant with their respective jobs and are carrying these out accordingly.

(g) Ensuring that all the actions necessary are taken to maintain good industrial relations in the wksp.

(h) Ensuring that all the personnel are properly deployed in relation to the workload & records are maintained to indicate these.

(i) Prepare drafts on policies dealing with there respective subjects.

(j) Ensuring that the personnel are trained & to organize training for their jobs & to ensure that it is carried out effectively.

(k) Laying down instruction for wksp guidance with regard to the procedure followed in gp & sections working under him.

(l) Maintenance of production targets as per schedule.

5.2.2 Generic responsibility of management level II is as under :-

(a) Prepare & issue the orders & instructions necessary to implement the decisions & requirements as given by CO & MD.

(b) Progressing the implementation of orders & instructions issued & reporting of any irregularities.

(c) Ensuring all document are registered, filed & in safe custody & are available.

(d) Asst. GM to co-ordinate activities among various departments.

(e) Compute & submit all reports & return in time.

(f) Prepare drafts, recording to minutes, briefs & analyze all problem relating to their work.

(g) Ensure special checks are made, non-conformities reported & corrective actions are taken.

(h) To draft syllabi & training programmes of coarse for the personnel.

(i) Arrange for the repairs/ inspection of resources & ensure proper maintenance of the same.

(j) Ensure by personnel supervision that the quality of output is maintained.

(k) Ensure the production scales are received and explained the task involved to subsections.

(l) Responsible & motivate workers for ideas & innovation.

5.2.3 Generic responsibility of management level III are :-

(a) All actions are implemented as per procedures & instructions existing on the subject.

(b) Ensure quality is kept & advice remedial action to be taken to avoid recurrence of non-conformity.

(c) He will conduct close survey & keep close liaison at working level.

(d) He will scrutinize the suggestions received from workers & encourage workers participation.

(e) All documents & data sheets are filed & maintained.

(f) Ensure correct tools & techniques are used by workmen.

(g) Ensure proper planning & utilization of any idle capacity in his Gp & section to achieve high degree of efficiency.

(h) Ensure that the technical integrity is maintained.

(i) Looking after the welfare of all personnel under his control.

5.2.4 Specific Responsibility

Specific responsibility of management level I, II & III have been listed out in the appropriate procedures & `Works Instructions'.

5.3 RESPONSIBILITY MATRIX

ISO 9002 Clause No	Title of Function	MD	GM (P) & MR	DGMP & P	OICTSS	MCO	RI	DGMWSG	MR	DGM (Gp)
4.1	Management Responsibility	P	P	P	P	P	P	P	P	P
4.2	Quality System	P	P	P	P	P	P	P	P	P
4.3	Contract Review		P	P		C			P	
4.4	Document & Data Control	P	P	P	P	P	P	P	S	P
4.5	Purchasing					P		P		
4.6	Control of Customer Supplied Product			P						P
4.7	Product Identification & Traceability			P					P	P
4.8	Process Control (Production)				C		C	P	P	
4.9	Inspection & Testing								P	
4.10	Control of Inspection, Measuring & Test Equipments						P		C	
4.11	Inspection & Test Status								C	
4.12	Control of Nonconforming Product								C	
4.13	Corrective & Preventive Action	P	P	P	P	P	P	P	P	P
4.14	Handling Storage & Preservation of Material			P	P	P		P		C
4.15	Control of Quality Records	P	P	P	P	P	P	P	P	P
4.16	Internal Quality Audits	C	P	C	C	C	C	C	P	C
4.17	Training	P	P	C	C	C	C	C	P	C
4.18	Servicing									
4.19	Statistical Techniques			P						

5.4 M R APPOINTMENT

General Manager (Prod) is hereby appointed as Management Representative (M.R.) to look after the implementation of the Quality System, based on the International Quality System Standard ISO 9002 : 1994.

He in addition to his other responsibilities, shall be responsible and have authority for :

(a) Establishment, implementation and maintenance of the documented Quality System.

(b) Reporting on the performance of the Quality System to the undersigned for review and as a basis for improvement of the Quality System.

(c) Liaison with external agencies related to the company's Quality System.

(d) To ensure regular monitoring of Quality Systems.

7.6 QUALITY SYSTEM PROCEDURES

EQUIPMENT DEPOT WORKSHOP, AGRA CANTT

QUALITY MANAGEMENT	Copy No :
SYSTEM PROCEDURES	Issue No :
(Based on ISO-9002)	Date :

1.0 Table of Contents

2.1 QUALITY PROCEDURE MANUAL

2.2 GENERAL

This quality procedures manual and contents therein are the property of EDW, Agra cantt and will not be reproduced either wholly or in part without prior consent in writing from CO & MD.

2.3 INTRODUCTION TO THE MANUAL

The purpose of this quality procedure manual is to lay down the detailed procedures for all quality system elements of ISO : 9002 : 1994 in Radio Gp of EDW, Agra Cantt.

2.4 SCOPE OF THE MANUAL

2.4.1 This manual describes the quality assurance procedures adopted by EDW to meet the requirements of international standard ISO 9002 : 1994.

2.4.2 It also establishes the responsibilities for implementing various procedures documented therein.

2.4.3 The manual applies to all activities that contribute to the quality repaired/overhauled product as per the specification laid down.

2.4.4 The manual covers all the quality related activities of the production, maintenance, services, quality assurance, procurement & provisioning, human resource development and other interface with the above.

2.5 RESPONSIBILITY

The management representative of EDW is responsible for administration, distribution & control of these manuals.

2.6 IDENTIFICATION OF COPIES

Quality procedures manual copies are identified as controlled & uncontrolled document.

2.6.1 CONTROLLED COPIES

2.6.1.1 Every page of controlled copies is stamped in red color as :

CONTROLLED COPY
WHEN IN RED

2.6.1.2 Controlled copies are subjected to revision control & are mandatory as & when system/ procedure changes take place.

2.6.2 UNCONTROLLED COPIES

2.6.2.1 Every page of uncontrolled copies is stamped in blue color as

UNCONTROLLED COPIES
WHEN IN BLUE

2.6.2.2 Uncontrolled documents may be made available to customers/ users for information only with prior consent of CO & MD & record of such distribution maintained.

2.7 DISTRIBUTION OF QUALITY SYSTEM PROCEDURE MANUAL

2.7.1 The management representative of EDW is responsible for the distribution of all copies of Quality System Procedure manual maintains a record of recipients, revision status of copies issued & whether issued as controlled copy. He also maintains an up to date master copy of manual. All recipients of controlled copies acknowledge the receipt of copies.

2.7.2 All controlled copies are issued to holders as per distribution list given in this manual. Each of these copies are issued with unique and sequentially marked `copy no'. The holders of the controlled copies are responsible for updation as & when amendments are issued by MR.

2.8 REVIEW AND REVISION

2.8.1 The management representative of EDW is responsible for issuing revisions to the Quality Systems Procedure Manual.

2.8.2 This manual is reviewed at least once in two years or as required for completeness and correction/changes.

2.8.3 Revisions if any, are subjected to authorization by CO & MD. MR maintains a record where in all revision to quality procedure manual are listed date wise indicating brief description of revision with reasons, if any, containing authorization of CO & MD for change.

2.8.4 All revisions are recorded in the revisions record. And this record sheet and the concerned received papers are issued to the holders of the Quality System Procedures manual.

2.8.5 Any revisions/ change to any clause/section would result in revision change of the whole section. RQI is the first revision & R00 indicates no revisions.

2.8.6 Quality Systems procedure Manual issue no & issue date are for the whole manual. For R00 revision issue date & revision date is same.

2.8.7 After 20 revision serial no. the manual is reviewed for next issue change. Each issue of Quality Systems Procedures Manual supersedes all previous issues and revisions. CO & MD authorizes all revisions.

2.9 NUMBERING SYSTEM

The quality procedure manual is identified by QSP, issue 1, Issue no are appropriately advanced as and when higher issue of this quality procedure is released.

2.10 **RESPONSIBILTY OF THE CONTROLLED COPY HOLDER**

(a) Maintaining & ensuring availability of this manual for reference to concerned persons working in their area.

(b) Returning back the quality procedure manual copy to MR for distribution to the person replacing the holder in case of transfer/ superannuation / retirement/ resignation etc.

(c) Ensuring, understanding and implementation of the system and procedure by all personnel working in their area.

(d) Updating the controlled document as & when revisions are received from MR by replacing the affected sheets.

(e) The obsolete sheets of any document are returned to the MR.

3.0 **MANUAL DISTRIBUTION LIST**

Proper distribution records along with copy number will be maintained.

4.1 **AUTHORISATION**

4.2 This quality procedure manual QSP, issue I, has been prepared to meet the requirement of ISO : 9002 : 1994.

4.3 The management of EDW hereby authorized the Quality Assurance system detailed in this manual, for implementation with effect from specified date at all levels in the wksp. Revision shall be approved by CO & MD.

4.4 This is a controlled document and is considered as RISTRICTION.

4.5 Responsibility is assigned to heads of various departments & other for compliance with regard to their respective activities concerning quality embodied in this manual. It is their responsibility to ensure that the overall objectives of the Quality System are met and that all concerned understand their part in ensuring that product quality meets the expectations of users.

Col
CO & MD

5.0 **REVISION RECORD**

S.No.	Section No	Brief Description of Change	Rev No	Date

6.0 **GLOSSARY OF TERMS**

For the purpose of this manual, the following definitions are given .

6.1 **User** : User is the customer who provides product for repairs. It is synonym to "Customer" as given in ISO 9002 : 1994 parlance.

6.2 **Overhaul** : Complete stripping and then building up with new/reclaimed or old but serviceable parts, components, sub assemblies and assemblies.

6.3 **Serviceable** : Parts, sub assemblies, assemblies and components within laid down specifications.

6.4 **Customer supplied product:** All Radio and Line Eqpt of Telecom nature held on charge of COD, Agra & issued by them and furnished to the wksp for repair and overhaul in meeting the requirements of the contract.

6.5 **Unit** : EDW, Agra Cantt.

6.6 **Contract**: Equipment forwarded by COD, Agra Cantt for Repair and Servicing as per their Issue Plan.

6.7 **Defect:** It is taken as nonconformity.

6.8 **Servicing** : Maintenance and Field repairs carried out by EME Field Wksp in Field Army.

6.9 **Production, Installation and Servicing Process** : It is used to imply repair and servicing at EDW.

6.10 **ISR** : Inter Section Requisition is used within the wksp for obtaining the service of section other than the one on which the main work order is placed. IAF(EME) W-27 is used for this purpose. These are initiated against original job no.

6.11 **Job No** : It is the control no. allotted by the planning department of EDW to every work order received in the wksp for purpose of accounting of time & material. Accounting of repairable eqpt. Is also carried out against original job no.

6.12 **Purchase/ Local Purchase** : Stores/ spares that are not available through normal source of supply and are purchased by the wksp vide EMER (I) to meet production requirements.

6.13 **Out Inspection** : The out inspection refers to the final inspection of eqpt/vehicle on completion of the repairs in EDW before the eqpt is handed over to Depot.

6.14 **Reclaimation** : Reclaimation refers to extensive and specialized repairs by process like metal spraying, heavy electrical deposition, glass polishing, metal deposition, welding, soldering on components or assemblies which are otherwise sentenced as unserviceable.

6.15 **Record** : A collection of related items of data treated as unit.

6.16 **Repair Programme** : These are formulated by AHQ and issued by HQ BWG(EME) based on GS requirements. Repairs are carried out as per to meet issue requirements of COD, Agra.

6.17 **Route Card** : This a document that is tagged on the job requiring work in more than one section. The route/sequence of the processes involved are recorded on it.

6.18 **Stage Inspection** : Stage inspection refers to the in-process inspection of Equipment's undergoing repairs/overhaul at the end of each stage/operation.

6.19 **Work Content** : Effort required to do a job converted in to man-hours by trade is the work content.

6.20 **Work Order** : It is the document (IAFO-1370) authorizing a work to be undertaken in the EDW. It is approved by competent authority.

6.21 **Workshop Completion Notice (WCN)** : WCN refers to the intimation by EDW to the originators of work orders on completion of job and for its collection.

6.22 **WPI** : Work planning instructions is a self contained and comprehensive document issued in three parts. PART I gives advance notification of the equipments and particulars of the anticipated stores, equipments and services. Part II gives details of layout, allocation of floor space, minor works and other services. Part III contains schedules of work, operation and personnel required to undertake and carry out the commitment.

6.23 **Procurement** : Implies items/ spares obtained from service sources.

6.24 **Army Headquarters** : Corporate Headquarters

6.25 **Head Quarters Base Workshop Group, EME** : Controlling Head Quarters.

6.26 **In Inspection** : In inspection refers to receipt inspection of equipment received for repair and servicing by the EDW.

7.0 ABBREVIATIONS

Army Base Workshop	ABW
Army Repair and Calibration Cell	ARCC
Army Head Quarters	AHQ
Ancillary	ANCY
Assembly	ASSY
Commanding Offr and Managing Director	CO & MD
Central Expendable Stores	CES
Central Ordnance Depot	COD
Deputy General Manager	DGM
Department	Dept
Equipment Depot Workshop	EDW
Equipment	Eqpt
Electrical & Mechanical Engineers Regulation	EMER
General Manager	GM
Head Quarters Base Workshop Group	HQ BWG
Head Quarters Technical Group	HQTG
General Staff	GS
Instrument Group	IN GP
Laser Based Instruments	LBIs
Local Purchase Officer	LPO
Material Control Organization	MCO
Material	Mtrl
Material Provisioning Officer	MPO
Manager	Mgr
Management Representative	MR
Methods Engineering	ME
Technical Stores Section	TSS
Officer in Charge	OIC
Production	Prod
Production and Planning	P&P
Personnel and Administration	Pers & Adm

Passive Night Vision Devices	PNVDs
Quality Manual	QM
Quality Assurance	QA
Receipt and Issue	R&I
Receipt Voucher	RV
Resident Inspector	RI
Training	Trg
Technical	Tech
Technical Training Cell	TT Cell
Workshop Services Group	WSG
Workshop	Wksp
Work Plan Instructions	WPI
Workshop Completion Notice	WCN

8.0 PROCEDURE FOR "MANAGEMENT REVIEW"

8.1 Purpose:

The purpose of this procedure is to implement a system for review of continuous suitability and effectiveness of the quality system.

8.2 Scope:

30 This procedure is applicable to the entire Quality System and its related activities.

8.3 Responsibility:

Management Representative is responsible for the implementation of this procedure.

8.4 Authority:

This procedure is authorized by the CO and MD and can be amended only by him.

8.5 **Procedure:**

8.5.1 Review is made by the Management Review Committee having the following composition

(a) CO and MD

(b) GM(works) -Member

(c) OIC Adm. -Member

(d) MCO -Member

(e) DGM P&P -Member

(f) RI BWG-14 -Member

(g) LPO -Member

(h) MGR(TT) -Member

(i) DGM(GPs) -Member

(j) GM(Prod.) -Member Secretary

The Chairman, at his discretion, may co-opt any other member not specified above, if required.

8.5.2 Review is done at least once in six months. Review may be carried out earlier also, if required.

8.5.3 Following inputs make the agenda of each review meeting:

31 Minutes of the last Management Review meeting.

(a) Effectiveness of Quality Policy and objectives.

(b) Corrective and Preventive actions taken and their effectiveness.

(c) Internal Quality Audit reports.

(d) Customer complaints.

(e) External Quality Audits reports, whenever applicable.

(f) Development activities.

(g) New resources requirements.

8.5.4 M.R. informs all the members of MRC, in advance, for review meeting along with its agenda. Record of meeting notice and its agenda is maintained by M.R.

8.5.5 M.R. summaries all the decisions, taken by MRC, and

preserve minutes of the review meeting. Minutes are authorized by the Chairman and maintained by M.R.

8.5.6 Decisions taken by MRC are covered to all its members by M.R. through a copy of the minutes of the review meeting, for taking the required corrective action.

8.6 Records

8.6.1 Records of management review committee consists of :

(a) Review meeting notice includes Agenda.

(b) Minutes of management review committee.

8.7 Reference : QSM Section 4.1

8.8 Annexure :

Appendix 'A' - Format - Agenda management review committee.

AGENDA : MANAGEMENT REVIEW MEETING

S. NO	ITEM	SPECIFIED ISSUE TO BE DISCUSSED	REPORTED BY
1.	Customer feedback/ complaint	Specific cases as received with suggestive corrective action	DGM(Gps)
2.	Management effectiveness in implementing quality policy and objectives	Internal quality problems and related solutions.	
3.	Internal Quality Audits	Results of quality audit defects/irregularities noted.	MR
4.	Non-conformance reports	Specific problems concerning Non-conformance reports.	DGM(GPs)
5.	Progress on implementation of last solution	As per minutes of last Management quality review meeting	MR
6.	Updation of quality system/documentation	New technologies/quality concerned to be adopted/expansion plans	CO & MD
7.	Maintenance problems and breakdowns	Specific causes	Mgr WSG
8.	Any other issue relating quality	As relevant	Concerned to department Head

9.1 **PROCEDURE FOR "CONTRACT REVIEW"**

9.2 **PURPOSE** : To control planning activities pertaining to repair & servicing of Army eqpt.

9.3 **SCOPE** : This procedure covers all the documented and controlled activities to ensure that the repair and servicing of Radio and Line equipments are met with.

9.4 **AUTHORITY** : CO & MD has the authority to approve and bring about changes to this procedure.

9.5 **RESPONSIBITY** : GM(W), DGM(P&P) are responsible for implementation of the contract.

9.6 **PROCEDURE**

9.6.1 GENERAL : EDW has a planned/ well defined capacity to undertake repair of Army Eqpts in a production year. The production year commences on 01 April every year and terminates on 31 March of subsequent year as per requirement of COD, Agra for issue to Army units.

9.6.2 The planned capacity is periodically intimated to HQ Base Wksp Gp.

9.6.3 DGM(P&P) intimates the details of the anticipated load to the affected groups involved in the repair activities by issuing a quarterly repair schedule.

9.6.4 COD forwards the Eqpt through a route card.

9.6.5 The repairables are delivered to the EDW by the COD under their own arrangement.

9.6.6 Production groups carry out detailed inspection, dismantle various system/sub system/ assemblies and evaluate the work content. In case variations from the earlier estimated repairables are visualized, the same is intimated to DGM(P&P).

9.6.7 In case of amendment to contract/ order (targets), DGM(P&P) takes up necessary action to intimate the change in the load pattern of repairables to affected parties.

9.7 RECORDS

9.7.1 Contract Review Folder

9.7.2 Calling in Notice IAF(EME)W 54.

9.8 REFERENCE : Quality Manual Section 4.3

9.9 ANNEXURES : Nil

10.0 PROCEDURE FOR "DOCUMENT AND DATA CONTROL"

10.1 Purpose : The purpose of this procedure is to implement a system to control the documents and avoid inadvertent use of invalid documents.

10.2 Scope:

This procedure is applicable to all the documents/ data related to the Quality System in the Wksp.

10.3 Responsibility:

Management Representative is responsible for the implementation of this procedure.

10.4 Authority:

This procedure is authorized by the CO and MD and can be amended only by him.

10.5 Procedure:

10.5.1 The documents/ data, controlled by this procedure, are mentioned below along with their authorizing/ approving and issuing/ controlled authorities.

(A) Manuals

S.No	Document/ data	Control & Issuing Authority	Approving Authority
1.	Quality System Manual	M.R.	CO & MD
2.	Quality System Procedures	M.R.	CO & MD

(B) Other Documents

S.No	Documents	Control & Issue Authority	Approving Authority
1.	Test & calibration procedure	Concerned DGM	Concerned
2.	Machine care/Operation sheet	-do-	-do-
3.	Work instructions	-do-	-do-

(C) Supporting Documents

1.	Drawings	DGM	Concerned GM
2.	Check List	Concerned OIC	Concerned GM
3.	Register	Concerned section in-charges	Concerned GM
4.	Forms & Formats	Concerned section in-charges	Concerned GM

10.5.2 QUALITY SYSTEM MANUAL (QSM) :

10.5.2.1 QSM is prepared, controlled and issued by Management Representative. It is approved and authorized for issue by CO & MD.

10.5.2.2 Controlled copies of QSM are issued by M.R. as defined in section no 1.0 and 1.1 of QSM . M.R. maintains its distribution record.

10.5.2.3 M.R. maintains master copy of QSM identifying its current revision status.

10.5.3 QUALITY SYSTEM PROCEDURES :

10.5.3.1 QSPs are prepared by the concerned Deptt. Head/ M.R. and approved & authorized for issue by CO & MD.

10.5.3.2 All QSP are controlled by giving a document control number as defined below : QSP/Sr. No.

10.5.3.3 Controlled copies of QSP are stamped "CONTROLLED COPY" with copy no. (in red) and issued by M.R. to all concerned. Distribution record of QSP is maintained by M.R.

10.5.3.4 M.R. maintains master copy and master list of all procedures identifying their current revision status.

10.5.4 WORK INSTRUCTIONS (WI) :

10.5.4.1 Work Instructions are prepared & approved / authorized by Concerned GM and controlled & issued by concerned DGMs. These are prepared for various functions/ operations wherever required.

10.5.4.2 All work instructions are controlled by giving a document control no. as defined below : WI/Deptt. or function code/ Sr no.

10.5.4.3 Controlled copies of WI are stamped "CONTROLLED COPY" with copy no in red. Distribution Record of Work Instruction is maintained by the respective issuing authority.

10.5.4.4 The issuing authority ensures availability of Work Instruction to the operators or at the location of work/ use, required for that function /process activity.

10.5.4.5 Issuing authority maintains master copy and master list of Work Instructions, controlled by them, identifying their current revision status.

10.5.5 **SUPPORTING DOCUMENTS**

10.5.5.1 Supporting documents viz quality plan, drawings, check lists, records & registers generated by the respective departments for specific activities. The reference number given by the concerned department is used for identification.

10.5.5.2 One specimen of each format is approved by the respective approving authority and maintained by issuing authority. Master list of these formats, identifying their current revision status, is maintained by the respective issuing authority.

10.5.5.3 Distribution record of the supporting documents is not maintained.

10.5.5.4 Master list of the documents of external origin is maintained by the concerned GM.

10.5.6 Uncontrolled Copies : Uncontrolled copies of any documents, except QSM, are not issued.

10.5.7 Controlled documents bear the following details :

QSM : Issue no,. Revision no, Controlled copy no.

QSP : Issue no, Rev no, & controlled copy no.

WI : Doc control no, Rev no, & control no.

Supporting documents: Doc control no, & Rev no.

10.5.8 Revision status of all the existing formats (without bearing any revision no) is 00. In case of any revision to a format, next revision no, will be given on the format.

10.5.9 **Review of documents :**

QSM and QSP are reviewed by M.R once a year or earlier, if required, to ascertain whether any revision is required. If a revision is required, M.R. raises a "DOCUMENT CHANGE NOTE" which is reviewed by the concerned Deptt. Heads and the approving authority. If the revision is justified, it is approved.

10.5.10 **Amendment/ Revision to documents :**

10.5.10.1 Any employee may request, in writing on Document Change Note, for revision of a document through his Gp OIC to the respective issuing authority.

10.5.10.2 Issuing authority will review the request for the revision. Finally the requested revision is reviewed by the respective approving authority and is authorized for issue, if found justified.

10.5.10.3 It is ensured that various aspects and cross-functional requirements are considered and taken care of before any revision is made. All amendments/ revisions are authorized by the same authority who had authorized the original document.

10.5.10.4 Authorized revisions are issued to all holders of the original document.

10.5.10.5 Recipients of such revisions promptly incorporates the revision in their document and return the obsolete document to its issuing authority.

10.5.10.6 In case of any amendment, fresh revision (having next revision no) is issued. Fresh issue (having next issue no) is issued, after 20 revisions.

10.5.10.7 Recipients of controlled documents ensure that only the current issues/ revisions are maintained for use.

10.5.10.8 Record of amendment /revisions to the controlled documents is maintained by the respective controlling/ issuing authority.

10.5.11 Control of obsolete documents:

10.5.11.1 Invalid / obsolete documents are promptly removed from all locations of issue or use and returned to their respective issuing authority.

10.5.11.2 Any obsolete document, retained for legal requirements or knowledge preservation purpose, is say now identified and kept separately by stamping this work as obsolete

10.5.12 External Documents

10.5.12.1 Documents issued by external agencies and used on policies, guides, standards, instructions such as EMER, DGOS, instructions, test standards and documents, including process documents, process documents, work instructions, test standards and drawing obtained from country of origin on payment. GM(production) is responsible for clarifying these documents as controlled or uncontrolled based on instructions received from higher headquarters.

10.5.12.2 The external documents are identified by original and unique identification code and maintained in technical library under the control of DGM P&P.

10.5.12.3 External documents received from the country of origin are identified as per index number allotted to each document. A master index ledger giving the nomenclature of the documents, number of copies received and distribution is maintained by DGM P&P.

10.5.12.4 The revision of external documents is done by original issuing authority and changes / amendments carried out either in ink or typed giving authority for change.

10.5.12.5 Various OIC groups are responsible for updating the external documents and insuring Old / obsolete documents are marked obsolete and kept separately.

10.5.13 Electronic Media

Electronic media such as computers and floppies, films, cassettes are used to hold data. Control of such media is exercised by GM(P) and is responsible for review, corrections of status.

10.6 Records:

(a) Distribution record of QSM

(b) Distribution record of QSP

(c) Distribution record of Work instructions

(d) Document Change Note

(e) Amendment record of QSP

(f) Amendment record of Work Instructions

(g) Amendment record of Formats

10.7 Reference:

(a) QSM Section

10.8 Annexures:

Appx 'A' ------- Document control master index register.

10.9 DOCUMENT CONTROL MASTER INDEX

S.no	Document Ref.	Document name	Controlled Copy no.	Issued By whom	Distributed To whom	Location with whom the document is available	Remarks

NOTE :- In case the document is withdrawn by originator or obsolete, this column shall be marked as 'WITHDRAWN' or 'OBSOLETE' as appropriate.

11.0 PROVISIONING

11.1 PURPOSE

To establish procedure for provisioning of spare parts expendable items / raw materials / plant & machinery / tools / test equipment from service source.

11.2 SCOPE

Covers procedures for provisioning of above items from service source required for repair and servicing of Radio and Line Equipments.

11.3 RESPONSIBILITY

MCO and DGM (WSG) is responsible for implementation of this procedure for their respective gps.

11.4 AUTHORITY

This procedure is authorized by CO & MD and can be amended only by him.

11.5 PROCEDURE

11.5.1 PROVISIONING BY MATERIAL CONTROL ORGANISATION (MCO)

11.5.1.1 The provisioning of spare parts, expendable items and raw materials is done by Material Control Organization (MCO) headed by DGM(M). P&P informs MCO about anticipated repairables. Based on the equipment to be repaired, requirements of spares is communicated to the service source 10 months in advance of the commencement of production in the form of AP(Advance Provisioning) demands. All AP demand forms are filled & fwd to TSS for provisioning of these items well in advance prior to the commencement of production year based on previous experience or receipt of information from COD.

11.5.1.2 The broad functions of TSS are as under:

(a) Preparation of demands on the basis of VIR and their submission to

Service source for supply.

(b) Collection of serviceable stores from service source is done by the groups /section

(c) To arrange for retrieval or Local Purchase(LP), in case the items are not available (NA) with the service source.

11.5.1.3 Based on Viewers Inspection Report (VIR) / scales, demand for materials / spares is processed by DGM(M) on Service Source form no. IAFO-2763, giving details of items required.

11.5.1.4 Stores are issued by the Service Source against the demand on form IAFO-2672 to TSS. The Service Source on same demand also indicates the non-availability.

11.5.1.5 Stores on receipt are checked visually by representative of RI DET BWG 14&TSS and production groups and in case stores are found defective, damaged / unserviceable or of wrong type, further action is taken as under:

(a) Defect reports in accordance with Army Order 8/93 are initiated by DGM (M) and progressed for items found defective. A copy of Defect Report is maintained by DGM (M).

(b) Stores found damaged / UNSV /wrong type are returned to Service Source for further action.

11.5.1.6 Forwarding of documents

After the signature of MPO / DGM (M), copies of issue Voucher (IAFO-2672) are forwarded to P&P (job folder) & Service source, while one copy is retained at TSS.

11.5.1.7 Customer Verification of Sub Contracted Product- A well established.procedure exists for quality assurance by this workshop's representative(i.e. Directorate General of Quality Assurance (DGQA), Ministry of Defence) of items supplied by the Service Source. Ilowever, incase any odd item is found to be non conforming reports in terms of defect reports are raised by this workshop as per procedure

laid down vide Army Order 8/93. Remedial measures as directed by DGQA are then taken by the service source.

11.5.2 Provisioning of Workshop Service Group (WSG)

11.5.2.1 The provisioning of Plant & Machinery Tools, Test Equipment is done by DGM (WSG). The dept. procedure of WSG is well defined and demand of tools & SMTs/STEs is maintained as per Tech Directive.

11.5.2.2 Provision of Tools

All tools which are scaled are provisioned on a demand for Ordnance store (IAFO-2705) from the dept concerned. Besides general tools special maintenance tools.(If any) for any special equipment can be provisioned once requirement is received from demanding sec/gp. They have to be demanded on the basis of proper authority as laid down in EME regulations issued for various equipment.

12.5.2.3 Forecasting requirement of STEs, plant and machinery :

Forecast of machinery requirement for the year is to be submitted to HQ BWG in the month of Sep of the preceding year. This forecast can be due to any of the following reasons :-

(a) In order to cater for the replacement of the machines of old vintage/ poor mechanical condition in the wksp.

(b) In order to demand any other machinery which is controlled and the requirement for which has arisen as a consequence of any new or specialized job work which might have been allotted freshly to the workshop. List of such machines which are required is contained in the master list of controlled stores issued by the Army HQs and as amended from time to time.

12.6 RECORDS

12.6.1 Following records are maintained by DGM(M) :

(a) Viewers Inspection Report (VIR).

(b) Folder for demands on form No IAFO-2763.

(c) File of defects reports (R/LINE).

(d) Folder of Issue Voucher IAFO-2672.

(e) AP demand forms (R/LINE).

(f) Overhaul scales / ISG /MS.

12.6.2 Following records are maintained by DGM(WSG) :

(a) Forecast requirement of plant & machinery.

(b) Demand Control Register (Tools/SMTs).

(c) LPR Control Register.

(d) Demand Forms for Tools/SMTs.

12.7 REFERENCES

12.7.1 (a) QUALITY SYSTEM MANUAL section 4.6

(c) TECHNICAL DIRECTIVE

12.7.2 External Documents

(a) Overhaul Scales

(b) Stocking Guides

(c) EME regulations

(d) Army Order 8/93.

12.6.1(a) VIEWERS INSPECTION REPORT

I.A.F (EME)W-16

Sheet ----------of sheets ----------

Vehicles/ Equipment ----------Make and Model ----------

Assembly ----------Section and Part No ----------

Work Order No ----------Serial No.----------

No of assemblies covered in this report ----------

Classification ----------

Examiner's signature ----------

Sr no	Section	Part No	Nomenclature	No per assy	Def	U/S	Rep	Reqd	Remarks

13.1 PROCEDURE FOR "PURCHASING"

13.2 PURPOSE

To establish a procedure to ensure that purchased item conforms to the specified requirement.

13.3 **SCOPE**

Covers purchase of items which are not available from service source in respect of Radio and Line Equipments.

13.4 **RESPONSIBILITY** DGM(M) and DGM(WSG) are responsible for implementation of this procedure for their respective gps.

13.5 **AUTHORITY** This procedure is authorized by CO & MD & can be amended only by him.

13.6 **PROCEDURE**

13.6.1 **GENERAL**

13.6.1.1 Local purchase is resorted under any of the following conditions :

(a) Items to be purchased are not available from service source and there is urgent requirement of the item.

(b) Repairs to equipment is likely to be held up for the articles intended to be purchased.

13.6.1.2 Payment to vendor/ sub-contractors is made through Controller of Defence Accounts (CDA) on receipt of purchase documents.

13.6.2 **PURCHASING PROCEDURE**

13.6.2.1 Local Purchase Requisition (LPR) – IAF (EME) W-80 LPR is initiated by MCO/WSG only after the condition on para 13.5.1.1 are met and sanction of departmental head is obtained. A controlled number is allotted to LPR and separate LP folder opened for it.

13.6.2.2 LP Enquiry – IAF(EME)W-82

An enquiry for call of quotation from minimum of 3 vendors/ subcontractors is raised. Details of item to be procured are stated in the enquiry. If required, samples are also made available. Due date for submission of quotation is also stated.

13.6.2.3 Comparative Statement of Tender (CST) : IAFZ 2125 Quotations from vendors are received in quotation box. Quotations are opened in the presence of Board of Officers detailed to open the quotations as published in monthly Part – I orders. A comparative statement of tenders (CST) is prepared and the vendor supplying the items as per specification at the lowest rates is selected by CO through GM(W) to the extent of financial powers applicable to them. In case of proprietary nature of item only single firm can be called for and CST is not prepared. Rate card (IAF (EME)W-78) is also seen before approving the CST to check for any major variations in price quoted.

13.6.2.4 Supply Order (IAD(EME)-W-83) Supply order is prepared on the approved vendor by DGM(W). Delivery date and other details are duly mentioned on this order.

13.6.2.5 Inspection Note (IAFO-1447) Items are received against the supply order along with the vendor's documents invoice/ challan/ contractors bill. The items are inspected by Board of Offrs detailed by CO through Part I orders. The Board of Offrs inspect the items in following ways :

(a) Visual Inspection

(b) Comparison with simple.

(c) Testing in EDW/Outside laboratory (if required).

(d) Functional tests out by user gp or by QA staff.

Quantity accepted and rejected is entered in Inspection Note

by Board of Offrs. Rejected items are returned to the vendor

for supplying the right items on clean exchange basis. Issue/

Receipt Note (IAFO-1391A) is also prepared.

13.6.2.6 Issue/Receipt

All receipts from vendors & issues to gps are controlled through Issue and Receipt Registers.

13.6.2.7 Cancellation

Local Purchase Requisition of supply order may be cancelled under the following circumstances :

(a) Vendor not being able to supply item of right specification.

(b) Requirement getting cancelled during the purchase process for reasons of availability from service source of any other reason.

13.7 **RECORDS**

Following records are maintained :

(a) In each purchase folder.

(I) Local Purchase Requisition

(II) Local Purchase Enquiry

(III) Quotations received from vendors

(IV) Proprietary Article Certificate(if any).

(V) Comparative Statement

(VI) Supply order

(VII) Inspection Note

(VIII) Contractors Bill

(b) LPR control register for Radio & Line Equipments.

(c) Local Repair Contractor Register –P&P

(d) Rate card – IAF (EME) W-78).

(e) LPR Control Register(WSG).

13.8 **REFERENCES :** Quality Manual – QSM section 4.6.

13.9 **ANNEXURE : NIL**

14.1 **VENDOR RATING**

14.2 PURPOSE

To establish procedure for assessment of sub contractors (vendors) based on vendor rating system.

14.3 SCOPE

Covers subcontractors (vendors) listed in approved list (AVL) supplying items for repair and servicing of Radio and Line Equipments.

14.4 RESPONSIBILITY : DGM(M) DGM(WSG) are responsible for implementation of this procedure.

14.5 AUTHORITY : This procedure is authorized by CO & MD and can be amended only by him.

14.6 PROCEDURE

14.6.1 Reassessment of subcontractors (Vendors) is carried out once in a year as per under mentioned procedure.

14.5.2 Weightages have been awarded as shown below against appropriate parameters

(a) Quality Performances - 40
(b) Prompt Performance - 25
(c) Service Performance - 25
(d) Price Performance - 10

14.5.3 Quality performance is assessed against percentage rejects Prompt performance is assessed for delayed supply beyond 10 days.

14.5.4. An illustration of awarding vendor rating to subcontractors "XYZ" is given at Appx `A` attached

14.5.5 In addition, visits to the contractors premises may be undertaken for evaluation of the contractors at the time of registration

14.6 RECORDS

a. Vendor Rating Register

NO	FACTOR	WEIGHTAGE	MEASUREMENT FORMULA
a	Quality performance	40	100% - Percentage rejects
b	Service performance	25	100% - 1% for each non supply
c	Prompt performance	25	100% - 1% for supplied beyond 15 days
d	Price performance	10	No of SOs placed No of enquiries given

14.7 REFERENCES

a. Quality Manual - Sec 4.6

14.8 ANNEXURES

Awarding Vendor Ratings (an Example).

14.8(a) VENDOR RATING : CRITERIA APPX-'A'

Vendor rating 'VR' = 40 (quality) + 25 (service) +25 (prompt)+10(price)

ILLUSTRATION

Subcontractor 'xyz'

A----------SOs placed---------- = 93

B----------Fully supplied---------- = 73

C----------Partially supplied---------- = 8

D----------Enquiries given---------- = 223

E----------Supplied within 15 days---------- = 43

F----------No of rejections---------- = 5

PERCENTAGE REJECTS ----$\frac{F}{B+0.5\,C}$ X 100 =6.5%

NON SUPPLY---------- A- (B+0.5 C) =16

SUPPLIED BEYOND 15 DAYS---- (B-E) =30

NO	Factor	Weight	Performance Evaluation
1	Quality	40	40(1-0.06) =38
2	Service	25	25(1-(0.01 X 16)) =21
3	Prompt	25	25(1-(0.01 X 30)) =17.5
4	Price	10	10 X 93/223 =4
			OVERALL EVALUATION = 80.5

15.1 CONTROL OF CUSTOMER SUPPLIED PRODUCT

15.2 PURPOSE

To ensure that the customer supplied products are verified, stored, maintained and also to ensure recording and reporting of lost or damaged product to the customer.

15.3 SCOPE

This procedure covers the control, verification of receipt, storage and maintenance provided b user for repairs and servicing of Radio and Line equipments.

15.4 RESPONSIBILITY

DGM(P&P), DGM(Gp) are responsible to implement this procedure.

15.5 AUTHORITY

This procedure is authorized by CO & MD and can be amended only by him.

15.6 PROCEDURE

15.6.1 RECEIPT OF USER SUPPLIED ITEM

15.6.1.1 The equipment is issued to COD, Agra directly from the manufacturers & PSUs. The inspection of the equipment received from factory is done by Det BWG –14. During inspection if the equipment does not meet the specified standards, then it is repaired by the factory reps in-situ. The equipment if it malfunctions during periodic inspection and is under warranty period is repaired by the factory reps. Once the warranty period expires and the equipment is found defective during periodic inspection, then the equipment is fed to EDW on route card prepared by Det BWG – 14.

15.6.1.2 After pre issue inspection equipment is merged with COD Stock. Units received the equipments either from stock as well as pre issue. COD Produce the summary of equipments to Det BWG –14 which prepare the inspection programme and inspect the equipments, those equipments which are serviceable will remain with the COD Groups and repairables equipments are fed to the Equipment

Depot Workshop for repair through route card generated by Det BWG –14.

15.6.1.3 Units return equipments stores and test equipments etc, mostly in BLR condition and those equipments declared repairable by Det BWG-14 are fed to Equipment Depot Workshop for necessary repairs through route card.

15.6.2 HANDING COVER OF USER SUPPLIED ITEMS

15.5.2.1 After repairs eqpt is produced for inspection to Det TG-14 and eqpt is declared serviceable or unserviceable.

15.5.2.2 Eqpt found unserviceable is sent for repairs again till it is fully repaired.

15.5.2.3 In case of eqpt which are condemned after stripping in the prods Gps, condemnation report will be prepared by section I/C and fwd to R&I. R&I will deposit the same salvage depot alongwith condemnation report. Any loss of eqpt is also communicated to the user.

15.5.3 STORAGE OF USER SUPPLIED ITEMS

15.5.3.1 Where appropriate, the accepted items are stored in their original packing as received in our premises. Items opened for inspection are kept in Earmarked area till such time these are required for overhaul/ repairs.

15.5.3.2 Rep of DET BWG 14 after carrying out inspection on behalf of the user packs the eqpt in their packing cases where applicable till the time eqpt is handed over to user rep. The eqpt is kept earmarked till handing over to the user.

15.5.4 MAINTENANCE OF USER SUPPLIED ITEMS

15.5.4.1 During repairs the complete equipment and its individual systems/ assemblies/ subassemblies are stripped to the lowest practical level and then built up to specified

standards. The repairing process therefore automatically takes care of all maintenance aspects.

15.5.4.2 All assemblies/ subassemblies which have been repaired and are awaiting integration/ final assembly are stored taking appropriate precaution. It is insured that these systems are attended to by the user reps where necessary.

15.5.4.3 The responsibility for maintenance of equipment which have been repaired and handed over to the user but lying inside the workshop, is that of user. However all necessary assistance by way of providing raw material and technical help is extended till the equipment is finally dispatched.

15.6 RECORDS

(a) Route card
(b) Job card
(c) Job card control register
(d) Condemnation report
(e) Inspection report

15.7 REFERENCES

(a) Quality Manual -Sec 4.7

16.0 PROCEDURE FOR "PRODUCT IDENTIFICATION AND TRACEABILITY"

16.1 Purpose

The purpose of this procedure is to implement a system for identification and traceability of the material/ product at all stages of receipt, manufacturing / processing, packaging and delivery.

16.2 Scope

This procedure is applicable to raw material/ components (used in the product), semi-finished and finished product.

16.3 Responsibility

OIC Gps are responsible for implementation of this procedure in their respective areas.

16.4 Authority

This procedure is authorized by the CO & MD and can be amended only by him.

16.5 Procedure

16.5.1 Identification

16.5.1.1 Each equipment piece has unique regd number as well as the major subassemblies. The equipment has the regd number fixed on the body and the same is also mentioned in respective logbook.

16.5.1.2 On the receipt of the equipment for overhaul, receiving inspection is carried out and a job number is allocated by DGM(P&P).

16.5.1.3 Each assy/ sub assy when dismantled from the eqpt is kept at an earmarked place in the group. Only one eqpt is opened in a controlled are at a time.

16.5.1.4 Individual assy/ sub assy is allotted to particular personnel for processing.

16.5.1.5 After processing these assemblies are kept at earmarked place in group.

16.5.1.6 Re-assembly of assemblies and subassy is then carried out based on their unique regd number.

16.5.1.7 Final product is then handed over to the user in similar manner, as taken over and handing/ taking over record maintained.

16.5.2.1 Procedure for traceability of spares fitted

The procedure is adopted as under,

(a) Against each equipment work order, unique job no and date is allotted by DGM(P&P). Work order and job no. depict, make, type and regd no. of the eqpt.

(b) Spares for overhaul of product have unique cat part no are issued by OSS on unique voucher no and date against specific job no. The voucher no differentiates between source of supply i.e. service source or local purchased source.

(c) In case non-conformity of the spare part is detected in any assy / sub assy/ during testing/ usage, the same is traced back to the job no and the issue voucher for source of supply of spares. In case of the item found defective is ex service source, non conformity in the form of defect report is initiated by the MCO and remedial measures as suggested by DGQA are undertaken.

16.6 Records

(a) Job folder & Record of spares issued (job folder)

(b) Record for repair & work order control register

16.7 Reference

QUALITY SYSTEM MANUAL -Section 4.8

16.8 Annexure

NIL

17.0 PROCEDURE FOR ENGG. SUPPORT PLANNING

17.1 Purpose

Purpose of this procedure is to implement a system to provide engineering support in terms of repairs and servicing to the customer supplied product.

17.2 Scope

This procedure covers the receipt of the repairable and support literature/ tools for the repair and servicing of Radio and Line Equipments.

17.3 Authority

This procedure has been approved by CO & MD and can be amended only by him.

17.4 Responsibility

DGM(P&P) and DGM Gps are responsible for implementation of this procedure.

17.5 Procedure

17.5.1 Receipt of Repairable / User supplied product

17.5.1.1 User dispatches the complete equipment for repairs to the workshop on a route card.

17.5.1.2 R&I receives the equipment and forwards route card to the P&P office as per R&I procedures mentioned in EDW/QSP/08.

17.5.2 Preparation of Visual Inspection Report/ Deficiency List (DL)

17.5.2.1 The rep of concerned section carries out visual inspection of the repairable and prepares a VIR / Deficiency list. The VIR is prepared as per specimen given in IAF EME (W16) and the signatures of the user representative are obtained on it six copies of deficiency list as prepared. The distribution is as follows :

1. Two copies are forwarded to MCO for preparation of VIR demand.
2. One copy is handed over to the user Rep.
3. One copy is attached to the route card and fwd to P&P.
4. Two copies to LAO.

17.5.2.2 The route card along with the VIR is fwd to P&P by R&I.

17.5.3 **Route Card Review**

17.5.3.2.1 Route Card review is carried out on as and when required basis.

17.5.4 **SMTs/STEs & Tech Literature**

17.5.4.1 At the time of allocating the responsibility of repairs and servicing of various eqpts to EDW the corporate HQ had released a set of SMTs/STEs and tech literature for each type of eqpt to the wksp. The tech literature is available in tech library and the Gp. The SMTs/STEs have been issued to the Gp by the WSG.

17.5.4.2 Every mechanic has been issued with a basic tool kit containing required day to day use tools.

17.5.4.3 The test equipment that is not released by the corporate HQs has been procured from local market through WSG and has been provided to the mechanics.

17.5.5 **Checking of Tools, SMTs/STEs & Test Jigs**

17.5.5.1 All tool kits of mechanics are checked once in a period of three months for serviceability. Tools found unfit for use are declared Unsv & returned to store & new tools issued from stock held in the Gp.

17.5.5.2 All SMTs are checked once in 6 months for serviceability. In case found unserviceable the same is removed from the section concerned & new SMT issued, if held. When new SMT is not held for replacement DGM(WSG) is intimated for procurement of the same through service sources/ local manufacturer for the same within the wksp.

17.5.5.3 All test jigs are checked for serviceability once in 6 months. Test jigs found Unsv are fwd to ARCC through WSG for repair.

17.6 **Records**

17.6.1 Monthly repair schedules.

17.6.2 List of SMTs/STEs(EMER).

17.6.3 VIR.

17.6.4 Route card.

17.7 **Reference** : QSM Section 4.9

17.8 **Annexures** : Nil

18.1 PROCEDURE FOR PROCESS CONTROL

18.2 **Purpose**

To lay down procedures to ensure that all stages of repairs and servicing are carried out under controlled conditions to ensure required quality of repairs of Army equipments.

18.3 **Scope**

This procedure is applicable to all Gps, sections and stages involved with in repairs and servicing of Radio and Line Equipments.

18.4 **Responsibility**

OIC TL Gp & all section supervisors are responsible for implementation of this procedure.

18.5 **Authority**

This procedure has been approved by CO & MD and can be amended only by him.

18.6 **Procedure**

18.6.1 **General**

18.6.1.1 On receipt of the eqpt along with the route card, all concerned sections strip the assemblies/ sub assemblies of

their responsibility. The detailed work instructions on critical processes on repairs of the assy/ sub assy/ components are available in the concerned sections.

18.6.2 Stripping of the equipment

18.6.2.1 All the sub assys of the eqpt are opened and checked one by one, in a controlled environment, for defects if any.

18.6.2.2 The checking/opening of the sub assys is done by concerned mechanic in accordance with the controlled documented procedures/ instructions contained in work instructions made available to all concerned at their place of work.

18.6.2.3 Appropriate tools are used for stripping/ dismantling.

18.6.2.4 The dismantled sub assys/ components are cleaned and checked by section incharges for :

(a) Reuse
(b) Reclamation
(c) Repairs and overhaul
(d) Discard and replacement
(e) Requirement of spares

18.6.2.5 The requirement of spares is projected to the DGM(M) for supply of spares (record).

18.6.3 Reclamation of spares/sub assys

Some of the sub assys which require remetalising/ grinding & ploshing are sent to the concerned section for reclamation of the same on an inter section requisition (ISR).

18.6.4 Repair of Assemblies/ Sub assemblies/ Components

18.6.4.1 The decision to reuse/ reclaim/ repair and overhaul/ discard and replace a component assembly/ sub assembly is taken based on their conformance or otherwise with the documented suitable parameters.

18.6.4.2 DGM(M) provides spares as per the VIR and authorized scales.

18.6.4.3 Item scheduled for local manufacture/ reclamation in other Gps like manufacturing and reclamation group are subject to quality assurance measures prevalent in the wksp. The pilot samples of locally manufactured items are inspected by the concerned section of EDW with the help of the Gp QA staff and further manufacture taken up only if the items are acceptable. Accepted items are handed over to the group requisitioning.

18.6.4.4 All components/ sub assemblies/ assemblies are repaired by qualified and trained technicians using appropriate production/ servicing equipment's under suitable working conditions as per well defined, already approved and controlled process. The working details of all the process, equipment's stages and installation is given in the work instructions.

18.6.4.5 The quality of workmanship is certified by the GP QA representatives by comparing and testing the sub assemblies with available written standards for each stage. These standards are covered in work instructions of each section associated with the repair of eqpt as applicable.

18.6.5 **Assembly of Eqpts** All repaired components which have been tested for meeting the conformance are assembled together to build the complete eqpt in a controlled manner by the qualified technicians under controlled conditions and supervision.

18.7 **Final Inspection and Testing**

Final Inspection and Testing is done as per procedure QSP/13.

18.8 **Records**

Master list of WIs.

18.9 Reference

QSM section 4.9

18.10 Annexure

Annexure – 1 : Master List of Work Instructions.

19.0 PROCEDURE FOR MAINTENANCE OF PLANT & MACHINERY

19.1 PURPOSE

To lay down a procedure to ensure that plant, machinery and equipment used in the repairs and servicing of army equipment are adequately maintained.

19.2 SCOPE

This procedure is applicable at all the production plants and machinery used in repairs of army equipment.

19.3 RESPONSIBILITY

DGM(WSG) is responsible for implementation of this procedure.

19.4 AUTHORITY

This procedure is authorized by CO & MD and can be amended only by him.

19.5 PROCEDURE

19.5.1 GENERAL

19.5.1.1 Details of all plants and machinery used in the repair of army equipment are documented in the master file in WSG. The file also gives the location state of the machinery and the registration number for identification.

19.5.1.2 DGM(WSG) identifies and issues monthly oil changing programme and inspection programme concerned Section.

19.5.1.3 DGM(WSG) nominates the inspection teams carrying out periodical maintenance and inspection. An examination report form is filled for each plant and machinery to record the details for inspection.

19.5.1.4 The summary of the half yearly utilization plant and machinery id forwarded by concerned Gp/ section to the DGM(WSG).

19.5.2 REPAIRS TO PLANT AND MACHINERY

19.5.2.1 Repairs for cranes, Electrical connections and other repairs pertaining to MES are carried out as under:

(a) Complaint of the repair is lodged in complaint cell of WSG through a breakdown repair entry made in Breakdown register kept in WSG separately for plant & machinery and MES. MES is informed daily about the complaint to be rectified.

(b) Rectification details are recorded in the Breakdown register.

19.5.2.2 For repairs of plant, Machinery and special equipment (PMSE) an Inter Section Requisition (ISR) is required to be forwarded by the user group to plant Repair & Maintenance Section of WSG indicating the defect noticed i.e. Mechanical, Electrical and Electronics.

19.5.2.3 On receipt of ISR, it is controlled by giving complaint no. from complaint register maintained for this purpose and entry is made in the register accordingly.

19.5.2.4 As per defect, the repair team is detailed by DGM(WSG) to rectify the defects.

19.5.2.5 On rectification of defect or completion of repairs, Signature of user rep is obtained and remarks "COMPLETED" on the ISR with date.

19.5.2.6 In case the repair cannot be carried out by the plant Repair and Maintenance section due to technical limitation, the

equipment is repaired through Local Repair Contract(LRC) i.e. contracting the work to a vendor

19.5.3 HOUSE KEEPING AND ALLIED SERVICES

19.5.3.1 Various aspects of house keeping to ensure that all the services are efficiently provided to the user groups, is direct responsibility of WSG. Details of functions to be performed by the subgroups are:

(a) Up keep and cleanliness of workshop area

(b) Liaise with the MES authorities for proper supply of water and electricity.

(c) Carry out erection of temporary shelters and other miscellaneous works(if any).

(d) Reports to MES for damages caused by storm, rain etc.

(e) Maintenance and repairs of overhead cranes with the help of MES authorities.

(f) Maintenance of drains/ gutters/ doors/ windows/ buildings etc.

19.6 RECORDS

19.6.1 Master list of plants and machinery

19.6.2 Inspection program/ report form W3 Machy

19.6.3 Complaint register/ Breakdown register

19.6.4 Oil change programme

19.6.5 Inter section requisition

19.7 REFERENCES

QSM section 4.9

19.8 ANNEXURES

NIL

20.0 PROCEDURE FOR INSPECTION AND TESTING

20.1 PURPOSE

To establish a procedure for inspection and testing at various stages to ensure that equipments/ components/ assemblies/ sub assemblies/ products/ materials of specified quality are released for further processing/ delivery and finished products conform to the specified requirements conforming to the specified Quality standards.

20.2 SCOPE

20.2.1 The procedure covers the following

(a) Receiving inspection and testing of user supplied repairable Radio and Line Equipments or its subassemblies/ assemblies.

(b) In process/ stage inspection and testing of components/ sub assemblies / assemblies.

(c) Final inspection and testing of overhauled equipment.

(d) Receiving inspection and testing of contractor supplied stores/ spares.

20.2.2 The inspection and testing of various products at various stages is as given in relevant Work Instructions.

20.3 RESPONSIBILITY

DGM(P) of respective groups, DGM(P&P) and DGM(M) are responsible to implement this procedure.

20.4 AUTHORITY

This procedure is authorized by the CO and MD and can be amended only by him only.

20.5 PROCEDURE

20.5.1 RECEIVING INSPECTION AND TESTING

20.5.1.1 CUSTOMER SUPPLIED PRODUCT

20.5.1.1.1 R&I section of P&P Gp receives the repairable equipment and the work order from the users. The work order is forwarded to P&P for allotment of job number. The equipment is inspected as per procedure.

20.5.1.1.2 QA staff of each section involved in the repair of army equipment carries out visual inspection and prepares a consolidated Viewers Inspection Report (VIR) which also includes the details of deficiencies if any, in quadruplicate. Copies of VIR are forwarded to MCO for stores provisioning.

20.5.1.2 CONTRACTOR SUPPLIED SPARES/ STORES

20.5.1.2.1 The spares for repair of army equipment are procured in conformance with the procedure given in QSP/05.

20.5.1.2.2 The spares/ stores obtained from service source are subjected to inspection by the user representative i.e. DGQA.

20.5.1.2.3 Board of officers accepts / rejects the stores by one or more of the under mentioned methods:

(a) Visual inspection

(b) Comparison with samples

(c) Testing in EDW outside laboratories (if required)

(d) Functional tests/ inspection by user group.

20.5.1.2.4 Receipt section in the purchase dept services the contractors delivery notes with respective supply order and enters the stores in the daily receipt register.

20.5.1.2.5 Inspection form is prepared separately for each supply order.

20.5.1.2.6 The spares/ stores register along with all copies of inspection form / certificate are tendered for inspection before the board of officers detailed for this purpose.

20.5.1.2.7 Quantity accepted and rejected. If any is entered in the inspection form by the board of officers. The inspection

form is signed by the presiding officer and the stores are segregated as accepted and rejected.

20.5.1.2.8 Rejected items are returned to the vendor for supplying the right items on clean exchange basis. Issue / receipt note is also prepared in case of rejection.

20.5.2 The Q&A staff for army equipment and nominated by group QA staff carries out quality checks of the following:

(a) stage inspection and final inspection as per concerned work instruction of each component/ subassembly/ assembly before it is passed on to the next stage. Records of some visual tests are not maintained.

(b) Records of other tests of important stages are maintained as per concerned WI by the QA staff associated with sections carrying out repair of army equipment.

(c) Components / sub assemblies/ assemblies not conforming to specified standards are rejected and segregated. Remaining non conforming described items are deposited as salvage with R&I and dealt with as per procedure for controlling con conforming product QSP/16.

20.5.3 **FINAL INSPECTION**

20.5.3.1 Already tested components / sub assemblies/ assemblies are finally assembled in respective groups and subsequently tested by QA staff.

20.5.3.2 Detailed final inspection and testing of the complete equipment, as per the Base Inspection standards as check sheet final inspection is carried out by the QA staff and RI staff. A record of such tests is maintained. After detailed inspection by Gps QA staff the final inspection on behalf of the user is carried out by the RI DET BWG 14 indicating the pass/ fail ratio.

20.6 RECORDS

(A) VIR

(B) Inspection Form

(C) Stage wise test records as per WIs where applicable.

(D) Final inspection check sheets

(E) Inspection Performa

20.7 REFERENCE

(A) QSM Section 4.10

(B) Work instructions.

21.0 PROCEDURE FOR CONTROL OF INSPECTION MEASURING AND TEST EQPT

21.1 PURPOSE

To establish procedure for control calibration and maintenance of inspection measuring and test eqpt to ensure and demonstrate conformance of the product to the specified requirements.

21.2 SCOPE

Covers inspection, measuring and test equipment used to verify conformance of product repaired by EDW to the specified requirements.

21.3 AUTHORITY

These procedures have been approved by CO & MD and can be amended only by him.

21.4 RESPONSIBILITY

DGM(Gps) are responsible for implementation of these procedures.

21.5 CONTROL PROCEDURE

21.5.1 Selected inspection, measuring & test equipment affecting Quality are identified by their unique Register No.

21.5.2 List of the inspection, measuring test equipment's held on charge of Gp is maintained by Gp & these are issued on loan register to concerned personnel.

21.5.3 The log book & technical literature of the test equipment is also held with the concerned personnel holding charge of test equipment.

21.5.4 Test equipment are calibrated in Army Repair and Calibration Cell (ARCC) as per periodicity specified.

21.5.5 All test equipments due for calibrations will be collected centrally and fwd to ARCC by EDW.

21.5.6 The test equipment's are calibrated as per the procedure specified in the respective technical literature of the test equipment.

21.5.7 After calibration, adjustment point of the test equipment's are sealed by applying red paint/ varnish/ sticker by ARCC.

21.5.8 Endorsement of calibration is made in the log book of the test Equipment and the status of the same is indicated on the test equipment indicating when the calibration is due next by ARCC. ARCC calibration report is maintained & quality record with the Gp concerned.

21.5.9 Test equipment when not in use are kept in safe custody by the concerned personnel.

21.5.10 In case the eqpt is found out of calibration all previous measurements are reviewed and validated by Gp QA Staff.

21.6 Records

ARCC calibration reports

List of Test Equipment

Reference

QSM section 4.11

22.0 PROCEDURE FOR INSPECTION AND TEST STATUS

22.1 PURPOSE : To lay down a procedure to ensure proper indication of inspection and test status of components/ sub assy/ assy/ complete equipment during all stages of repair and servicing of army eqpt.

22.2 SCOPE : Covers complete repairs and servicing of Radio and Line Equipments carried out in EDW.

22.3 AUTHORITY : This procedure has been authorized by CO & MD and he only can change this procedures.

22.4 RESPONSIBILITY

All DGM Gps concerned are responsible for implementation of this procedure.

22.5 PROCEDURE

22.5.1 All components/ sub assy/ assy of eqpt system which are repaired at EDW Agra are identified for their inspection and test status, both at various stages of processing and at finally overhauled stage to ensure that only those items are which are cleared by previous inspection and test status are used for further processing at subsequent stage.

22.5.2 All movement of components/ sub assy/ assy for next operation/ stage is effected only on ensuring that the inspection and test activities have been completed and conformance verified and recorded where applicable at previous stage.

22.5.3 INSPECTION AND TEST STATUS AT RECEIVING STAGE

22.5.3.1 On completion of inspection and testing the concerned Receiving inspection persons provides the inspection status as applicable by :-

a. Storage (separate for under inspection/ inspected OK or inspected not OK)

22.5.3.2 Receiving report/ viewers inspection report(VIR) is made indicating the inspection and test status at receiving stage.

22.5.4 INSPECTION AND TEST STATUS AT PROCESS STAGE

22.5.4.1 All components/ assys/ sub assys are identified by one of the Following method for inspection and test status. The specific method of marking and identification of inspection status is documented in the works instructions of each section associated with the overhaul/ repair of eqpt. The identification is done by putting a white sticker & writing 'Checked OK' or 'Checked Not OK' & segregated them by keeping at a designated place.

22.5.4.2 Stamping on route cards/ test report/ inspection check sheets form the records indicating inspection and test status at in progress stage.

22.5.5 INSPECTION AND TEST STATUS AT FINAL INSPECTION STAGE

22.5.5.1 Items remarked BLR/BER at final stage are cross marked with red paint & kept at a segregated place.

22.5.5.2 Inspection check sheet/ test certificate, inspection clearance Certificate from the records indicating inspection and test status at final inspection stage.

22.5.5.3 Records of inspection and test status at final stages are with respective Gps.

22.5.6 **INSPECTION AND TEST STATUS OF CONTRACTOR SUPPLIED SPARES/ STORES**

22.5.6.1 These are identified for inspection and test status by keeping. Them segregated at designated areas.

22.5.7 **INSPECTION & TEST STATUS OF REJECTED ITEM**

22.5.7.1 **RECEIVING STAGE :** Item rejected at receiving stage are identified by segregating them & storing at a different place earmarked for them.

22.5.7.2 **IN PROCESS STAGE :** Item rejected at in process stage are identified as follows :

(a) Item which can't be repaired are sentenced UNSV & a red cross mark on them, these items kept at a segregated place suitably earmarked for them.

(b) Item which can be repaired are identified by putting a white sticker & marking 'Checked not OK' & kept at a segregated place suitably earmarked for them.

22.5.7.3 **FINAL INSPECTION STAGE :**

The eqpt found unserviceable at final inspection stage is sentenced as BER/BLR & marked with red paint as BLR. The BER/BLR certificate is prepared & the eqpt is turned to R&I for handing over to user.

22.6 **References** Quality manual - Section 4.12

22.7 **Records** Stage inspection check sheets where applicable.

23.0 PROCEDURE FOR "CONTROL OF NONCONFORMING PRODUCTS"

23.1 **Purpose :** The purpose of this procedure is to implement a system to control the nonconforming product and to prevent its use for further process or delivery.

23.2 **Scope :** This procedure is applicable to all non conforming products i.e. raw/ packing material, semi-finished and finished products.

23.3 **Responsibility** GM(P) & OIC Gps are responsible for Implementation of this procedure in their respective depts./areas.

23.4 **Authority :** This procedure is authorized by CO & MD and can be amended only by him.

23.5 **Procedure :**

23.5.1 Any deviation from stipulated and applicable standards (except during receipt inspection of customer supplied product) is treated as non conformance. In case of customer supplied product it is the deficiency noticed during receipt inspection.

23.5.2 Concerned quality assurance personnel identify all non conforming items and accord suitable disposition.

23.5.2.1 All non conformance is recorded as per the instruction procedure QSP/13.

23.5.3 Non conformance (less that of customer supplied product) is reviewed by DGM(Gp) for disposal of action. GM(P) is authorized to resolve the non conformity during receipt stage and CO & MD during all other stages as under :-

(a) Product reworked to meet the specified requirements.

(b) Acceptance with or without repair by concession.

(c) Re-gradation for alternative application.

(d) Rejection or for declaring as scrap.

23.5.4 All reworked products are re-inspected before disposal and further use.

23.5.5 **Incoming product**

23.5.5.1 Incoming product/ items comprise of brought out items from trade and those received from service sources.

23.5.5.2 **Identification**

23.5.5.2.1 All incoming non conforming product/ items are identified after inspection by a board of officers, nominated by CO & MD, by keeping them in a separated designated area.

23.5.5.2.2 Testing of materials if any is done by making a small portion of it undergo the required process and then compare the results with applicable standards.

23.5.5.3 **Documentation**

23.5.5.3.1 Following documents are maintained in respect of incoming items/product.

(a) Inspection report/(VIR).

(b) Proceedings of board of officers, inspecting the incoming items/ products.

23.5.5.4 **Review and disposal of non conformance**

23.5.5.4.1 Non conforming incoming products are segregated and kept in a place earmarked for those after review and raising VIR and providing necessary identification to the item/product.

23.5.5.4.2 Defect report is raised for all defective items received from service source and corrective action taken as intimated by AHSP.

23.5.6 **In process product**

23.5.6.1 In process products comprise of materials, part/ sub assys and assy under process in the wksp.

23.5.6.2 Identification : All non conformance noticed during in process inspection are kept in designated areas.

23.5.6.3 Documentation

23.5.6.3.1 All non conformance noticed during the process are documented by the concerned section supervisor in the check sheet.

23.5.6.4 Review and disposal of non conformance.

23.5.6.4.1 The nature of non conformance noticed is communicated to the OIC Gp and is reviewed by him to arrive at a decision to take corrective action.

23.5.6.4.2 The in-charge of the concerned section is responsible to take the disposal action under the direction of OIC Gp.

23.5.6.4.3 In case the segregated non conforming product can be reworked and brought to specified requirements the same is carried out by the concerned section and item produced for inspection and clearance.

23.5.7 **Final Product**

23.5.7.1 Non conformance noticed during final inspection is carried out on behalf of user by reps of Resident Inspector Det HQ BWG-14 and items / products returned to Gp for rework/replacement.

23.5.7.2 If feasible rework is carried out and on removal of non conformance the item /product is reproduced or inspection.

23.5.8 **Non conformance at storage stage**

23.5.8.1 Non conformance attributed to storage is documented by the store in charge.

23.5.8.2 Non conformance items/ products are sent to the concerned gp for carrying out rework to remove the non conformance and items/ products after re-inspection by R&I Det HQ BWG-14 is sent to R&I for further action.

23.6 **Reference** : QSM Section 4.13

23.7 **Records :**

(a) Incoming inspection report.

(b) Check sheet

(c) Inspection Performa

24.0 PROCEDURE FOR " CORRECTIVE AND PREVENTIVE ACTION"

24.1 **Purpose**

To lay down procedures for corrective and preventive actions to eliminate the root causes of actual or potential non conformities to degree appropriate to the magnitude of problems and commensurate with the risks encountered.

24.2 **Scope**

Covers all areas pertaining to quality system and product repaired at EDW Agra Cantt.

24.3 **Authority** This procedure is authorized by CO & MD and can beamended only by him.

24.4 **Responsibility**

GM Production and OIC Gp are responsible for implementation of this procedure.

24.5 **Procedure**

24.5.1 GENERAL

24.5.1.1 Quality system and product non conformance noticed through internal quality system audit, product overhaul/ feedback from users and other are brought to the notice of GM(P) and the concerned department.

24.5.1.2 GM(P) is responsible for coordinating the investigation of the causes of non conformances and for initiating immediate corrective action to be taken.

24.5.1.3 MR is responsible for analysis of all process work operations, concessions,quality records, service reports and user complaints to direct and eliminate potential causes of non conformances through internal quality audit.

24.5.2 CORRECTIVE ACTION FOR SYSTEM NON CONFORMANCES

24.5.2.1 Normally the system non conformance is identified through analysis of quality records.

24.5.2.2 On receipt of non conformance report (NCR) the concerned Department initiate action to correct the findings through immediate corrective action and arranges to close the NCRs.

24.5.2.3 The concerned department also analyses the NCRs and also initiate long term system corrective actions to overcome the recurrence.

24.5.2.4 The department also monitors the effectiveness of such corrective action initiated. In case the corrective action initiated is found to be inadequate suitable remedial measures are initiated.

24.5.3 CORRECTIVE ACTION FOR PRODUCT NON CONFORMANCES

24.5.3.1 Product non conformances are normally identified as a result of inspection or feed back from users.

24.5.3.2 All corrective action pertaining to the product are initiated in two stages :-

a. Immediate corrective action by initiating preventive action whenever non conformance is detected.

b. Long term corrective and preventive action which are to be taken to serve chronic problem.

24.5.4 CORRECTIVE ACTION

24.5.4.1 Immediate corrective action includes :

a. The production Gp initiates action to suspend processing of the job till immediate remedy is insuited. Suspension of processing depends upon severity of non conformance and risks encountered. Decision on suspension of processing is taken by GM(P).

b. The concerned QA group inspectors step up activities on items already processed to segregate defective items as per procedures laid down for control of non conforming product.

c. The production Gp co-ordinates with QA group to investigate the problem noticed and initiates immediate corrective action to prevent recurrence.

24.5.4.2 Long term corrective action initiated to overcome chronic problem, generally require detailed analysis and is carried out by MR assisted by DGM(Gp) and other heads of the department. The information regarding such areas are identified by using various quality record.

24.5.4.3 User feedback report, work inspection reports, rework data Are periodically analysed on a monthly basis by the production department and areas where non conformances are repeatedly occurring are identified. Such areas are taken up for detailed analysis to initiate corrective and preventive actions.

24.5.4.4 After analysis the corrective and preventive actions are determined and recommended decision by appropriate authority OIC Gp depending upon the severity and risk involved.

24.5.4.5 Step requiring to deal with preventive action are also determined and approval of the GM(P)/ CO & MD obtained for instating the change.

24.5.4.6 Corrective and preventive actions include activities such as change in process/ procedures modifications of systems, developments of inspection facilities, providing technical know how, trainings jigs, fixtures , inspection gauges/ instruments.

24.5.4.7 Effective controls are applied to ensure effectiveness of the corrective and preventive action.

24.5.4.8 Corrective and preventive records are maintained and relevant Information on action taken is submitted for management review.

24.5.4.9 All long term corrective and preventive action taken up by Production department and QA Group are documented as corrective action report. Format is attached as Appendix 'A' such report include :

a. Data analysis to identify area requiring corrective action.

b. Analysis of probable cause.

c. Recommendation for corrective & preventive actions.

d. Document requiring change.

e. Based on the analysis, appropriate corrective & preventive actions as suggested by the production department and QA staff for implementation are taken after approval by the CO & MD.

24.5.5 HANDLING OF USER RETURNS/COMPLAINTS

24.5.5.1 On the receipt of the complaints/query/ defect report from the user, OIC Gp concerned ascertains the details of the job and the date of repair, servicing, inspection and delivery.

24.5.5.2 The details of complaints/ query/ defect report from the user are forwarded to GM(Prod), who examines/

investigates into the matter, with co-ordination of (RI Det BWG – 14) and of other concerned departmental heads.

24.5.5.3 A solution is evolved and duly recommended by GM(P) is put up to CO & MD for his executive orders, after which necessary orders are issued for implementing the corrective and preventive actions.

24.5.5.4 The user is informed about the remedial action to be taken.

24.5.5.5 Particulars of complaints and action taken thereon are documented in user complaint register, format is attached at appendix 'B'.

24.6 Records

24.6.1 Demerit rating file.

24.6.2 User complaint register/ file.

24.6.3 Corrective Action Plant & Mechy.

24.7 References

24.7.1 Following references are made to :-

a. QSM Section 4.14.

FORMAT – Corrective Action Report

Implementation details

1. Implementations order No and Date :
2. Details of implementation order :
3. To be implemented by ;
4. Control points initiated to check implementation.
   1. Check 1. (give details of report with sign and date)
   2. Check 2. (Details with sign and date)
5. Implementation completion report
6. Details of documents amended.

Sign of DGM (QA)/head of dept

Recommended/ Approved/ Confirmed

Sign of GM/Prod(II)MR

Recommendations/Approved

Sign of CO & MD

FORMAT – User Complaint Register

S.No	Complaint recd from	Letter and date	Work order/ Supply order	Brief Details of the Complaint	Action Dept concerned	Action taken	Remarks
a	B	c	d	e	f	g	H

25.0 PROCEDURE FOR HANDLING, STORING, PACKAGING, PRESERVATION AND DELIVERY

25.1 PURPOSE

To establish procedures for handling, storage, packaging, preservation and delivery of product to ensure preservation of damage or deterioration.

25.2 SCOPE

Covers all connected activities from receiving of equipment / component at EDW to the dispatch of the product.

25.3 RESPONSIBILITY

All concerned DGM (Gps) are responsible to implement this procedure

25.4 AUTHORITY

This procedure is authorized by CO & MD and can be amended only by him.

25.5 AUTHORITY

25.5.1 GENERAL

25.5.1.1 All components and final product (if stored before use / dispatch) are stored in such a way that no damage / deterioration takes place during storage.

25.5.1.2 All components and product, if required are packed in accordance with relevant instructions before dispatch to prevent transit damage/ deterioration, since maximum number of components are fitted and installed on main equipment. Packing method are defined as packing instruction.

25.5.2 HANDLING

25.5.2.1 Handling methods employed ensure that no damage / deterioration is inflicted on the product.

25.5.2.2 Specific handling facility wherever required, for any particular item/ assembly/ product is identified and cared for.

25.5.2.3 Wherever specific handling facilities are identified, the use of such facilities are indicated in the relevant work instruction, referred to in the document control master index register of that particular department / register.

25.5.2.4 Proper usage of all such handling facilities is the responsibility of concerned production personnel. However, maintenance of such facilities is the responsibility of the WSG.

25.5.3 STORAGE

25.5.3.1 All items/ products are categorized for the purpose of storing and specific areas are allotted for each category / items.

25.5.3.2 These facilities include general items such as racks, bins, handling facilities and environment requirements

25.5.3.3 Issue Control Register and Receipt Control Register are maintained for stock levels.

25.5.3.4 Periodic checks on all stored items are carried out by the concerned section in charge for any expiry of shell life/ damage/ deterioration.

25.5.3.5 Any deterioration/ damage / expiry of shell life is brought to the notice of respective DGM to assess the non-conformance/ suitability for use and to intimate appropriate disposal.

25.5.3.6 Items with short shell life when stored in the groups, are identified. Close monitoring and reporting on their condition is done to avoid excess procurement and to prevent deterioration / damage during storage and to ensure usage/ disposal prior to expiry dates.

25.5.3.7 List of short life item.

25.5.4 **PACKAGING**

25.5.4.1 Packing requirement in case of final product to be dispatched or handed over to the user, if requested are met. In addition the packaging ensures that

(a) Stationary requirements are met

(b) Type and specification of packing ensure protection against possible damage/ deterioration during transit.

(c) Easy handling is facilitated

(d) Instructions regarding anchorage, locking of movable parts, supports and directions for storage are taken care of.

(e) Details of instructions and data which are required to be marked on the packing are identified.

25.5.5 **PRESERVATION**

25.5.5.1 The type of preservation treatment to be adopted for items in group stores is given in relevant Wis the prod Gps. There is no specific items which need preservation.

25.5.6 **DELIVERY**

25.5.6.1 Delivery of product to the user rep is carried out by the R&I section.

25.6.0 **REFERENCE**

25.6.1 Packing instructions

25.6.2 QSM Section 4.15

25.7.0 **RECORDS**

25.7.1.7 Receipt & Issue Voucher

26.0 PROCEDURE FOR "CONTROL OF QUALITY RECORDS"

26.1 Purpose

The purpose of this procedure is to implement a system to maintain and control quality records to demonstrate conformance to the specified requirements and effective operation of the Quality System.

26.2 Scope

This procedure is applicable to all quality records related to the Quality System in EDW.

26.3 Responsibility

M.R. and all deptt. heads & OIC Gps are responsible for implementation of this procedure in their respective areas /functions.

26.4 Authority

This procedure is authorized by CO & MD and can be amended only by him.

26.5 Procedure

26.5.1 Quality Records their retention period, location and the person responsible for their control and retention are identified and defined in MASTER LIST OF QUALITY RECORDS.

26.5.2 All persons responsible to maintain and control Quality Records are also responsible for their review to maintain effectiveness of the Quality System.

26.5.3 All Quality Records are indexed identifying type / nature of the record and year/ volume/ period.

26.5.4 All Quality Records are stored and retained to ensure their easy and readily accessabilility/ retrivability, whenever required and to prevent damage and loss.

26.5.5 All quality Records are retained for a defined period or required to fulfill the contractual obligation / agreement , whichever is later. Obsolete records which need not be retained after their retention period are disposed off considering nature of record and after seeking approval from MR/OIC Gps.

26.5.6 All Deptt. Heads / M.R. ensure that the Quality Records are made available to the customer where this is an agreed contractual requirement and the external / internal auditors at the time of quality audits.

26.5.7 Quality Records required to be retained for legal / knowledge preservation for a period more than defined retention period are defined and kept separately

26.5.8 All the persons responsible to maintain Quality Records, maintain a Master List of Quality Records related to their functions/ areas.

26.5.9 Management Representative (M.R.) maintains the Master List of Quality Records. Of the entire company.

26.6 **Reference**

26.6.1 QSM Section 4.16

26.6.2 Master List of Quality Records

26.7 **Records**

Master List of Quality Record

27.0 **PROCEDURE "INTERNAL QUALITY AUDITS"**

27.1 Purpose

The purpose of this procedure is to implement a system for planned Internal Quality Audits is to verify compliance of

the quality activities and related results with the planned arrangements and to determine the effectiveness of Quality System.

27.2 Scope

This procedure is applicable to all activities of the Quality System and requirements of the International Standards in Radio & Line Equipments.

27.2 Responsibility

M.R. is responsible for implementation of this procedure.

27.3 Authority

This procedure is authorized by CO & MD and can be amended only by him.

27.5 Procedure

27.5.1 Audits are designed for one or more of the following Purposes. To determine conformity or nonconformity of the activities to be specified requirements and elements of the International Standard / Quality System.

(a) To determine effectiveness of the implemented Quality System in the meeting the specified Quality Policy and Quality Objectives

(b) To verify compliance of quality activities and related results with the planned arrangements/ documented Quality System.

27.5.2 Internal Quality Audits are conducted at least once in three months.

27.5.3 Audit planning and schedule:

27.5.3.1 MR makes annual plan for internal audit in the beginning of the year and these are approved by the CO & MD.

27.5.3.2 Based on the annual plan, MR prepares audit schedule based on the status and importance of the activity. He

appoints the auditors for each area to be each audit team is required to audit all applicable elements of the Quality System in the assigned department / function for audit.

27.5.3.3 MR informs the audit schedule to all the auditors and heads of the auditee deptts

27.5.3.4 Audit is conducted by the trained personnel, independent of those having responsibility for the area / activity audited.

27.5.4 Executing the audit :

27.5.4.1 Before audit. The auditor covers entire scope of the audit.

27.5.4.2 Before starting audit, the auditor prepares the checklist for convenience in audit to save wastage of time during audit and to follow a professional approach.

27.5.4.3 OIC Gp ensures availability of the resources and facilities Evidences are collected by the auditors through interview , examination of documents and observations of activities & conditions in the concerned area/ function.

27.5.4.4 Clues indicating non conformities are noted, if they seem significant even though not covered by the checklist and investigated.

27.5.4.5 Information collected through interview is verified obtaining the same information from other independent sources like physical observations, measurements and records.

27.5.4.6 All audit findings are documented in an internal quality audit report to identify the actual non-conformities.

27.5.4.7 All the audit findings and non-conformities are by the audit or auditee acknowledged.

27.5.4.8 Identified non conformities are documented in a clear & concise manner and are supported by evidences.

27.5.7 Corrective action follow-up:

27.5.7.1 OIC of Auditee dept. is responsible to determine and initiate corrective action required to correct the nonconformity or its cause & the target date completion.

27.5.7.2 Corrective action is followed up by the auditor, if required , MR is also consulted in this regard.

27.5.7.3 Corrective action taken is followed up by the MR with the help of the auditor. On the agreed completion date or earliest possible, auditor goes to the auditee deptt. and verifies the satisfactory & effective implementation of the corrective action taken.

27.5.7.4 Auditor records his comments regarding verification of the corrective action taken on the same IQA report and submits to M.R.

27.5.7.5 M.R. finally verifies effectiveness of the corrective action taken. On satisfaction he signs and closes the non conformity.

27.5.7.6 M.R. includes the summary audit reports, with details of the corrective actions taken in the agenda of the next Management Review Meeting.

27.6 **Reference**

(a) QSM Section 4.17

27.7 **Records**

(a) Summary of IQA
(b) Annual Plan for Internal Audits
(c) Internal quality audit report folder containing
(d) Internal Audit Checklist
(e) IQA Report

27.8 **Annexure**

27.8.1 Definition: Quality Audit

27.8.2 Non Conformities – categorization

27.8.3 Internal quality audit report – Observation

27.8.4 Summary of IQA format

27.8.5 Annual plan for IQA format

27.8.6 Internal Quality audit Schedule Format

DEFINITIONS: QUALITY AUDITS

1. **QUALITY AUDIT:**
A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements whether these arrangements are implemented effectively and are suitable to achieve objectives.

2. **QUALITY SYSTEM**
The organized structure, responsibilities, procedures, processes and resources for implementing Quality Management.

3. **AUDITOR (QUALITY):**
A person who has the qualification to perform quality audits.

4. **LEAD AUDITOR:**
Solo member / Leader of Audit Team.

5. **CLIENT:**
A person or organization or group or department requesting the audit.

6. **AUDITEE:**
A group / department to be audited.

7. **OBSERVATION:**
A statement of fact made during an audit and substantiated by evidence.

8. **OBJECTIVE EVIDENCE:**

Qualitative or quantitative information records or statements or facts pertaining to the quality of an item or service or to the existence and implementation of a Quality System element which is based an observation, measurement or test and which can be verified.

9. **NONCONFORMITY:**

The non-fulfillment of specified requirements.

NON CONFORMITIES – CATEGORISATION

1.0 Categorizing non conformities- (Deficiencies)

1.1 It is necessary to categorize the non-conformities in order to relate them to the type and magnitude of corrective action required. Based on this we have the following categories:

(a) Critical - Will affect the product.
(b) Major - Could affect the product
(c) Minor - Will not affect the product

1.2 Category I – Critical

1.2.1 When the total element or a significant part of the element of the quality system is deficient. Such a non compliance is considered wholly unacceptable and should be reported as a system deficiency requiring immediate corrective action for the cause of non conformity. Examples of this category of deficiency are :

(a) No management policies established.
(b) No inspection instructions.
(c) No corrective action programme in force.
(d) No system for control of suppliers.
(e) Total lack of compliance to the major requirements which are defined in the contract.

1.2.2 Example of significant part of a deficient elements are :

(a) Established management policies do not define the authority and responsibility of each department.
(b) Established inspection instructions do not include identification of inspection instruction to be used,

characteristics to be inspected or omits the sampling plans to be used.

(c) No follow-up system for corrective action is initiated.

(d) No evaluation of supplier performance has been affected.

1.2.3 This category also applies to a single significant non conformity observed,which requires immediate correct action for cause. Example of such a deficiency are :

(a) Critical operating procedure not being impler

(b) A supplier is working to the wrong revisior a drawing which will affect the product.

(c) Test eqpt is unable to test the item adequately.

(d) Product tested, accepted and placed in storage have been re-tested and do not conform to the requirements.

2.0 **Major non conformity :**

2.1 Include those in which a significant number of minor non-conformities occur in one requirement. Examples of this are

(a) Several inspection instructions fail to indicate or identify the inspection instruments or the characteristics to be inspected or not specified in the sampling plan.

(b) Several corrective actions do not show adequate follow up when necessary.

(c) Several suppliers were not evaluated for adequacy of performance.

2.2 This category of non-conformities indicates a breakdown in the system of control and therefore is an important as the earlier category viz. Critical.

3.0 Minor non-conformities

3.1 When a single non-conformity as above is found. It may be reported as a minor non conformity. The deficiency is

required to be corrected. However, it is not necessary to report corrective action for cause since it is considered a relatively minor occurrence. Examples include :

(a) An established inspection instruction which fails to indicate or identify an inspection instrument.

(b) A measuring instrument which is slightly overdue for calibration.

(c) A single drawing or document in a file which is obsolete.

(d) A document which is not dated and signed properly.

(e) A specific corrective action request does not show adequate follow up.

(f) A specific supplier has not been evaluated for adequacy of performance.

APPX 'C'

INTERNAL QUALITY AUDIT REPORT – OBSERVATION

PART – 1

DEPARTMENT/AREA AUDITED LAST DATE AUDITED _____ SCOPE OF AUDIT OBJECTIVE OF THE AUDIT LIST OF REFERENCE DOCUMENT	AUDIT NO _____SHEET___OF_____ DATE OF AUDIT AUDITED BY

S.NO	OBSERVATION	SIGNATURE
1.	Action on previous audit observations (of non-conformities)	
2.	Observations (of non-conformities) during the period under review	

Date :

Signature of auditee

Signature of auditor

PART – II

ACTION BY HOD

1. Corrective action planned :-
2. Target date for corrective action :-

Date : Signature

PART – III

VERIFICATION OF CORRECTIVE ACTION

Date Signature

PART – IV

NON CONFORMANCE CLOSED

Date Signature MR

APPX 'D'

QUALITY SYSTEM AUDIT – CONCLUSION

1. REFERENCE DOCUMENT :
2. GROUP/ DEPT.
3. NAME OF AUDITOR

Sno	Para Ref	Requirement as per system element	Compliance status

28.0 PROCEDURE FOR "TRAINING"

28.1 **Purpose** : The purpose of this procedure is to implement a system for identification of training needs of the personnel/employees and to provide them the required training.

28.2 **Scope** : This procedure is applicable to all those personnel/employees of associated deptts whose work or activities may effect the product quality/ quality system.

28.3 **Responsibility** : GM(P) and DGM(Gp) are responsible for implementation of this procedure.

28.4 **Authority** : This procedure is authorized by CO & MD and can be amended only by him.

28.5 **Procedure :**

28.5.1 Performance is a combination of knowledge, skill, experience, attitude and environment. Drop in requisite level of performance determines the need and the type of training required. To achieve and maintain proficiency at all levels, the following steps are taken periodically :-

(a) Evaluation by the Gp of the general education, experience and proficiency of the personal for the activities to be performed.

(b) Identification by the Gp OIC of the individual training needs against those required for satisfactory performance.

(c) Planning, organization and carrying out of vocational training, either in house or by an outside body.

(d) Recording of training and achievement so that records can be updated and gaps in training can readily be identified and filled.

28.5.2 Training of executive management (officers).

28.5.2.1 The managers at all levels are detailed to attend the quality oriented programmes run by external agencies from time to time. Records of such training are maintained by TT Cell.

28.5.3 Training of supervisors.

28.5.3.1 Workers are assessed for promotion to supervisors level by HQ BWG periodically and those who meet the laid down criteria for promotion are promoted to supervisor level. Specific training necessary for assignated task in respect of supervisors is required when they are either promoted or on getting transferred to new assignment. Training

requirements for supervisors are also spelt out in the training directive issued by CO & MD. Based on the above requirements, appropriate training is planned and is either carried out in house or externally depending upon the expertise available to conduct the same. Records of the same are maintained by Mgr (TT).

28.5.3.2 Record of training of supervisors is maintained by Mgr(TT).

28.5.4 Training of civilian workers.

28.5.4.1 EDW generally has civilian industrial workers who have ITI qualified and are associated with production. Initial training to some mechanic provided to them by respective OEMs for required period, after that these workers are associated with the overhaul and repair of the product. All other workers are trained by these personnel by conducting on the job training.

28.5.4.2 Training needs of the workers are identified by respective heads of departments/ OIC Gps based on the following :-

a. Newly recruited worker.
b. Inter section transfer.
c. Annual Trg directive.
d. Award of demerit rating failing to meet quality of work.
e. Up gradation of trade skills.

28.5.4.3 Training as per 5.4.2 a,b,c,d above is planned and organized by OIC Gp in the form of OJT by TT Cell who also maintain the record for the same where applicable.

28.5.5 Training of service personnel

28.5.5.1 Service personnel associated with production comprise of approx 15 to 20% of overall strength. Service personnel posted at EDW are qualified and have prior experience with the similar type of job. Record of the same is available in their personal particulars held with OIC Adm.

The formal trade training of service personnel is planned and organized by AHQ and is conducted at Army training establishment.

28.5.5.2 Training needs of service personal are identified by OIC Gp based on the following :

a. Newly posted to various Gps.
b. Inter section transfer.
c. Annual training directive.
d. Award of demerit rating for failing to meet quality of work.

28.5.5.3 Training as identified above is organized and planned by OIC Gp in the form of OJT.

28.6 Records

28.6.1 Training needs identification file

28.6.2 Indl detailed on Trg file

28.6.3 Feedback report on Trg.

28.6.4 On the job training register.

28.7 Reference : Quality manual – section 4.18

28.8 Annexure : Nil

29.0 PROCEDURE FOR " STATISTICAL TECHNIQUES"

29.1 **Purpose :**

The purpose of this procedure is to maintain a system for identification of the needs for statistical techniques and to maintain the same for verification of the process capability and product characteristics.

29.2 **Scope :** This procedure is applicable to Planning, Production, Maintenance and Quality Assurance/ Control deptts.

29.3 Responsibility :

OIC Gps are responsible to implement this procedure in respective Groups/ Deptts.

29.4 Authority :

This procedure is authorized by CO & MD and can be amended only by him.

29.5 Procedure :

29.5.1 Criteria for adopting statistical methods of analysis are from among the following

a. Where large number of data is required.

b. Where inferences based on single or few isolated data

results in large scales non-conformances.

c. Where it is practically impossible, uneconomical and Time consuming for 100% verification/check.

d. Any other specific requirement.

29.5.2 Statistical techniques are used for the following reasons.

a. To assist in deciding what data to obtain.

b. In making the best use of the data.

c. To gain a better understanding of user requirement and expectation.

d. To diagnose problems and suggest appropriate Computational approaches to further statistical diagnosis.

29.5.3 Statistical techniques are applied where appropriate in the following areas depending on the situation /data collected.

a. Management information system.

b. Performance assessment.

c. Non conformance analysis.

d. Problem analysis.

e. Finding root causes for non conformance leading to Catastrophic failure situation/report.

f. Quality reporting.

29.5.4 The statistical tools and techniques used are one or more of the following

a. Graphs (histograms and pie).

b. Causes and effect diagrams.

29.5.5 Steps in using the statistical techniques.

29.5.5.1 Respective Gp heads/deptt identifies the need and areas where statistical techniques could be employed.

29.5.5.2 Observation and recording of process, parameters specifications and other relevant data.

29.5.5.3 Analysis of the data using statistical tool or techniques is carried out.

29.5.5.4 Adducing deductions/inference from the analysis and adopting control measures to rectify the variations.

29.5.5.5 Validating the result/inference.

29.6 Records : Nil

29.6.1 Copy of Demerit Rating where applicable.

29.6.2 Bar chart for equipment.

29.7 Reference : Quality manual section 4.20

29.8 Annexure : Nil

7.7 **Work Instructions for various Army Equipments**

7.7.1 Technical specifications of Army Radio equipments cannot be clearly outlined in Work Instructions due to security concerns. Moreover there are large number of diverse equipments which are in service. However a draft layout of Work Instructions for any equipment is given below:

1. Purpose
2. Scope
3. Authority
4. Responsibility
5. Tools requirements

6. Procedure for opening and stripping of equipment.
7. Records
8. References
9. Annexure

PROBLEMS AND HOW THEY CAN BE OVERCOME

8.1 Introduction

It is felt that Indian economy is entering a new era of domestic competition under globalization. As a result only those organizations which are quality conscious and cost competitive can survive and thrive in this new environment which can upgrade their products to global standard can only exist. Therefore adopting ISO – 9000 standards is a highly desirable activity.

8.2 Problems envisaged during implementation

The relevance and applicability of ISO –9000 standards is universally adoptable to each and every sphere of activity being performed in Army Workshops. Therefore EME, which is running repair workshops for Army Eqpts, should adopt these standards, but to adopt these standards certain problems are envisaged.

8.2.1 Army top bosses will have to be convinced about usefulness of these standards.

8.2.2 Enhanced quality of repairs will take time to establish itself.

8.2.3 Requirement of ISO – 9002 standards and operational requirement may contradict at some level.

8.2.4 Repairs carried out during war may get hampered as these are to be carried out as forward as possible.

8.2.5 Paper work will increase therefore more work force may be required.

8.2.6 In certain areas secrecy may get compromised due to secret nature of some equipments.

8.3 Measures to overcome problems

8.3.1 Selection of Management representative should be Appropriate as this is the key of success of this movement. The rep should be too junior and should not be too senior as he may not have enough time.

8.3.2 Training and awareness:

The standards requires that organization must clearly enunciate its quality policy. The intentions and directions of the organization as regards quality.

8.3.3 ISO 9000 standards requires that the working practices shall be documented and implemented effectively.The documented system must address all the requirements of the standard. The common mistakes committed in documenting the system are :

(a) All the documents are written by one person, usually QA Manager or the management representative.

(b) A consultant is hired to write QA manual and other documents.

(c) Copying the systems of an already certified organization.

8.3.4 **Commitment and support from the top**

It does not take much effort to say "I am committed". The problem is in actually demonstrating this commitment. There are many reasons for this:The belief that quality is the job of the QC/QA department. It is not the job of marketing,design, production, sales, handling, stores & purchase.Each department has individual targets. So, what do we end up with? Each department pulls its own directions with production and purchase fighting quality like bitter enemies. The reasons also cannot exclude the fact that the individual performances is also related to the target set for the department. The top management encourages individuals to fight fires, get the job done, and if it means breaking systems – do it. March blues, end of the month syndromes, when quality department looks the other way or better still joins the production to meet targets. - implies that the top management demand

them. In other words, whatever are the words, actions are still demonstrating "short terms profits".

CONCLUSION

ISO 9000 series of standards is nothing but a common sense well documented. It. is code with down to earth approach with phraseology, which is compact, specific and yet very comprehensive. This is the only code, which permits a supplier to write down his own policy, his own manual, in line with the framework of the elements laid down in the code. The code is flexible and at the same time rigid too. The code does not allow rendering of non-conforming products or services. Thorough understanding of the code and religious implementation of the same in any industry or activity center can be a boon. It can save enormous amounts of money and a great deal of headache. The advantages in working to a system like the ISO are so marked that they themselves should ensure satisfaction and fulfillment

In an ISO-9000 certified company the top management get fully involved in and is committed to the consumer satisfaction and quality improvement. If it tries to remain aloof the sheer force of the system drags it in. The Standard revolves around 'customer satisfaction'. The result in most of the Indian industries is that it has now become a buzzword. Organizations, which are really serious about the aspect, will go beyond the ISO standards and ensure total customer satisfaction. Expectations of customers about a certified organization grow. There will be more and more demand from their side. They will stop excusing you for wrongs howsoever trivial. The spirit of the standard will set direction for quality improvement, bring in teamwork, changes frames of minds, bring in ownership and responsibility for the actions, improve clarity improve discipline. The system will become a handy tool for effective control of operations, will retain gains made, create confidence in the

minds of the customers, and ensure continuous and consistent improvements on all fronts. On time delivery and speedy resolution of customer complaints will become a haunting problems forcing the management to act on them thus paving way for improvement in the operations

It might force an organization to change its structure. Responsibilities, authorities and inter-relationships may have to be redefined. There is a likelihood that people will concentrate on documenting procedures and get themselves satisfied by complying to those procedures loosing the sight of the fact that value addition is more important than mere compliance. The whole affair is likely to become fetish and the spirit behind the words is likely to be lost The system if not implemented in the right spirit, will kill creativity, propagate mistrust, bring in manipulative approach, add to the cost of operations and finally make people to loose faith in it.

Army repair organizations of EME cannot keep itself away from the changing standards of the industries all over the world. In order to implement these standards thinking will have to change and then a comprehensive policy to adopt these ISO-9000 standards by EME workshops can be evolved and implemented.With all the merits and demerits, the ISO-9000 approach provides a systematic, documented and an all-pervasive linkage through the value chain. It formally and publicly commits the management for taking responsibility for this qualitative revitalization through a well-defined and interactive process. Quality today has become a business strategy and ISO-9000 systems acts, as launching pad for Total Quality Management and Army workshops of EME should not lag behind and march forward by adopting these standards.

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