

**MATERIAL TESTING
AND STANDARDS
DEPARTMENT**

MANUAL

MANUAL OF MATERIAL TESTING AND STANDARDS DEPARTMENT

CHAPTER – I

OBJECTIVE, ORGANISATION, DUTIES AND RESPONSIBILITIES

1.0 Introduction:

Material Testing and Standards (MTS) Department, an ISO 9001:2008 Certified (since 2010) department of the BES&T Undertaking was formed in the year 1969 with a view to Test and ensure the quality of various materials procured for activities of Electric Supply Branch of the Undertaking in order to have adequate stock of quality material conforming to relevant Indian Standards (I.S.) and/or BEST Undertaking's Specifications. This chapter describes the organizational setup of the MTS department and lays down the duties and responsibilities of the Officer/staff of the department. As per Administrative Order No.220 dtd. 2.5.1995, Testing of electrical materials utilised by Building Department (now Electrical Works department) was started in September 1995.

1.1 Objective:

The objective of the department is to test & check the quality of materials procured in the Electric Supply Branch & certain electrical items used in electrification of Undertaking's premises by Electrical Works department and confirm whether these materials are supplied as per the required specifications with respect to Indian Standards and/ or BEST Undertaking's Specifications.

1.2 Functions:

Following are the functions carried out by the MTS department to achieve the following objectives.

- 1.2.1** To carry out testing of tender sample of materials procured for the Electric Supply Branch received so as to help the recommending authority to scrutinise the offer & make tender recommendations.
- 1.2.2** To carry out sample testing from the lot supplies referred against Inspection Memos (IMs) to decide on their acceptance.
- 1.2.3** To carry out testing of samples received from the Electrical Works department referred against their Departmental Letters (D.Ls) & declare their conformity with the relevant I.S.(or otherwise).
- 1.2.4** To carry out testing of in-service materials requested vide their D.L.s by various divisions of Electric Supply Branch.

- 1.2.5** To procure testing equipment required for Material Testing Laboratory.
- 1.2.6** To maintain the testing equipment of Material Testing Laboratory & get them periodically calibrated from accredited laboratories.

1.3.1 **Organization:**

The department shall perform its function under general supervision and control of the Divisional Engineer Material Testing & Standards, in grade A3, who shall be reporting to the Deputy Chief Engineer (Stores), in grade A2.

The MTS department's office and its lab are located at below address / location

Divisional Engineer,
Material Testing & Standards Department,
1st Floor, Bijlee Bhavan, Kussara Bunder Road,
Mazgaon, Mumbai - 400 010.
Tel.No.022-23719753, 022-23716126 Extn.841,
Telefax. No. 022-23719753.
Email ID – (i) demts@bestundertaking.com
(ii) bestdemts@rediffmail.com

Location of Deputy Chief Engineer (Stores) office,
3rd Floor, Backbay Veej Bhavan,
Captain Prakash Pethe Marg,
Mumbai - 400 001.
Tel.No.022-22820835
Email ID- dcestores@bestundertaking.com.

1.3.2 **Working Hours:**

The Material Testing Office, Laboratory & its Centralised Inspection Cell shall observe the following timings;
9.00 a.m. to 5.30 p.m. with 30 minutes lunch break from Monday to Friday.
8.30 a.m. to 2.00 p.m. on Saturday without lunch break.

The Administrative office staff shall observe working between 9.00 a.m. to 5.00 p.m. on Weekdays (i.e. from Monday to Friday) with 45 minutes lunch break.

Unless warranted by situation, the department shall observe weekly-off on Sunday & non working on Holidays declared under Negotiable Instrument Act.

1.3.3 **Sections :-**

- A. Material Testing Section.
- B. Centralised Inspection Cell.

1.3.4 Organization Structure

The organization chart annexed at (Annexure“A”) shows the establishment set up as per sanctioned strength of the department.

1.4 Duties & Responsibilities of Divisional Engineer (Material Testing & Standards)

1.4.1 The Divisional Engineer Material Testing and Standards (DEMTS) shall be responsible for this smooth and efficient working of the Material Testing & Standards Department. He shall endeavour to achieve the objectives of the department by supervision and control of both the sections.

1.4.1.1 Material Testing Section :

He shall

- a) carry out frequent checks, inspection of materials certified by AEMTS, and ascertain problems concerning testing of materials, to consider difficulties faced by other divisions of Electric Supply Branch for the materials failed in testing and to consider development activities.
- b) ensure that the equipments used for testing are duly calibrated by Government recognised laboratories or manufacturers with adequate traceability certificate.

1.4.1.2 General

- a) He shall deal with all internal and external correspondence.
- b) He shall plan and co-ordinate the work of the sections.
- c) He shall be responsible for the submission of Annual reports, Variations in Establishment Schedule and Budget Estimates of the department.
- d) He shall control Budget Grants.
- e) He shall deal with all the staff matters of the department.
- f) He shall deal with the matters related with maintenance, replacement and procurement of new testing instruments.
- g) He shall attend Stores Co-ordination Committee meetings and follow up the proceedings for taking action for testing in time and maintaining requisite quality of materials.

2.0 CENTRALISED INSPECTION CELL:

2.1.1 Introduction:

In order to streamline the procurement of certain sundry materials (presently 140 items), like hand tools and consumables, where no testing is involved a new Centralised Inspection Cell (CIC) was formed in the M.T.S. Department where such items are being decided both at tender as well as lot supply stages, by mere physical inspection. For smooth and efficient working of the cell, new post of Superintendent, in Grade-A4, under BCR No.554 dtd.10.11.1997 was created.

2.1.2 Objective:

First : The Cell shall prepare Tender recommendation and carry out inspection at the time of accepting the lot of 140 items. Earlier as these 140 items were distributed among different divisions for acceptance and recommendations, the work sometimes got delayed. To reduce this delay and streamline the activity, the CIC cell was created.

Second : The cell is responsible for compiling monthly reports of Inspection Forms and Major Tender References (of value over Rs. 10 Lacs) dealt by various divisions of Supply Branch and put up summary report about progress of Tenders/ Inspection Forms to DGM(ES) vide Procedure Order No.123 dtd. 9/12/98.

2.1.3 Organisation :

At present the CIC is allocated with one Dy. Engr. in grade G/GVI, One Charge Engineer in grade P1/T8, & Two Nawghanies in grade P1/T1 on the establishment of M.T.S. Department.

The routine activities are carried out by the testing staff allocated to the Superintendent (CIC) who arranges to get the material inspected as per the prescribed method and time, under the guidance of DEMTS.

Necessary record on progress of the tenders recommended, Inspection Forms cleared and monthly reports sent to the management, with duplicate copies thereof are maintained by the Cell.

2.1.4 The Duties and responsibilities of the Superintendent C.I.C.

The Superintendent (Supdt.CIC), in grade A4 shall generally assist the DEMTS in the performance of his duties.

In particular he shall:

- i) deal with staff matters of the cell.

- ii) deal with all matters connected with calibration of the equipment of department.

2.1.4.1 Supdt.CIC generally assists the DEMTS in the performance of his duties, to achieve objective:

- iii) He is responsible for all the Functions of the CIC section.

He shall:

- iv) overall supervise the section activities.
- v) frequently inspect materials already inspected by the subordinate.
- vi) ensure that inspection of material are carried out as per standards laid down.
- vii) ensure that no delay is caused in inspection of the materials.
- viii) suggest changes in existing specification if required.
- ix) put up the proposal for change in inspecting/recommending authority for existing and newly procured materials if required .
- x) keep liaison with manufacturers towards development of better products;
- xi) keep all concerned officers informed about the drawbacks/improvements in materials used in supply section.
- xii) ensure periodical records of inspection results maintained as per prescribed method.
- xiii) submit the progress of inspection forms and major tender references dealt with various divisions of electric supply branch.

2.1.5 Duties of Deputy Engineer CIC:

The Deputy Engineer-CIC, shall be in charge of Testing and Inspection of Inspection forms and Tender References of the Material pertaining to CIC section, and shall be responsible to Supdt.CIC for inspection, testing and certification of materials.

He shall,

- i) inspect materials received against Inspection Forms and Tender References as per standards laid down.
- ii) be responsible for carrying out calibration of the equipments of department according to their annual schedule.

- iii) prepare the progress report of inspection forms and major tender references dealt with various divisions of electric supply branch.
- iv) check the existing specifications and suggest any necessary changes, if required, and bring to the notice of Supdt.CIC.
- v) to ensure that no delay is caused in inspection of the materials.
- vi) to bring to the notice of Supdt.CIC , for change in inspecting / recommending authority for existing and newly procured materials if required .
- vii) be assisting Supdt.CIC to keep liaison with manufacturers towards development of better products;
- viii) be assisting Supdt.CIC to keep all concerned officers informed about the drawbacks/improvements in materials used in supply section.
- ix) be assisting Supdt.CIC to ensure periodical records of inspection results maintained as per prescribed method.
- x) maintain plant and equipment of the laboratory for performance and safety.
- xi) maintain discipline, cleanliness and harmony in the department.

3.0 The Duties and responsibilities of the Assistant Engineer of Material Testing and Standards (AEMTS)

3.1 The Assistant Engineer (AEMTS), in grade A5 shall generally assist the DEMTS in the performance of his duties.

In particular he shall:

- i) deal with all staff matters of the department;
- ii) deal with all matters connected with installation, Commissioning & maintenance of equipments of the department.
- iii) be responsible for the submission of Annual Report and Budget Estimates of the department.

3.2 AEMTS generally assists the DEMTS in the performance of his duties, to achieve objective:

- i) He is responsible for all the functions of the Material Testing and Standards Laboratory.

He shall:

- ii) overall supervise the Material Testing Laboratory.

- iii) frequently inspect materials already inspected by the other staff;
- iv) ensure that all the tests are carried out as per standards laid down;
- v) ensure that no delay is caused in testing of the materials;
- vi) submit correct analysis of the samples received;
- vii) develop methods of tests for various materials and prepare draft standards, where National Standards do not exist.
- viii) plan and follow up development activities;
- ix) plan and execute research activities;
- x) arrange for testing of materials at various other laboratories where such tests are not feasible in M.T.S. Laboratory.
- xi) keep liaison with other laboratories and other facilities.
- xii) keep liaison with manufacturers towards development of better products;
- xiii) visit and keep liaison with manufacturers for testing of supplies;
- xiv) keep in touch with all the latest testing methods and procedures;
- xv) contribute towards development of National Standards;
- xvi) keep all concerned officers informed about the drawbacks/ improvements in methods and materials used in supply section;
- xvii) maintain safety of personnel and equipments, in his charge;
- xviii) keep himself informed with the BEST Committee proceedings regarding Tender transactions and recommendations therefore;
- xix) ensure that all the personnel are properly trained in the correct use of testing equipments;
- xx) ensure that the equipments used for testing are calibrated by Government agencies/ manufacturers with adequate traceability Certificate.
- xxi) ensure accuracy of testing equipments by comparison to National or International standards.
- xxii) justify and convince the accuracy of test results to other officers and suppliers if need be.
- xxiii) clarify such test results as required by any other officer;

- xxiv) arrange for overtime working of the department, sanction of the management when necessary.
- xxv) keep himself in touch with the proceedings of Supply Branch Conference, particularly regarding items of testing and problems regarding items of testing and materials.
- xxvi) keep the cost of testing as low as possible by multiple batch testing and increase in variety and efficiency.
- xxvii) update and maintain the Deadstock and Capital inventory records of equipments/materials pertaining to the department.

4.0 Duties of Deputy Engineers : -

4.1 The Deputy Engineer-I, shall be in charge of Testing of Inspection forms References of the Material Testing Laboratory, and shall be responsible to AEMTS for inspection, testing and certification of materials.

He shall:

- i) carry out inspection of materials;
- ii) test materials as per standard methods;
- iii) in consultation with AEMTS, develop jigs and fixtures and alternative methods for testing materials and equipments;
- iv) prepare and check the test reports;
- v) ensure that all equipments are in working condition
- vi) ensure that all safety precautions are observed while using the equipments for testing.
- vii) report about the tests carried out, to the concerned department after approval of AEMTS.
- viii) keep record of the Test Reports;
- ix) plan tools and equipments for tests.
- x) maintain harmony and discipline in the laboratory.

4.2 To clear Inspection Forms within stipulated period of 7 days.

4.3 Prepare monthly reports as per standard procedure and submit to AEMTS by 5th of every month. The report should mention the major events and justification for exceeding clearance of References beyond stipulated period.

4.4 Ensure that Standard's documents and Testing Procedure of various type of materials are kept updated, alongwith relevant BEST's Specifications and also arrange to procure various IS/BIS booklets National/ International Publications referred in laboratory or amendments /revisions etc.

4.5 Be responsible for maintaining the instruments/equipments, cleanliness etc. for following laboratories.

- i) Schering Bridge Laboratory
- ii) Energy Meter Testing Laboratory
- iii) Illumination Laboratory.

4.6 For carrying out the above activities, he will be normally assisted by the following staff

- One Sub-Engineer in grade G/GV
- Two Charge Engineers in grade T8
- One Test Asst. in grade T5

4.7 The Deputy Engineer-II, is in charge of the testing against Tender References of the Material Testing Laboratory and is responsible to AEMTS.

His duties are listed below:

He shall:

- i) test the samples received against Tender References.
- ii) bring to the notice of AEMTS variations required in specifications of the items.
- iii) prepare specifications of plant and equipment required to be purchased for the Material Testing and Standards Laboratory.
- iv) maintain plant and equipment of the laboratory for performance and safety.
- v) prepare draft standards for methods of tests of various materials, under instructions of AEMTS.
- vi) keep the record of Technical Literature and I.S/B.I.S/BEST Specifications.
- vii) develop and arrange the fabrication of jigs and fixtures required for all testing facilities, in consultation with AEMTS.
- viii) train all junior staff in the proper and safe use of testing equipments.
- ix) assist AEMTS to prepare Annual Reports, Budget Estimates etc. of Material Testing Laboratory Section.

- x) maintain discipline, cleanliness and harmony in the department.
- 4.7.1** Complete the testing of samples received vide Tender Reference and samples received vide DL from Electric Works Department within stipulated period of 15 days. Samples received vide DL from Supply Branch Departments are to be tested within 21 days.
- 4.7.2** Prepare monthly reports of the testing, carried out on materials of above References and submit to AEMTS by 5th of every month. The report should mention the major events during the month and justification for exceeding the stipulated period of clearing References.
- 4.7.3** Ensure that Standard's documents and Testing Procedure of various types of materials, are kept updated, alongwith relevant BEST's specifications and also arrange to procure various IS/BIS booklets, National/International Publications referred in department on amendment/revision.
- 4.7.4** Be responsible for maintenance of instruments/equipments, cleanliness etc. for following laboratories of the department.
- i) Heat run Testing Laboratory
 - ii) H.V. Testing Laboratory
 - iii) Chemical Laboratory
- 4.7.5** Be responsible for implementing the programme of calibration of all the instruments/equipments of the Department as per sanction obtained from the management and submit monthly report to AEMTS.
- 4.7.6** For carrying out the above activities, he will be normally assisted by the following staff
- One Sub-Engineer in grade G/GV
Two Charge Engineers in grade T8
One Test Asst. in grade T5

5.0 DUTIES & RESPONSIBILITIES OF OFFICE ASSISTANT, IN GRADE AGVIII

- 5.1** Office Assistant, (OAMTS) in grade A/GVIII shall look after all the Administrative and Establishment work and report to Divisional Engineer (MTS). He shall:-
- i) prepare various periodical statements (monthly/quarterly/half yearly and yearly) to be forwarded to various levels of management (Appendix "C").
 - ii) Supervise the work of clerical staff of the Department.
 - iii) Assist DEMTS to deal with internal and external correspondence/follow up of departmental proposals.
 - iv) Prepare and control Budget Estimates of the department.

- v) Update and maintain the Deadstock and Capital inventory records of the equipments used in the department.
- vi) Amend, revise and update the departmental manual.
- vii) Ensure proper records of test reports and to dispatch them to proper acceptance authority/Inspecting Authority within time.
- viii) Arrange for the payment of Incentive Bonus/OT payments if any, to the staff and subsequently to obtain Management's sanction whenever required.
- ix) Keep follow up of various proposals, reply Audit queries, check of all the incoming and outgoing departmental files & put up position as Internal MIS to DEMTS before 10th of every month.
- x) Maintain and arrange to reimburse, from time to time, the departmental Imprest cash.
- xi) Assist DEMTS in repairing/calibrating work of various equipments installed in laboratory for testing various materials.
- xii) Assist DEMTS in putting up proposals of scrapping /replacement/ New purchase of equipments, required in Laboratory from time to time.
- xiii) Ensure proper records of various IS/BIS booklets, other Indian Publications/International Publications purchased by department.
- xiv) Arrange various test reports forms, other stationery items used in department by printing / xeroxing.
- xv) Deal with all the staff matters as regards to Establishment/ Administrative work

CHAPTER - II

PROCEDURAL WORKING OF THE DEPARTMENT

6.0 This chapter lays down the procedure of working of the department, where BEST Standards already exist, a reference is made.

6.1 **Testing of Tender Samples:**

The Tender Samples received against tenders are referred to the Material Testing Laboratory for carrying out the specified tests, and submitting report thereof. All scheduled tests are carried out as per the standards and specifications laid down for different materials either by BEST or IS, to the maximum extent possible. In addition to the test results, the report submitted to the recommending authority should also contain a comparative statement about the quality, performance, construction workmanship etc. of the samples. A register is kept which shows the date of receipt and the date of disposal of the Tender to and from the Material Testing Laboratory and the D.L./Note reference no. under which the record is sent. Normally 15 days are allowed for such tests. However, if numbers of samples are more this period may be extended.

6.2 **Testing under Reference of Deptt. Letters:**

Under this category various in-service materials like transformer oil, Current Transformers, Potential Transformers etc. are referred for testing in MTS Laboratory from various divisions of Supply Branch. Bench marks for clearing these references are 21 days.

6.3 **Testing of electrical materials from Electrical Works department of Electric Supply Branch)**

As per Administrative Order No. 220 dtd. 2.5.95, Electrical items under 12 categories are referred for testing under Departmental Letters. A separate record regarding testing of these materials is kept and are sent to Electrical Works Department. The Bench marks for clearing these references are 15 days.

6.4 **Acceptance Testing:**

The materials received in transit stores of the Materials Management (MM) Department against the various purchase orders are subjected to tests, known as "Acceptance Tests", for confirming that the supply is according to BEST Specifications and / or approved samples. Whenever, the material is received, the Materials Management (MM) Department sends the Inspection Forms giving the particulars of the materials received. After receipt of the Inspection form, the following procedure shall be followed:

- i) Enter the Inspection Form Number & Date in a Register
- ii) Get the relevant purchase order, and specification details.
- iii) Get the details of variation in the specification, if made after placing the order.
- iv) Obtain details of inspection of approved sample if any and modifications suggested by consuming or Planning Department.
- v) Get the relevant I.S./B.S./BEST Specification if any.
- vi) Get the approved sample, if any.
- vii) Decide about the tests to be carried out.

Bench marks for clearing the Inspection Forms in this category are seven days.

- viii) Select at random a fixed number of samples from the lot.
- ix) Carry out the tests as per Standard Methods of Tests, if any, on all samples.
- x) If no standard methods of tests are laid down or no specifications are given, or if no testing equipment is available, the certification should be carried out as per the prevailing methods with the available equipment, at the discretion of AEMTS in consultation with heads of consuming departments. AEMTS shall draw the attention of Planning Department all such cases where improper or no specifications are drawn.
- xi) Whenever the quantity is large, certain tests may be carried out on random samples as per sampling procedure laid down in relevant I.S. or as per common plan adopted by the Department.
- xii) A brief report about the results of tests carried out should be entered in a form, (Appendix D/E Test reports A & B forms).
- xiii) The inspection form together with the test report (Form A) is despatched to the inspection authority after making appropriate entry in the register.

6.5 Testing of Energy Meters:

Under this category Energy Meters are referred through MRE Department for testing and test reports are sent to Div. Engr. (Meter & Relays) for acceptance.

6.6 Formulation of Standard Test Methods:

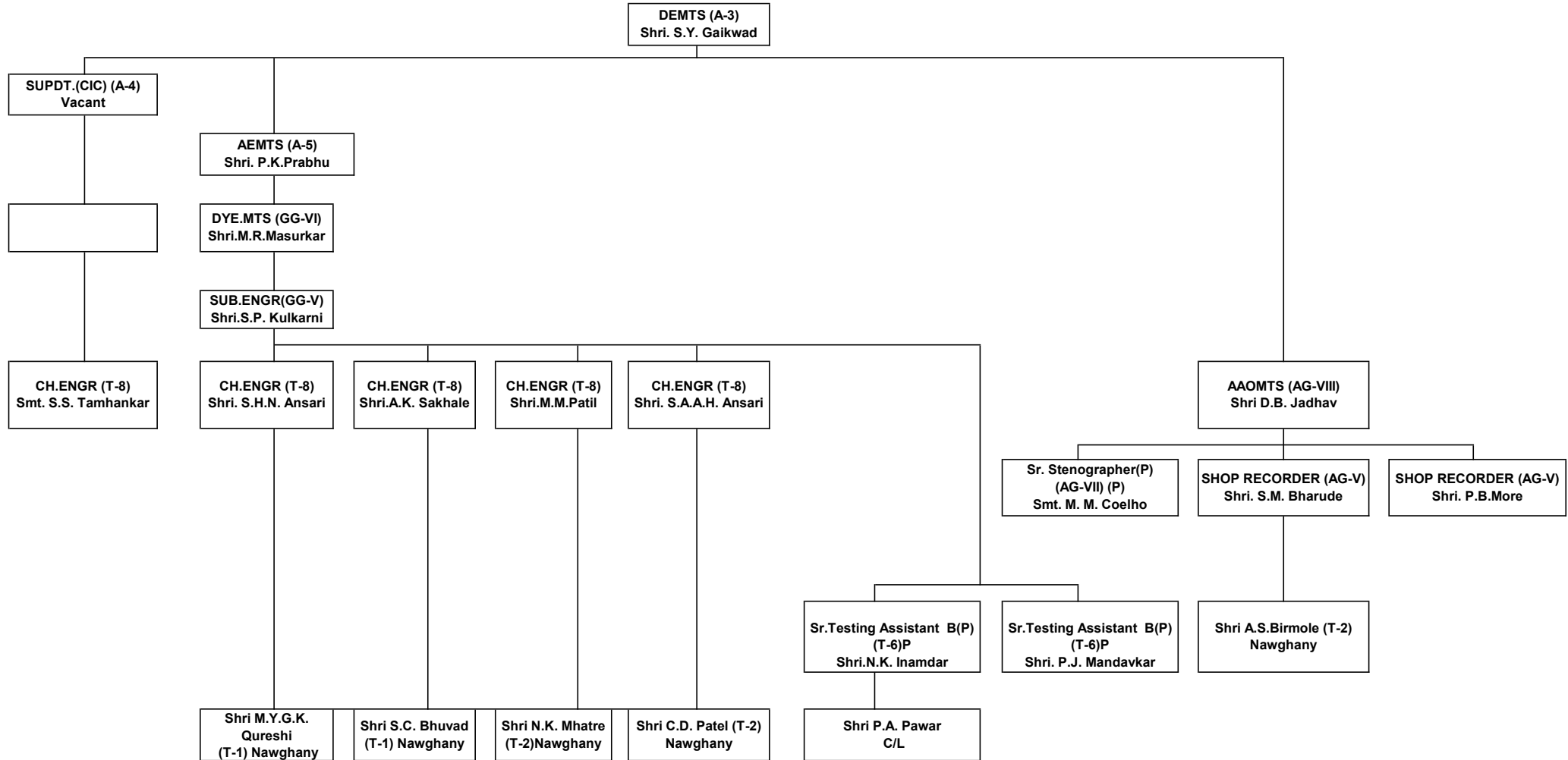
- i) The standard methods of tests are to be developed by the Material Testing section. For preparing these standards the following procedure shall be adopted.
- ii) Select items for which the Standard Methods of Tests can be developed.
- iii) Refer the relevant I.S./BIS./BEST Specification.
- iv) Note down the tests recommend in the above specifications.
- v) Consult the User departments, in respect of their special requirements, if any, about the materials.
- vi) Decide the tests which should be carried out.
- vii) Prepare a draft standard, describing the procedure of testing, and testing equipments required for testing.
- viii) Send the draft standard to DEMTS for finalising and issuing it as a BEST Standard. All the items required for the Supply Branch should be covered one by one.

- ANNEXURES**
- A. Organisation Chart of MTS Department
 - B. List of items of Electrical Works Department
 - C. Periodical Returns
 - D. List of materials tested at M.T.S. Laboratory

ANNEXURE A

DOC No. : MTS/MR/OCMTS
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ORGANISATION CHART OF M.T.S. DEPARTMENT AS ON 30.01.2021



LIST OF ITEMS OF ELECTRICAL WORKS DEPARTMENT

Sr. No.	Name of the Material
1	PVC cables with and without armoring
2	Miniature circuit Breaker distribution Boards with isolator
3	Kit Kat fuse base and carrier.
4	Indoor and Outdoor integral lanterns luminaries (HPMV, HPSV, LPSV types)
5	HPMV, HPSV, LPSV Lamps
6	Miniature Circuit Breakers
7	Earthing wire
8	Fuse switch units of 63 Amps and above
9	Insulation tapes
10	400 watts HPSV flood lighted luminaries
11	400 Watts HPSV Lamps
12	Bus Bars
13	Fluorescent tube light fittings
14	Fluorescent tubes.
15	Ceiling fans.
16	Exhaust Fans.
17	Air Circulators.
18	DOL and star Delta type starters.
19	Earth leakage circuit Breakers.

LIST OF REPORTS/ RETURNS FORWARDED TO THE VARIOUS LEVELS OF MANAGEMENT FROM MTS DEPT.

Sr. No.	Periodical Forwarded to	Returns
<u>MONTHLY</u>		
1.	Management Information System (MIS)	DGMES
2.	Report regarding testing of electrical materials utilised by Electrical Works Department.	AGM(C)
3.	Disposal of dept.enquiry cases, appeals, payment of final dues etc.	AMES/Dy.LOES
4.	Calibration of equipments.	DGMES
5.	On roll, superannuation position as on 1 st	AMES
6.	Position of staff vacancy (permanent)	AMES
7.	Position of Staff vacancy (Temp.)	AMES
8.	Absentee memo of "A & B" grade officers	IA
9.	Statement of officer/staff remaining absent for long time.	AMES
10.	Statement of mandays lost	AMES
11.	Report of pending cases/References etc.	SOES
12.	Disposal of letters received from VIPs like MPs/MLAs/Best Committee members etc.	SOES
13.	Expenses over Tea, snacks etc on outside visitors of DEMTS	SOES
14.	Input / output statement regarding Incentive Bonus	DETIE/JWSC
<u>QUARTERLY</u>		
15.	Staff on roll, transfers, promotions,	AMES/APM(BC)
16.	Expenses over recruitment of SC/ST, OBC etc.	AMES/APM(BC)
17.	Deputation reports of officers	DETIE
<u>HALF YEARLY</u>		
18.	Verification of Registration books of Motor Cars /Scooters maintained by A&B grade officers	Sr.MA/AGM(TE)
<u>YEARLY</u>		
19.	Renewal of NABL Accreditation	NABL, Delhi
20.	Renewal of ISO Certification	URS
21.	Renewal of Spirit license/Stock register of MTS Dept.	Collector of Mumbai
22.	Variations in Establishment Schedule	AMES
23.	Capital Budget	AMES
24.	Revenue Budget	CAO
25.	Confidential reports of A&B grade officers	AGM(P)/GM

LIST OF MATERIALS TESTED IN M.T.S. DEPARTMENT AGAINST I.M & TENDER	
Sr. No.	DESCRIPTION OF MATERIALS WITH IS NO.
1	Distribution Transformers (IS 2026 / 1986 & BEST Specification)
2	A) Energy Meters , Insuction Typy Class 2 (IS No. 13010 - 1990) & BEST Specification
	B) Energy Meters Static Whole Current Class - I (IS No. 13779 - 1999 & BEST Specification)
	C) CT operated Static Energy Meter Class 0.2 & 0.5 (IS No. 14697 / 1999 & BEST Specification)
3	L.V Capacitors (IS No. 13585 - 1994)
4	L.V .Armoured Cable (IS No. 1554 (P I) - 1988) & BEST Specification
5	Un-Armoured Cable (IS No. 694- 1990)
6	Cut - Out (IS No. 2086 - 1993) & BEST Specification
7	Fuse Base (IS No. 2086 - 1993) & BEST Specification
8	HRC Fuse (IS No.13703 - (Part I & II) - 1993 & BEST Soecification
9	Lanterns (with ignitor & capacitor) (IS No. 10322 part V sec. 3) & BEST Specification
10	Ballast HPSV / HPMV (IS No. 6616 - 1982) & BEST Specification
11	HPMV Lamps (IS No. 9900 (P I to IV) - 1992) & BEST Soecification
12	HPSV Lamps (IS No. 9974 (P I & II) - 1992) & BEST Specification
13	Switch Fuse Unit (200A, 400A & 630A)
14	Contactors (IS No. 13947(P I & IV sec.1) & BEST Specification
15	Current Transformers (IS No. 2705 (P I to IV) - 1992) & BEST Specification
16	Potential Transformer (IS No. 3156 (P I to IV - 1992) & BEST Specification
17	L. T. Bitumen tape (IS No. 2448 (P I & II) - 1995)
18	H.T. Bitumen tape (IS No. 7755 - 1993)
19	Rubber Handgloves (Type I) (IS No. 4770 - 1991)
20	Cotton Tape (IS No. 1923 - 1992)
21	Fuse Switch Unit (IS No. 13947 P I & III - 1993) & BEST Specification
22	Safety Shoes (IS 7400 P-15 & IS 5424) & BEST Specification
23	PVC Non Adhesive Tape (Red, Yellow, Blue, Black) (IS No. 13262 - 1992) & BEST Specification
24	Cork Sheet Compound Synthetic Rubber type 'C' Grade RL -70 C, (IS No. 4253 (P II) - 1980)
25	Outer Sleeve Compound (IS No. 702 - 1988) & BEST Specification
26	Iner Sleeve Compound (IS No. 7084 - 1973) & BEST Specification

Sr. No.	DESCRIPTION OF MATERIALS WITH IS NO.
27	Black Adhesive Tape 7809 (P-I & P-II) - 1977 & BEST Specification
28	Plastic Putty as per BEST Specification
29	Transformer Oil (New) (IS No. 335 - 1993) Transformer Oil (Old) (IS No. 1866 - 2000)
30	Epoxy Joining Kit (HV & LV) (IS No. 10333 - 1982) & BEST Specification
31	Lead Sheets (IS No. 405 (PI & PII) - 1992)
32	Lead Pipes (IS No. 404 (PI & PII) - 1992)
33	Paints 1) AL. Paint (IS No. 2339 - 1963) 2) Red Oxide Primer (IS No. 2074 - 1992) 3) Anti Corrosive Black Paint (IS No. 290 - 1961) 4) Enamel Paint (IS No. 2932 - 1993)
34	RCC Trough (150 mm, 100 mm) (IS No. 458 - 1988) & BEST Specification
35	RCC Tiles for 33kV cables (IS No. 458 - 1988) & BEST Specification
36	Al. Solder Stick (Test is not carried out in outside lab) (IS No. 5479 - 1985)
37	Tarpaulin (IS No. 2089 - 1977)
38	Aluminium Busbar (IS No. 5082 - 1998)
39	Cooper Busbar / Strip (IS No. 1897 - 1983)
40	Porcelain Insulator Drg No. ES/TE/A - 3 Rev. 'B'
41	Insulator Cable Hanger Drg No. ES/TE/A - 15 Rev. 'B' dtd 03.07.1984
42	Sheet Aluminium Plain (IS No. 2676 - 1981)
43	Backlite Sheet (IS No. 2036 - 1995)
44	Cork Sheet (IS No. 4253 (P II) - 1980)
45	Rubber Hand Gloves (IS No. 4770 - 19991)
46	Synthetic Mats (11 & 33 kV) (IS No.1562 / 2006) & BEST Specification
47	Rubber Mats (IS No. 5424 - 1969)
48	Gum Boots
49	Lugs & Ferrules (IS No. 8309 - 1993)
50	Brass Glands BEST Specification & Drg.
51	Fuse Wire (Cooper) (IS No. 2086 - 1993)
52	Super Enamelled Cu winding wire (IS No. 13730 (P 0/sec.1) - 1993)
53	Galvanised Iron Earthing Wire (IS No. 4826 - 1979) & BEST Specification
54	Sealing wire (IS No. 280 - 1978)
55	Metal Halide Lamps & BEST Specification

Sr. No.	DESCRIPTION OF MATERIALS WITH IS NO.
56	Halogen Lamps (500/1000/1500W) BEST Specification
57	Compact Fluorescent Lamps BEST Specification
58	Paper Separator BEST Specification
59	H.V.Insulating self amalgamating / self fusing tape as per BEST Specification
60	MCCBs IS 13947 (P-II) / 1993
61	MCBs IS 8828 / 1993
62	ELCB IS 12640 / 2000
63	ICTPN IS 13947 (P- I & P- III) / 1993
64	IGNITORS IS 9974(P-I & P-II)/1981 ,IS 12449(P-II) & BEST Specification
65	L.V.PILLARS / BOARDS IS 5039/1983, IS 2086/1983, IS 13703/1993, IS 5082/1981 & BEST Specification & Drg.
66	MINI PILLAR IS 5039/1983, IS 5082/1993 & BEST Specification
67	CEILING FAN IS 374/1979 & BEST Specification
68	EXHAUST FAN
69	ELECTROMAGNETIC CHOKES IS 1535 / 1993 & IS 2418 / 2000
70	PAPER As per BEST Specification
71	COPPER EARTHING WIRE IS 8130 / 1991
72	630A NON FUSIBLE COPPER LINKS As per BEST Specification & Drg.
73	T.L.FUSES As per BEST Specification
74	ELECTRONIC BALLAST IS 13021(P-I & P-II)/2000 & BEST Specification
75	LANTERN CAPACITORS IS 1569 / 1976 & BEST Specification
76	TERMINAL PROJECTOR (FOR SF-6 INSULATED) RMUS as per BEST Specification
77	15W LED LAMP
78	Single Phase PORTABLE RSM Class 0.2 (direct mode) Class 0.5 (clamp mode)