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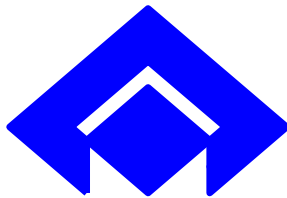
THIS MANUAL IS EFFECTIVE FROM **21.03.2024**.

CET **Quality Manual**

EDITION : 2

(Issue status: 1)

ISO 9001:2015 QMS



Steel Authority of India Limited

**CENTRE FOR ENGINEERING & TECHNOLOGY
RANCHI - 834002**

05 MARCH 2022

CET-QMS-MANUAL-Q

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FOREWORD

Centre for Engineering and Technology (CET) has been progressively growing since its inception in 1983. In pursuit of excellence and for providing quality services of International Standards to customers, CET's endeavor has always been to strengthen the existing areas of excellence and identify new areas of activities.

Since the date of first certification on 25th May, 1994, CET has been successfully maintaining its Quality Management System (QMS) certified under ISO 9001 standard. The manual has since been updated nine times from 1994 to 2022.

The present Quality Manual (Edition 2, Issue Status 0) has been revised to Edition – 2, Issue status – 1 to accommodate revised Quality Policy which has been reviewed by the new leadership of CET. Other contents of the manual has been kept unchanged which shall be reviewed by appropriate committee and remaining required changes shall be effected along with recommendation of the Committee in the new edition of the manual.

It is imperative that we follow the procedures and various provisions of QMS religiously to bring uniformity in our approach and strive for achieving customer satisfaction, customer delight and finally customer loyalty.

Ranchi

**(Shrawan Kumar Verma)
Executive Director**

NOTE

1. CET Quality manual is a confidential document for internal circulation and shall be used for Quality Management System (QMS) of Centre for Engineering & Technology (CET). It shall neither be reproduced in any form nor used for any other purpose except with the written permission from Management Representative (MR) of CET, Ranchi.
2. Provisions given in this manual will supersede those given in any other document/ manual in circulation in CET.
3. In case of revision of the existing edition of the manual, the changes in this manual are highlighted in ***bold and italics***. The letters will be normal in case of new edition of manual. The issue status of chapters will be '0' in case of new edition of manual. The issue status of chapters subsequently will be 1, 2 etc. for each revision of the existing edition. While making a new edition (In case of many changes in the manual or in case of revision of standard), issue status of chapters will again be '0' for the new edition number.
4. All documents and records can be stored in hard/ soft copy. Transmission can also be done in hard/ soft copy.
5. In case of soft copy being transmitted through e-mail, signature is not necessary.

Edition Status

(ISO 9001:2015 based QMS)

EDITION STATUS	DATE OF EDITION	DESCRIPTION OF CHANGES IN CHAPTER/ PARA
EDITION 02 (ISO 9001:2015)	05.03.2022	New edition
<i>EDITION 02, Issue Status -1</i>	<i>18.06.2024</i>	<i>Chapter-4 (Cl No. 4.3)</i>
<i>EDITION 02, Issue Status -1</i>	<i>21.03.2024</i>	<i>Chapter-5 (Quality Policy)</i>

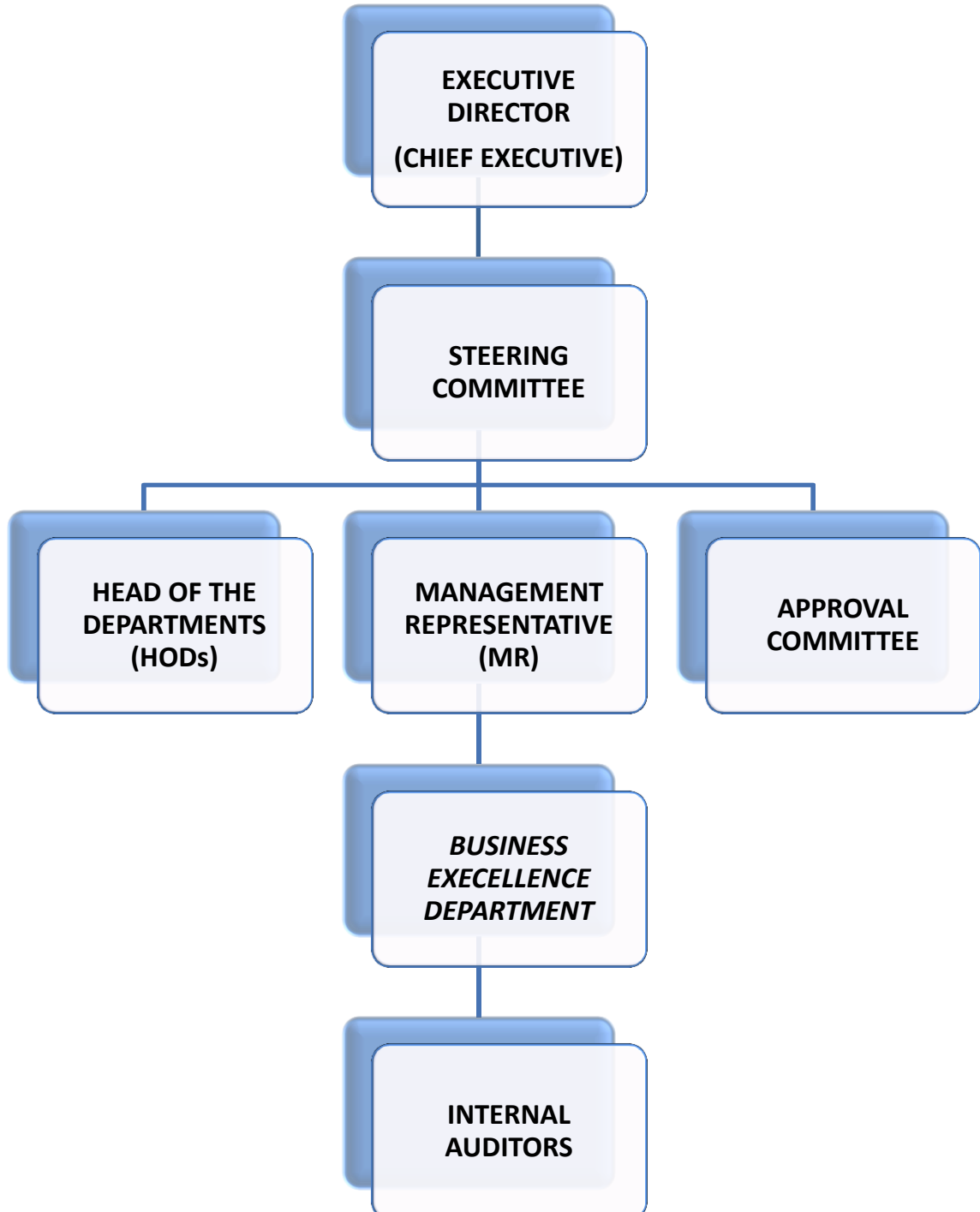
1.0

QUALITY OBJECTIVES OF CET

Customer Satisfaction	
Objective (Organizational): To fulfill customer's requirements first time and every time.	
Items	Targets
Customer complaints	Should be within 0.8 % of the total reports submitted in six months period.
Customer Satisfaction Index (CSI)	Average CSI should not be less than 7.5 on a scale of 10.0. However for individual item of the format, value should not be less than 5.0
Responsiveness	
Objective (Organizational): To act promptly on customer requests.	
Items	Targets
Interim reply to customer's queries / letters.	Within 5 days from the date of receipt of customer communication by the concerned section, who sends reply.
Communication regarding acceptance/non-acceptance of assignment.	Within 15 (fifteen) days from the date of receipt of final inputs from customer in projects section by I/c Projects.
Effective resource management	
Objective (Organizational): To increase productivity and efficiency.	
Items	Targets
Budgeted engineering hours	Actual engineering hours should be within +9% & -15% of budgeted engineering hours up to R=0 documents
Error free products and services	
Objective (Organizational): To provide error free product and service to customers.	
Items	Targets
QMS audit findings for non-conformities in documents and drawings	Continual decrease in the number of findings
Verification of design sheets, summary sheets, design calculation, drawings, specifications	100%
Vetting and design review of reports	100%
Schedule Compliance	
Objective (Organizational): Completion of all the accepted assignments as per schedule.	
Items	Targets
Submission of drawings & documents as per original schedule	+ 93% fulfillment

2.0

ORGANIZATION STRUCTURE FOR QMS OF CET



INTRODUCTION

3.0 Purpose:

This Quality Manual depicts the Quality Management System developed, implemented and maintained in CET to meet the requirements of ISO 9001:2015.

This chapter “Introduction” explains the profile of the organization and structure of the quality manual.

3.1 Profile of CET:

Centre for Engineering & Technology (CET) is the in-house, design, engineering and technical services providing unit of Steel Authority of India Limited (SAIL), a Government of India undertaking, and was set up in 1983. The head office of CET is located at Ranchi and there are five (05) sub-centres located at Bhilai, Bokaro, Burnpur, Durgapur, and Rourkela. Interplant Standardization for Steel Industry (IPSS) Secretariat is located in Ranchi.

3.2 The range of services provided by CET to its customers includes:

- i. Preparation of feasibility reports for enabling customers to take investment decisions.
- ii. Preparation of detailed project report including basic/ detailed engineering and tender specifications
- iii. Preparation of mining plan
- iv. Preparation of drawings
- v. Preparation of draft investment proposals (board note)
- vi. Preparation of tender evaluation report
- vii. Preparation of technical note, scheme, study report, tender document, expression of interest
- viii. Approval of contractors’ drawings
- ix. Provision of designer’s supervision during erection and commissioning
- x. Provision of post commissioning services
- xi. Formulation and implementation of IPSS standards

3.3 List of important documents prepared by CET are as below:

- i. Approach Note (AN)
- ii. Feasibility Report (FR)
- iii. Scheme (SC)
- iv. Study Report (SR)
- v. Technical note (TN)
- vi. Tender document (TD)
- vii. Expression of interest (EOI)
- viii. Board Note/ Draft Investment Proposal (DIP)

- ix. Detailed Project Report (DPR)
- x. Mining Plan (MNP)
- xi. Tender Specification (TS)
- xii. Ordering Specification (OS)
- xiii. Tender Evaluation Report (TER)
- xiv. Price Bid Evaluation Report (PBER)
- xv. Drawings generally form an integral part of most of the documents submitted by CET to customers. Detailed engineering drawings are also provided separately as per need of the assignment.

The provisions of IS/ISO 9001: 2015 are applicable to the above activities.

3.4 CET was established to provide in-house design, engineering and technical services to all steel plants / units of Steel Authority of India Limited (SAIL). Therefore, its existing major customers are all steel plants & units of SAIL located at Bhilai, Bokaro, Burnpur, Bhadravati, Durgapur, Rourkela, Salem, Chandrapur, various captive mines under plants, CMO and RDCIS. With the rich experience gained over the years and development of certain areas of excellence, CET is marketing its services to customers in the steel sector outside SAIL also. The IPSS secretariat performs all activities related to 'Inter Plant Standardization for Steel Industry' with main stress on formulation and implementation of IPSS Standards.

3.5 The present Quality Management System (QMS) of CET is based on process approach, which includes:

- i Understanding and fulfilling customer requirements.
- ii Providing adequate resources.
- iii Treating every activity for fulfilling the customer requirements as a process.
- iv Monitoring of processes for analysis and control.
- v Monitoring of customer satisfaction by obtaining and evaluating feedback received from customers on the services provided by CET.
- vi Continual improvement in the QMS based on analysis of data.
- vii Active involvement and commitment of management in order to achieve organizational objectives as stated in the quality policy of CET.

3.6 Model of process based QMS of CET is shown in pictorial form in chapter 4. This model shows that customers of CET play a significant role in defining their requirements as inputs. The Plan-Do-Check-Act methodology is applied to all the processes to fulfill customer requirements.

3.7 **Structure of Quality Manual:**

This Quality Manual is structured according to the table of contents. The individual chapters are subdivided into paragraphs.

This Quality Manual will be changed to the next edition to facilitate addition and modification, whenever required. The Quality Manual is issued with the signature of Management Representative and ED, CET in the last page of each chapter.

3.8 Issuance:

The Management Representative is entrusted by the management of CET to prepare, modify and issue this Quality Manual after approval by ED, CET. The hard copy of the latest edition will bear “MASTER COPY” stamp. This Master Copy is maintained by MR in the office of BE.

Controlled copy of Quality Manual is uploaded in the CET Portal in not editable format.

3.9 Changes:

The Quality Manual is scrutinized at regular interval by the Management Representative & HODs and, if found necessary, is revised. In case the revision shall be carried out for the whole document, the latest edition status shall be indicated in Chapter: D (Edition of status) and in all pages of each Chapter. Chronological edition status of the Manual is given in Chapter: D (Edition of status) along with document change history.

3.10 Translation :

Quality Manual of CET, Ranchi is available in English language only.

Issued & Controlled by

Approved by

Management Representative

ED, CET

CONTEXT OF THE ORGANIZATION

4.0 Purpose:

This chapter of the Quality Manual describes the internal & external issues of the organization, the need of internal & external parties, scope of the QMS and its processes.

4.1 Understanding the organization & its context:

The internal & external issues of CET are determined at organization level through brainstorming by senior management personnel based on inputs from various departments. The internal issues include customer requirement, knowledge base, training, adaption of new technologies, non-availability of standardized cost data etc. These issues are documented & reviewed annually by the senior management committee (Refer doc. No. CET-QMS-CO).

The external issues include legal requirement, technology up-gradation, change in market dynamics, stringent environmental norms etc. These issues are documented & reviewed annually by the senior management committee based on inputs from various departments (Refer doc No. CET-QMS-CO).

The facilitating processes/ actions are determined & documented for both the issues. This is monitored & reviewed annually & records of review are kept.

4.2 Understanding the needs & expectations of interested parties:

The interested parties relevant to QMS of CET are determined by senior management team by brainstorming & documented, which includes internal & external customers, employees, legal authorities, top management, suppliers, contractors etc.

The needs and expectations of these interested parties are determined, documented & reviewed annually. The records of review are kept.

4.3 Determining the scope of the quality management system:

The scope of QMS of CET is determined considering the external & internal issues, requirement of relevant interested parties and services provided by CET.

The scope of QMS covers *“Providing Design, Engineering and Technical Consultancy Services to the Iron & Steel Industry.”* provided by CET.

It includes the following areas:

- i) Head office at Ranchi consisting of all the sections / departments (Excluding F & A and P & A except training)
- ii) Five sub centres located at Bhilai, Bokaro, Burnpur, Durgapur and Rourkela

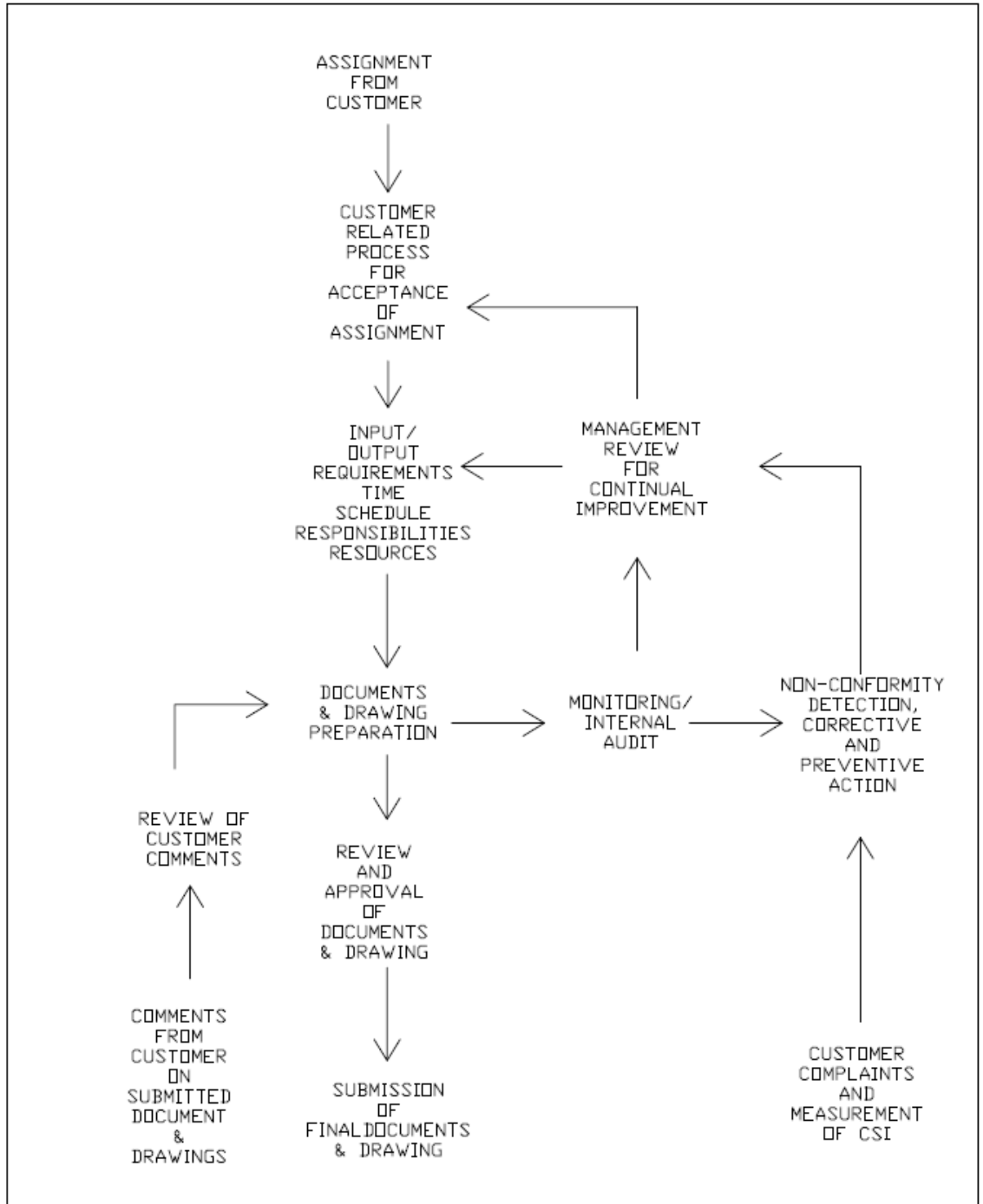
4.4 **Quality management system & its processes:**

4.4.1 Key processes of the Quality Management System are determined and managed along the following dimensions:

- a) **Definition:**
Input & Output requirements, activities, sequence of operation, interaction with our processes, process criteria, resource requirement.
- b) **Control:**
The process is controlled by monitoring & measurement methods.
- c) **Improvement:**
Various quality improvement tools along with statistical techniques are used for taking corrective & preventive action with an aim to continual improvement. Risk & opportunities are defined alongwith Risk mitigation plans (refer clause no. 6.1).
- d) **Ownership:**
Process owners are clearly identified who are responsible for determination, planning, monitoring and managing work activities.
- e) **Effectiveness:**
The process performance is evaluated by process owners & HODs on regular basis & they implement any changes required for improvement.

4.4.2 The interactions of various processes are described below:

PROCESS INTERACTION DIAGRAM





4.4.3 Required procedures are stabilized & maintained to support the process. The procedures are developed by departments and controlled by MR. Records are maintained to show evidence of monitoring & measurement of the processes.

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(EXECUTIVE DIRECTOR)

LEADERSHIP

5.0 Purpose:

The purpose of this chapter is to show leadership & commitment of top management w.r.t. establishing, implementing and maintaining Quality Management System ISO 9001:2015 which includes customer focus, establishing & communication of quality policy, defining roles, responsibilities & authorities.

5.1 Leadership and Commitment:

5.1.1 The management of CET ensures its leadership and its commitment by:

- a) Ensuring effectiveness of Quality Management System through accountability & assigning responsibilities & authorities (refer clause no.5.3).
- b) Establishing a Quality Policy & its objectives in line with strategic direction of CET and its business process (refer clause no.5.2).
- c) Promoting process approach, risk based thinking and providing resources. (refer clause no. 4.4 & clause no. 6.1).
- d) Ensure proper communication on the importance of Quality Management System and conforming to the QMS requirement. (refer clause no. 7.4).
- e) Promoting improvement & providing support and review of the system at appropriate level (refer clause no. 10).

5.1.2 Customer Focus:

- a) New assignments from customers are received by Projects (PFC) department and are examined by ED and CGMs. Risk and opportunities that can affect conformity of products & services are addressed periodically so that customer satisfaction can be addressed & determined.
- b) Appropriate attention is given to maintain higher level of CSI (Customer Satisfaction Index).
- c) Statutory/ Regulatory requirements regarding product & service, if any, are taken care during planning and are complied.

5.2 Quality Policy:

5.2.1 The Quality Policy of CET is established by the top management of CET which is given at the end of this chapter. The policy is appropriate to the purpose & context of CET which provides framework for setting quality objectives & includes commitment to continual improvement.

5.2.2 The Quality Policy is communicated to all concerned employees under QMS through training, publication through CET portal and display of posters. Quality policy can be given to the interested parties, if they need so, with the permission of MR.

5.3 **Organizational roles, responsibilities and authorities:**

The organization structure of CET related to Quality Management System is described below. The roles have been defined keeping in mind the requirement of the ISO 9001:2015 standard. The responsibility and authorities are communicated through distribution of this Quality Manual.

5.3.1 (a) **Executive Director (ED)**

Executive Director is the chief executive of the organization. He/ she is the chairman of steering committee. He/ she has overall responsibility and authority for the whole QMS of CET for smooth running of the organization, formulating policy and strategy and ensuring its implementation & maintenance. He/ she also ensures provision of resources needed for QMS, review of risks, opportunities, needs & expectations of the interested parties and internal & external issues, usually during management review.

(b) **Chief General Manager (CGM)**

Full responsibility and authority is delegated by ED to CGM, regarding effective implementation and continual improvement of the QMS in his functional area. He/ she is also responsible for apprising and taking approval from ED as per need. He/ she is also responsible for identification of issues, risks, opportunities, needs and expectations of the interested parties.

(c) **Steering Committee**

The steering committee is constituted by ED and act as the apex body for QMS. ED is the chairman of this committee. All the HODs, CGMs of CET and MR are members of this committee. Senior most person of BE department is the convener of this committee. It has overall responsibility and authority for establishing, implementing, maintaining and continually improving the QMS as per provisions of ISO 9001: 2015 which includes effectiveness of the QMS, status of internal & external issues, risks, opportunities, needs & expectations of the interested parties in the changing scenario.

(d) **Approval Committee**

Approval committee is constituted by ED. It has responsibility and authority for modification/ addition of quality documents, procedures and quality manuals.

(e) **Heads of Departments (HOD)**

These positions generally correspond to section/ sub-centre in-charges referred to as Head of Department (HOD) in the QMS of CET.

HOD has responsibility and authority for:

- Implementation, maintenance, review and continual improvement of QMS in his functional area.
- Sending all information regarding QMS to MR, CGM and ED's secretariat from his functional area. For better co-ordination of QMS in his area, HODs may designate coordinators from their respective areas.
- Managing risks & opportunities, needs & expectations of the interested parties.

(f) **Head of Department of lead section HOD (LS)**

These positions are of in-charges of the section/ sub-centre, which is assigned the leading role for taking up the specific assignment received from the customer. Approval of ED is taken for finalizing the lead section and assigning the assignment to the section.

HOD (LS) has responsibility and authority for:

- Carrying out the various activities for the specific assignment through task force
- Carrying out periodical reviews
- Apprising CGM and ED about developments of assignment

(g) **Task Force**

Most of the assignments received from the customer are multi-disciplinary and to handle them, a Task Force (TF) consisting of members drawn from various disciplines is constituted. A member of task force is also referred to as TFM.

The TF has responsibility and authority for:

- Planning the various activities for each specific assignment, collecting data/ documents, interacting with customer, preparing documents and completing the assignment.
- Fulfilling the quality objectives.
- Keeping concerned HODs informed about development.

(h) **Task Force Leader**

Each task force has a task force leader (TFL) who is generally from the lead section. In some cases, the TFL may not be from lead section.

TFL has responsibility and authority for:

- Completion of all activities as per schedule.
- Fulfilling the quality objectives in relevant functional area.
- Keeping concerned HOD (LS) informed about development.

(i) **Internal Auditors**

Internal auditors have responsibility and authority for conducting internal audits of QMS as per approved schedules.

(j) **BE Department**

It is actively associated with all activities for the establishment, implementation and maintenance of ISO 9001 QMS. It is responsible for all activities assigned by MR and functions under overall guidance of MR.

(k) **Management Representative (MR)**

Management Representative is appointed by ED. He/ she is the contact person for all activities connected with QMS.

Responsibilities:

MR is responsible for overall activities of QMS. In addition to that, he/ she has the following responsibilities related to Quality Management System.

- Ensure establishment, maintenance & revision of Quality Management System in accordance with Standard ISO 9001:2015.
- Periodic reporting on the performance of the Quality Management System to the top management for review.
- Ensuring the promotion of awareness of customer requirements throughout the organization.
- Maintaining liaison with external Quality System auditors for audit/ certification/ re-certification.
- Authority: Full authority for responsibilities assigned.

QUALITY POLICY OF CET

***RENDERING INNOVATIVE AND COST
EFFECTIVE TECHNICAL CONSULTANCY
SERVICES WITH FOCUS ON ENVIRONMENTAL,
SOCIAL & GOVERNANCE (ESG) PRINCIPLES
ALONG WITH ACHIEVING CUSTOMER
SATISFACTION THROUGH CONTINUAL
IMPROVEMENT IN TERMS OF QUALITY OF
DELIVERABLE SERVICES & TIMELINE.***

सेट की गुणवत्ता नीति

पर्यावरण, सामाजिक और शासन (ई.एस.जी.) के सिद्धांतों को ध्यान में रखते हुये, नवाचार और लागत प्रभावी तकनीकी परामर्श सेवाओं के प्रतिपादन के साथ-साथ हमारी सेवाओं की गुणवत्ता और समय-सीमा के अनुपालन में निरंतर सुधार के माध्यम से ग्राहक संतुष्टि प्राप्त करना।

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(EXECUTIVE DIRECTOR)

PLANNING

6.0 Purpose:

The purpose of this chapter is to describe planning of the organization with regard to address risk & opportunities, actions to mitigate the risk, setting of quality objectives & action plans to achieve them & planning of changes.

6.1 Actions to address risk and opportunities:

6.1.1 The risk associated with all the key processes are taken into consideration through risk assessment as per the document Doc. No. CET-QMS-RC. The risks & contingency plan, opportunities and action plans are addressed through documents viz. CET-QMS-RC and CET-QMS-OA. The risk assessment takes into account the issues related to these processes (refer clause no.4.1). Contingency plans are developed for medium & high level risks as evolved from the risk assessment.

6.2 Quality Objective & planning to achieve them:

6.2.1 Quality objective & measurable targets are established, documented at relevant functions, levels & processes and are consistent with Quality Policy.

These objectives are regularly reviewed and the results are communicated to relevant levels. The objectives & targets are updated periodically to achieve continual improvement.

6.2.2 Action plans are determined to achieve the targets which include responsibility, time frame & resource.

6.3 Planning of changes:

Any changes to the QMS are carried out in controlled manner which includes with description of purpose & potential consequence of change, provision of resources, responsibility. The changes are done after approval of the competent authority. Related documents are updated to maintain integrity of the processes.

Issued & Controlled by

Approved by

Management Representative

ED, CET

SUPPORT

7.0 Purpose:

7.1 The purpose of this chapter is to describe resources (internal & external) needed for implementation, maintenance & continual improvement of QMS which includes provision of resources like people, infrastructure, environment for operation of processes, monitoring & measuring resources and organizational knowledge etc.

7.1.1 Adequate resources like equipment, infrastructure and trained personnel have been identified and provided for implementing QMS. Customer satisfaction is enhanced by resolving quality complaints and reviewing Customer Satisfaction Index (CSI) received from the customer.

While determining the resources the capabilities & constraints of existing internal resources & what is needed from external providers is considered.

7.1.2 People:

CET provides required & competent persons at relevant levels & functions for effective implementation of QMS and operation & control of the process. The requirement of manpower is assessed by top management which is fulfilled by recruiting through corporate and at CET level. Necessary orientation training is given before posting at different departments.

The possibility of getting suitable persons from internal sources is explored through internal advertisement/ circular, from time to time in order to fill up vacant posts.

7.1.3 Infrastructure:

The organization determines, provides and maintains the appropriate infrastructure needed to achieve conformity to product requirements, which include:

- a) Buildings, workplace and associated utilities
- b) Equipment (Software & Hardware)
- c) Communication and information system

7.1.4 Environment for the operation of processes:

The physical factors like heat, noise, light, hygiene, humidity, cleanliness, environment etc. are made conducive for meeting the requirements of CET wherever applicable as per the requirement of the processes.

High level of housekeeping in work places is promoted through regular cleaning of the work places.

7.1.5 Monitoring and measuring resources:

Most of the existing customers of CET have their own inspection wings for carrying out inspection of equipment / materials during execution of projects. The engineers of

CET generally assist them, if required by customer, in carrying out inspection of critical equipment as per the details of design/ drawings given in specifications and approved drawings. The inspection equipment to be used during inspection is generally supplied by the supplier as in most of the cases inspection is carried out at outstation locations. This inspection is done after the supplier has carried out the inspection of materials offered. CET does not keep any measuring instruments for the purpose.

The responsibility for ensuring that calibrated equipment are used during inspecting at supplier's premises lies with engineer(s) (customer & CET) deputed for the purpose.

7.1.6 **Organizational knowledge:**

The knowledge required for different processes are determined & necessary guidelines, references, manuals, etc. are kept in the e-Docman/database/SAN. The knowledge of the experienced people is disseminated to downstream through guidance by them to young engineers during on the job training, technical manual, knowledge sharing elaborate etc. Learning from training sessions, visits, interactions elaborate, internet etc. are shared amongst the working group. Technical Manuals, Project Contracts and approved drawings of projects are uploaded in the E-Docman for future reference. The learning points from different projects are also uploaded in E-Docman for knowledge sharing and future reference.

7.2 **Competence:**

Competence of personnel performing work in identified job positions, which affect quality, is determined. Employee competence is ensured through appropriate learning, training and experience. Human resource development in CET has been identified as one of the supporting processes and procedures thereof have been defined and implemented.

7.3 **Awareness:**

The head of training and the HODs of concerned departments jointly carry out the training need assessment. The gaps arising out of competency mapping are also considered for providing training.

These are used as a basis for developing annual and monthly training plans by training department. Training modules are developed and list of faculty is maintained. Training programmes are organized and the records are maintained.

Special training sessions are organized to train people on ISO 9001 awareness, quality policy, objective, contribution of effectiveness of QMS & implications of not conforming to QMS.

The assessment of training needs, development of training plan, imparting training, evaluation of effectiveness and keeping of records are done in accordance with the procedure for training, (Refer procedure no. P 7.2-05).

7.4 **Communication:**

The internal & external communication requirements are determined which includes the purpose, time period, whom to be communicated, system of the communication with responsibility.

Communication as regards status of the Quality Management System, customer complaints, customer feedback, system effectiveness and improvement action across the organization are done regularly. Management Review meeting's agenda notes and minutes circulated to the concerned persons constitute this communication. Training and awareness programmes, posters, in-house journals are also used for this purpose. The quality policy is made known to all employees by various means like through the quality manual, display at important places etc. Controlled copies of CET quality manual & CET procedures manual are issued by MR and are uploaded in the CET portal.

Record notes of steering committee meeting are also sent to all HODs, along with analysis of data with respect to effectiveness of QMS for communication to all employees. Summary of internal audit reports and surveillance audit reports are communicated to all employees through concerned HODs.

Other communications regarding QMS are made through mails and display on notice boards.

7.5 **Documented information:**

7.5.1 Documented information as required by this standard & by different processes are determined and established. The list of these documents is maintained by MR.

a) Documents required by the QMS are controlled according to the Procedure for 'Control of Documents and records.'

7.5.2 Creating and updating:

The documented information are created & updated considering the identification, description, format, review system & approval.

7.5.3 **Control of Documented Information:**

The purpose of documentation is to ensure that procedures of QMS are standardized, properly communicated and implemented uniformly. This para describes the measures for generation, approval, issue and modification of those documents, which are relevant to the QMS, and other documents like reports, specifications and drawings.

The scope of documentation control covers:

- i. CET Quality manual & CET procedures manual
- ii. Documents and drawings generated in CET
- iii. Documents of external origin like IS codes.
- iv. Customer supplied products like drawings, documents etc.

- Both CET Quality manual & CET procedures manual are controlled by MR.
- The documents and drawings generated in CET, assignment files, are controlled by I/c Projects and HODs.
- Documents of external origin like various reference books, journals, standards, IS codes etc. are controlled by concerned HODs
- Drawings/ documents supplied by customer are controlled by concerned HODs.

Issue of manuals

MR is responsible for issue of CET Quality Manual and CET Procedures Manual with the approval of the Approval Committee. In case of issue of new editions of manuals, all procedures and chapters will be signed by ED. In case of modification/ addition of procedures, it will be signed by Chairman, Approval Committee.

The controlled copies are uploaded in the CET portal under the control of MR.

It is the responsibility of MR/ BE coordinator to withdraw the superseded chapter(s)/ procedure(s) and issue the new revisions of the CET quality manual and CET procedures manual. Small errors/ typographical errors may be corrected by BE coordinator (senior most person in BE department)/ MR.

CET procedures manual contains various documented quality system procedures giving details regarding various activities carried out by CET to achieve its quality objectives and the person responsible for implementing each activity of such procedures.

Procedure for document control is given in the CET Procedures Manual. In the procedure no: P 7.5-02, provisions are made for:

- Reviewing for adequacy, legibility, identification and approval prior to issue of documents by authorised persons.
- Ensuring that documents are reviewed, updated, re-approved and issued as required.
- Ensuring that changes in documents are done in controlled manner and are highlighted in 'bold and italic' letters except in case of new edition of manual.
- Ensuring that pertinent issues of appropriate documents are available at all points of use.
- Ensuring that obsolete documents are removed promptly from all points of issue and use.
- Keeping record of changes.
- Retaining the superseded copies for retention period.

Document control procedure for documents and drawings generated in CET

Preparation, verification, approval, revision and issue of various documents of CET have been covered in relevant procedures. Protection of documents and drawings is done through regular back up of data.

Document control procedure for documents of external origin

Registration, identification, storage, control and distribution, if required, of all documents received from external agencies have been covered in related procedures. Protection of documents and drawings is done through regular back up of data.

Document control procedure for customer supplied products like drawings/documents

Registration, identification, storage, controls and distribution, if required, of all documents received from customer has been covered in related procedures.

Control of records:

Records required by the QMS are controlled according to the Procedure for Control of Records.

A documented procedure defines the control needed for the identification, legibility, storage, protection, retrieval, retention time and disposition of records. These records are maintained to provide evidence of conformity to requirements and of the effective operation of the QMS. Following have been identified as records:

- i. Steering committee / management review meeting records.
- ii. Qualification and training records of employees.
- iii. Acceptance of assignments records.
- iv. Design summary sheets.
- v. Records of presentation (design review) and approval of reports.
- vi. Records of verification of MNP, TS and OS
- vii. Assignment review records.
- viii. Design validation records.
- ix. Internal audit reports (summary).
- x. Customer complaints and non-conformity records.
- xi. Preventive actions taken for non-conformities.
- xii. Records of customer satisfaction index.

Full details regarding control of records are available in the following procedure(s):

- i. Procedure no. P 7.5-02 – Control of records.

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OPERATION

8.0 Purpose:

The purpose of this chapter is to describe the operational planning and control process including requirement for product & services, control of externally provided processes, product & service provisions, release of product & control, control of non-conforming outputs.

8.1 Operational planning & control:

Once request/ an assignment from customer is discussed with all HODs, CGMs & ED and accepted, a Task Force (TF) is formed consisting of engineers having adequate qualification and experience in respective disciplines. The Task Force Leader (TFL) discusses the assignment with TF to workout various details and formulate the action plan for timely completion of assignment. HOD (LS) conducts review of assignment at least once every month. As per need, CGMs and ED also review assignments.

Procedures are there for acceptance of request/ assignments and planning and preparation of various documents & drawings. These procedures ensure fulfillment of quality objectives, requirements of the product, provision of resources, identification of responsibilities for various activities, necessary review and verification specific to documents and drawings. Appropriate records are maintained to provide evidence that the documents and drawings have been prepared, following requirements of QMS.

- a) To achieve the desired quality of services, different processes & their criteria are defined and documented. Sequences of activities & control to be exercised are brought out in the procedures (refer clause no. 4.4). Required resources like input & support services are provided to meet specific requirements of product.
- b) Criteria for service acceptance are decided as per customers' requirements, national standard as applicable, verification & monitoring, specific to services are planned and subsequently documented.
- c) Required records are maintained to provide evidence of the processes/ activities. (refer cl.7.5.3).
- d) Any change required in the processes are controlled & reviewed for consequences. (refer clause no. 6.3).
- e) Outsource processes or part of it & are documented & controlled.

8.2 Requirements for products and services:

8.2.1 Customer Communication

Communication with customer, at various stages of an assignment, is done as per laid down system. Customers are sent an acknowledgement within five days from the date of receipt of their communication and are generally informed about acceptance/ non-acceptance of assignment within 15 days from the date of receipt of final inputs from them. While working on assignments, regular contact with customer is maintained to gather and share information.

The requests for assignment, correspondence with customers and other related records are maintained by DO and kept in assignment file/PMS database. ED's secretariat and all concerned are also informed.

The following procedures give details of customer related processes:

- i. Procedure no. P8.2-07 - Acceptance of assignment.

8.2.2 Determining the requirements for products and services:

Assignments from various customers are received alongwith details of specific activities to be performed by CET. The assignment is scrutinized within CET and a decision is taken by ED in consultation with CGMs regarding acceptance of the assignment. In case, CET agrees to undertake the assignment, an acceptance letter is issued to customer by I/c Projects. The acceptance letter is sent within stipulated time.

A task force is formed to take up the assignment.

Task force determines and understands:

- i. Requirements specified by customer up to commissioning and post commissioning activities.
- ii. Requirements not stated by customer but necessary for successful completion of the project.
- iii. Statutory and regulatory requirements related to the project.
- iv. Any other requirement.

8.2.3 Review of the requirements for products & services:

Proper system is in place to review the requirements related to assignment. This is done prior to accepting an assignment and also during preparation of drawings and documents to ensure:

- i. Project requirements are well defined.
- ii. CET is in a position to meet the requirement of the project and customer including submission schedule.

Proper system is in place to:

- i. Scrutinize the request received from customer for adequacy of information.
- ii. Clarify all points as required and ascertain if CET can take up the assignment.
- iii. Communicate acceptance of assignment to customer including submission schedule.
- iv. Monitor time schedule for acceptance of assignments.
- v. Communicate change in requirement of customer (scope of work) to all concerned.

8.2.4 Changes to requirements of products & services:

For any change in the requirement, relevant documents are modified and relevant persons are made aware of the changes.

8.3 Design and development of products and services:

8.3.1 General

CET has established, implemented and maintained the design & development process which is appropriate to its processes for meeting the requirements of QMS.

8.3.2 Design and Development Planning

Design & development planning is done for documents and drawings. Activity planning is done by TFL for various stages of preparations of documents and drawings which include:

- i. Various stages of design & development of reports/ specifications in the form of milestones
- ii. Plan for review, verification and validation (if required) of documents.
- iii. Responsibilities of various task force members for timely completion of assignments.

HOD (LS)/ TFL manages the interfaces between different sections/ TF involved in design & development to ensure effective communications. For this, records of assignment review, internal assignment/ activity planning details are sent to all task force members. Planning output is updated, if needed, based on assignment review [by HOD (LS)] outcome.

8.3.3 Design and Development Inputs

Design and development inputs are determined for products like reports/specifications, detailed engineering drawings, design/capacity calculations, selection of technological processes, equipment and parameters.

Inputs are available through internal assignments from other sections, customer supplied drawings/documents, similar designs/ reports/ specifications and any other source.

These inputs include functional and performance requirements, statutory and regulatory requirement if any, other requirements essential for design and development.

While planning, the organization considers the nature and complexity of design & development activities, required process stages, design & development verification & validation activities, responsibility and authority of the persons involved in this process, internal & external resources, control of interfaces, need for involvement of customers and users, requirement of subsequent provision of services, level of control expected by customers and other interested parties and maintenance of relevant documented information.

8.3.4 Design and Development Control

Necessary control of design & development process is exercised through reviews, verification activities and validation activities.

Design and Development Review:

Review of assignment is done at suitable stages by HOD (LS) for the whole assignment and by HOD for the assignment of the section. This is done to:

- a) Review the progress of the assignment including proper utilization of engineering hours.
- b) Identify the problems and take necessary actions to overcome that.
- c) Apart from HOD (LS) and TFL, task force members are also present in these review meetings. Depending on the need, assignment review is also done by higher authorities like CGM & ED. Records of such reviews are kept in respective assignment files/ PMS database.

On completion of reports, a presentation is made by the TF in the presence of senior executives and engineers drawn from various disciplines. The observations made during presentation are noted, reviewed and incorporated in the report. Approval for sending the report to customer is obtained from competent authority.

Design and Development Verification: Verification of documents and drawings are done by appropriate persons before issue to customer.

Design and Development Validation:

Wherever required, designs are validated prior to their further use. Post commissioning validation is done based on performance guarantee parameters.

8.3.5 Design and Development Outputs

Design and development outputs are in the form of reports/specifications, detailed engineering drawings, design sheets and design summary sheets.

Reports /specifications are verified by TFL. Drawings are designed, checked and approved by authorised personnel. Design summary sheets are verified by authorised persons. Records of these verifications are kept in assignment files.

These outputs are verified against design and development inputs prior to their release and further use. These are verified so that design and development outputs

- i. Meet the input requirements for design and development
- ii. Provide appropriate information for purchasing, production and service provisions like utilities etc.
- iii. Specifies acceptance criteria in the form of performance guarantee test.
- iv. Specify safety requirements, if any.

8.3.6 Design and Development Changes

The procedures provide for identification, documentation, review and approval of design changes and modifications. Procedure has provision for revision of drawings and their approval after revision.

The relevant records pertaining to design are maintained by concerned persons. Relevant procedures are as follows:

- i. Procedure no. P8.3-09 - Design
- ii. Procedure no. P8.5-23 – Review of assignments

8.4 Control of externally provided processes, products and services:

8.4.1 The processes or part of the process, products, services to be provided by external provider are determined & documented as per latest edition of Purchase & Contract Procedure issued by SAIL.

List of externally provided products & services are listed as below.

Products: PCs, printers, photocopiers, laptops, air conditioners etc.

Services: AMC for maintenance of assets/ products, job contracts related to day to day working of CET.

Suppliers are registered through technical & financial assessment.

8.4.2 Type & extent of control:

Controls including verification & other activities are exercised for externally provided processes to ensure that these are as per requirement.

8.4.3 Information for external providers:

CET ensures adequate communications on the requirements from the external providers through documents such as purchase order for vendors, contracts documents

for other external providers etc. It also communicates, as applicable, the methods, processes, equipment, release of order & service, competence of the vendors.

The purchase requests are made in prescribed formats known as indent forms. These documents contain the following:

- a) Complete description, specification and drawings, if required, to meet the specified requirement of user departments.
- b) Clearly defined requirements of user like delivery period, scope of work/ specifications, cost estimate, names of suggested vendors etc.

The indents received are further scrutinized by concerned materials planning/ purchase officer and then processed. The offers received are evaluated in consultation with the indenter for technical acceptability and acceptable tender with lowest quotation is considered for placing the purchase order/ contract.

8.5 Production & service provision:

8.5.1 Control of product & service provision:

The nature of working of CET calls for generation and storage of documents and drawings. These are identified and kept properly so that these documents and drawings are readily available.

CET quality manual, CET procedures manual, IS and IPSS codes, other reference manuals and documents are readily available. These are controlled and updated regularly.

Various office equipment like PCs with appropriate software, phones, FAX machines, printers, photocopy machines etc. are installed at suitable places and are maintained, generally, through annual maintenance contracts (AMC) for proper upkeep.

In CET procedures have been established for monitoring the important processes.

For achieving quality objectives, relevant procedures have provision for monitoring of following processes:

- i. Acceptance of assignment
- ii. Preparation of reports
- iii. Preparation of specifications
- iv. Review of assignments
- v. Determination of customer satisfaction index
- vi. Handling customer complaints and taking corrective actions for non-conformities.

Documents are released by I/c Projects and sent to customer through HOD (SC). If there is no sub-centre / unit office nearby, the documents and drawings are sent to customer directly by I/c projects. Drawings are usually sent to customer directly by concerned HOD.

All the documents and records relevant to control of production and service provision are maintained by concerned sections.

For the inspection of equipment/ materials at supplier's premises, assistance is provided to customers for joint/ independent inspection during execution of projects on case to case basis. In such cases, system adopted by customer for inspection is followed.

Relevant procedures are as follows:

- i. Procedure no. P7.5-02 – Control of documents and records
- ii. Procedure no. P7.5-03 – Control of BIS codes
- iii. Procedure no. P8.3-11 – Preparation of FR, AN, Scheme, Study Report and DPR
- iv. Procedure no. P8.3-12 – Preparation of TS, TN, TD & EOI
- v. Procedure no. P8.3-18 – Preparation of drawings
- vi. Procedure no. P8.5-23 – Review of assignments

8.5.2 Identification and traceability:

As soon as the request/ assignment is accepted, an assignment number is allotted. The assignment number is unique identification for the specific assignment.

The assignment files of TF, documents and drawings and all correspondences regarding an assignment bear assignment number for easy identification and traceability.

It is ensured that documents and drawings are identified at all stages of preparation by proper document number and drawing number.

All the documents and records relevant to allocation of assignment number are maintained by DO.

8.5.3 Property belonging to customers or external providers:

The documents and drawings received from the customer are collected/ received, identified, verified and referred for preparation of documents and drawings. In most of the cases, the documents and drawings are received on non-returnable basis.

The procedure has the provision for the following:

- i. Recording and safe storage of all documents received from the customer.

- ii. Recording and reporting to customer about any document that is lost or damaged or is otherwise unsuitable for use.

Records of all documents received from the customer are maintained by TF.

Relevant procedures are as follows:

- i. Procedure no. P8.5-24 - Customer supplied products

8.5.4 Preservation:

A copy of all documents and drawings are preserved in Storage Area Network (SAN).

The responsibility for storage of all reference documents in SAN lies with I/c Projects. The responsibility for storage of working drawings lies with TF. The responsibility for submission of documents to customers lies with DO.

Records of issued drawings and documents are maintained in SAN.

Records of sending of documents and drawings are kept in the concerned assignment file with DO/ TF. Each section maintains a drawing register (hard/ soft form) for record of drawings.

Relevant procedures are given in CET Procedures Manual as follows:

- i. Procedure no. P 8.3-11 - Preparation of AN, FR, SC, SR and DPR
- ii. Procedure no. P 8.3-12 – Preparation of TS, TN, TD & EOI
- iii. Procedure no. P 8.3-18– Preparation of drawings

8.5.5 Post-delivery activities:

Post-delivery activities of CET include evaluation of tender, evaluation of price bids etc. Post commissioning assistance is also given to the customers as and when required by the customers.

8.5.6 Control of changes:

Any change required in the above processes are reviewed by authorized persons & controlled. Records are retained on the results of review of changes.

8.6 Release of products & services:

Appropriate inspection & verification is done before the product/ service is released to the customers. Release of products & services are done after approval of competent authority.

8.7 Control of nonconforming outputs:

In CET, documents and drawings are revised to eliminate the non-conformities. Revised documents and drawings are sent to customer. The numbering system of documents identifies and segregates each revision of the documents.

In the procedures, provisions are made for identification, evaluation, documentation and segregation of non-conforming documents, drawings and their replacement by revised documents.

Provisions are made in the procedure for informing the concerned HOD (LS) about the non-conformity, review of non-conformity, correcting the non-conformity and re-verification after corrections.

The following records are maintained for control of non-conforming products:

- i. Record of customer complaint and non-conformity.
- ii. Design sheets and design summary sheets in case of change in design

Relevant procedures are as follows:

- i. Procedure no. P8.3-09 – Design.
- ii. Procedure no. P8.7-27 – Customer complaints and taking corrective actions for non-conformity.

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PERFORMANCE EVALUATION

9.0 Purpose:

The purpose of this chapter is to describe monitoring, measurement, analysis & evaluation, internal audit & management review with regard to QMS.

9.1 Monitoring, measurement, analysis and evaluation:

Monitoring, measurement, analysis and evaluation processes are planned and implemented to:

- a) Demonstrate conformity of the product.
- b) Ensure conformity of Quality Management System.
- c) Continually improve the effectiveness of QMS.

The parameters, method of monitoring, measurement analysis & evaluation, time frame, are determined & documented to ensure the performance & effectiveness of QMS. Appropriate records are maintained as evidence of the results.

9.1.1 Monitoring & Measurement of Processes

The deliverable parameters like delivery schedule, engineering hours etc. are monitored for each assignment to assess the effectiveness of QMS.

9.1.2 Customer Satisfaction:

In CET, system has been established for periodical measurement of customer satisfaction index. This is done to monitor customer perception as to whether the customer requirements have been fulfilled or not.

Procedure has provision for recording data related to customer complaints to find out percentage of customer complaint against no. of reports submitted.

Responsibility of collecting, analysis and maintaining data for customer satisfaction lies with I/c Projects.

Following records are maintained:

- i. Feedback on customer satisfaction
- ii. Records of customer complaint and non-conformity

Relevant procedures are as follows:

- i. Procedure no. P 9.1-26- Customer satisfaction index

- ii. Procedure no. P8.7-27 – Customer complaints and taking corrective actions for non-conformity.

9.1.3 Analysis & evaluation:

In CET, systems are in place to collect and analyse appropriate data to demonstrate the suitability and effectiveness of the QMS and also to evaluate how continual improvement to QMS can be made. This includes data generated from various sources as given in procedures including monitoring and measurement of processes and products.

Procedure also has provision for collection and analysis of data for the following:

- i. Results of audits
- ii. Customer feed-back/ complaints
- iii. Process performance and product conformity
- iv. Status of preventive and corrective actions

The following records are maintained for analysis of data:

- i. Summary of internal audit findings.
- ii. Feedback on customer satisfaction.
- iii. Record of customer complaint and non-conformity.
- iv. Steering committee meeting records.

Relevant procedures are as follows:

- i. Procedure no. P 9.3-04 – Management review of QMS
- ii. Procedure no. P 9.1-25 – Internal audit of QMS
- iii. Procedure no. P 9.1-26 – Determination of customer satisfaction index.
- iv. Procedure no. P8.7-27 – Handling customer complaints and taking corrective actions for non-conformity.

9.2 Internal audit:

Internal audits are conducted at planned intervals to determine whether the QMS conforms, to the planned arrangements, to the requirements of IS/ISO 9001: 2015, to the requirements as specified in the CET Quality manual and CET Procedures manual and is effectively implemented.

A team of internal auditors has been specifically trained to carry out the audits. An audit schedule is worked out at least one week in advance and intimated to all HODs. At least two internal audits are planned in a year. Care is taken so that the audit team members are not the persons directly involved in the work area of auditee.

At the end of audit, the auditors prepare audit reports and hand over a copy of audit report to concerned HOD and BE department and discuss about proposed corrective actions and time schedule for the same.

Summary of findings of internal audits is reviewed in steering committee meeting in order to identify areas needing attention and continual improvement of QMS.

BE department is responsible for preparation, obtaining approval and communication of schedule to auditors and HODs. The responsibility for carrying out internal audits lies with trained internal auditors. The responsibility for facilitating internal audit in his section and taking corrective actions lies with HOD of the concerned auditee section.

The following records are maintained by BE coordinator/ HOD:

- i. Internal audit reports.
- ii. Records of corrective and preventive actions taken.

Relevant procedures are as follows:

- i. Procedure no. P9.1-25 – Internal audit of QMS

9.3 **Management review:**

9.3.1 **General**

The steering committee conducts the management reviews for reviewing the quality management system at least once in a year. The Quality policy and objectives are also reviewed during management reviews. ED chairs such reviews. Record notes of the steering committee meeting are prepared and sent to all employees through concerned HODs. Prior to the steering committee meeting, a report is sent to ED by MR covering all aspects of QMS.

9.3.2 **Management Review Input**

The agenda for steering committee meeting include all or some of the following items:

- i. The status of action from the previous review
- ii. Changes in internal & external issues
- iii. Information on performance and effectiveness of QMS which include customer satisfaction & feedback, status of quality objectives, process performance, non-conformity and corrective action, monitoring results, audit results and performance of external providers.
- iv. Adequacy of resources
- v. Effectiveness of actions taken to address risks and opportunities
- vi. Opportunities for improvement

9.3.3 **Management Review Output**

The outputs are prepared in the form of record notes based on the discussion in steering committee meeting. The record notes include all or some of the following items:

- i. Opportunities for improvement
- ii. Any need for change to the QMS
- iii. Resource needs



Following records are maintained by BE department.

- i. Agenda for steering committee meeting
- ii. Minutes/ record notes of steering committee meeting

Details regarding management review are available in the following procedure:

- i. Procedure no. P9.3-04 – Management review of QMS.

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IMPROVEMENT

10.0 Purpose:

The purpose of this chapter is to describe the opportunities for improvement, corrective actions & plan for continual improvement.

Improvement of the Quality Management System is ensured through the use of quality policy, quality objectives, audits, analysis of data, correction, corrective actions, continual improvement, breakthrough change, innovations & management reviews. Improvement plans include addressing future needs & expectations, improvement in products & services, reduction in non-desirable effects & improvement in performance & effectiveness of QMS.

10.1 Non-conformity and corrective actions:

Documented procedure is established for corrective actions which include:

- i) Reviewing product & process non-conformities
- ii) Root cause analysis
- iii) Corrective actions to eliminate non-conformities to ensure it does not recur/ occur
- iv) Follow-up action for implementation
- v) Maintaining records of results of corrective actions
- vi) Reviewing the effectiveness of the corrective actions taken.
- vii) Updation of risks & opportunities, if necessary
- viii) Make changes in QMS, if necessary

Records are maintained to show evidence of nature of non-conformities, actions taken & results of corrective actions.

10.2 Continual Improvement:

To achieve continual improvement, opportunities and needs are determined considering the results of analysis & evaluation of process & product performance, internal audits, output from management review, internal & external customer satisfaction.

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GLOSSARY OF TERMS

ABBREVIATION	EXPLANATION
Adm. Officer	Administering Officer
AN	Approach Note
BE	Business Excellence
BIS	Bureau of Indian Standards
C & C	Contracts & Commercial
CET	Centre for Engineering & Technology
CGM	Chief General Manager
Cl. No.	Clause Number
CSI	Customer Satisfaction Index
CTE	Cost & Techno-Economics
DC	Draft Contract
DE	Detailed Engineering
Dept.	Department
DGM	Deputy General Manager
DIP	Draft Investment Proposal
DO	Desk Officer – executive of project division monitoring all assignments of particular customer(s)
DPR	Detailed Project Report
Drgs	Drawings
DS	Designer’s Supervision
ED	Executive Director
e-Docman/SAN	e-Documents/ Storage Area Network
EOI	Expression of Interest
FR	Feasibility Report
GM	General Manager
HOD	Head of Department (includes head of sub-centre, unit office, and section).
HOD (SC)	Head of Sub-centre or Unit office
HOD (LS)	Head of Department (Lead Section)
IBM	Indian Bureau of Mines
I&A	Instrumentation & Automation
I/c	In-charge
IA	Internal Auditors
IPSS	Interplant Standardisation for Steel Industry



IS	Indian Standard
ISO	International Organization for Standardisation
ITT	Invitation to Tender
MAN	Manual
Mgr	Manager
MNP	Mining Plan
MP	Master Plan
MR	Management Representative
NCR	Non-Conformity Report
NIT	Notice Inviting Tenders
OF	Offer
OS	Ordering Specification
P&A	Personnel & Administration
PCA	Post Commissioning Assistance
PCR	Project Completion Report
PFC	Project Formulation & Coordination (a wing of project division)
PMS	Project Management System
QMS	Quality Management System
QAP	Quality Assurance Plan
RDCIS	Research & Development Centre for Iron & Steel
SAIL	Steel Authority of India Limited
SAILCON	SAIL Consultancy Division
SC	Scheme
SR	Study Report
TD	Tender Document
TE	Tender Evaluation
TF	Task Force/ Task Force member
TFL	Task Force Leader
TN	Technical Note
Trg	Training
TS	Tender Specifications
w.r.t	with respect to