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Guidelines for the Type Tests for major equipment of Power sector



**GOVERNMENT OF INDIA
MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY**

Guidelines for the Type Tests for Major Equipment in Power Sector

1. Back ground:

Prior to commercialization, any equipment passes through product development stage, which requires various testing to achieve desired functionalities of the equipment. Once, the equipment design is finalized, it is subjected to type tests before going for commercial production. Type tests are generally performed on any equipment conforming to relevant National/ International standards to validate the design and to demonstrate its functional requirement meeting the intended application and reliable performance during its service life. These tests are also called ‘Proof Tests’ or ‘Design Validation Tests’. Such tests are not required to be performed on each unit of the equipment but are performed on representative design of the equipment. Moreover, successfully type tested equipment does not guarantee that there will be no failure of the equipment as the equipment is likely to encounter various types of electrical, mechanical, thermal and environmental stresses during its service life which may not match exactly with the conditions simulated during testing.

[Note: The word “equipment” used in the document refers to all items listed in the Tables in this document.]

National/ International standards does not specify any period for validity of type test results. However, since the quality of workmanship and the quality of components/ materials used in manufacturing of the equipment may change/ deteriorate over the years affecting overall quality, reliability and performance during service life of the equipment, utilities insists for repetition of type tests after a reasonable period of time to ensure that equipment quality, performance and reliability of the equipment is being maintained. The frequency of repetition of type tests by Indian utilities, even if the equipment has remained essentially the same (in terms of basic design, construction, material and manufacturing process etc.) has become a matter of concern as

it varies from utility to utility. Few utilities even do not accept type tests conducted on equipment of same rating /specifications and demand for repetition of type test(s). Sometimes testing time exceeds the entire production time e.g. over voltage cycling test for capacitors etc.. Facilities for some of the type tests for some equipment are not available in India for which these equipment are being sent abroad for testing.

In view of the increasing grievances of the manufacturers regarding type test requirements mandated by the utilities in their specifications and requests from many utilities, Central Electricity Authority (CEA) had organized a meeting with all major stakeholders on 10.09.2018 to deliberate and standardize the duration of validity of type tests conducted on transmission system equipment. All manufacturers and utilities had emphasized the need of uniform guidelines in this regard across the utilities in the country as this is unnecessarily leading to wastage of national resources, time & money and increasing burden on manufacturer and cost to the end consumers. Therefore, there was need to address such issues and develop uniform practice /guidelines relating to period of validity of type test reports of major equipment in Power sector for the benefits of end users, utilities and manufacturers in the country considering the cost/ complexity associated with frequent type testing of the equipment.

Further, Ministry of Power (MoP) had desired the Standardization of Test Protocols for E&M Equipment used in Power Sector. Accordingly, Central Electricity Authority (CEA) had constituted a Committee with members from CEA, Power Sector Utilities, Manufacturers, etc. vide CEA OM dated 01.11.2021 (enclosed as Appendix) to deliberate on the subject matter. The major decisions taken during the series of meetings (02.11.2021, 05.11.2021 and 30.11.2021) held by the Committee were to standardize the duration of validity of Type Tests conducted on various E&M equipment and preparation of Model Quality Assurance Plan (MQAP) of major E&M equipment in the entire power sector.

After detailed discussions amongst the Committee and sub-group members and inputs provided by the manufacturers/ vendors/ utilities, etc. this document has been prepared containing Guidelines for Type Test validity period of major Equipment used in all sub-sectors of Power sector viz.

Thermal generation, Hydro generation, Transmission, and Distribution sector.

2. Purpose of uniform Guidelines for Validity Period of Type Test(s)

The purpose of publication of these guidelines is enlisted below:

- a) To reduce the repeatability of tests, wherever possible:** Specifying validity period of Type Test would ensure that the equipment need not be tested again and again unnecessarily if no major change has been introduced in the basic design/ technology/ material/ mechanical construction/ functionalities of the equipment/performance characteristic/ manufacturing process of the equipment. This would help in saving cost as well as time of all the stakeholders involved (i.e. manufacturers/ vendors/ utilities, etc. and in turn the end consumer as well).
- b) To avoid overloading of testing facilities:** It is often observed that certain testing facilities are overburdened due to non-optimal utilization of testing facilities spread across the country. Specifying the validity of Type Test(s) would reduce frequency of tests on similar equipment and hence reduce burden on the existing laboratories.
- c) To avoid discrepancy in validity period of Type Test(s) being accepted or followed by various manufacturers or utilities and set uniform guidelines for all equipment manufacturers and procurers across the country.**

3. Broad Guidelines for Power Sector

- a) Validity period of type tests conducted on the equipment i.e. the period for which Type Test Reports (TTRs) shall remain valid and acceptable to user/ utility provided no major change has been introduced in the basic design/ technology/ material/ mechanical construction/ functionalities of the equipment/ performance characteristic/ manufacturing process of the equipment, shall be as given in **Annexures** [Annexure-I: Transmission Sector; Annexure-II:

Distribution Sector; Annexure-III: Thermal Generation; Annexure-IV: Hydro Generation].

- b) The type tests reports shall be valid as on the last date of submission of bid.
- c) Type test reports of 220kV voltage class equipment shall be valid for 230kV voltage class equipment as the highest system voltage is same in both cases provided Basic Insulation Level is same.
- d) Type tests on indigenous equipment, for which testing facility is available in India, should have been conducted in any independent laboratories approved by Government or accredited by National Accreditation Body of the Country, like Central Power Research Institute (CPRI), Electrical Research and Development Association (ERDA) etc.
- e) Type tests on indigenous equipment, for which testing facility is not available in India, should have been conducted in a laboratory of foreign Country accredited by National Accreditation Body of that Country.
- f) Type tests on imported equipment should have been conducted in an Indian laboratory or foreign laboratory accredited by National Accreditation Body of respective Country.
- g) The type tests conducted in-house by manufacturers shall also be acceptable provided the lab is accredited by National Accreditation Body of the Country and the tests have been witnessed by a representative of NABL accredited laboratory/ Power Utility.
- h) The result of all type tests shall be recorded properly in Type Test Reports (TTRs) containing sufficient information like the ratings, the relevant drawings, model number, test circuit, calculations (if any), photos and compliance to the relevant standards (IS/IEC) etc. The relevant clauses of the standards (IS/IEC) according to which type tests

have been conducted and acceptance criteria/values need to be brought out clearly in the report.

- i) All the testing equipment used for type testing should have been duly calibrated and the valid calibration reports should form part of the Type test reports.
- j) The equipment shall be supplied from the same manufacturing works, where from the sample unit was manufactured and successfully type tested as per relevant standard (IS/IEC) or at the works of Parent organization in case of technology transfer/ Joint Venture (JV)/ own manufacturing plant etc. for the initial period of 03 years from the date of establishment of manufacturing plant.
- k) In case of GIS and Hybrid switchgear, type test reports of parent company/ collaborator may be accepted provided same design and process by which parent company/ collaborator has manufactured the equipment, has been followed by the Indian manufacturer.
- l) The type tests of the equipment shall be repeated during its validity period, if there is change in technology or basic design or generic materials employed or manufacturing process or combination of any of above. However, minor changes, which have no effect on functionality & reliability of the equipment, may not require repetition of type tests. Minor changes do not include change in electrical stress, thermal stress, mechanical stress, change in construction, change in dielectric material, impregnating oil, thickness of electrode & internal fuse design in a capacitor, enclosure materials (magnetic, non-magnetic like stainless steel, Aluminum) etc.
- m) If relevant standard (IS/IEC) of the equipment is revised or amended, fresh type test is warranted even if equipment has not changed in design/ material etc. However fresh type testing will be limited to only those tests for which test procedure/ method, any technical requirement or test levels have been changed in the revised standards. In such cases, enough time as mutually agreed between the user and

manufacturer, should be given to manufacturer to comply with revised provision in standards.

- n) The utilities should co-relate the need of repeating type test(s) to changes in design/technology and may emphasize/ insist for stage inspection to check workmanship, manufacturing process and to ensure quality of the component/ material used in the manufacturing of the equipment.
- o) The change in the make of component(s) of the equipment shall not be the criteria for repetition of type tests provided that the component of new make has been successfully type tested and its use shall not affect the, functionality, performance & reliability of the equipment. The type test reports of the component of new make shall be submitted.
- p) Utilities, if so desires, may repeat the type tests, at their own cost even if valid TTRs have already been provided by the bidder/manufacturer. However, the utilities should refrain from making it a regular practice. The utility must clearly specify which type tests would be repeated in the event of award of the contract and quotation for such tests should be invited separately in the price bid. In such case utility shall provide extra time for repetition of such type tests.
- q) The philosophy of extending type test results of the equipment is based on two primary factors: similar design and design with higher stresses (electrical, mechanical, thermal, and environmental). Validity of type test report of a equipment can be extended to the same equipment of similar design and/or lower design stress provided relevant standard (IS/IEC) permits.
- r) It is practically impossible to subject all possible arrangements of the GIS (for a particular switching scheme corresponding to a specified voltage level) to type tests as various arrangements are possible using same combination of equipment depending on layout arrangement and space availability. The performance of any particular arrangement shall be substantiated from type test results obtained on representative

assemblies or sub-assemblies. The user shall check to ensure that tested sub-assemblies can be a representative form of the user's arrangement and meet his desired requirement/ objective.

- s) For capacitors, the successful completion of each type test is also valid for units having the same rated voltage and lower output (KVAR), provided that they do not differ in any way (i.e. design, construction, material, and production process etc.) that may influence the properties to be checked by the test.
- t) Repetition of short circuit test on transformer is not required due to change in make and type of bushings and/or make of OLTC provided bushings and OLTC of supplied make have same or better rating and have been successfully type tested as per relevant IS/ IEC.
- u) The utility shall not reject the transformer for supply against the contract, if the Short Circuit (SC) tests was conducted on the subject transformer as per relevant standard (IS/IEC) and it has successfully passed the SC tests and other type tests as per relevant standards.
- v) **Guidelines specifically applicable to Hydro Power Sector**
 - i) The latest CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations shall be also complied with for ensuring the minimum technical requirements for construction of Hydro-Electric Generating Stations.
 - ii) The design of turbine/ pump-turbine/ reversible turbine along with its various components/ parts/ sub-assemblies varies on the basis of various parameters such as available head, discharge, dimension of water conductor system, capacity etc. to achieve an optimum performance and efficiency, and hence are specific to the project & tailor-made. Not only the type of turbine

(Kaplan/ Francis/ Pelton, etc.) differ based on the available head, but various components of a particular turbine, viz. runner, guide apparatus, stay and guide rings, head cover, turbine shaft, shaft seal, bearings, governor system, etc. differ depending upon the requirements of different projects. As such, it is not possible to specify uniform Type Test validity period for different types of turbine/ pump-turbine/ reversible turbine along with its various components/ parts/ sub-assemblies. Hence, only those components of turbine auxiliaries are included for which Type Test validity could be specified for a longer period and which don't undergo major changes.

- iii) The design of Synchronous/ Asynchronous Machine/ Generator-Motor along with its various components/ parts/ sub-assemblies depend on various parameters such as MW rating, Voltage level, Current Level, specific speed, number of poles, head & type of turbine used, run-away speed etc. Similar to the case of turbines, different types of generators (umbrella, semi-umbrella or suspended type) are selected depending upon the project requirements. Further, their components such as rotor, stator, windings, shaft, bracket, bearings, etc. are uniquely designed for each project. As such, it is not possible to specify uniform Type Test validity period for different types of Generators along with its various components.

Transmission System (66 kV and above)
(Transmission lines material & Substation/Switchyard Equipment)

Sl. No.	Name of Equipment	Periodicity (in years)
1.	Power Transformer	5
2.	Shunt Reactor	5
3.	OLTC	10
4.	Power transformer Bushing / Reactor Bushing	7
5.	Transformer/reactor fittings and Accessories	10
6.	Circuit Breaker	10
7.	Isolator	10
8.	Lightening Arrester	10
9.	Wave Trap	10
10.	Instrument Transformers	10
11.	GIS & Hybrid Switchgear	15
12.	Cables and associated joints	10
13.	Capacitor	10
14.	Relays	7
15.	Conductors and earth wire	10

16.	High Temperature (HT) / High Temperature Low Sag Conductor (HTLS) conductor	7
17.	Insulators (Porcelain/ Glass)	10
18.	Composite Insulator	5
19.	PLCC/ FO cable / OPGW	5
20.	Transmission Line insulator hardware fittings, and accessories for conductor & ground wire	7

Distribution System (33 kV and below)

Sl. No.	Name of Equipment	Validity Period (in years)
1.	Power Transformer	5
2.	Distribution Transformer	5
3.	Circuit Breaker	5
4.	Isolator	5
5.	Lightning Arrester	5
6.	Instrument Transformers (CT/PT)	5
7.	LV and MV Switchgear	5
8.	GIS & Hybrid Switchgear	5
9.	Cables and associated joints (ABC/Underground)	5
10.	Capacitor/ Capacitor Bank	5
11.	Energy Meters <ul style="list-style-type: none">• Electronic Meter• Smart Meter	5 3
12.	Battery and Battery Charger	5
13.	Conductors (Bare/Covered)	5
14.	Insulators (Porcelain/ Glass/ Composite)	5

Thermal Power Plant**List of major electrical equipment :**

S.N.	Name of Equipment	Periodicity (in years)
1.	Power Transformer (GT, ST, UT, ICT)	5 (10 for UT)
2.	LT Auxiliary Oil filled Transformer	5
3.	Dry type Transformers	5
4.	Shunt Reactor	5
5.	OLTC	10
6.	Power transformer Bushing /Reactor Bushing	7
7.	Transformer/reactor fittings and Accessories	10
8.	HT Motors	5
9.	LT Motors	5
10.	DC Motors	5
11.	Circuit Breaker	10
12.	Isolator	10
13.	Lightening Arrester	10
14.	Wave Trap	10
15.	Instrument Transformers	7
16.	Dry Cast Resin CT, PT, NGT,CVT and CBCT	7
17.	Power Contactors	10
18.	Control Transformers	10
19.	LV and MV Switchgear	10
20.	GIS & Hybrid Switchgear	10
21.	Isolated Phase Bus Duct	10
22.	Segregated Phase Bus Duct	10
23.	LT-Sandwich Bus Duct	10
24.	Neutral Grounding Resistor	10
25.	Transformer-Insulating Oil	5
26.	Lighting & Welding Transformer	10
27.	EHV Cables	10
28.	HT, LT and Control Cables and associated joints	10
29.	DC Cables	10
30.	Cable Termination Kit & Straight Through Jointing Kit	10
31.	GI Cable Trays and GI Cable Tray Flexible Support System	10
32.	Capacitor	10
33.	Numerical Relays	7
34.	Energy Meter (including smart meters and ABT meters)	5
35.	Battery and Battery Charger (Lead-Acid & Ni-Cd) including Battery Health Monitoring System	7
36.	Substation Automation System	5
37.	Control & Relay Panel	5
38.	DG Set	5
39.	Lighting Fixtures	10

40.	Lighting Mast	10
41.	VFD System	5
42.	IN-Line Magnetic Separator/ Suspended Magnet	5
43.	Metal Detector	5
44.	Electro-hydro thruster (EHT) Brake/ EHT Rail Clamps	5
45.	Actuators (Without Integral Starter)	5
46.	Geared Motor	10
47.	Belt Weigher	7
48.	Weigh Bridge	7
49.	Heavy Duty Limit Switches	5
50.	Aviation Light	5
51.	ESP-TR Set	10
52.	ESP-Panel Type Hopper Heater	5
53.	Conductors and earth wire	10
54.	High Temperature (HT)/ High Temperature Low Sag Conductor (HTLS) conductor	7
55.	Insulators (Porcelain/ Glass)	10
56.	Composite Insulator	5
57.	PLCC/ FO cable / OPGW	5
58.	Transmission Line insulator hardware fittings, and accessories for conductor & ground wire	7
59.	Excitation system	5

Note(s) :

1. In case only type test reports are submitted, the following confirmation shall be submitted by the bidder/ OEM.
 - a. .No change in the Design after the type tests.
 - b. No change in the material/ sourcing.
 - c. No change in the manufacturing process.
2. In case of any conflict on the periodicity of similar items in transmission chapter, the periodicity mentioned in the transmission chapter shall be considered.

List of major mechanical equipment :

S.N.	Name of Equipment	Test(s)	Periodicity (in years)
1.	Butterfly Valves (Water Application)	Life Cycle Test (Proof of Design Test) as per AWWA C 504 / C-516	5 Years
2.	GRP (Glass Reinforced Pipes)	UV Test	Once for each product type
3.	3 LPE Coated MS Pipes	Adhesion Test, Impact Test Indentation Test, Elongation Test, Cathodic Disbondment Test, Degree of Cure for Epoxy, Long Duration test- Heat aging, Light aging and Coating Resistivity	5 Years for each product type/ size/ design
4.	Metallic Expansion Joint	Life Cycle test for 10 ⁴ Cycle Meridional yield, Rupture test Squirm test	5 Years
5.	Rubber Expansion Joint in Condenser Inlet and Outlet	Life Cycle test, Burst test	5 Years for each product type/ size/ design

6	PVC Drift Eliminators	Ultra Violet Rays Resistance Test for 500 Hours & then Izod Impact Test, ASTM B 256 / ASTM G 155-1	5 Years for each product type/ size/ design
7.	PVC Fills	Ultra Violet Rays Resistance Test for 500 Hours & then Izod Impact Test, ASTM B 256/ ASTM G 155-1	5 Years for each product type/ size/ design
8.	FRP Blades	Structural Stability Test	5 Years for each product type/ size/ design
9.	Carbon Fiber Shafts	Torsional Test	5 Years for each product type/ size/ design
10.	Dual Plate Check Valve	Life Cycle Test – 10 ⁵ cycles	5 Years for each product type/ size/ design
11.	Main Turbine Oil Centrifuge	Particle size impurities test and moisture test on one oil centrifuge	5 years
12.	Drive turbine oil centrifuge	Particle size impurities test and moisture test on one oil centrifuge	5 years
13.	Boiler Feed Pump	On one BFP <ul style="list-style-type: none"> - Thermal shock test - Visual Cavitation Test - Pressure Pulsation test - Axial thrust measurement - Complete strip down test - Pressure drop test on one strainer of each type & size On one BFP and One BP <ul style="list-style-type: none"> - Dry running test NPSH (R) test	a. One per size/ type/ model in each project Performance test, NPSH test, Strip Test at shop, and b. 5 years Pressure drop test on one strainer size/ type/ model
14.	Condensate Extraction Pump	<ul style="list-style-type: none"> - NPSH (R) test - Pressure drop test on one CEP Suction strainer 	a. One per size/ type/ model in each project, and b. 5 years Pressure drop test on one strainer size/ type/ model
15.	Drip Pump	Cavitation Test, NPSH Test	One per size/ type/ model in each project
16.	Boiler Circulating Pump	Measurement of performance parameters like unit functioning at pump temperature and pressure, hot standstill and start up test etc.	One per size/ type/ model in each project
17.	Light Resin Bound Mineral Wool	Thermal Conductivity Test	One year
18.	Fireproof Door	Flame Proof Test	5 years
19.	ID Fan	Measurement of performance parameters like flow, pressure, power, efficiency etc	One per size/ type/ model in each project
20.	FD Fan	Measurement of performance parameters like flow, pressure, power, efficiency etc	One per size/ type/ model in each project

21.	PA Fan	Measurement of performance parameters like flow, pressure, power, efficiency etc	One per size/ type/ model in each project
22.	Seal Air Fan	Measurement of performance parameters like flow, pressure, power, efficiency etc	One per size/ type/ model in each project
23.	Dampers/ Gates	Leak Tightness Test	One per size/ type/ model in each project
24.	Gravimetric Coal Feeder	Weighing Accuracy	One per size/ type/ model in each project
25.	CW Pump	Performance test	One per size/ type/ model in each project

Note(s) :

1. In case only type test reports are submitted, the following confirmation shall be submitted by the bidder/ OEM.

- a. No change in the Design after the type tests.
- b. No change in the material/ sourcing.
- c. No change in the manufacturing process.

List of major C&I Equipment :

S.N.	Name of Equipment	Test(s)	Periodicity (in years)
1.	Control valve	CV test	Once per product type/ size/ design
2.	UPS	Surge withstand capability	5 years
		Dry Heat test	
		Damp Heat test	
		Vibration test	
		Electrostatic discharge tests	
		Radio frequency immunity	
		Electromagnetic Field immunity	
		Degree of protection	
		Fuse Clearing Capability	
		Short Circuit current capability	
3.	PA System	Amplifier	10 years
		Microphones	
		Loud Speaker	
4.	Transducers	All Type Test	10 years
5.	Electronic Transmitters	All Type Test	10 years
6.	Dust emission Monitor	Degree of protection	10 years
7.	Instrument cable/ Control Cable	Conductor	10 years
		Resistance test-	
		Diameter test	
		Tin Coating test (Persulphate test)	
		Insulation	
		Loss of mass-	
		Ageing in air ovens**	

		TS elongation before and after ageing	
		Heat Shock	
		Hot deformation	
		Shrinkage	
		Bleeding & blooming	
		Inner sheath	
		Loss of mass-	
		Heat Shock	
		Cold bend/cold impact test	
		Hot deformation	
		Shrinkage	
		Outer Sheath	
		Loss of mass-	
		Ageing in air ovens**	
		TS elongation before and after ageing	
		Heat Shock	
		Hot deformation	
		Shrinkage	
		Bleeding & blooming	
		Colour fastness to water	
		Cold bend/cold impact test	
		Oxygen index	
		Smoke Density Test	
		Acid gas generation test	
		Fillers	
		Oxygen index test	
		Acid gas generation test	
		AL-MYLAR shield	
		Continuity test	
		Shield thickness	
		Overlap Test	
		Over all cable	
		Flammability Test	
		Swedish Chimney Test	
		Noise interference	
		Dimensional checks	
		Cross talk	
		Mutual capacitance	
		HV test	
		Drain wire continuity	
8.	Power supply	Surge withstand capability	10 years
		Dry Heat test	
		Damp Heat test	
		Vibration test	
		Electrostatic discharge tests	
		Radio frequency immunity	
		Electromagnetic Field immunity	
		Degree of protection	
9.	Battery	Ni-Cd Batteries	10 years
		Lead Acid Plante Batteries	
10.	LIE	Degree of protection	10 years
11.	Flue gas analysers	Degree of protection	10 years
12.	Master Clock	Functional Test	10 years
13.	Junction boxes	Degree of protection	10 years
14.	Flow nozzle	Calibration	10 years

15.	Electronic measuring instruments	All Type Test	10 years
16.	DDCMIS	Surge withstand capability	10 years
		Dry Heat test	
		Damp Heat test	
		Vibration test	
		Electrostatic discharge tests	
		Radio frequency immunity	
17.	PLC	Electromagnetic Field immunity	10 years

Note(s) :

1. In case only type test reports are submitted, the following confirmation shall be submitted by the bidder/ OEM.

- a. .No change in the Design after the type tests.
- b. No change in the material/ sourcing.
- c. No change in the manufacturing process.

Hydro Power Plant

Sl. No.	Name of Equipment	Periodicity (in years)
1.	Auxiliaries of Turbine and Governing System a) Turbine Auxiliaries i. Heat Exchanger b) Governing System i. Servovalves	05 10
2.	Generator Auxiliaries a) Fire Fighting System	07
3.	Main Inlet Valve/ Penstock Valve a) Spherical Valve/ Butterfly valve i. Servomotor	10
4.	All types of Pump i. Pump (Oil/Water) ii. Motor (AC/DC)	05 05
5.	Isolated Phase Bus Duct (IPBD)/ Segregated Phase Bus Duct (SPBD)	10
6.	a) DC Excitation System for Synchronous Machines b) AC Excitation System for Asynchronous Machines	10 10
7.	EOT Crane Auxiliaries i. Motors ii. Brakes iii. Limit Switches iv. Ropes v. Hooks	05 05 05 05 05
8.	Hydraulic Valves	07
9.	Static Frequency Converter (SFC) system/ Variable-Frequency Drive (VFD)	05
10.	Current Limiting Reactors	05
11.	Generator Circuit Breaker	15
12.	Phase Reversal Disconnecting Switch	10

13.	Dynamic Braking cubicle/Starting Switch	10
14.	EHV XLPE Cable and termination bushings	10
15.	Shunt Reactor/ Generator Transformer/ Distribution Transformer*	05
16.	Circuit Breaker*	10
17.	Isolator*	10
18.	Lightning Arrester*	10
19.	Wave Trap*	10
20.	Instrument Transformers (CT, PT)*	07
21.	LV and MV Switchgear*	10
22.	GIS & Hybrid Switchgear*	10
23.	Other Cables and Associated Joints*	10
24.	Battery and Battery Charger*	07
25.	Transformer/ Reactor Fittings and Accessories*	10

*The validity period of Type Test(s) in Transmission Sector shall be referred for these equipment.

Notes:

- i) *Bought-out equipment have not been included in the above list since their Test Certificates (TCs) establishing the requirement of purchaser upon review shall be acceptable to the purchaser and these need not be tested again.*
- ii) *Complete systems such as Fire Fighting, Public Address & Communication, Heating, Ventilation & Air Conditioning (HVAC), Illumination, Dewatering and Drainage, Cooling Water, Oil Handling, Air Compressor system and Control & Protection System are not covered in this list since these systems are not hydro power sector specific. Further, they cannot be Type tested as a whole and contain certain bought-out equipment for which TCs upon review shall be acceptable. However, some components of these systems, which are considered important for their basic functioning in the power plant, such as pumps, motors, hydraulic valve, current limiting reactors, phase reversal disconnecting switch and dynamic braking cubicle / starting switch are included in this Type Test list.*
- iii) *Any equipment not covered in the list shall be subject to the terms of mutual agreement between supplier and purchaser.*

**CEA OM DATED 01/11/2021 REGARDING
CONSTITUTION OF COMMITTEE FOR
STANDARDIZATION OF TEST PROTOCOLS FOR
ELECTRO-MECHANICAL EQUIPMENT IN
POWER SECTOR**



भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केन्द्रीय विद्युत प्राधिकरण/Central Electricity Authority
जल विद्युत अभियांत्रिकी व प्रौद्योगिकी विकास प्रभाग
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No. 10/3/HE&TD/2021/

Date: 01.10.2021

OFFICIAL MEMORANDUM

Subject: Constitution of Committee for Standardization of Test Protocols for Electro-Mechanical equipment in Power Sector-reg.

As Hon'ble Union Minister of Power has desired to standardize Test Protocols for Electro-Mechanical equipment in Power Sector, a Committee is hereby constituted consisting of the following members:

1.	Member (GO&D & Hydro), CEA	Chairman
2.	Chief Engineer (TE&TD), CEA	Member
3.	Chief Engineer (PSE&TD), CEA	Member
4.	Chief Engineer (DPT), CEA	Member
5.	Chief Engineer (RTD), CEA	Member
6.	Representative of CPRI	Member
7.	Representative of NTPC	Member
8.	Representative of PGCIL	Member
9.	Representative of NHPC	Member
10.	Representative of BHEL	Member
11.	Representative of SECI	Member
12.	Representative of DISCOM	Member
13.	Chief Engineer (HE&TD), CEA	Member & Convener


Further, the Committee may co-opt any other member, if required.

The **Terms of Reference (ToR)** of the Committee shall be as given below:

- 1) Standardization of Type Tests, Routine Tests, Field Acceptance Tests, etc.
- 2) The possibility of using CEA Regulations as part of Test Protocols.
- 3) Incorporation of outcome at Sl. No. 1 in CEA Regulations for making it enforceable.
- 4) Any other issue/ agenda with the consensus of the Committee.

The Committee shall submit a Report within 01 week from the date of receipt of this order.

This issues with the approval of the Competent Authority.


01/10/21
(Sonam Srivastava)
Asstt. Director

File No.CEA-HY-17-145/1/2018-HETD Division

To :

1. Chairman, CEA
2. Member (GO&D and Hydro), CEA
3. Chairman & Managing Director, NTPC Limited, NTPC Bhawan, SCOPE Complex, Institutional Area, Lodhi Road, New Delhi – 110003 – with a request to nominate a representative of NTPC (not below the rank of ED/GM)
4. Chairman & Managing Director, PGCIL, Power Grid Corporate Office, Saudamini, Plot No.2, Sector 29, Near IFFCO Chowk, Gurgaon (Haryana) – 122001 – with a request to nominate a representative of PGCIL (not below the rank of ED/GM)
5. Chairman & Managing Director, NHPC Ltd., NHPC Office Complex, Sector-33, Faridabad – 121003 (Haryana) – with a request to nominate a representative of NHPC (not below the rank of ED/GM)
6. Managing Director, SECI, 6th Floor, Plate-B, NBCC Office Block Tower-2, East Kidwai Nagar, Kidwai Nagar, New Delhi, Delhi 110023- with a request to nominate a representative of SECI (not below the rank of ED/GM)
7. Chairman & Managing Director, Bharat Heavy Electricals Limited, BHEL HOUSE, Siri Fort, New Delhi-110049 – with a request to nominate a representative of BHEL (not below the rank of ED/GM)
8. Chief Engineer (TE&TD), CEA
9. Chief Engineer (DPT), CEA - with a request to co-opt a representative from any DISCOM
10. Chief Engineer (PSE&TD), CEA
11. Chief Engineer (RTD), CEA - with a request to co-opt members from RE Sector (not below the rank of ED/GM)
12. Chief Engineer (HE&TD), CEA
13. DG, CPRI, Central Power Research Institute, Prof.Sir C.V.Raman Road, Post Box No: 8066, SadaShiva Nagar (p.o), Bengaluru, 560080