



भारतीय मानक ब्यूरो

(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)

BUREAU OF INDIAN STANDARDS

(Ministry of Consumer Affairs, Food & Public Distribution, Govt. of India)

मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली - 110002

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi-110002

दूरभाष Phone : 2323 0131 / 2323 3375 / 2323 1192

वेबसाइट Website : www.bis.org.in

कार्यवृत्त

प्रलेख प्रेषण संज्ञापन

हमारा संदर्भ : ईटीडी 16/ ए 2.24

संदर्भ ईटीडी	दिनांक
ईटीडी 16/ ए 2.24	14-01-2019

विषय: ट्रांसफार्मर, विषय समिति, ईटीडी 16

ट्रांसफार्मर, विषय समिति ईटीडी 16/ ए 2.24 के सभी सदस्य

महोदय /महोदया,

ट्रांसफार्मर, विषय समिति, ईटीडी 16 की बैठक के कार्यवृत्त की एकप्रति पत्र के साथ संलग्न की जा रही है। यह बैठक 12-12-2018 को भारतीय मानक ब्यूरो, दिल्ली में आयोजित की गयी। सभाध्यक्ष द्वारा इस बैठक के कार्यवृत्त अनुमोदित किए गए हैं।

सम्मति याँ भेजने की अंतिम तिथि : 28-01-2019

आशा है कि आप इस कार्यवृत्त को सही पाएंगे। यदि आपकी अभिलेखित कार्यवृत्त पर कोई सम्मतियाँ/अवलोकन हो, तो कृपया इन्हें अधोहस्ताक्षरी को ईमेल द्वारा भेजें। अगर उक्त तिथि तक आपसे कोई उत्तर प्राप्त नहीं होता तो यह मान लेने की अनुमति दें कि बैठक के कार्यवृत्त सही हैं।

धन्यवाद

भवदीय

(श्याम कुमार)

वैज्ञानिक 'सी' (ईटीडी)

ईमेल eetd@bis.org.in

संलग्न : उपरलिखित



भारतीय मानक ब्यूरो

(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)

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Our Ref: ETD 16/ A 2.24

Subject: Meeting of Transformers Sectional Committee, ETD 16/A 2.24

MINUTES

DOCUMENT DESPATCH ADVICE

Ref:
ETD 16/A 2.24

Date:
14-01-2019

Our Ref: ETD 16/ A 2.24

All Members of Transformers Sectional Committee, ETD 16

Dear Sir(s),

Please find enclosed minutes of the 24th meeting of Transformers Sectional Committee, ETD 16 held on 12-12-2018 at BIS HQ, Delhi. The minutes have already been approved by the Chairman ETD 16. Comments if any, confined to the accuracy of recording, may please be mailed to the undersigned. If no reply is received by the date given below, we may be permitted to presume your confirmation of the minutes as recorded.

Last date for comments is: **28-01-2019**

Thanking you,

Yours faithfully,

(Shyam Kumar)

Scientist 'C' (ETD)

E-mail: eetd@bis.org.in

Ph: 011-23608405

(Encl: As above)

BUREAU OF INDIAN STANDARDS

MINUTES

MEETING	NO. OF MEETING	DAY & DATE	TIME	VENUE
Transformers Sectional Committee, ETD 16	24 th	Wednesday 12 th Dec 2018	1030 Hrs	Auditorium Bureau of Indian Standards, Manak Bhavan, 9, B. S. Zafar Marg, New Delhi- 110 002

Item 0 GENERAL

0.1 Welcome and opening remarks by the Chairman

0.1.1 Shri B V Raghavaiah, Chairman extended a hearty welcome to all the members present. He expressed that during earlier meetings some important tasks were assigned to the panels constituted under this committee, however, progress of work in these panels is not as expected. He requested panel conveners to report work progress during the next meeting of the committee. He requested members to actively participate during the meeting.

0.1.2 Shri Rajeev Sharma, Head (ETD) welcomed all the members present. He expressed that some important matters have been listed in the agenda for discussion and requested the committee to take concrete decisions in national interest and for active participation during the meeting.

0.1.3 Shri Shyam Kumar, Member Secretary welcomed all the members present and requested for their active participation in finishing the agenda within time. The meeting commenced with a brief introduction of the committee members.

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

1.1 The committee considered the comments received from DHI and KSSTMA and decided as below:

a) DHI comments: The committee agreed to changes suggested by DHI wrt recording of discussions held during the last meeting.

Regarding DHI proposal for making standard on Transformers core, the committee requested expert group under ETD 16 to examine the proposal submitted by DHI in detail and to submit their viewpoints on the same.

Regarding criteria for defining losses, the committee informed that the loading on distribution transformers varies throughout the day (roughly from 40 % to 120 %). Considering this, from standardization point of view, it was decided to specify losses at both 50 % and 100 % loading after long detailed discussions while formulating the standard. Hence, no change is required in the criteria of 50% and 100% loading as specified in the standard.

b) KSSTMA comments: It was informed that the points raised by KSSTMA have already discussed in detail during the last meeting of the committee and there is no need to discuss these points again. The committee decided to drop these comments.

c) Regarding comments on the losses specified in the standard, it was informed that the losses specified in IS 1180 (Part 1) as well as draft document ETD 16 (6824) have been harmonized with the losses specified by Bureau of Energy Efficiency (BEE) for distribution transformers vide gazette notification S.O.184(E) dated 12th January, 2009 and S.O.4062 (E) dated 16th December, 2016. It was expressed that BEE may be requested to provide technical calculation/justification/basis for the losses specified by them for distribution transformers vide above mentioned gazette notifications.

After detailed discussion, the committee decided to write to BEE to provide technical calculation/justification/basis for the losses specified by them for distribution transformers. The committee also decided to request BEE to consider comments from AITMA regarding lowering of losses at 100 % loading.

There being no other comments, the committee formally confirmed the minutes of the 23rd meeting of Transformers Sectional Committee, ETD 16 held on 10-08-2017.

1.2 ISSUES ARISING OUT OF PREVIOUS MEETING

Sl. No.	Item No. of Last Minutes	Subject/Decision	Remarks/Decision
a.	2 (a) & 3.1 (b)	<p>To write to following organizations for fresh nominations/active participation:</p> <ul style="list-style-type: none"> i) CBIP ii) Telangana Utility iii) West Bengal utility iv) Transformer & Rectifier v) Tata Power for principal member vi) ALSTOM vii) Rural Electrification Corp. Ltd. viii) EMCO 	<p>The committee noted the information provided and requested BIS to write again for nominations considering the importance of these organizations in the transformer industry.</p> <p>IEEMA to provide contact details of ALSTOM</p> <p>Shri Amarpal to contact Telangana Utility</p> <p>The committee decided to drop West Bengal Utility from the coopted members.</p>
b.	3.1 (a)	<p>To request following organizations to nominate Alternate member for this committee:</p> <ul style="list-style-type: none"> i) M/s AVI-OIL India (P) Ltd. ii) M/s Transcon Industries iii) M/s National Switchgears 	<p>The committee noted the information provided and requested BIS to write again</p> <p>Shri Amarpal was requested to send formal mail with all the details of Mr. Shrinivas, Alternate member from M/s Transcon.</p>
c.	3.1 (c)	<p>To write again to following organizations to accept the offer of representation in ETD 16:</p> <ul style="list-style-type: none"> i) Delhi Transco ii) Southern Power Distribution Company 	<p>The committee noted the information provided and decided as below:</p> <p>Delhi Transco: To write again</p>

		of Telangana (TSSPDCL) iii) West Bengal State Electricity Distribution Company Limited (WBSEDCL)	State Utilities : Please see decision at sl. no. a) above
d.	3.2	To update the composition of Panel 2, Panel 3, Panel 4, Panel 10, Panel 11 as decided during the 23 rd meeting.	The committee noted the information provided.
e.	3.6	To co-opt DMRC	The committee noted the information provided.
f.	8.1(b)	Withdrawal of IS 11333: 1985 ‘Flameproof Dry Type Transformers for Use in Mines’ The committee decided to write to ETD 22 to confirm whether all the requirements given in IS 11333 (including performance requirements) have been duly addressed in IS 60079 series or not.	The committee noted the information provided.
g.		Comments from Singareni Collieries to extend the scope of single phase transformers for 3.3 and 6.6. kV voltage class	The committee noted the information provided.
h.		Comment from Shri Wadhwani to change reference from IS 335 to IS 1866 in clause 21.4 (e) of IS 1180 (Part 1)	The committee noted the information provided.

Item 2 COMPOSITION OF THE SECTIONAL COMMITTEE

2.1 The committee reviewed the composition of sectional committee and decided as given above at sl no. 1.2 a), b) and c).

To update nominations as below:

- AITMA- Shri G Murali as Second Alternate – Shri Vivek Jain was requested to send formal mail with all details of the second alternate member
- Vijay Electricals Ltd.- Shri Ishwaran as Second Alternate – Shri Ishwaran was requested to send formal mail with all details of the second alternate member
- PGCIL – Shri B N De Bhowmik as principal member and to request him to also nominate Alternate member for this committee.

2.2 The committee reviewed the composition of panels as given in Annex 2 of the agenda and decided as follows:

Sl No.	Title of the Panel	Decision of the committee
1.	Panel 1 ----Repair and Maintenance of the distribution transformers	No Change in the composition.
2.	Panel 2 ----Revision of ‘Specification for dry type power transformers’	No Change in the composition.
3.	Panel 3 ---- IS 1180 Part 2 Distribution Transformers with use of Ester oil	To add following: a) M/s Crompton Greaves b) M/s Savita Oil
4.	Panel 4 ----Revision of IS 3639- Fittings and	To be reviewed as mentioned in

	accessories for power transformers	Annex 2
5.	Panel 5 ----Revision of IS 8468:1977 ‘On-load tap changers’	To add following: a) TATA Power, Mumbai b) GETCO
6.	Panel 7 ----Solar transformers	To be reviewed as mentioned in Annex 3
7.	Panel 9 ----On-site diagnostic testing for condition/health assessment of power transformers	To add M/s Savita Oil.
8.	Panel 10 - To formulate standard on Dry Type Distribution Transformers	To add Shri N. Babu, M/s Kotsons
9.	Panel -11 Use of Internal Circuit Breakers in Distribution Transformers:	To add AITMA.
10.	Panel 12 - Clarification on Standards for Transformers	No change in the composition.

2.3 The committee expressed its concern over poor participation from some important organizations and requested BIS to write letter to Head of the Organization having zero attendance in last three meetings to ensure active participation in the future meetings.

2.4 The committee members were requested to give their suggestions that would help in improving the participation in committee’s work.

2.5 Members were requested to identify experts available in the country related to Transformers Industry who may be co-opted in this committee.

2.6 The committee considered the cooption requests received and decided as below:

- a. To co-opt M/s Kotsons as a member in ETD 16.
- b. The committee decided to drop the cooption request from M/s Atlanta as currently manufacturers are duly represented in ETD 16.

Item 3 APPROVAL OF DRAFT INDIAN STANDARDS FOR FINALIZATION

3.1	Draft Indian Standard	Circulated vide BISDG letter No. & date	Remarks/Decision
a)	ETD 16 (12138) Draft Amendment No. 3 to IS 1180 (Part 1) : 2014	ETD 16/ T- 2 letter dated 31-07-2018 with last date of comments as 28/09/2018	<p>The committee considered the comments placed at Annex 5 of Agenda.</p> <p>The committee noted that most of the comments have already been discussed earlier and do not require further discussion. The committee requested expert panel under ETD 16 to review the comments received and to make necessary changes in the draft amendment which will be sent for 1 month wide circulation if any technical change is required. In case no technical change is required, the amendment will be placed before the committee for finalization during the next meeting.</p> <p>ETD 16 to also consider BEE’s reply to ETD 16 request</p>

			<p>to provide technical justification/calculation/basis for the losses specified for distribution transformers while finalizing this amendment. Please see decision at sl. no. 1.1 c).</p> <p>Regarding DHI comment on the technical calculation/justification for losses specified, please see decision given at sl. no. 1.1 c)</p>
b)	ETD 16 (6824) Outdoor/Indoor Type, Oil Immersed Distribution Transformers upto and including 2500 kVA, 33 kV – Specification (Part 2 Ester Liquid Immersed)	ETD 16/ T- 2 letter dated 02/11/2018 with last date of comments as 02/01/2019	<p>The committee noted the comments received and decided not to consider these comments at this moment as the document has already been finalized by the committee after long discussions.</p> <p>It was observed that the document is pending for long only due to losses part specified in the document.</p> <p>It was expressed that as decided during this meeting, BIS will write to BEE to provide technical calculation/justification/basis for the losses specified by them for distribution transformers and also to request them to review losses in view of the comments received from AITMA. As this process is going to take time, document ETD 16 (6824) should not be kept on hold as the standard is required by the Industry.</p> <p>After detailed discussion, the committee decided to send document ETD 16 (6824) for printing specifying losses given in existing IS 1180 (Part 1): 2014 (i.e. level 1, level 2 and level 3 losses) with all the amendments.</p>

Item 4 APPROVAL OF DRAFT INDIAN STANDARDS FOR WIDE- CIRCULATION

Sl No.	Draft Indian Standard	Circulated vide BISDG letter No. & date	Remarks
a)	Doc ETD 16 (11842) Power Transformers Part 1 General [Third Revision of IS 2026 (Part 1)]	Document was circulated and comments received were placed before the committee during its last meeting where the committee requested Shri M K Wadhwani to examine the comments and to update the draft document.	<p>The committee considered the comments placed at Annex 7 of Agenda and agreed to the clarifications provided by Shri M K Wadhwani against the comments received. The committee requested member secretary to change IEC references given in the draft document to IS and to send back the document to Shri Wadhwani.</p> <p>Shri Wadhwani was requested to make necessary changes in the document in view of the comments received and discussion held during the meeting and to return the document within a week which will be sent for wide circulation for two months.</p>
b)	Doc ETD 16 (11350)	—	It was informed that this document was finalized by the committee during its earlier meeting and is under

	Power transformers Part 11: Dry-type transformers		<p>process of printing. This document is based on IEC 60076-11: 2004. However, the IEC has been revised and a new version (IEC 60076-11: 2018) is available.</p> <p>The committee decided to drop the existing document ETD 16 (11350) and to circulate the latest IEC in wide circulation for 2 months. In case, no comments are received, the same will be sent for printing with the approval of Chairman.</p>
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Item 5 COMMENTS ON PRINTED STANDARDS

5.1 The committee noted the information given in Agenda.

Comment on IS 1180 (Part 1): 2014: Head (Central Marks Department-III), BIS expressed that since the committee has decided to keep amendment to IS 1180 (Part 1) (Doc no. 12138) on hold due to want of technical calculation/justification/basis for the losses specified for distribution transformers from BEE, a new amendment may be issued to IS 1180 (Part 1) deleting losses for non-preferred ratings which were added through amendment no. 1 and to keep the losses for non-preferred ratings as per agreement between the user and the supplier. He expressed that this will ensure smooth implementation of amendment no. 1 to IS 1180 (Part 1): 2014.

After detailed deliberations, the committee decided to issue an amendment to IS 1180 (Part 1) to address the concerns raised by CMD-III. Draft amendment is placed at **Annex 1**.

The committee decided to send the draft amendment placed at Annex 1 for printing.

Item 6 PRESENT POSITION OF WORK

6.1 The committee noted the information given in the agenda. It was decided to identify standards (identically adopted) whose corresponding IEC standards have been revised and to circulate the latest IEC in wide circulation for two months in consultation with the Chairman.

6.2 Present status of work as identified during previous meetings of ETD 16:

Sl No.	Item no. of the last meeting	Subject	Decision of the committee
a.	7 (a)	<p>Progress of work in Panel 4</p> <p>Revision of IS 3639 series on Fittings and Accessories for transformers</p>	The committee agreed to the recommendations of P-4 (given in Annex 2) and requested Shri V K Lakhiani, Panel convener to submit a report of work completed during the next committee meeting.
b.	7 (b)	Progress of work in Panel 11	<p>The committee noted the information given in the agenda.</p> <p>It was expressed by AITMA members present that the tripping</p>

		Self protection/ disconnection device for distribution transformers	<p>criteria should be based on current as with the increase in current losses increases and therefore, overloading should not be allowed for longer periods. They proposed that tripping of the internal breaker should be based on current.</p> <p>However, other members expressed that current setting will create problem for the customers as every time with increase in current, transformer will trip. This will also reduce life of the breaker as well as deteriorate the transformer oil due to arching. Further the trip temperature governing equation given in draft amendment comprises of three temperatures : ambient temp + top oil temp rise + bimetallic temp rise due to load current, hence increase in load current has been duly addressed in the governing equation while deciding the tripping criteria.</p> <p>After detailed deliberations, the committee decided to send the modified document to Shri N. Babu Kotsons for his review. Shri Babu was requested to return the document within a week which will send to committee members for comments for 15 days.</p> <p>Chairman expressed that the document is pending for a very long time and requested members to give their comments within time norms so that the document may be finalized during the next meeting.</p>
c.	7 (d)	Progress of work in Panel 7 Solar transformers	The committee agreed to the recommendations of P-7 (given in Annex 3) and decided to request Shri S S Mishra, Panel convener to submit a report of work completed during the next committee meeting.
d.	7 (c)	Progress of work in Panel 9 On site diagnostic testing of distribution transformers	<p>The committee noted the information given the agenda. Chairman requested committee members to actively participate in this panel as the subject is of national importance and is under government priority and the standard is to be prepared on top priority.</p> <p>The committee requested Shri R K Tyagi to call a meeting of the panel and to submit report of the work progress during next meeting of ETD 16.</p>
e.	7 (f)	Progress of work in Panel 1 Repair of distribution transformers	<p>The committee noted the information given the Agenda.</p> <p>Shri Manas Kundu, ICAI informed that the document has been prepared after long discussions with the stakeholders involved as well as taking assistance from internationally available documents. He further informed that the document has been thoroughly reviewed and rephrased to address the concerns raised by the committee members during its last meeting.</p> <p>The committee decided to circulate the draft document to committee members for 1 month. Comments received, if any, will be sent to ICAI for making suitable modifications in the document.</p> <p>Updated document will be sent for wide circulation for 2 months</p>

			in consultation with the Chairman.
f.	7 (g)	Progress of work in Panel 10 Dry type distribution transformers	It was informed that Shri Sameer Pandita, Director BEE is now looking after the Standards & Labelling Programme in BEE and is also the Principal member in ETD 16 from BEE. The committee appointed Shri Sameer Pandita as the convener of this panel and decided to request him to call a meeting of the panel to finalize the document.
g.	7 (e)	Proposal for using 363 transformers	Shri Lakhiani informed that the matter was discussed with experts in the Transformer Industry as well as Prof. Saklani, IIT Bombay. All are of the view that the technology is new and also not time tested. There are no field results/data available for such type of transformers. It was expressed by other members that many such technologies are also being used by the industry while manufacturing transformers and it is not possible to standardize all such available technologies. Moreover, the standard should be technology neutral. Considering the views expressed by members, the committee decided to drop the proposal sent by Shri G Srinivasan. The committee requested Shri Lakhiani to draft a letter (specifying reason for not considering the proposal) which will be sent to the proposer.
h.	8.1 (a)	Revision of IS 10028 series – Code of practice for selection, installation and maintenance of transformers	It was informed that the organization of Shri Ramachandran is not correctly mentioned in the minutes of the last meeting. Shri Ramachandran is associated with ABB as technical advisor. The committee decided to correct the organization name of Shri Ramachandran and requested Shri Rajaram Shinde to contact him to take his consent to chair the sub group. Shri Shinde was also requested to provide contact details of Shri Ramachandran so that official mail from BIS may also be sent to him for chairing the sub group. The committee also decided to co-opt Shri R Pillai, Tata Sons (<i>Shri Shinde to provide contact details</i>) and Shri Patnaik (<i>Shri Raghavaiah to provide contact details</i>) in this sub group.
i.	8.1 (a)	Revision of IS 8447 : 1989 ‘Manually operated voltage regulators for domestic use’ and IS 8448 : 1989 ‘Automatic line voltage correctors step type for domestic use’	The committee noted the information provided. The committee requested Shri N Babu, representing IEEMA to contact M/s Jindal which is a major manufacturer of the voltage regulators and to provide draft revision documents taking inputs from the manufacturers. IS 8447 and IS 8448 to be sent to Shri N Babu. Shri N Babu agreed to provide the draft revision documents within 2 months.
j.	12.2	Adoption of IEC/ TS 60076-20 :	The committee noted that panel was formed during the last meeting; however, no progress has been made on the subject so

		2017 'Power Transformer — Energy Efficiency'	<p>far.</p> <p>It was expressed that since CEA is already working on the same subject, this work item should be dropped to avoid duplication of work. The committee would take this item for consideration and standardization once the guidelines on the subject finalized by CEA are available.</p> <p>After detailed deliberations, the committee decided to drop this work item and to write to CEA to refer Euro 20-21 energy efficiency norms as well as IEC/TS 60076-20: 2017 while preparing the guidelines.</p>
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Item 7 REVIEWS OF PUBLISHED STANDARDS FOR REVISION/ REAFFIRMATION

- 7.1** The committee decided to reaffirm the standards due for reaffirmation as mentioned in the agenda.

It was informed that revision of these standards has already been taken up.

Item 8 NEW SUBJECTS AND FUTURE PROGRAMME OF WORK

- 8.1** The committee noted the information as given in the agenda.

8.2 Proposal from DHI for preparing standard for transformer core

Please see decision mentioned at sl. No. 1.1 a).

Item 9 INTERNATIONAL ACTIVITIES

- 9.1** The committee noted the information as given in the agenda. Report of participation is placed at Annex 3.

The committee agreed to the request from M/s Sukrut to participate in WG 32 under IEC/TC 14. The committee decided to nominate Shri Atul Bapat to represent in WG 32 under IEC/TC 14. Shri Pritesh was requested to send formal mail with complete details of Shri Atul Bapat.

- 9.2** Shri Rajaram Shinde was requested to review the IEC work programme and to suggest IEC standards which may be adopted as Indian Standards (either identically or technically modified).

Item 10 IMPLEMENTATION OF INDIAN STANDARDS

- 10.1** The committee noted the information as given in the agenda.

Item 11 BIS YOUNG PROFESSIONAL PROGRAMME

- 11.1** The committee noted the information as given in the agenda.

Item 12 WTO-TBT ENQUIRY POINT

- 12.1** The committee noted the information as given in the agenda.

**Item 13 PROVISION OF HONORARIUM FOR TRANSLATION OF EXISTING
INDIAN STANDARDS TO HINDI.**

13.1 The committee noted the information as given in the agenda.

Item 14 INFORMATION ON e-SALE OF STANDARDS BY BIS

14.1 The committee noted the information as given in the agenda.

Item 15 NATIONAL INSTITUTE FOR TRAINING IN STANDARDISATION (NITS)

15.1 The committee noted the information as given in the agenda.

Item 16 DATES AND PLACE FOR THE NEXT MEETING

Shri Rajaram Shinde, Cargill India Private Limited proposed to host the next meeting of ETD 16 committee at Cargill office, Pune.

The committee accepted the proposal and decided to meet in the second week of April, 2019 at Pune.

Item 17 ANY OTHER BUSINESS

There being no further business, the meeting concluded with a vote of thanks to the chair.

ANNEX 1

AMENDMENT NO. 3 TO IS 1180 (PART 1) : 2014

[Page 3, Table 3 (*see also Amendment No. 1*)] — Delete rows at sl no. i), ii), iv) and vi) of the table.

[Page 3, Table 3 (*see also Amendment No. 1*)] — Insert the following note at the bottom of table:

‘NOTE — For non-preferred ratings of Table 1, maximum losses are subject to agreement between the user and the supplier.’

ANNEX 2

RECOMMENDATIONS OF PANEL (P-4) FOTTINGS AND ACCESSORIES FOR TRANSFORMERS

The following are the recommendations of Panel P-4 made during its first meeting held on 11/12/2018:

Composition of the panel needs to be revised. It should have at least four transformer manufacturers, three users, three fitting manufacturers and one laboratory. Following are the major stakeholders who may be co-opted in this panel:

Stakeholder category	Name of Organization	Remarks
Transformer manufacturers	Shri A S Jhala — Transformer & Rectifier Shri Abahy Agarwal — ABB Shri Goel/ Shri Manish Jain — GE Shri Jayasenani — Siemens	Shri Lakhiani was requested to contact M/s GE and also to provide contact details so that official mail may be sent
Users	Shri Ghosh — CESC Shri B N De Bhowmik — PGCIL Shri Y V Joshi — GETCO	—
Fitting manufacturers	Shri Pritesh Dehadray — Sukrut Shri Gupta — VIAT Shri Vyas — CTR	Shri Lakhiani was requested to contact M/s VIAT and also to provide contact details so that official mail may be sent
Laboratory	Shri Kapil Mishra — ERDA	—

The panel informed that IEC is also working on developing standards for fittings and accessories and these IEC documents will be reviewed while revising IS 3639 series.

It was decided to cover fitting and accessories for both distribution and power transformer fittings (different size of fitting will be specified for power and distribution transformers).

Panel reviewed the scope of IEC documents as well as fittings being used in Indian industry and categorized them broadly in 15 chapters as given below:

Sl No.	Sub groups	Responsibility for preparing initial draft
1.	Radiators	CTR
2.	Coolers (OFAF , OFWF, liquid leakage detector)	T&R
3.	Temperature indicators and thermometer pockets	ABB
4.	Relays Buckholz relay + aircell rupture relay + sudden pressure relay + gas collecting device + liquid flow relay	Sukrut
5.	Cooling Fans and pumps	T&R
6.	Valves (butterfly valve + gate valves + sampling valve + drain valve + filter valve + drain plug + air vent device)	Siemens
7.	Pressure relieve device	Sukrut
8.	Flow indicators (non returning valve)	Sukrut
9.	Level Indicators	Sukrut

10.	Breathers	GETCO
11.	Air cell	Sukrut
12.	Impact recorders	T&R
13.	Rollers + earthing terminal + neutral grounding bar + support insulator	T&R
14.	Terminal boxes	Sukrut
15.	Terminal connectors	GETCO

Individual members were requested to submit draft document with 3 months as assigned above.

Member Secretary to provide existing drafts and IEC documents/ standards

ANNEX 3

RECOMMENDATIONS OF PANEL (P-7) FOR SOLAR TRANSFORMERS

The following are the recommendations of Panel P-7 made during its second meeting held on 11/12/2018:

Composition of the panel needs to be revised. It should have inverter manufacturers, utilities, EPC contractors, solar transformer manufacturers. Following are the major stakeholders who may be co-opted in this panel:

Stakeholder category	Name of Organization	Remarks
Inverter manufacturers	GE, ABB, Schneider, Delta, Siemens	Shri Rajaram Shinde was requested to contact concerned person in these organizations and also to share their contact details so that official mail may be sent
EPC contractors	Tata solar, CESC – Mr. Nandi, Mahindra – Mr. Amit Jain/Mr. Basant Jain, Larsen & Toubro	Shri Rajaram Shinde was requested to contact concerned person in these organizations and also to share their contact details so that official mail may be sent
Solar Transformer Manf (Solar)	Schneider, Raychem, Silcher, T&R, Toshiba,	Shri Rajaram Shinde was requested to contact concerned person in these organizations and also to share their contact details so that official mail may be sent
User Utilities	CESC, NTPC	To contact members in ETD 16
Expert member	In personal capacity	Shri V K Lakhiani, Member ETD 16

Panel formed a sub group comprising of following members for preparing the initial draft:

Shri Rajaram Shinde, M/s Cargill India — Leader of the sub group
M/s Raychem,
Shri Vyas, M/s CTR
M/s GE Power,
M/s Tata solar,
Shri V K Lakhiani, In personal capacity

Draft document: Shri Rajaram Shinde was requested to coordinate with stakeholders involved so as to collect technical details. Sub group was also requested to consider following aspects while preparing the draft document which were identified during the first meeting of the panel:

1. Impedance band for zone wise ratings
2. Harmonic breakup and THD
3. DC injection part
4. Switching frequency of the inverter
5. Electrostatic shielding
6. dv/dt and peak voltage observed at output of the inverter
7. Duty cycle/overloading cycles

The sub group was requested to review IEC rectifier standard IEC 61378 : 2011 and IEEE standards available on the subject.

The sub group was requested to provide the draft document by second week of April 2019 which will be circulated to panel members for 1 month.

It was decided to hold next meeting of Panel in the last week of May 2019.