



INSTITUTE OF MINERALS AND MATERIALS TECHNOLOGY
BHUBANESWAR
APEX QUALITY MANUAL
(Edition: 2 Revision: 0)

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1.2 Preamble

This document entitled Apex Quality Manual (AQM) is the apex level manual for Institute of Minerals and materials Technology (IMMT), Bhubaneswar. It describes the Laboratory research practices and addresses its alignment with the requirement of the Quality Management System (QMS) as per IS/ISO 9001:2008. The organization has set goals of maximizing customer satisfaction through quality research and development outputs and technology transfer.

The Laboratory is having **nine R&D Departments** namely: Advanced Materials Technology, Bio-minerals, Colloids & Materials Technology, Design & Rural Technology, Environment & Sustainability, Hydro & Electro Metallurgy, Mineralogy, Mineral Processing, and Natural Products; **two Cells** namely Process Engineering & Instruments and Library & Documentation and **two S&T Management Departments** namely: Business Development and R&D Planning.

To ensure uniformity in QMS practices while undertaking basic and applied research, each department/cell is having the documented standard, operating procedures described in the form of Departmental Quality Manual (DQM). DQMs address various processes in respective departments.

The manual is written in English language. All revisions and distributions of this document are controlled by the Management Representative (MR). The document is also available in soft form through IMMT intranet.

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1.3 Distribution

This Apex Quality Manual is approved by the Director, IMMT and is issued and controlled by the Management Representative. The controlled copies are distributed as follows :

Copy No	Copy Holder	Copy Type
1	Director	Hard copy
2	Management Representative (Also shared by External Auditors/Certifying Agency)	Hard copy
3	Deputy MR	Hard copy
4	Heads of Departments & Cells	Soft copy
5	IMMT Employees	Soft copy

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1.4 Amendment sheet

Sl.No	Section No	Page No	Description of Change	Issued on	Status			
					Previous		Current	
					Ed.	Rev.	Ed.	Rev.
1	2	4	Sec 2.3	18/11/2002	1	0	1	1
2	3	10	Sec 3.4	18/11/2002	1	0	1	1
3	4	2-3	Sec 4.2.3 Sec 4.2.4	18/11/2002	1	0	1	1
4	8	4-5	Sec 8.5.1 Sec 8.5.2 Sec 8.5.3	18/11/2002	1	0	1	1
5	9	1,2,7,9,10	Forms F-01, F-02 F-04, F-06 F-07	18/11/2002	1	0	1	1
6	3	10	Sec 3.4	02/06/2003	1	1	1	2
7	3	10	Sec 3.4	31/05/2004	1	2	1	3
8	1	1-3	Content Pages	28/12/2004	1	0	1	1
9	1	5 6	List of holders of AQM, Sec1.4	28/12/2004	1	0	1	1
10	2	2 5 6	Sec 2.1 (Text) Sec 2.4 (Text) Sec 2.4 (Chart)	28/12/2004	1	0	1	1
11	4	1	Ref of Annex I	28/12/2004	1	0	1	1
12	5	3,4	Sec 5.5.2	28/12/2004	1	0	1	1
13	10	1	Text in Table	28/12/2004	1	0	1	1
14	1	5	Text	05/01/2006	1	1	1	2
15	1	6	Amendment	05/01/2006	1	1	1	2
16	2	1-6	2.1-2.4 Text	05/01/2006	1	1	1	2
17	3	10	3.4	05/01/2006	1	3	1	4
18	4	2	4.2.3 Text	05/01/2006	1	1	1	2
19	7	6	7.2.3 Text	05/01/2006	1	1	1	2
20	7	14	7.6 Text	05/01/2006	1	1	1	2
21	8	1	8.2.2 Text	05/01/2006	1	1	1	2
22	9	1-10	Formats	05/01/2006	1	1	1	2
23	10	1	List	05/01/2006	1	1	1	2
24	All	All	All	01/10/2008	1	1-4	1	5
25	All	All	All	12/11/2009	1	1-5	2	0

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2.0 Laboratory overview

2.1 Background information

In October 1963, the Governing Body of CSIR decided to establish a multidisciplinary Regional Research Laboratory (RRL) at Bhubaneswar, Orissa, the fourth in the chain of RRL's. The Laboratory was formally founded on 13th April 1964 and came into existence in June 1964. The main Laboratory building was declared open on 7th September, 1968. The institute's focused area was to conduct research in harnessing the mineral and other natural resource utilization in the country. RRL was subsequently renamed as the Institute of Minerals & Materials Technology (IMMT), w.e.f. 13th April 2007, consequent upon a decision taken by the parent body, the Council of Scientific & Industrial Research (CSIR), New Delhi.

2.2 Business process flow

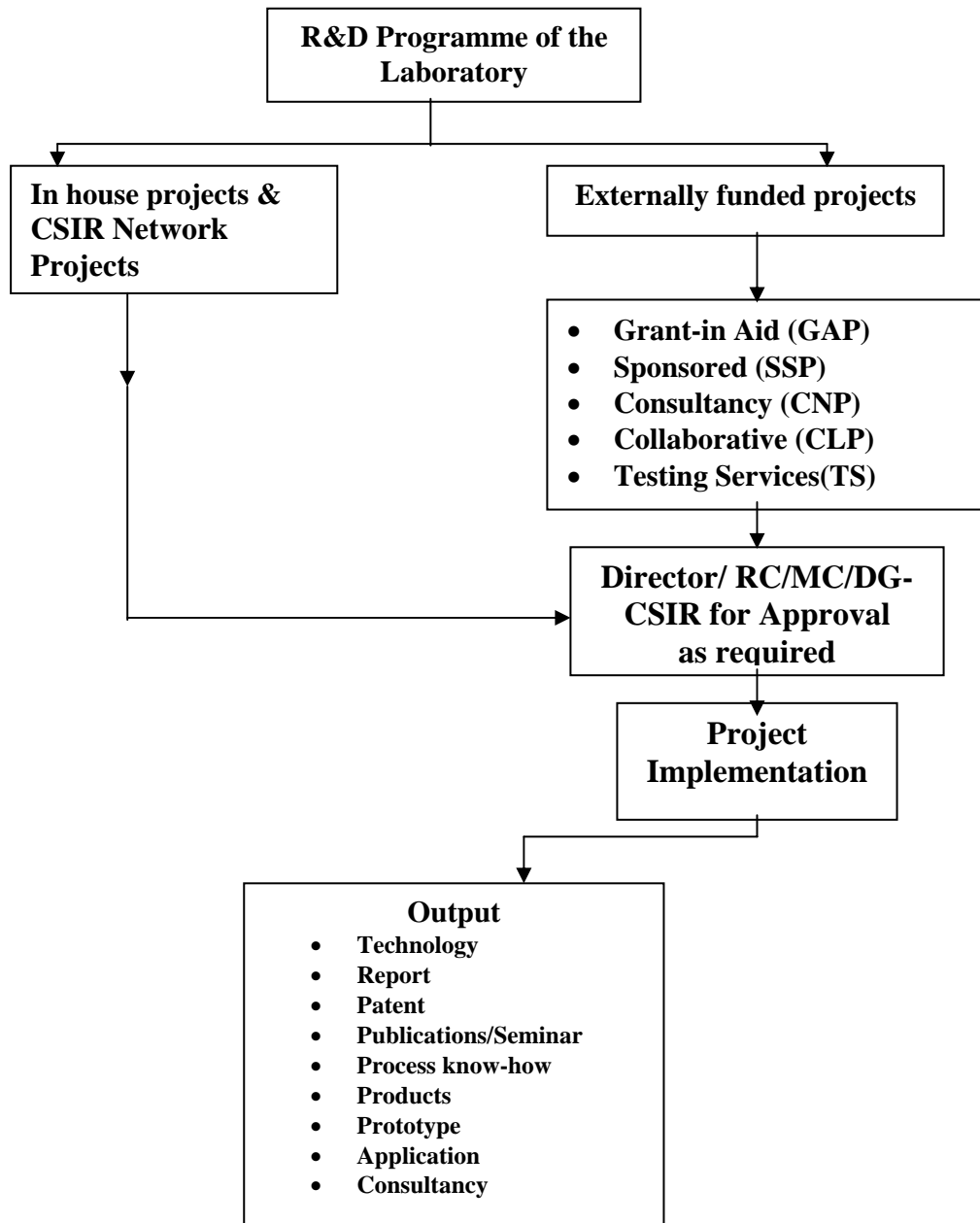
Institute of Minerals & Materials Technology (IMMT) is a constituent institute of the Council of Scientific & Industrial Research (CSIR), an autonomous body registered under the Societies Act. The funds for carrying out the R&D programmes and activities are received broadly under the following heads.

- a. Grant from Govt. i.e. CSIR for network/in-house R&D projects as well as meeting infrastructure cost. The major grant is received from Govt. through CSIR HQ against submission of annual plans/ budgetary proposals to the CSIR HQ. The sanctioning and controlling authority for such grant is vetted in the CSIR HQ.
- b. Grants from various Govt. departments for projects specifically funded by them either partially or wholly. This is obtained by submitting specific project proposals to the concerned departments as per their requirements and needs. These are termed as Grant-in-Aid Projects (GAP).
- c. Support for need-based, market oriented R&D projects sponsored by various industries & private parties who bear the full cost of these projects. These are classified as contract research projects (Sponsored Projects-SSP).
- d. Support for R&D projects which have larger national interest and where cost/infrastructure/expertise is shared between the institute and other organizations. These are termed as Collaborative Projects (CLP). These projects may be fully funded or partially funded by participating external organizations, including international/ overseas bodies/ agencies/ universities etc.
- e. Cost of providing various consultancy services and technical services including testing services is borne by the agencies/private parties for whom these are rendered. These are taken as Consultancy Projects (CNP) or Testing Services (TS).
- f. Fund is also received through provision of licensing of intellectual property and technology transfer.

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2.3 Process flow for core activities

R&D Programme



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2.4 Organizational structure

IMMT, Bhubaneswar, a constituent institute of CSIR, functions within the rules and bye-laws as amended from time to time and applicable to CSIR. The Governing Body of CSIR is the apex body for taking such decisions. CSIR is headed by the Director General (DG CSIR) who is its Chief Executive Officer.

At the Laboratory level, IMMT is headed by the Director, who is the executive head responsible to the Director General of CSIR on all matters pertaining to the management of the Laboratory.

The Director is advised by a Research Council on R&D matters. The Research Council is constituted by the Director General. There is a Management Council chaired by the Director, IMMT to decide on matters pertaining to the running of the institute as provided under the CSIR bye-laws by the DG CSIR and has representation from a sister CSIR institute at a high level. The decisions of the Management Council are subject to review by departments at CSIR HQ.

The Laboratory has at present thirteen S&T units called department/cell (as given in section 1.2). There are also house-keeping/service departments like administration, stores & purchase, finance & accounts, and engineering services to carry out the supportive functions.

Each of the S&T department/cell is headed by a senior scientist (Head of the Department/Cell), who is the executive head for efficient and quick transaction of business and decision making and reports directly to the Director.

There are a number of statutory committees to manage the affairs of the Laboratory. These are the Stores & Purchase Committee, Grievance Committee, House Allotment Committee, Royalty Distribution Committee, Official Language Implementation Committee, etc. as required by CSIR. There are also a number of other committees to advise the Director on various matters like Human Resource Development, Safety, Occupational Health, etc.

Organizational structure of IMMT is enclosed as Annexure.

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3.0 Quality management system drivers

3.1 Mission, Vision and Mandate

Mission

To harness the potential of science and technology for sustainable utilization of natural resources and to continually improve the standards of activities to maintain an optimum level of research and business (R&B) balance.

Vision

To build capability through scientific and industrial research to meet the demands of tomorrow in utilization of natural resources for sustainable economic, industrial, and societal development and to help create a vision for Indian minerals industry of the future.

Mandate

IMMT is committed to establish a synergy with the government and the industry to:

- Identify national priorities and be a part of industrial growth
- Generate innovative ideas through basic and long term high-risk research
- Generate program for industry of the future through green and viable technology development and its timely dissemination by adopting smart business strategy
- Develop human resources for and on behalf of the stakeholders to sustain the user driven market pull
- Win the aspiration of the stakeholders

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3.2 Vision - 5 years

The institute is located in a mineral and bio-diversity rich area of the country. The most effective utilisation and derivation of value-added items from these two major resource bases has been the main goal of the institute. The thrust in the coming decade will be to provide support to Indian industries to upgrade their technology to meet the challenges and needs of globalisation, diversify their product range and introduce new processes and technologies to exploit the endogenous resource base.

The objective is to develop value added products from the natural resources/wastes/off-grade minerals through development and utilization of cutting edge technologies for advanced materials, mineral processing, industrial derivatives from bio-resources, energy generation and conservation, environment management of industrial units, generation of products for use in the rural, agricultural and other non-formal sectors.

Besides, the institute would be providing services to various mineral and metallurgical industries for plant auditing, optimisation study & improvement plants, testing requirements, human resource development etc. Keeping these in view the institute's R&D activities would focus to develop core competency and generate indigenous technologies to meet the needs of the industrial customers in the following broad R&D areas:

- *Characterization of ores, minerals, and materials*
- *Beneficiation of low-grade ores and tailings*
- *Extraction of metal value from lean and complex ores*
- *Bio-mineral processing for extraction of copper, nickel, and uranium from low grade ores*
- *Environmental assessment and monitoring*
- *Advanced ceramic processing and application of plasma technology in metallurgy and materials science*
- *Herbal drugs formulations & standardization*
- *Consultancy & Technical Advisory projects for mineral, metallurgical, material, chemical and agro industries*
- *Techno-economic feasibility reports and basic engineering packages*
- *Analytical testing for water quality and chemical contents in ores, rocks, soils, slags, finished metals, and intermediates of metallurgical products*
- *Value addition to industrial wastes through processing of byproducts*
- *HRD in scientific and technological streams*
- *Appropriate technologies and devices for rural empowerment*

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Future Plan, Recommendations and Road Map

- **Development of complete packages in the value chain**
 - Partnership with engineering companies, PSU, Industry
 - Networking with CSIR and other National laboratories
 - Consortium
- **Adopting a royalty driven approach**
 - Development of brand image
 - Overcoming pitfalls in technology generation, up-scaling, testing and marketing
 - Leveraging capabilities to access business opportunities
- **Vigorously pursuing PPP**
 - Setting up of technology parks/ knowledge alliance centres
 - Allowing risk sharing
- **Establishing a sustainable knowledge continuity process**
 - Internal: Providing expert training to scientists
 - External: Arranging *on-site* training programmes for industry
- **Continuously replacing outdated paradigms with newer and more potent ones**
- **Emphasizing on quality infrastructure development**
- **Fostering innovation through promotion and reward**
- **Demonstrating leadership**
 - Sound information base
 - Good market outlook
- **Building a portfolio of the world class research laboratory of tomorrow**
- **Recognizing the importance of sustainable development of mineral resources and actively manage the situation while creating ECF opportunities**
- **Entering into and promoting new areas of research**
- **Promoting advanced centers of research and training**

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3.3 Quality policy

“Institute of Minerals and Materials Technology, Bhubaneswar is committed to adopt Quality Management Principles in pursuing world-class basic and applied research leading to the development of energy-efficient, environment-friendly and competitive technologies for effective utilization of mineral and other natural resources.

The institute shall systematically and continually improve its quality management policy to achieve success in a complex, demanding and ever changing system in addressing the needs and expectations of its stakeholders, while fulfilling the industrial, societal, statutory and regulatory norms.”

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3.4 Quality objectives (Three Years)

	Parameter	Achievement 2007-08	Target 2008-09	Achievement 2008-09	Target 2009-10
A	Business related External cash flow (Rs. Lakhs figures after Tax deductions)	738.6	1000	984.0	1000
B	Performance related Externally funded projects (new + continued)	CNP:13 CLP: 07 SSP: 37 GAP:51	Total: 100	CNP:10 CLP:05 SSP:40 GAP:68	CNP:12 CLP:05 SSP:45 GAP:80
	Patents (Filing & Grants)	Filing: 09 Grants: 08	Filing: 10 Grants:10	Filing:08 Grants:24	Filing: 10 Grants:10
	Publications	146 SCI:83	150 SCI:90	152 SCI:77	170 SCI:100
	Technology Transfers	04	05	14	10
	Awards to Scientists	06	08	05	10
	Exhibitions	-	03	04	05
	Scientific Events Organized including Training programmes	09	10	12	15

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3.5 Annual quality improvement plans

In the business of Research & Development, the Institute will constantly aim to complete the externally funded projects within the stipulated time-frame, meeting the objectives and goals of the project and thereafter, regularly keep in touch with the end-users. Deficiency, if any, will be promptly attended to keeping the customer satisfaction to zero complaint level. The organization shall continually improve the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

4.0 Quality management system

4.1 General requirements

In order to effectively deploy its Quality policy in the organization, IMMT, has implemented its Quality Management System (QMS) in accordance with the standard IS/ISO 9001:2008, so that maximum effectiveness and efficiency is achieved by utilizing the available resources in the most efficient manner, leading to the continual improvement in results and customer's satisfaction. The quality programme at IMMT controlled by policies, procedures and instructions and the quality management system is implemented in accordance with the written document. The Quality Assurance System (QAS) provides the planned arrangement (monitoring, measurement, analysis) of activities affecting the quality of components and subsystems to an extent consistent with their contribution to their final product quality. IN the event of outsourced services, the institute follows its set process.

(Ref. Annexure for process approach for Research activity)

(Ref. Process approach for outsourced jobs/services)

4.2 Documentation requirement

4.2.1 General

This QMS document includes the following:

- (a) Quality policy and quality objectives of the institute
- (b) Process description, procedures for effective planning, operation, control, measurement and continual improvement as means of effective process management
- (c) Maintenance of records determined by the institute

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4.2.2 Quality manual

The institute has prepared a comprehensive quality manual, which describes the quality management system practiced in various departments/cells as described in section 1.2. This document provides the overall generic guidance for quality management system in practice and establishes the procedures for management of research & development projects in the institute.

4.2.3 Procedure for document control

The following types of documents are controlled in the institute. They are Apex Quality Manual, Departmental Quality Manual, Work instructions, Specific contract R&D related Quality plans, Design drawings/design analysis, MoU/Agreement signed with customers/contractors, manuals of important instruments, project reports, various CSIR procedures, guidelines and administrative circulars, project proposals, annual reports and final reports.

The controlled documents in printed legible hard copies are systematically numbered and stamped in ink as “Controlled Copy”. Controlled documents with multiple copy holders are also additionally marked with respective controlling authority/Head of the Department, MR and Director.

The AQM is controlled by the Management Representative, who is responsible for any amendment, revision and distribution thereof. Any subsequent changes in the document is approved by original issuing authority prior to incorporation and circulation. Amended history of the document is maintained as per the format given at 1.4

The DQMs of the Department are controlled by the Heads of each department. The Head initiates any amendment, revision thereto and effects such changes after discussion with the Management Representative and Director. The DQMs are distributed and controlled by the Heads of departments as per approved list of distribution. Obsolete documents (e.g. Controlled document made obsolete through later revisions) at user points are destroyed by the concerned HOD. Existence of obsolete documents, if any, is to be probed by internal quality auditors during audit exercises to ensure effectiveness of controlled process. Important documents of external origin are maintained with the respective heads of department.

Electronic version of the AQM is made available to the staff of the institute through the intranet setup. Each department maintains a minimum number of hard copies of the DQM. Heads of department/cell ensure that the soft copies of the DQMs are available to all the staff working in the department.

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4.2.4 Control of records

Records pertaining to each Department are maintained by respective Departmental Heads. The various record types may be of the following categories (not an exhaustive list) and are maintained for each Department.

1. Leave record
2. Meetings record
3. Correspondence
4. Circulars/ Guidelines on various issues/rules
5. Services (Stores, Purchase, Engineering Services)
6. RC/MC/Budget review
7. Work record
8. Project records/files/reports
9. QMS related records including training, ISO audits, etc.

All the project related records are to be maintained by the project leader. These records include evidence of project conceptualization, project proposal (a kind of project quality plan), MoU, with various agencies, including client related to specific project, correspondences with client, amendments to project concept/ proposal, corrective actions to client initiated complaints, project progress reviews (at various levels eg. HOD / Director MC / RC level etc.). R&D Planning Departments also maintains a simultaneous record of all projects mainly pertaining to approvals, statutory/laid out requirements, extensions, report submission, etc.

Concerned HODs and project leaders are responsible for maintaining such records in appropriate project folders/computer files (as suitable) for specified period of storage as follows :

All records are retained for 7 years from the date of completion of any project (for audit requirement etc) as per the Government of India guidelines.

5.0 Management responsibility

5.1 Management commitment

The Director, IMMT, through his Management Representative (MR) is committed to develop, implement and improve the quality management system to attain its maximum effectiveness through the following;

- a. Communicating to the organization and the component staff members about the importance of customer focus as well as complying statutory and regulatory requirements.

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- b. Establishing the quality policy.
- c. Ensuring that the quality objectives are fully established.
- d. Conducting management reviews and planned quality audits.
- e. Ensuring the availability of adequate resources and
- f. Maintaining very responsive customer communications and relations management.

5.2 Customer focus

The Director, IMMT, through Management Representative (MR) and staff will ensure that the customer requirements are fully understood, identified and determined so as to enhance the effectiveness of the quality management system and to deliver quality results/products to the utmost satisfaction of the customers. Customers' opinion is honoured at every step of the project implementation/execution and their objections/complaints are immediately taken care of within the stipulated period of project implementation. Periodic reviews of projects are undertaken by internal committees as well as by the funding agencies. Efforts are made to seek and analyze customer feedback at the completion of the process (project).

5.3 Quality policy

Quality policy of the organization has been framed after deliberations involving the HODs and the same has been stated under clause 3.3. Due care is being taken to display it at all pertinent places of the institute and is being communicated to all levels. As and when required quality policy will be reviewed in the management review meeting for its continued suitability.

5.4 Planning

5.4.1 Quality objective

The apex level quality objectives and annual quality improvement plans are elaborated under clause 3.4 and 3.5 respectively. Department/functional level quality objectives are detailed in respective DQMs.

5.4.2 Quality management system planning

The Director, IMMT, through his MR and staff will ensure that

- a. the planning of the quality management system (QMS) is carried out at regular intervals and whenever it is felt appropriate, in order to meet the requirements, as well as the quality objectives.

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- b. the integrity of the QMS is maintained when the changes to the QMS are planned and implemented, and
- c. project related planning are carried out whenever a new R&D project proposal is submitted.

5.5 Responsibility, authority & communication

5.5.1 Responsibility and authority

The Director, IMMT owns the overall responsibility of addressing the requirements of this quality management system and is empowered to operate/sanction/delegate within the policy guidelines of CSIR. HODs and functional leaders of IMMT are required to meet the applicable requirements of management responsibility in the respective areas under their control and authority. The HODs are responsible for monitoring and coordinating the departmental and project activities, strictly adhering to the provisions provided in the respective Departmental Quality Manual (DQM). The responsibilities and authorities of key personnel are defined as under:

Director

- a. Ultimate responsibility of administration, finance and implementation of quality management system.
- b. Responsible for formulating and deciding policy matters for the organization.
- c. Chairman of the management review committee.
- d. Overall authority for purchase.
- e. Overall authority for research, business development and marketing.
- f. Overall authority for arranging training in and outside the organization.
- g. Management of customer relationship.

Head of the Department/Cell (HOD)

- a. Overall responsibility for administration of the Department/Cell
- b. Implementation of ISO 9001:2000 Quality Management System
- c. Development of team for project if necessary
- d. Identification of training needs
- e. Interface with customers

Controller of Administration (COA)/ Administrative Officer (AO)

The COA handles the administrative functions of the Laboratory. In the absence of COA the Administrative Officer (AO) is delegated the responsibility.

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Controller of Finance & Accounts (COFA) / Finance & Accounts Officer (F&AO)

The COFA handles the financial functions of the Laboratory. In the absence of COFA the Finance & Accounts Officer (F&AO) is delegated the responsibility.

Stores & Purchase Officer (SPO)

The SPO handles the purchase related functions of the Laboratory. In the absence of SPO the Dy SPO is delegated the responsibility.

The Organization Structure (Clause 2.4) shows the relative authority and interrelationship of these personnel.

5.5.2 Management representative

The Director, IMMT has nominated Dr. Srikant Sharma, Senior Scientist and Head R&D Planning as the Management Representative (MR) with proper authority and responsibilities in addition to his other responsibilities. The MR has the authority and responsibility for ensuring that the requirements of the standard are effectively met and maintained by the Laboratory. MR also reports to the Director for actions he may deem necessary in carrying out his job. This includes the establishment, implementation and maintenance of the quality system including future revisions.

MR is also responsible for control of all quality manuals including amendments made from time to time. These responsibilities also include liaising with external assessment body on quality related matters, including certification audits by them.

The Deputy Management Representative, Shri Snehasis Behera, Scientist, PEI Cell, shall assist the MR in the overall activity of the system. In the absence of the MR, Dy MR shall shoulder his responsibility.

(Ref. Office Memorandum Nos. 19(2)/96-E I Dated 16/11/2004 & 12(6)/94-Admn Dated 30/11/2004). File Reference: IT/QS/2002-05

Powers accorded to MR:

MR shall have the following responsibilities in order to implement the ISO 9001:2000 programme effectively.

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- a. To randomly inspect quality records in all Departments of the institute or through planned Internal Quality Audit Programme.
- b. To withhold any non-conforming product/service being supplied to the customer.
- c. To coordinate with the external surveillance audit teams.

5.5.3 Internal communication

The Director, IMMT, through his MR shall issue necessary circulars and directives in printed form to the concerned R&D personnel and service staff periodically, whenever necessary, for the effective implementation of the QMS. For faster communication, the electronic communications system like e-mail/ telephone are also used. All feedbacks/expectations from the customers are studied, summarized and periodically disseminated by the Project Leader to all concerned along with required measures to be undertaken. All customer complaints are handled by the Project Leader when addressed directly to him. In the event when the complaint is received by the Director, the same is handled by the project leader through planning department.

5.6 Management review

5.6.1 General

The Director, IMMT, through his MR shall ensure that proper review of the effective implementation of the institute's QMS is done at planned and regular intervals (half-yearly). While doing so the major thrust shall be given on the continuing suitability, adequacy and effectiveness of the QMS. Such reviews shall include assessing opportunities for improvement and need for amendments to the QMS, including the quality policy and quality objectives. The management review will operate at different levels to monitor the overall system performance. Records of all such management reviews shall be meticulously maintained.

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5.6.2 Review input

The input for the management review shall include the following information:

- a. Results and observations of the internal and external audits
- b. Feedbacks from the customer and assessment of customer satisfaction results
- c. Process performance (Department wise)
- d. Product conformity
- e. Status of preventive and corrective actions
- f. Follow-up actions from previous management reviews
- g. Changes that could affect the QMS
- h. Recommendations for improvement
- i. Evaluation of supplier agencies
- j. Progress on achievement of institute objectives/targets

5.6.3 Review output

The output from the management review shall include all decisions and actions related to :

- a. Improvement of the effectiveness of the QMS and its processes.
- b. Improvement of products with respect to customer's requirement and satisfaction.
- c. Requirement of resources.

6.0 Resource management

6.1 Provision of resources

IMMT determines and provides the necessary resources such as adequate materials, qualified and technical manpower/human resources, infrastructure facilities (e.g. institute equipments, implements etc.) and proper work environment so as to

- a. Implement and maintain the QMS and continually improve its effectiveness and
- b. Continuously strive to enhance customer satisfaction by taking into account the customer requirements and expectations.

The resource requirements are analyzed and budgetary allocations are made at appropriate levels so as to ensure the availability of adequate resources for successful execution of the project.

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6.2 Human resource

6.2.1 General

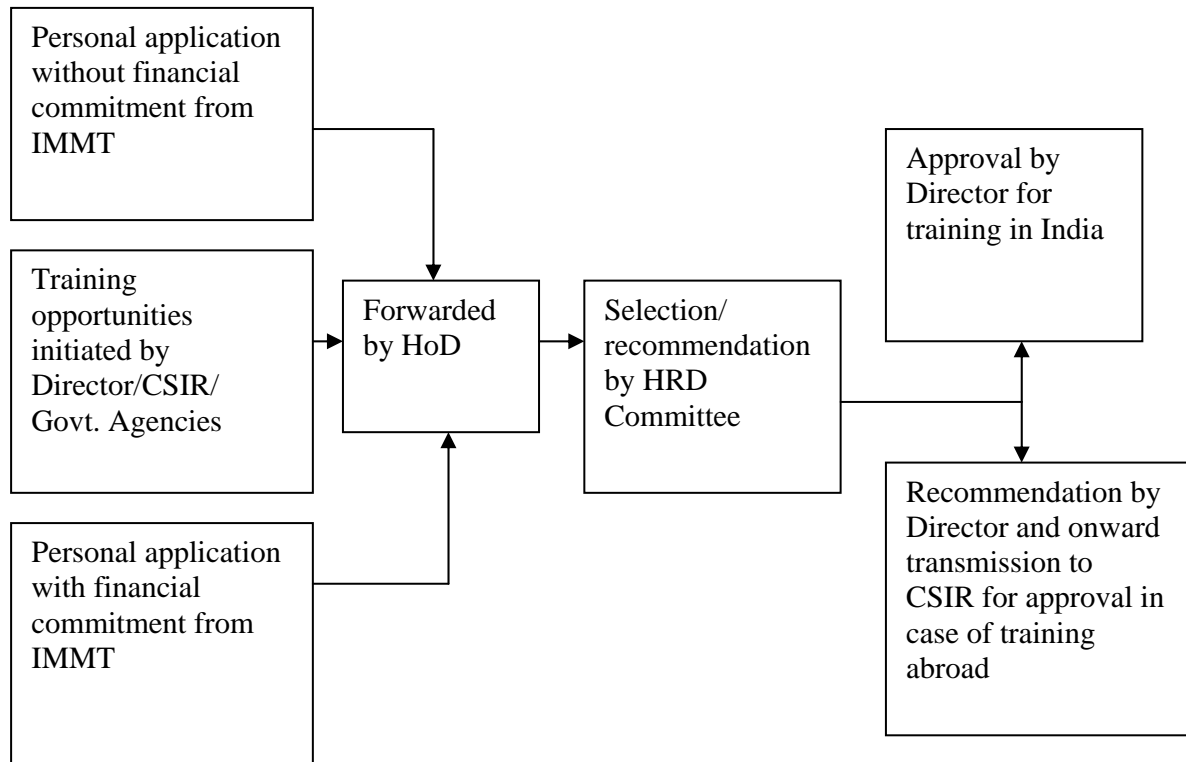
The institute ensures that qualified, trained and competent personnel are assigned the tasks of process performance for result generation and output delivery. This is achieved through continuous professional improvement, sustaining a high degree of team spirit and commitment to maintain a motivating work environment. The Laboratory, through its appropriate Assessments Committees, regularly assesses the skills and competence of the employees and considers whether they have the skills and abilities to perform the tasks that have been assigned to them and awards promotions/career enhancements if applicable.

6.2.2 Competence, awareness and training

The institute ensures the following

- a. Identifying and engaging, and if necessary, hiring of qualified personnel with appropriate education, training, work experience, professional skills and competence.
- b. Definite training plans are in place (in the line with CSIR HRD policy) for providing training where there may be gaps in needed skills and for bringing new needed skills to existing work force. Necessary trainings are provided to improve the professional skills/update technical knowledge and improve the overall competence for carrying out assigned tasks.
- c. Periodic evaluation of the effectiveness of the training or other actions taken.
- d. Its personnel are aware of and understand the importance of Quality Policy and the relevance of their activities as well as their contribution in achieving the quality objectives.
- e. Appropriate records of personnel education, training, skills and experience are maintained.
- f. External cash flow, publications and patents are considered as the indicators of competence enhancement
- g. A flow chart showing the process of selection for training activities is given below:

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6.3 Infrastructure

The institute regularly reviews, provides and maintains the required infrastructure in accordance with the service and product requirements and to achieve the planned results.

The infrastructure includes

- a. Buildings, institute workspace, well equipped workshop and associated utilities such as water, electricity, reprographic and library facilities etc.
- b. Latest equipments, gadgets, analytical instruments, computers, application software packages etc.
- c. Proper transport and communication facilities, including information system.

Of the above equipment, gadgets, analytical instruments and computers are maintained through Annual Maintenance Contracts (AMC) with the respective companies, while other infrastructure such as buildings, institute workspace, information systems and other utilities including transport, and telecommunications are maintained by the Engineering Services Department. The details are further elaborated in respective DQMs.

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6.4 Work environment

The institute takes care to monitor and timely improve its work environment so as to enhance the ability of employees to perform effectively in order to meet quality expectations. Elements of the institute's work environment include the following:

- a. Ability of the employees to be creative and become involved
- b. Clean work areas
- c. Proper safety rules and equipments
- d. Ergonomically appropriate work areas
- e. Pollution free work areas
- f. Ability to interact with others and work with a team spirit
- g. Complying to applicable regulations/statutes while operating pilot plants either in-house or at customers' premises.

7 Product realization

7.1 Planning of product realization

The objective of the institute is to undertake Research and Development (R&D) Projects to promote effective utilization of various endogenous resources that lead to economic prosperity and better quality of life for the people and provide knowledge-based services to various industries, public and private organizations, international agencies, and foreign organizations to advance their organizational objectives, keeping the overall national interest in view.

The resources required for carrying out these R&D projects are obtained from:

- a. CSIR Headquarters
- b. Government Departments and Agencies
- c. Public Sector Industries
- d. Private Sector Industries
- e. Private Organizations
- f. International Agencies
- g. Foreign Organizations

A brief description of various types of R&D projects are mentioned below:

In-house CSIR Projects:

The identification of these projects starts with the formulation of Five Year Plan document. A number of key technology areas or Major Laboratory Programmes are identified in this document on which the institute proposes to focus during the

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subsequent five years. This broad Five Year Plan provides the basis for the preparation of Annual Plan, which outlines the specific projects and the budgetary support sought from CSIR Headquarters for a year.

In addition, there are some centrally coordinated projects that are approved and directly monitored by CSIR headquarters and may involve multi-institute or multi-institution participation. These are special type of projects that are approved by CSIR Headquarters under various mission programmes, viz., network projects, facility creation programmes, etc.

Externally funded Projects:

Grant-in-Aid and Collaborative projects: The institute also applies to other Government Departments, Agencies, and Public Sector Industries directly, for full or partial financial support to carry out specific projects of relevance to its research programmes.

Sponsored projects: Based on the expertise and infrastructure available at the institute, both public and private sector industries and other organizations sponsor research and development programmes on specific problems of interest to them. The cost of such projects is fully borne by them.

Consultancy and Technical Service projects: They also seek knowledge-based services such as engineering consultancy, testing and analytical services etc. the cost of which is fully borne by them.

According to the source of funding and type of work, the projects are thus divided into six categories, viz; (1) In-house, (2) Grant-in-Aid, (3) Sponsored, (4) Collaborative, (5) Consultancy (6) Technical services and (7) CSIR coordinated Network projects.

Scope of projects:

CSIR or in-house projects are fully supported by CSIR and are meant for building capability in identified areas of research, and to do exploratory work for concept proving at institute scale. The expected outputs are; (1) Business development in the form of Sponsored/ Collaborative/ Grant-in-Aid/ Consultancy/ or S&T Service Projects from external/ user agencies (2) Advancement of knowledge through Publications/ Reports (3) Generation of intellectual property rights (4) Development of processes, products, & applications at institute scale (5) Human resource development.

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In addition the Mission oriented CSIR projects are meant for technology development in specific mission/ thrust areas and involve basic R&D, technology development, scaling up, demonstration, facility creation, infrastructure development, etc. These are directly approved and monitored by CSIR Headquarters.

The institute applies for Grant-in-Aid projects in R&D areas of relevance to its programmes, to various Government agencies as per their guidelines and priorities. These involve grant by way of financial inputs either in full or part, assistance in kind e.g. equipment, training etc. to supplement institute's efforts in on-going or new R&D projects or for creating new capabilities/ facilities.

Sponsored Projects are fully funded by clients having specific focused R&D objectives, well defined expected project output/ results, generally culminating in generation of intellectual property.

Collaborative Projects are partially funded by the client, and/or supplemented by provision of inputs such as expert manpower, engineering, production/ fabrication of product, testing/ trials, infrastructural facilities or other inputs.

The institute provides knowledge-based and technical services under Consultancy Projects and S&T Services, which are fully funded by the clients as per the norms of CSIR.

The externally funded projects are governed by specific guidelines issued by CSIR as regards scope, implementation, costing and approving authority.

The In-house projects are formulated annually keeping the Five Year Plan and other national priorities in mind. These are processed by the R&D Planning Department and submitted to CSIR after obtaining approval of Director in the form of an Annual Plan along with other projects (including projects partially/ wholly funded by external agencies), for allocation of funds from CSIR. The Planning Department acts as the nodal department for processing and approval of all R&D projects.

The project proposals submitted by various Departments include the following details for approval:

1. Preamble
2. Statement of the Proposal
(a) Title of the Project, (b) Review of present State-of-the-Art, (c) Objectives & Summary of Planned Tasks, (d) Deliverables
3. External agencies involved in the implementation of the Project and their physical and financial involvement

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4. Work Plan and Programme Schedule
5. Monitoring and review of the Project including Milestones/ checkpoints
6. Team Formulation and Assignment of responsibilities
7. Financial Requirements and Costing
8. Critical Infrastructural Requirements for the Project
9. Major constraints and plans to overcome them
10. Impact/ Benefits/ Returns expected in the form of
 - (a) Technology development
 - (b) Economic benefits
 - (c) Societal benefits
11. Expected Users / Beneficiaries
12. Terms and conditions and other documents approved by the Funding Agency/
Client

The R&D Planning Department (RDPD/PME) allocates a unique project identification number to each of the project that is taken up by the institute and maintains a project file on each of them which contains the approved project proposal, amendments made to the proposal from time to time, details of financial inputs, periodic progress and review reports, and documents and correspondences with external agencies which have contractual obligations for the institute.

The projects have an identified leader, who is the nodal person responsible for execution of the project along with his team members. The team consists of both scientific & technical staff.

The inputs required for successful execution of the projects as well as the specifications of deliverables are mentioned in the proposal. The outputs/ results are recorded in the project record book along with all the relevant operating conditions. The Project Leader maintains all relevant documents pertaining to the project in his Project File.

The project is reviewed from time to time by the project team/Head of the Department regarding its progress as provided in the project plan. The Project team/ Head of the concerned Department verify the conformance of the outputs obtained vis-à-vis the project requirements at the end of the project. The records of these reviews and verification are maintained in the project file. The PME Department/MC/RC including the client, if so desired, also periodically review the project.

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7.2 Customer-related processes

7.2.1 Determination of requirements related to the product

Before initiation of a project the scientists study the state of the art, interact with interested users/ beneficiaries and peer groups to determine the need, suitability and economic viability of the project. Then a proposal is submitted and reviewed internally before transmission to the client for funding.

Based on the feedback received from the funding agency and subsequent follow-up the proposal is revised, if necessary. Once the approval of the customer to the original or revised proposal is received, the project is planned for implementation and the details are put down in a specific format for approval of the competent authority. An agreement, sanction letter, work order or MoU with the client supports the proposal. This document specifies the requirements of the client in clear terms.

The Project Team tries to visualize all necessary performance and statutory requirements for the successful achievement of project objectives before undertaking the project. These along with the minimum acceptability criteria for the deliverables (where applicable) are mentioned in the project plan. The institute remains open for post delivery activities in accordance with project agreements.

7.2.2 Review of requirements related to the product

Before a project proposal is submitted to the client or taken up for implementation at the institute or an agreement is executed with the client, the same is reviewed and approved by the competent authority. The following aspects are examined during the review process:

- Project objectives and the specified deliverables
- Availability of resources to meet the objectives in the specified time-frame at the specified cost
- Relevance & justification for taking up the project
- Expected benefits to the customer and interested parties
- Constraints/ risks involved in taking up the project

7.2.3 Customer communication

During the execution of the project, the Project leader/ HoD/ Head PME remain in touch with the customer for necessary interaction, review and validation as provided in the approved project proposal.

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After the project is completed, the customer is requested to send its feedback on the project for further improvement and corrective action, in an appropriate format to the customer service cell of the institute.

The institute, through its S&T publications and website makes continuous efforts to provide information to its clientele. The website is constantly monitored and regularly updated. The computer department is responsible to update the website with latest contents on achievements and future strategy.

7.3 Design and development

Most of the projects undertaken by the institute involve process or product design and development. In order that these projects are successfully implemented, the following processes are followed.

7.3.1 Design and development planning

The methodology and work plan of the project, the assignment of responsibilities to team members as well as the time plan of execution are defined in the project proposal. In addition the proposal mentions the monitoring checkpoints/milestones for review of the project and reassessment of the adopted methodology keeping the overall timeframe and cost in mind. This is done periodically by the Project team/ Head of the Department. If it requires any changes in the requirements laid down by the customer the same is intimated to the customers for their approval. The project team headed by the project leader is primarily responsible for the successful implementation of the project. For all interfaces with the project team, the Head of the Department / Project leader act as the nodal point.

The planning involves assessment of constraints, risks and critical infrastructural requirements for the successful implementation of the project. The team also decides the monitoring checkpoints for review and assessment of outputs realized and future course of action.

7.3.2 Design and development inputs

The project objectives and the minimum acceptance criteria of the deliverables are clearly recorded by the project team before embarking on the project and as the project work progresses the same are continuously assessed. These requirements include functional and performance specifications of the process/ product, applicable statutory and regulatory requirements, and other environmental and operating requirements essential for successful realization of the objectives the project. Some of the process/ product specifications to be considered are:

- a. Product/ Process specifications including minimum acceptance criteria

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- b. Material specifications
- c. Testing specifications
- d. Operation, Installation, Application requirements
- e. Storage, Handling and Delivery specifications
- f. Maintenance
- g. Physical parameters and environmental requirements
- h. Reliability and availability
- i. Safety considerations
- j. Price and life-cycle costs
- k. Liability and environmental costs
- l. Waste disposal
- m. Statutory/ regulatory requirements
- n. Benchmarking of these against competing products/ processes

7.3.3 Design and development outputs

The deliverables of the project are clearly defined in the proposal. The outputs are recorded in the project record and verified by the project team/Head of the Department in order to ensure that they are authentic, reliable and meet the acceptance criteria. The information is preserved in accordance with the policy of the institute mentioned elsewhere.

7.3.4 Design and development review

The project execution and results are reviewed periodically or as scheduled in the project plan first by the project team which is certified by the Head of the project leader's Department, and optionally in presence of the client, if so desired. The team takes care to fulfill the planned objectives and milestones for the successful implementation of the project. The Project Monitoring and Evaluation Department also reviews the progress of projects periodically.

7.3.5 Design and development verification

The project leader in association with his team members does verification of satisfactory achievement of objectives laid down in the project proposal as modified from time to time, and explicitly records his observations including shortfalls, if any, for appropriate action. The Head/ Heads of the Department(s) certify this.

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7.3.6 Design and development validation

After verification of the project results, the project team validates the same if necessary, in presence of the client, and the same is certified by the Heads of the Departments, before sending/ delivery to the client.

7.3.7 Control of design and development changes

Any changes, modifications to a process or product delivered earlier are reviewed, verified and validated by the same team which did the job in the first place or in their absence by a competent team designated by the Head of the Department/ Director.

7.4 Purchasing

Provision of adequate and timely supply of material to scientists is of prime importance for carrying out meaningful scientific research as well as for meeting the targets set for completion of various in-house & sponsored projects. On the other hand, any public procurement will not only have to be made in fair and transparent manner but will also have to fall in line with the canons of financial propriety. The purchase procedure strives to achieve both these ends. IMMT follows CSIR purchase procedure for all procurements in principle and spirit.

The institute shall take care of the following issues while purchasing a product or service:

- a. Timely, effective and accurate identification of needs of purchased product/ service specifications
- b. Evaluation of the product taking into account performance, cost, delivery, post delivery service and warranty
- c. Procedure for verification of purchased products
- d. Training & Documentation
- e. Logistic and infrastructural requirement including personnel
- f. Statutory Requirements
- g. Safety Requirements

In addition the following issues related to suppliers/ vendors are taken care of during the tender evaluation process:

- a. Evaluation of previous experience with the supplier with regard to product quality, price, delivery, post-delivery service, response to problems etc.
- b. Checking of supplier's reference and available data on his track record
- c. Supplier's infrastructural, financial, logistic and service facilities and history of performance

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7.4.1 Purchasing process

The procurement of material in the institute can be divided into the following distinct stages:

- a. Finding the budget
- b. Prioritization of purchase of equipment, machinery etc. for the financial year for CSIR budget on project needs & priorities of externally funded projects.
- c. Placing of the indent by the scientist and other officers concerned after verifying the non-availability in stock.
- d. Consideration of the indents by the respective Stores & Purchase Committee (SPC).
- e. Calling for tender/ quotations and processing of tender papers by the purchase department.
- f. Evaluation of the tenders/ quotations by the respective Stores & Purchase Committees.
- g. Submission of the papers to the competent authority for sanction.
- h. Placement of orders.
- i. Arrival of equipment, inspection, installation and commissioning.
- j. Issue, stock entry, and payment as per terms.

The detailed process is described in the CSIR purchase manual “**Purchase Procedure – 2002/ Revised Purchase Procedure**” and its subsequent amendments.

7.4.2 Purchasing information

For items to be procured out of CSIR funds, the Director will appoint a committee at the beginning of every financial year to correctly assess the requirement of equipment, machinery, plant etc. for various projects including infrastructure requirement. A scientist of sufficient seniority will chair this committee. The committee will consult various heads of departments, get their requirements for the year and prioritize the list of purchases to be made in that year. The committee shall check the availability of such equipment in the lab, its performance and the rationale for procurement of another piece of equipment. This list will be circulated to all concerned by 30th of April. All purchases that are made during the year from CSIR funds will be in accordance with this list. The priority list for sponsored projects shall be finalized either through a committee or by PME or by Heads of departments/ Project leaders and approved by the Director. However, in order to meet emergency

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requirements, about 10-15% of the budget allocated for this purpose is kept as reserve and all emergency purchases may be made from this reserve.

Whenever an indent is placed by the scientist/ other concerned official, he has to ensure that the following details accompany it :

- a. A detailed description of the equipment including summary of its function and detailed specifications including whether the requirement is fresh or additional or replacement.
- b. The details, such as, the useful life of equipment, availability of spares, arrangement for maintenance etc.
- c. The estimated cost of equipment and that of spares, last purchase price if any,. (to be given separately).
- d. The list of available vendors, their addresses, past experiences if any and their website wherever available.
- e. A certificate to the effect that the item is of proprietary nature, if it has to be bought from a known, single source. (This certificate shall be given by the indenter, which shall be duly approved by the Project Leader. Both shall be responsible, if the certificate is found to be incorrect).
- f. a description of space requirement for the equipment, the installation area and other infrastructural requirements such as, power, civil works etc. wherever applicable.
- g. The approximate period required for the equipment to become operational from the date of its arrival.
- h. Tentative inspection schedule.
- i. Emergency purchase certificate, in case of purchase is to be made on emergent basis.
- j. Budget provision certificate duly linking with the Project/ scheme.

(Note: The indenter will submit his indent type written. No hand written indent will be accepted. No addition/alteration will be generally made in the indent. In case, this becomes necessary on rare occasions, the indenter will affix his initials on the corrections/additions made. Electronic submission of indents can be accepted with built in safety mechanism).

They shall be thoroughly checked in order that they are strictly raised as per the purchase procedure 2001. The SPO/ Dy. SPO should not normally accept indents, which are faulty or incomplete and return such indents to the indenter within two working days. Minor defects in the indents, however, should be set right by discussions with the indentors.

The Purchase Officer shall ensure while purchasing office equipment that the provisions of official Language Act 1963 are complied with.

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The Purchase Officer shall check that items sought to be imported do not fall within the restrictive list contained in the Exim policy.

The Purchase Officer shall satisfy himself if necessary by verifying from F&AO/PME/PL that funds are available commensurate with the delivery schedule.

The Indentor/PL/HOD shall ensure that the specifications suggested by the indentor confirm to the latest BIS specifications wherever applicable.

Since speed is of the essence, the Purchase Officer while vetting the indents must play a facilitating role. This role is to guide the indentor in order that the right item is bought at the right price. If necessary, he could help the indentor raise the indent in the correct manner by giving him relevant inputs.

7.4.3 Verification of purchased product

The indentor shall inspect the materials as soon as it arrives and shall normally adhere to the schedule given by him at the time of placing the indent. Normally the concerned indenting division should ensure completion of inspection within ten days of receipt of advise from the stores. For imported equipments the packing may be opened in the presence of the Indian agent to avoid short/ damaged supply due to improper packing. In any case the inspection shall be completed within the validity period of the insurance policy so that the claims for shortage/ damage if any, can be lodged with the insurance company. Failure to inspect the material within the time schedule shall make the Indentor and the concerned Project leader responsible for the loss. Once the inspection is complete and the indentor certifies the inspection report, Stores should ensure that the bill containing the stock entry reference and copy of the inspection report is sent to Purchase within three working days after the inspection is over. The Purchase wing shall send the same directly to accounts within four working days for payment and then the accounts must arrange payment to the vendor within five days from the date of receipt of bill. If for any reason, the payment is held up beyond the period stipulated, the matter shall be brought to the notice of the Director for his decision.

7.5 Production & service provision

The execution of project and follow-up actions necessary after the project outputs are delivered to the customer covered under this.

7.5.1 Control of production and service provision

While executing projects, the institute shall follow standard Good Laboratory Practice guidelines in the public domain. Some of the issues that are to be addressed by the Project Leaders and the Heads of the Department are:

- a. Proper planning of the project
- b. Competency of project team
- c. Training needs of project team

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- d. Adequacy of infrastructural support like information, supply of stores and equipment, services and utilities, tools, plant & equipment
- e. Monitoring, review and verification of the project outputs
- f. Recording of project data
- g. Disposal of harmful chemicals and waste products
- h. Implementation of product deliverables, and post delivery activities, if any

7.5.2 Validation processes

Sometimes it may not be possible to verify the project outputs at the institute. In such cases the project team shall define methods under which the scaling has been done and techniques followed to assure that project outputs meet the requirements laid down for the process/ product.

Further, where possible the same would be validated under field conditions, if provided for in the contract with the customer. The record of such validation, if any may be maintained in the project file.

7.5.3 Identification and traceability

A project number uniquely identifies each project. The corresponding project files of the project are maintained by the Project Leader and the PME department separately.

7.5.4 Customer property

The institute/ project team shall exercise care with customer property while it is under its control or being used by it. This also includes intellectual property or information to be treated in confidence. The use & access to customer's property must be in accordance with the mutually agreed principles and (or) following institute's policies regarding control of records. Damage, loss or unsuitability if any must be recorded and reported to the customer.

7.5.5 Preservation of product

The institute/project team shall maintain conformity of the product with customer requirements during internal processing and delivery to the intended destination, including constituent parts of the product. This shall include identification, handling, storage and protection.

7.6 Control of monitoring and measuring devices

The project leader shall identify the measurements to be made and the measuring and monitoring devices required to provide evidence of conformity of project results to specified requirements.

Measuring and monitoring devices shall be used and controlled to ensure that measurement and monitoring capability is consistent with the measurement and monitoring requirements.

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Where applicable, the project leader with the support of Calibration Head ensures that the measuring and monitoring devices shall,

- a. Be calibrated and adjusted periodically or prior to use, against devices traceable to international or national standards; where no such standards exist, the basis used for calibration shall be recorded.
- b. Be safeguarded from adjustments that would invalidate the calibration.
- c. Be protected from damage and deterioration during handling, maintenance and storage.
- d. Have the results of their calibration recorded.
- e. Have the validity of previous results re-assessed if they are subsequently found to be out of calibration, and corrective action taken
- f. Software used for measuring and monitoring of specified requirements shall be validated prior to use.

All the respective heads of research units have been instructed to educate the project staff to be judicious while using institute chemicals in experiments. Following safety norms specified by the manufacturer, checking for the expiry date of the chemicals, disposal of toxic wastes, etc. are few such instances.

8. Measurement, analysis and improvement

8.1 General

The institute shall plan and implement the monitoring, measurement, analysis and improvement processes to demonstrate conformity to product requirement, to ensure conformity of the quality management system and to continually improve the effectiveness of the quality management system.

8.2 Monitoring and measurement

8.2.1 Customer satisfaction

- a. All the In-house and externally funded projects are periodically reviewed and assessed by Research Council (RC), once in six months, separately for effective customer need addressal.
- b. At the end of the project, a detailed project report is sent to the customer. In some cases the draft project report is first sent and subsequently the final report is sent to the party after incorporating necessary inputs, if any, from the customer.
- c. The Heads of Department and Business Development Department of the institute ensure to organize getting feedback from customer on performance

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effectiveness of IMMT with respect to each project handled, either during execution of the project (mid course) or definitely at time of discussing the draft results with the customer. The customer evaluation form (CSR) adopted by CSIR is generally followed to seek the feedback. The feedbacks received are appropriately evaluated for further improvement in QMS practice and the RC as well.

8.2.2 Internal audit

- a. Management Representative plans, co-ordinates and executes the Internal Quality Audit (IQA) through the team of trained quality auditors.
- b. Two to four scheduled IQAs are performed in a year at proper intervals. Unscheduled audits may also be performed as and when the system demands.
- c. Planning for individual rounds of audit shall be done by MR describing area to be audited, auditee, auditors, scheduled date of audit ensuring that an area is audited by auditors not belonging to their area of operation.
- d. This will be served as audit notice to the Departments.
- e. Auditors are required to furnish audit report within 2 days of conducting the audit as per standard form (RRL/AQM/F-02) with one copy each to auditee and MR. Further audit reports should explicitly mention the Quality Audit elements audited in a particular audited area of activity. Reports issued, if any, should be mentioned in the report, attributing clause of the standard against which it is raised. MR maintains all reports with him.
- f. Audit, in general, is conducted by a team of two auditors, one being identified as leader. Only in exceptional cases, MR has the authority to allow conducting of an audit by one auditor only.
- g. Follow up audit, wherever needed, is conducted to verify and record the implementation and effectiveness of corrective action taken.
- h. The audit finding and implementation status of corrective action is discussed in management review meeting held by the Management Representative. All results are communicated to/ discussed with Director, by MR/Dy MR, for guidance and instructions, if any

8.2.3 Monitoring and measurement of processes

The processes undertaken in the institute for fulfilling the requirements of the customer are monitored/measured for effectiveness, through evaluations of the customer satisfaction index, computed based on the feedback obtained from customers, indicating IMMT's performance effectiveness in respective projects (Refer 8.2.1c). Effective performance of such processes is also monitored through analysis of the customer complaints received by the institute.

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The processes, undertaken for maintenance of the quality management system get monitored and measured through mechanisms like internal audit, management review, control of corrective and preventive action and analysis of customers' feedback.

Monitoring and measurement of processes also do occur in respect of product realization activities e.g. operations of specialized/sophisticated equipment, instrument, lab/bench scale facilities and pilot plant operations etc., as applicable.

Relative importance is given to the mechanism of monitoring based upon its impact on product realization.

8.2.4 Monitoring and measurement of product

All the products of the institute are in the form of technical reports. The project leader reviews the report to ensure that the objectives have been met. Director, with advise of PME releases the report after reviewing the executive summary, which outlines to what extent project objectives are fulfilled. Project leaders and PME keep the records.

8.3 Control of nonconforming product

The nonconforming products of the institute are the inadequacies in report, test results etc. indicated by the customer, which may come up after the submission of the final report for a project. The observations by the customer are examined and analyzed by the project team. If necessary, additional effort is made to repeat the required experimentations and analyses etc. The reconfirmed original/revised outputs are discussed with the customer and the inadequacies are taken care of by incorporating suitable amendments. Records of all such instances are maintained.

8.4 Analysis of data

The institute shall determine, collect and analyze appropriate data to demonstrate the suitability and effectiveness of the quality management system and to evaluate where continual improvement of the effectiveness of the QMS can be made. This shall include data generated as a result of monitoring and measurement of various processes as described earlier and also such data from other external/relevant sources. The data analysis techniques are applied in different departments depending upon the relevance in individual project situation. Data on the following aspects will be analyzed.

- (a) Customer satisfaction; (b) R&D output; (c) Vendor evaluation

The SPO shall deal with analysis relating to the suppliers' performance. The suppliers are evaluated based on their performance in meeting product quality, timeliness of supply etc. Based on such evaluations, sub-standard supplies are weeded out.

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8.5 Improvement

8.5.1 Continual improvement

The organization shall continually improve the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management reviews. Internal audit reports and customers complaints are generally the inputs for initiating corrective and preventive actions. Action taken to eliminate quality problems/potential quality problems shall be appropriate to the magnitude and the risk involved. Continual improvement planning are managed as below:

Responsibility for continual improvement	Process
HOD/Project leader	Product realization
Management Representative	QMS
Project leader/Top management	Customer related

8.5.2 Corrective action

Corrective action to external complaints from customer/external agencies and to the non conformity situations identified through internal quality audits are logged. The concerned project leaders / HOD, after due analysis of the root causes take necessary corrective measures and also intimate MR of the actions taken. The results of corrective actions taken and effectiveness of such steps are received in Management Review Meeting. Records of corrective actions and the review decisions (along with compliance of recommended follow up actions are maintained by concerned project leader / HOD / MR for review.

8.5.3 Preventive action

Internal audit findings pointing to the potential inadequacy of QMS / lacunae in the output of any project situation are reviewed by the project leader/team members/HOD. Preventive actions are devised after detailed analysis of the process in error, to ensure that the causes of potential non-conformities are eliminated.

Prior to implementation of preventive action, the action steps are implemented by process owner, i.e. concerned project team/Department against committed time bounds. The effectiveness/status of the preventive action is firstly examined by internal auditor and subsequently reviewed in the management review meeting. Records of preventive actions, together with related analyses and management review decisions are maintained by concerned process owner, with MR maintaining summaries of such records.

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Quality Management System AUDIT SCHEDULE & NOTICE	ISO 9001:2000 Internal Audit Round:
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INTERNAL AUDIT ROUND – ____

Department	Auditee	Auditor(s)	Date & Time of Audit
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	
		1. 2.	

N. B. Any last minute deviation in schedule shall be in consultation with MR & Auditee

(This format may be slightly altered as and when required keeping vital information intact)

Date:

Management Representative

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RRL/AQM/F-02

Quality Management System AUDIT REPORT	ISO 9001:2000 Internal Audit Round:
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Department Audited :

Name & Designation of Auditee :

Name of Auditor(s) :

Date of Audit & Time :

Title of Process(s) Audited & Sample Project. Code:

Clause	Description	Grade x/xx	Audit Observation

x/xx: Improvement required/ Compliance satisfactory

Any Specific comment (Compliance time / Corrective action) :

Signature & Name with Date

Auditee

Auditor-I

Auditor-II

MR/MRR

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Quality Management System DOCUMENT CHANGE REQUEST FORM	ISO 9001:2000 Edition Revision	
TITLE OF THE DOCUMENT:		
DOC NO:	ORIGINATOR:	
EDITION :	REVISION:	APPROVED BY:
ISSUE DATE:	ISSUED BY:	
DETAILS OF CHANGES:		
JUSTIFICATION:		
DATE:	(SIGNATURE OF THE PROPOSER: HOD/MR)	
DOCUMENT CHANGE APPROVED/ NOT APPROVED		
Date:	Concurred by (MR/Director)	

(Coping with changing mode of communication, this format may be relaxed)

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**INSTITUTE OF MINERALS AND MATERIALS TECHNOLOGY
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Quality Management System CUSTOMER SATISFACTION FEEDBACK FORM	ISO 9001:2000 Edition Revision
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CSIR institute name:

Title of the project:

Project ID No.:

Project initiation date: (dd/mm/yy)

Project completion date: (dd/mm/yy)

Name of Project Leader:

Cost of the Project:

Please use 5-point scale to indicate your satisfaction level below. The 5-point scale ranges from 1 being least satisfied to 5 being most satisfied.

I: Responsiveness, Facilities and Infrastructure

- 1) Support services (main-gate, reception, telephone operator, hospitality etc.) ...
- 2) Business development group
- 3) Development and finalization of Proposal (including agreement)
- 4) Operation/Maintenance of facilities and Infrastructure

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

II: Interaction with Project Team during implementation

- 1) Commitment towards Project
- 2) R&D Competence
- 3) Project implementation Strategy
- 4) Flexibility in adopting changes during project
- 5) Adequacy of the effort
- 6) Value System (Confidentiality, Ethical issues, etc.)
- 7) Accessibility of the team leaders/members

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

III: Deliverables

- 1) Comprehensiveness
- 2) Time frame observance
- 3) Quality of work
- 4) Presentation of final Report
- 5) Relevance of output to meet the customer needs
- 6) Content of Innovation

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

IV: General Remarks

Please tick-mark the appropriate response options for the following questions.

- 1) Would you like to repeat business with the institute?

Yes No

Please provide reason

- 2) Would you recommend this institute to others for R&D Services?

Yes No

Please provide reason

- 3) Level of Overall Satisfaction

Poor Fair Good Very Good Excellent

Please feel free to provide additional information on your experience with the institute and the areas where it could improve (use a separate sheet).

Name of Customer:

Date:

Customer Signature and

Seal

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ANNEXURE

Departmental Quality Manual (Departments/Cells)

NAME OF DEPARTMENT
ADVANCED MATERIALS TECHNOLOGY
BIO-MINERALS
COLLOIDS AND MATERIALS TECHNOLOGY
DESIGN AND RURAL TECHNOLOGY
ENVIRONMENT AND SUSTAINABILITY
HYDRO AND ELECTRO METALLURGY
LIBRARY AND DOCUMENTATION
MINERALOGY
MINERAL PROCESSING
NATURAL PRODUCTS
PROCESS ENGINEERING AND INSTRUMENTATION
R&D PLANNING

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ANNEXURE

Sample files in a Department/Cell

1. Attendance & Leave Records of Staff
2. Meetings Record
3. Correspondence
4. Circulars
5. RC/MC/Budget Review
6. In-house & CSIR Network Project Records
7. Externally Funded Project records
8. Technical reports
9. QMS, HRD, ISO related records
10. Lab records/ Sample incoming-outgoing records

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