सत्यमेव जयते

भारत सरकार / Government of India

विद्युत मंत्रालय / Ministry of Power

केन्द्रीय विद्युत प्राधिकरण / Central Electricity Authority

विद्युत प्रणाली अभियांत्रिकी एवं प्रौद्योगिकी विकास प्रभाग

Power System Engineering & Technology Development Division

3rd Floor, Sewa Bhawan, R.K. Puram, New Delhi – 66

Telephone: 01126732349, Email: faraz@nic.in

दिनांक: 26.12.2019

To,

As per attached list.

विषय /SUB.:- Invitation of comments on the 'Guidelines for the Validity Period of Type Test(s) conducted on Major Electrical Equipment in Power Transmission System' - reg.

A meeting was held in CEA with power utilities and electrical equipment manufacturers on 10.09.2018 to deliberate and standardize the duration of validity of type tests conducted on transmission system equipment. All manufacturers and utilities emphasized the need of a uniform guidelines in this regard across the utilities in the country as this is unnecessarily leading to wastage of national resources, time & money and increase in burden on manufacturer and cost to the end consumers. It was decided that draft Guidelines on the same will be prepared and comments will be invited from stakeholders. Based on deliberation, draft Guidelines have been prepared [Enclosed herewith]. All the Utilities/Manufacturers/Other Stakeholders are requested to send their comments/observations/suggestions on the draft by post or through e-mail [faraz@nic.in] latest by 31.01.2020.

भवदीय,

Signature Not Verified
Digitally signed by **(फ़राज़)**
FARAZ
Date: 2019.12.26 15:20:49 IST

उप निदेशक

Guidelines for the Validity Period of Type Test (s) conducted on Major Electrical Equipment in Power Transmission System

1. Background:

Prior to commercialization, any product / equipment passes through product development stage, which requires frequent testing to achieve desired functionalities of the product. Once, the product / equipment design is finalized, it is subjected to type tests before going for commercial production. Type tests are generally performed on any equipment / product conforming to relevant National / International standards to validate the design and to ensure its functional requirement 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 every product / equipment but are required to be performed on representative designs of any product / equipment prior to its commercialization. These tests are based on known failure modes of a product / equipment and are carried out to identify its latent deficiencies based on such failure modes. IS / IEC does not specify any validity period for acceptance of type test results. Moreover, successfully type tested product(s) does not guarantee that there will be no failure of the product (s) as the product is subjected to different types of electrical, mechanical and environmental stresses during its service life. Sometimes testing time exceeds the entire production time (for example PQ tests on cables, over voltage cycling test for capacitators etc.). Some of the type testing facilities for various products / equipment are not available in India for which many of the products

/ equipment are sent abroad for testing. Adequate testing facilities need to be created in India to avoid dependency on foreign testing labs. It would also significantly reduce both time and foreign exchange requirement associated with the type testing process.

Ideally, repetition of type tests on the product is not desirable so long as there is no change in basic design / technology, mechanical construction, material, functionality of the product and manufacturing process. The change in design includes change in voltage stress, thermal stress, mechanical stress, current density, flux density, degree of protection etc. The change in materials includes enclosure material (magnetic, non-magnetic etc.), transformer core material (grades of CRGO, Amorphous, mu metal), insulating material (solid, liquid, gaseous), electronic parts (processor, memory, principal / main relays etc.). If relevant standard (IS/IEC) of the equipment / product changes, fresh type test is warranted even if product / equipment has not changed in design / material etc. However, many of the products involves manual intervention during manufacturing process and comprises of a number of bought out items. The quality of workmanship and the quality of components / materials used in manufacturing of the products may change / deteriorate over the years affecting overall quality, reliability and performance during service life of the product. Therefore, some Utility (ies) insist for repetition of type tests after a reasonable period of time to ensure that product quality, performance and reliability of the product is being maintained. The frequency of repetition of type tests by Indian utility (ies), even if the

product has remained essentially the same (in terms of basic design, construction, material and manufacturing process) has become a matter of concern as it varies from utility to utility. Few utilities also do not accept type tests conducted on products of same rating /specifications and demand for repetition of type test(s).

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 & manufacturers, 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 a uniform guidelines in this regard across the utilities in the country as this is unnecessarily leading to wastage of national resources, time & money and increase in burden on manufacturer and cost to the end consumers. Therefore, there is need to address such issues and develop a uniform practice across the utilities in the country. In view of above, efforts have been made to develop a guideline relating to period of validity of type test reports for the benefits of utilities and manufacturers in the country considering the cost / complexity associated with frequent type testing of equipment.

2. Broad Guidelines

The following points may be taken into consideration while deciding about repetition of type of tests on any equipment.

a) Type tests should have been conducted on the equipment in any independent Government approved labs or in labs approved by

National Accreditation Body of the country. As per Clause No. 5.4.3 of National Capital Goods Policy 2016, type testing of equipment of foreign origin shall be carried out in Indian laboratories, like Central Power Research Institute (CPRI) and Electrical Research and Development Association (ERDA) wherever type test certificate is a prerequisite for participation in bidding process.

b) The type tests conducted in-house by manufacturers shall also be acceptable provided the lab is NABL accredited and the tests have been witnessed by a third party.

c) The result of all type tests shall be recorded properly in Type Test Reports (TTRs) containing sufficient information like the ratings, the relevant drawings, calculations (if any) 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 need to be brought out clearly in the report for the benefit of utility (ies).

d) Validity period of type tests conducted on an equipment i.e. the period for which Type Test Reports (TTRs) shall remain valid and acceptable to user / utility provided no significant change has been introduced in the basic design / technology / material / manufacturing process of the equipment, shall be as follows:

Sl. No.	Name of Test/Equipment	Periodicity (in years)
i.	Energy Meters	3

ii.	Power Transformer	5
iii.	Distribution Transformer	5
iv.	OLTC	5
v.	Shunt Reactor	5
vi.	Power transformer Bushing / Reactor Bushing	5
vii.	Line Hardware & Accessories	5
viii.	Relays	5
ix.	Composite Insulators	5
x.	PLCC/ FO cable / OPGW	5
xi.	Transformer fittings and Accessories	7
xii.	Capacitors	7
xiii.	Cables (66kV and above voltage level)	7
xiv.	Isolators	7
xv.	Lightening Arresters	7
xvi.	Wave Traps	7
xvii.	Instrument Transformers	7
xviii.	Circuit Breaker	7
xix.	Battery and Battery Charger	7
xx.	Conductors	7
xxi.	LV and MV Switchgear	7
xxii.	GIS & Hybrid Switchgear	10

xxiii.	Insulators (Porcelain / Glass)	10

Note 1: Type test reports of 220 kV voltage class equipment shall be valid for 230 kV voltage class equipment as the highest system voltage is same in both cases.

Note 2: The period of validity shall be with reference to date of bid opening.

e) The type tests of an 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 an equipment, may not require repetition of type tests.

f) If relevant standard (IS/IEC) of the equipment / product changes, fresh type test is warranted even if product / equipment has not changed in design / material etc.

g) 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 manufacturing of the equipment.

h) The change in the make of component(s) of an equipment shall not be the criteria for repetition of type tests provided that the component of the new make has been successfully type tested and the test reports are enclosed.

i) No type tests shall be included as routine test / Factory Acceptance Tests (FATs) in the utility specification unless it is mutually agreed between user and manufacturer.

j) Utilities, if desires, may repeat the type tests at their own cost after award of contract even if valid TTRs have already been provided by the bidder/manufacturer. However, the utility (ies) should refrain from making it a regular practice.

k) The philosophy of extending type test results of an equipment is based on two primary factors: similar design and test on design with higher stresses (electrical, mechanical and thermal, environmental). Successfully type tested product (s) can be extended to cover products of similar design and / or lower rating / stresses provided relevant standard (IS/IEC) permits.

l) Successful conduction of PQ test on a cable sample produced in a manufacturing unit (using a particular manufacturing process) conforming to relevant standard (IS/IEC) shall be acceptable, provided the supply of cable is made from same manufacturing unit using same manufacturing process.

m) If performance certificate for more than one year, in support of satisfactory operation of cable, is submitted by the bidder / manufacturer, then Pre-Qualification (PQ) test is not required.

n) The equipment shall be supplied from the manufacturing plant, where from the sample unit was produced and successfully type tested as per relevant standard (IS/IEC).

o) 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.

p) For capacitors, validity of TTRs shall be based on voltage rating and not on the basis of kVAR rating as kVAR rating can be verified in routine tests.

q) The dielectric tests of the equipment of a particular voltage level should not be linked to current rating of the equipment for validation of the test.

r) Repetition of all type tests for Instrument Transformers should be discouraged for minor changes in accuracy class and burden.

s) Repetition of short circuit test on transformer is not required due to change in type of bushings and / or make of OLTC provided bushings and OLTC of supplied make have been successfully type tested as per relevant IS / IEC.

t) The utility shall not reject the transformer for supply against the contract, if the short circuit tests was conducted on the subject transformer as per relevant standard (IS/IEC) and it has successfully passed the tests..

****

1. Chairman & Managing Director,
   Powergrid Corporation of India Ltd.,
   Saudamini, Plot No. 2, Sector-29,
   Gurgaon-122001 (Haryana)

2. Chairman & Managing Director,
   Delhi Transco. Ltd.,
   Shakti Sadan, Kotla Marg, New Delhi-110002

3. Chief Engineer(Electrical)
   Goa Electricity Department
   Vidyut Bhawan, Panaji,
   Goa-403001

4. Chairman
   Haryana Vidyut Prasaran Nigam Ltd.
   Shakti Bhawan, Sector No. 6
   Panchkula - 134 109, Haryana

5. Managing Director
   Himachal Pradesh State Electricity Board
   Vidyut Bhawan, Shimla- 171 004

6. Managing Director
   Jammu & Kashmir Power Development Corporation Ltd.
   Exhibition Ground,
   Srinagar (J&K) -190009

7. Chairman
   Karnataka Power Corporation Ltd
   82, Shakti Bhawan, Race Course Road
   Bangalore- 560 001

8. Chairman
   Kerala State Electricity Board
   Board Secretariat
   Vidyuthi Bhavanam Pattom
   Thiruvananthapuram- 695004

9. Chairman & Managing Director
   Maharashtra State Electricity Transmission Company Ltd., C-19, E-Block
   Prakashganga, Bandra-Kurla Complex
   Bandra(E), Mumbai 400 051

10. Chief Engineer(P)
    Manipur Electricity Department
    Govt. of Manipur, Manipur Sectt.
    South Block, Imphal,
    Manipur- 795 001

11. Chairman & Managing Director
    Meghalaya Energy Corporation Ltd.
    Lumjingshai Short Round Road
    Shillong- 793 001

12. The Engineer-in-Chief
    Power and Electricity Deptt., Govt. of Mizoram,
    Power House, Bara Bazar
    Aizwal- 796 001, Mizoram

13. Chief Engineer
    Nagaland Department of Power
    Kohima 797 001
    Nagaland

14. Chairman & Managing Director
    Punjab State Power Corporation Ltd.
    The Mall, Patiala- 147 001, Punjab

15. Chairman & Managing Director
    Rajasthan Rajya Vidyut Prasaran Nigam Ltd.
    Vidyut Bhawan, Janpath
    Jaipur (Rajasthan)-302005

16. Managing Director
    Sikkim Power Development Corporation Ltd.
    31-A, N.H. Way,
    Gangtok- -737 101

17. Chairman & Managing Director
    Tripura State Electricity Corporation Ltd.
    Govt. of Tripura, Agartala- 799 001

18. Chairman & Managing Director
    Uttar Pradesh Power Corporation Ltd.
    Shakti Bhawan, 14-A, Ashok Marg
    Lucknow- 226 001.

19. Chairman & Managing Director
    West Bengal Power Development Corporation Ltd.
    Bidyut Unnayan Bhaban, Plot 3/C
    LA-Block, Sector-III, Salt Lake City,
    Kolkata- 700 098

20. Secretary(P)
    Andaman and Nicobar Electricity Department,
    Secretariat, Andaman and Nicobar Islands,
    Port Blair- 744 101

21. Secretary
    Dadra & Nagar Haveli Electricity Department,
    Dadar Nagar Secretariat,
    Silvassa- 396230

22. Secretary
    Daman & Diu Electricity Department
    Dadar Nagar Secretariat,
    Moti Daman- 396220

23. Secretary
    Lakshyadeep Electricity Department
    U.T. of Lakshyadeep
    Kavaratti- 682555

24. Secretary
    Puducherry Electricity Department
    Secretariat, Puducherry- 605001

25. Chairman & Managing Director
    Orissa Power Transmission Corporation Ltd.
    Janpath, Bhubaneswar- 751 022.

26. Chairman
    Jharkhand Urja Sancharan Nigam Ltd.
    Engineering Building, HEC
    Dhurwa, Ranchi- 834 004

27. Chairman
    West Bengal State Electricity Transmission Company Ltd (WBSETCL)
    Vidyut Bhawan, Block-DJ, Sector-II,
    Bidhan Nagar, Kolkata- 700 091.
28. Managing Director
    Bihar State Power (Holding) Company Ltd.
    Vidyut Bhawan, Bailey Road, Patna- 800 021

29. Chairman and Managing Director
Gujarat Energy Transmission Corporation Ltd.
Sardar Patel Vidyut Bhawan,
Race Course , Vadodara- 390 007

30. Managing Director
Madhya Pradesh Power Transmission Company
Ltd. Block No. 2, Shakti Bhawan
Rampur, P.O. Vidyut Nagar
Jabalpur- 482 008(MP)

31. Managing Director
Chhattisgarh State Power Generation Company Ltd., Vidyut Seva Bhawan
P.O. Sunder Nagar, Danganiya,
Raipur- 492 013.(Chhattisgarh)

32. Chairman & Managing Director
Punjab State Transmission Corporation Ltd.,
The Mall, Mall Road,
Patiala- 147 001, Punjab

33. Managing Director
Himachal Pradesh Power Transmission Corporation Ltd.
Barowalia House, Khalini
Shimla- 171 004.

34. Chairman & Managing Director
Uttar Pradesh Power Transmission Corporation Ltd.
Shakti Bhawan, 14-A, Ashok Marg,
Lucknow- 226001

35. Chief Engineer (Power)
Department of Power
Govt. of Arunachal Pradesh
Itanagar
(Arunachal Pradesh) – 791 111

36. Chief Engineer(Transmission)
Transmission Corporation of Andhra Pradesh Ltd.
Vidyut Soudha, Gunadala
Eluru Road, Vijaywada, Andhra Pradesh – 520 004

37. Managing Director
Karnataka Power Transmission Corporation Ltd.,
Kaveri Bhawan
Bangalore-560009

38. Chairman & Managing Director
    Transmission Corporation of Telangana Ltd.
    Vidyut Soudha, Khairatabad,
    Hyderabad - 500082

39. Managing Director
    Assam Electricity Grid Corporation Ltd.
    Bijulee Bhawan,
    Paltan Bazar
    Guwahati- 781 001

40. Chairman & Managing Director
    Tripura State Electricity Corporation Ltd.
    Govt. of Tripura,
    Bidyut Bhawan
    Agartala- 799 001.

41. Managing Director
    Power Transmission Corporation of Uttarakhand Ltd.
    Vidyut Bhawan, Saharnpur Road,
    Near I.S.B.T. Crossing, Dehra Dun
    Uttarakhand -248002

42. Managing Director
    Tamil Nadu Transmission Corporation Limited
    10th Floor/NPKRR Malikai, No. 144 Anna Salai,
    Chennai-600002

43. Chairman & Managing Director
    National Thermal Power Corporation Ltd.
    NTPC Bhawan, Core 7, Scope Complex
    7, Institutional Area
    Lodhi Road, New Delhi-110003

44. Chairman
    Damodar Valley Corporation,
    DVC Towers, VIP Road,
    Kolkata – 700 054

45. Managing Director
    Assam Power Generation Corporation Ltd.
    Bijulee Bhawan, Paltan Bazar,
    Guwahati- 781 001.

46. Managing Director
Madhya Pradesh Power Generating Co. Ltd.
Shakti Bhawan, Vidyutnagar
P.O. Jabalpur- 482 008.

47. Managing Director
Haryana Power Generation Corporation Ltd.
Urja bhawan, C-7, Sector-6
Panchkula, Haryana-13410

48. Chairman
Gujarat Urja Vikas Nigam Ltd.
Sardar Patel Vidyut Bhawan,
Race Course, Vadodara- 390 007

49. Chairman & Managing Director
U.P. Rajya Vidyut Utpadan Nigam Ltd.
Shakti Bhawan
14- Ashok Marg
Lucknow-226001

50. Chairman & Managing Director
NEEPCO Ltd.
Brookland Compound
Shillong – 793003

51. Managing Director
Maharashtra State Power Generation Co. Ltd.
Prakashgad, Plot No. G-9, 4th Floor
Bandra(E), Mumbai-400051

52. Chairman
Indraprastha Power Generation Co. Ltd.
Office of PRO, Himadri
Rajghat Office Complex
New Delhi.

53. Chairman & Managing Director
Block-1 Neyveli-607801
NLC India Limited
Cuddalore District, Tamilnadu

54. Chairman & Principal Secretary (Energy)
A.P. Power Generation Corporation Ltd.
Vidyut Soudha, Gunadala
Eluru Road, Vijaywada, Andhra Pradesh – 520 004

55. Chairman & Managing Director
Orissa Power Generation Corporation Ltd.
Zone- A, 7th floor, Fortune Towers
Chandrasekharpur,
Bhubaneswar- 751 023.

56. Chairman & Managing Director
Rajasthan Rajya Vidyut Utpadan Nigam Ltd.
Vidyut Bhawan, Jyoti Nagar
Jaipur (Rajasthan)

57. Chairman & Managing Director
Chhattisgarh State Power Holding Company Ltd.,
Vidyut Seva Bhawan
P.O. Sunder Nagar, Danganiya,
Raipur- 492 013 (Chhattisgarh)

58. Chairman & Managing Director
TANGEDCO
10th Floor/NPKR Ramasamy Malikai,
No. 144, Anna Salai, Chennai- 600 002

59. Chairman & Managing Director
Telangana State Power Generation Corporation Ltd.
Vidyut Soudha, Kharatabad
Hyderabad – 500082

60. Chairman
Jharkhand Urja Utpadan Nigam Ltd.
Engineering Building, HEC
Dhurwa
Ranchi-834004

61. Chairman & Managing Director
Bharat Heavy Electricals Ltd.
BHEL House, Siri Fort,
New Delhi-110049

62. Chairman & Managing Director
Toshiba Transmission & Distribution System(I) Pvt. Ltd.
Rudraram, Patancheru Mandal, Medak District,
Telangana-502329

63. Chairman
Bhakra Beas Management Road,
Sector-19B, Madhya Marg, Chandigarh-160019

64. Chairman & Managing Director
Pragati Power Corporation Limited
Himadri, Rajghat Power House Complex,
New Delhi – 110002

65. Managing Director
Uttarakhand Jal Vidyut Nigam Ltd.
Maharani Bagh, G M S Road,
Dehradun, Uttarakhand- 248 008

66. Chairman & Managing Director
National Hydro Power Corporation Ltd.
Corporate Office, NHPC Office Complex,
Sector 33, Faridabad 121 003, Haryana

67. Chairman & Managing Director
SJVN LIMITED
Himfed Building,
New Shimla 171 009

68. Chairman & Managing Director
THDC INDIA LTD.
Pragatipuram, Bye Pass Road,
Rishikesh 249 201 (Uttarakhand)

69. Head- Transmission Business
Adani Transmission (India) Ltd.,
Sambhav House
Judges Bungalow Road, Bodakdev
Ahmedabad 380015, Gujarat

70. Shri. T. A. N. Reddy
Vice president B. D. & Corporate Affairs (Sterlite Power)
F – 1, The Mira Corporate Suits, 1 & 2, Ishwar Nagar,
Mathura Road, New Delhi 110065

71. L&T Infrastructure Development Projects Limited (L&T IDPL),
L&T campus TCTC Building, First Floor,
Mount Poonamallee Road, Manapakkam,
Chennai - 600089, Tamil Nadu, India.

72. Essel Infraprojects Limited
6th Floor, Plot No. 19 & 20, Film City, Sector 16A,
Gautam Buddha Nagar, Noida 201301.

73. The Chief Engineer
Distribution Planning & Technology Division, Central Electricity Authority

74. Director General
CENTRAL POWER RESEARCH INSTITUTE (CPRI)
Prof.Sir C.V.Raman Road, Post Box No: 8066,
SadaShiva Nagar (p.o),
Bangalore, India , Pincode : 560 080

75. Director
Electrical Research & Development Association (ERDA)
ERDA Road, GIDC Makarpura
Vadodara – 390 010
Gujarat

76. The President
Indian Electrical and Electronics Manufacturers Association (IEEMA)
Rishyamook Building, First Floor
85 A, Panchkuian Road
New Delhi – 110001

77. Director General
Indian Transformer Manufacturers Association (ITMA)
2F CS-11, Ansal Plaza, Sector-3 Near Vaishali Metro Station (Opp. Bhushan Steel) Vaishali,
Ghaziabad, U.P- 201 010