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BUREAU OF INDIAN STANDARDS

DRAFT AGENDA

Name of the Committee	No. of Meeting	Day	Date	Time	Venue
Rotating Machinery Sectional Committee ETD 15	31st	**Tuesday**	**29th November 2022**	10:30 AM	**Samvaad (Green Room), Manak Bhawan, 9, BSZ Marg, Near ITO, Bureau of Indian standards, New Delhi**

CHAIRMAN : Shri Anish K Varshney **MEMBER SECRETARY** : Ms. Neha Agarwal

Item 0 GENERAL

0.1 Welcome and Opening Remarks by the Chairman

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

1.1 The minutes of the 30th meeting (online) of Rotating Machinery Sectional Committee, ETD 15 held on 18 May 2021 were circulated vide BISDG letter no. ETD 15/A-2.30 dated 31-05-2021.

No comments received.

The Committee may note and formally confirm the minutes of the last meeting.

1.2 Actions Arising Out of Previous Meetings (30th Meeting)

Sl. No.	Item No. of Last Minutes	Subject	Decision of the last meeting	Action/Remarks
1.	1.2 (1)	**Revision of IS 9283: 2013** Motors for Submersible Pump sets – Specification (Second Revision)	Dr. C Murugesan , SIEMA has explained the upgraded efficiency tables with different levels. He informed the committee that level 1 efficiency values are taken from IS 8043, level 2 & 3 efficiency values from existing IS 9283 and Levels 4 & 5 efficiency values are the upgraded in the revised draft. The committee discussed the draft and suggested the following: a) To maintain the consistency in all efficiency levels, it was suggested to follow nominal efficiency factor concept in all levels. b) It was observed that there are marginal difference in efficiency values for level 4 & level 5. Shri Dilip Bhave suggested to consider the reduction of losses as 10-15 % in each level depending upon the present technology available and thus efficiency values may be arrived upon. c) It was further suggested that IS 9283 and IS 8304 should be inline with each other. SIEMA was requested to consider all the suggestions discussed during the meeting and re-submit the revised draft to BIS within one month time for further necessary actions.	ETD 15 (17922)/ P Draft circulated vide email dated 18 August 2021 with last date of comments as 17 Sep 2021. Comments received from ICAI and Shri Dilip Bhave are placed at **Annex 1.**

2.	**1.2 (2)**	**Revision of IS 12075: 2008** Mechanical Vibration of Rotating Electrical Machines with Shaft Heights 56 mm and Higher - Measurement, Evaluation and Limits of Vibration Severity	It was decided to wide circulate the document for eliciting comments for a period of 2 months. It was suggested to add foreword in the document so as to mention the changes with respect to the previous edition. Shri Dilip Bhave was requested to provide the same.	ETD 15 (16745)/ WC Draft circulated vide email dated 10 June 2021 with last date of comments as 12 July 2021. Comments received from Marathon are placed at **Annex 2.**
3.	**1.2 (3)**	**ETD 15 (15753) (Third Revision of IS 996: 2009)** Single phase ac induction motors for general purpose	The committee discussed all the comments received on the revised draft. Refer Annex 1 for the decision. Further, the committee also discussed comments received during the meeting and decided the following changes to be done into the revised draft: a) It was suggested to compare the efficiency values with latest International practices. Shri Dilip Bhave kindly agreed to do the same. b) Table 12 & 13- Title of column 4 needs to modified with nominal efficiency instead of minimum. c) A new clause to be added to give reference of IS 13730 'Specifications for particular types of winding wire'. d) Clause 8.2- 10 minutes as preferred period shall be added inline with IEC standard. e) The committee decided to add a new note for ratings which are not specified into the standard. The performance values for those ratings may be agreed between customer and manufacturer. However, IEEMA was further requested to discuss the same with manufacturers in its rotating division meeting and suggest the suitable wordings which	ETD 15 (15753)/ WC Draft circulated vide email dated 02 August 2021 with last date of comments as 1 Sep 2021. Comments received from are placed at **Annex 3.**

			may be added into the revised draft. f) Shri Debdas Goswami suggested to modify Annex E to cover all special purpose motors. To draft the same, a small working group was constituted with the following composition: 1. Shri Ravi Singh, ERDA 2. Shri Bharat B, CG Power 3. Shri Rajiv Ranjan, Marathon, 4. PICL 5. Godrej g) Dr R Subramanian suggested to revise the frequency of testing for noise limit as once in a year. The same will be forwarded to CMD-3, if the SIT may be modified accordingly. With all these changes, the committee decided to wide circulate the draft again for one month period of time. To avoid further delay in finalizing the revised draft, it was decided to add the modified Annex E later on as an amendment.	
5.	**1.2 (4)**	NWIP- PERMANENT MAGNET PMAC / DC / PMSM MOTORS FOR SUBMERSIBLE PUMPSETS - SPECIFICATION	Shri Sanjeev Chowdhury informed that performance values for certain ratings were left blank so that other manufacturers may suggest the same as these ratings do not exist. He further informed that revised draft will be submitted to BIS by 31st May 2021. Shri Dilip Bhave suggested to draft the standard inline with MNRE norms so as to avoid any future complications.	ETD 15 (17399)/ P Draft circulated vide email dated 23 July 2021 with last date of comments as 22 August 2021. No comments received.
6.	**1.2 (5)**	Revision of IS 12065	It was decided to prepare an indigenous revised draft for IS 120 65. To prepare the draft, a small working group was created comprising of the following members:	Latest edition of IEC 60034-9 has been published in year 2021. Working group is requested to submit the draft inline

			Shri Dilip Bhave (Convener) Shri Prasad Hardikar Shri Salil Kumar, Shri Arun Singh (BHEL Bhopal) Shri Ashish Shere Shri Ashish Shere, Siemens vide email dated 15 Feb 2021 proposed to hold the revision of IS 12065 as the based IEC i.e. IEC 60034-9: 2007 is under revision.	with the latest IEC.
7.	**4.1**	New Work Item Proposal: Standards for Design, Manufacture, Assembly of Micro Back Pressure Steam Turbines in Processing Industries	Due to lack of expertise on turbines in the committee, Shri Anish Varshney said that the subject may be reviewed by the turbines division of BHEL, Bhopal. He will submit the feedback accordingly.	The reply is awaited.

Item 2 COMPOSITION OF ROTATING MACHINERY SECTIONAL COMMITTEE, ETD 15

2.1 The composition of the Sectional Committee ETD 15 is given in **Annexure 4.**

Co-option request has been received from the following:

1. THENNAVARAJAN S, Research And Development CSIR National Aerospace Laboratories

The Committee may consider**.**

2.2 Status of participation of members in the previous three meetings inviting suggestions for improvement

Standardization is a collaborative effort and its success largely depends on the participation and contribution of the members of the concerned technical committees. Further, for standards to be relevant it is also important that viewpoints of all interested stakeholders are brought on board and duly considered while building consensus on the standard being developed.

The status participation of members in the previous three meetings of ETD 15 are given at **Annex 4.**

The committee may review the participation and provide suggestion to improve the participation inthe upcoming meetings.

Item 3 APPROVALS OF DRAFT INDIAN STANDARDS FOR FINALIZATION/WIDECIRCULATION

Sl No.	Draft Standards	Circulated vide BISDG Letter	Remarks
1.	ETD/15/17752 (Identical To: 60034-4-1) Revision of IS 15999 : Part 4: 2017 Rotating Electrical Machines Part 4 Electrically excited synchronous machine quantities Section 1 Test methods (first revision)	Circulated vide email dated 20 July 2021 with last date of comments as 16 July 2021.	No comments received.
2.	ETD/15/17738 (Identical To: 60045-1: 2020) Revision of IS 14205 : Part 1: 1994 Steam Turbine Part 1 Specifications (first revision)	Circulated vide email dated 20 July 2021 with last date of comments as 16 July 2021.	No comments received.
3.	ETD/15/17753 (Identical To: 60034-7) Revision of IS 2253: 1974 Rotating Electrical Machines Part 7: Classification of types of construction mounting arrangements and terminal box position IM Code Second revision	Circulated vide email dated 20 July 2021 with last date of comments as 16 July 2021.	No comments received.
4.	ETD/15/17739 (Identical To: 60034-3) Revision of IS 15999 : Part 3: 2016 Rotating Electrical Machines Part 3: Specific requirements for synchronous generators driven by steam turbines or combustion gas turbines and for synchronous	Circulated vide email dated 20 July 2021 with last date of comments as 16 July 2021.	No comments received.

	compensators first revision		
5.	ETD/15/17754 (Identical To: ISO 2314: 2009) Revision of IS 15664: 2006 Gas turbines Acceptance tests first revision	Circulated vide email dated 20 July 2021 with last date of comments as 16 July 2021.	No comments received.
6.	ETD/15/21169 (Identical To: 60276: 2018) Revision of IS 1554 : Part 1: 1988 Carbon Brushes Brush Holders Commutators and Slip-Rings Definitions and Nomenclature	Circulated vide email dated 07 Nov 2022 with last date of comments as 07 December 2022.	No comments received.
7.	ETD/15/21172 (Identical To: 60034-2-1) Revision of IS 4889: 1968 Rotating Electrical Machines Part 2-1: Standard Methods for Determining Losses and Efficiency from Tests Excluding Machines for Traction Vehicles	Circulated vide email dated 07 Nov 2022 with last date of comments as 07 December 2022.	No comments received.
8.	ETD/15/21171 (Identical To: 1680) Revision of IS 12998 : Part 1: 1991 Acoustics Test Code for the Measurement of Airborne Noise Emitted by Rotating Electrical Machines	Circulated vide email dated 07 Nov 2022 with last date of comments as 07 December 2022.	No comments received.
9.	ETD/15/21170 (Identical To: 60034-20-1: 2002) Revision of IS 13079: 1991 Rotating Electrical Machines Part 20-1: Control Motors Stepping Motors	Circulated vide email dated 07 Nov 2022 with last date of comments as 07 December 2022.	No comments received.

10.	ETD/15/21165 (Identical To: 60193: 2019) Revision of IS 14197: 1994 Hydraulic Turbines Storage Pumps and Pump-Turbines - Model Acceptance Tests	Circulated vide email dated 07 Nov 2022 with last date of comments as 07 December 2022.	No comments received.
11.	ETD/15/21175 (Identical To: 60745-1: 2006) Revision of IS 4665 : Part 1: 1984 Hand-Held Motor-Operated Electric Tools Safety Part 1: General requirements Second Revision	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.
12.	ETD/15/21176 (Identical To: 60745-2-1) Revision of IS 4665 (Part 2): 1984 Hand-Held Motor-Operated Electric Tools Safety Part 2 Particular requirements Section 1 drills and impact drills	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.
13.	ETD/15/21177 (Identical To: 60745-2-2) Revision of IS 4665 (Part 2): 1984 Hand-held motor-operated electric tools - Safety - Part 2 Particular requirements Section 2 screwdrivers and impact wrenches	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.
14.	ETD/15/21178 (Identical To: 60745-2-3) Revision of IS 4665 (Part 2): 1984 Hand-held motor-operated electric tools - Safety Part 2 Particular requirements Section 3 grinders polishers and disk-type sanders	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.
15.	ETD/15/21179 (Identical To: 60745-2-5) Revision of IS 4665 (Part 2): 1984 Hand-Held Motor-Operated Electric Tools Safety Part 2	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.

	Particular Requirements Section 5 Circular Saws		
16.	ETD/15/21180 (Identical To: 60745-2-6) Revision of IS 4665 (Part 2): 1984 Hand-Held Motor-Operated Electric Tools - Safety Part 2 Particular Requirements Section 6 Hammers	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.
17.	ETD/15/21181 (Identical To: 60745-2-7) Revision of IS 4665 (Part 2): 1984 Safety of Hand-Held Motor-Operated Electric Tools Part 2 Particular Requirements Section 7 Spray Guns for Non-Flammable Liquids	Circulated vide email dated 09 Nov 2022 with last date of comments as 09 December 2022.	No comments received.

Item 4 REVIEW OF PROGRAM OF WORK OF ETD 15

The Programme of work of ETD 15 is given in **Annex 5**.

The Committee may review and note.

4.1 Review of Standards - Taking up Revision of Pre-2000 Standards

BIS has identified a list of standards which are very old (pre year 2000). Status of such Indian Standards under the purview of ETD 15 Sectional Committee on Safety of Electrical Installations are given at **Annex 6**. (The fields highlighted in yellow color needs to be reviewed and taken up for revision)

Members are requested to provide their views/comments on the above proposals and also volunteer for taking up revision and providing draft for standards.

a) Comments received on IS 12615: 2018 from Integrated Electric are reproduced asfollows:

1. In IS12615:2018, section 5:

5. Types of Enclosure
The motors shall have at least IP44 or better degree of protection provided by the enclosures as specified in IS/IEC 60034 (Part 5).

to be modified to:

5. Types of Enclosure
The motors may have at least IP44 or better degree of protection provided by the enclosures as specified in IS/IEC 60034 (Part 5).

Reason for change requested:
This clause is in conflict with 16.3.3 of PM/ IS 12615/ 2/ May 2019 where it is clearly mentioned that the Enclosure is as per mutual agreement between Manufacturer and Customer.

Item 5 INTERNATIONAL ACTIVITIES

5.1 The present position of work of the corresponding IEC Technical Committee IEC/ TC 2, 4 & 5 on Rotating Machinery is given at **Annex 7.**

5.2 Status of standardization in the areas dealt by the committee at international level and suggestions for improving participation in the related committees of ISO/IEC

India is the participating member in IEC TC 2 ‘Rotating Machinery’, IEC TC 4 ‘Hydraulic turbines’ and IEC TC 5 ‘Steam turbines’.

The committee may note.

Item 6 WTO-TBT ENQUIRY POINT

6.1 World Trade Organization (WTO) is the International Organization dealing with global rules of trade between nations. The Technical Barriers to Trade Agreement (TBT) tries to ensure that Regulations, Standards, Conformity Assessment procedures do not create unnecessary obstacles to trade. Manufacturers and exporters of each country need to know about the latest standards and technical regulations in their prospective markets. To help ensure that this information is made available conveniently, all WTO member governments are required to establish National Enquiry Point. India is a signatory to the WTO-TBT Agreement. Under this Agreement, India has to fulfill certain obligations such as establishing an enquiry point and transparency of its standards and its regulations. BIS functions as the National enquiry point as nominated by Ministry of Commerce, the dealing Ministry with WTO.

6.2 As the WTO TBT Enquiry Point, BIS answer all the reasonable enquiries pertaining to Technical Regulations. Standards and Conformity Assessments procedures addressed to it from the Enquiry Points of other countries. It also serves as the Information Centre within the country. Additionally, BIS also disseminate the TBT Notifications of other member bodies to the National Stakeholders.

6.3 The awareness regarding TBT Notifications is lacking amongst various stakeholders in India and as a result India is not sending comments on most of the draft notifications issued by other countries, which may be of trade interest to India. As a signatory of WTO-TBT agreement, there is a greater need for us to be aware of the TBT notifications issued by different countries in order to protect our interest.

6.4 BIS has been appointed WTO-TBT Enquiry Point to disseminate the TBT Notifications of other countries to the Indian Stake holders with a view to seek their comments and taking up the same at appropriate forum. The stakeholders are expected to examine the notifications on the following aspects:

1. Are the notifications in accordance with International Standards?
2. Are they stricter than the International Standards?
3. Are they stricter than the International Standards then necessary to meet the legitimate objective of
    - Protection of human health or safety
    - Animal or Plant life or health
    - Environmental Protection

6.5 The BIS technical committees have also been identified as stakeholders for the TBT Notifications and relevant notifications are being disseminated to them. The committee members should examine the TBT Notifications with a view to protect Indian trade interest. The e-mail address and website of BIS Enquiry Point is as follows:

BIS Website: www.bis.org.in
Email: info@bis.org.in

The committee may note.

Item 7 INFORMATION ON E-SALE OF STANDARDS BY BIS

7.1 Bureau of Indian Standards, the National Standards Body of India has published more than 19000 Indian Standards which are available for sale. They are available for e-sale as under:

Softcopy download from BIS sales portal http://www.standardsbis.in.

The committee may note.

Item 8 TRAINING PROGRAMME

8.1 National Institute of Training for Standardization (NITS) has been set up by BIS with world class facilities to impart training on various aspects leading to standardization, quality and other management systems, consumer protection, public service delivery, etc. The training calendar and other details for the current year by visiting BIS web site http://www.bis.org.in/trg/train.asp.
The committee may note**.**

The committee may note.

Item 9 DATE AND PLACE OF NEXT MEETING

Item 10 ANY OTHER BUSINESS

ANNEX 1

Revision of IS 9283: 2013

Comments from ICAI

Sl. No	Clause/ Sub-Clause	Type of Comment (General/ Technical/ Editorial	Comments	Proposed Change
1	Table 2 to 5	T	A few non standard out put ratings are included, it may be aligned with those in IS 12615	Non standard ratings may be deleted
2	Do	T	During last meeting of ETD 15 it was decided to create levels of efficiency and align efficiency values with IS 12615. Levels of eff are created but the eff values are much lower than IS 12615 values	Eff values may be aligned with IS 12615
3	12.1, Line 1	T	Statement of eff to be made by manufacturer- it is contradictory, eff values are given in Table 2-5, and no need to make separate declaration by mfrs; it also contradicts with cl 11 & 17	Delete line
4	17.1, Note 2	T	If mfr declares performance values, theoretically declared value after tolerance can be lower than the performance values specified in Table 2 -5. This need to be corrected.	Change the line with rider
5	17.1, Note 3	T	In this case mfr can declare anything and no control of performance. E.g.if it is declared 3.5 kw, as per Table 3 with eff 65% - can it be acceptable	We need to change the sentence to avoid confusion and create confidence on the standard so that everything cannot be declared

ANNEX 2

Revision of IS 12075: 2008

Comments from Marathon

Sl. No	Clause/ Sub-Clause	Paragraph/ Figure/Table	Type of Comment (General/ Technical/ Editorial	Comments	Proposed Change	Justification
1	1.2	NOTE	General	The mechanical vibrations in rotating machines of speed lower than 500 rpm shall be subject to agreement between….	The mechanical vibrations in rotating machines of speed lower than 500 rpm and higher than 3000 rpm shall be subject to agreement between….	Addresses higher speed like 2 pole / 60Hz
2	Table -1	NOTES	General	Notes 6 This level is the limit…..	* This level is the limit…. Asterix should also be marked with upper limits (wherever there are two values)	The same representation appear in IEC Table -1

ANNEX 3

Revision of IS 996

Comments from ICAI

A few decision taken in the last minute may not have been incorporated, request to look into Item 1.2 – a) Comparing IEC efficiency value under the series IEC 60034-30 was to be done for aligning it with IEC values and it was also decided that grades of efficiency value in line with IEC value may be specified though this is not recorded in Minutes.

b) Product of nominal efficiency and pf in Table 12 & 13 – this need to be looked into as who would provide nominal efficiency value. Moreover, this is performance requirement based on test result

c) Performance requirement given in Table 12 & 13 need to be linked with a more categorical statement under12.5.1 as these are not covered in 1st para of 12.5.1. Suggest to add a clause – 12.5.2 – For motor with specific application such as fans, blowers, domestic applications, air conditioners, room coolers, refrigerators, data processing equipment, and compressors etc., the performance values specified in Tables

3 to 11 may not be applicable as the motor design is based on the overall requirements of the application. In such cases shaded pole or split phase motor may be used as per performance requirements specified in Table 12 and Table 13respectively.
d) Based on above, Note 1 may be deleted and Note 2 may need to be relooked into if necessary
e) Efficiency values given under Table 14 can be modified giving a direct value like +/- 5% to avoid complication
f) Reference to IS 13730 to be added
g) A note as per e) of Minutes based on IEEMA response to be added
h) Cl 7.1 -NEMA sizes normally not given in Indian Standard; delete its reference
i) Cl 19.1.1 - Normally these type of requirements are not given in product spec standard, may check background why it is given
j) Cl 21.5.2 - A few more test may be applicable
k) Cl 21.6.1 - Type test should include all test given in 21.3

Comments from Marathon

Clause / Sub-Clause	Type of Comment (General/ Technical/ Editorial	Comments	Proposed Change	Justification
21.3(a)	Calls for resistance test as type test		If manufacturer is testing for current /watt in all speeds then resistance measurement should be only in high speed.	As current/watts are tested at all speeds generally hence resistance measurement at all speeds is not required however can be done for high speed.
21.3(p)		Reduced voltage test is 50% of rated voltage	It should correlate to the actual torque requirement of the motor	Should have a deviation route for customized applications where motors are designed to suite the exact requirement.
10.1.3		IP20 specification not found	IP should be minimum IP20 and that should be defined in scope	There are many application where Indian customers are taking IP20 motors which suits there application.
10.1.7 Environment Proof Motor/ Weather proof		The clause is giving a provision for IPE44/IPW motors to be rain proof	IP44 motors may not be rain proof as water ingress is possible in them as per std.	Manufacturer can follow IP44 Std . Change points(for IPE44/IPW44) to be clarified for testing standard

21.3 q(noise level)		IS 12065 appendix d IP 20 level is not mentioned(mentioned for IP22-44) not mentioned for 55 also	Should be clearly mentioned for all ratings. Testing frequency to be limited to initial Pilot run validation only	Noise measurement cannot be done on production lines and should be part of initial pilot run/sample built for the specific model.
21.3 r		Over speed test is 20% of rated rpm	It is derived from 3 phase motor std and to be excluded for single phase motors as the application requirement does not call for the same.	Should be excluded as motors are customized in majority of the applications
21.6.2		Routine test certificates for 100% motors		It will not be possible to send certificates for 100% motors as single phase motors are produced in bulk and consumed by different channels thus it is physically impossible to print each test report and place it along with the motor
General		Frequency for testing needs to be defined for change points amended along with testing facility requirements inside the plant.		

Comments from SHRI ABHIJIT DANDEKAR, Member ETD 25

Need to include Permanent Magnet AC Synchronous motors as a different part as it is now widely used for all elevators and escalator applications. This need was identified during BIS ET25 committee meeting as well.

ANNEX 4

SL. No.	NAME OF THE ORGANISATION	REPRESENTED BY	MEETINGS ATTENDED/ HELD
1.	Asea Brown Boveri Limited, Faridabad	Shri Lokesh B M *(Principal)* Shri Sumit Tyagi (Alternate)	3/3
2.	Bureau of Energy Efficiency	Ms P Samal (*Principal*) Ms Neha Kumari *(1st Alternate)* Shri Kamran Shaikh*(2nd Alternate)*	0/3
3.	Bharat Bijlee Ltd	Shri Salil Kumar *(Principal)* Mrs. Anjali Ranade *(Alternate)*	3/3
4.	Bharat Heavy Electricals Ltd.	Shri Nisheeth Khare (*Principal*) Shri Baboo Sonwane (Alternate)	3/3
5.	Central Electricity Authority	Sh. Prabhjot Singh Sahi *(Principal)* Sh. Jugal Kishore *(Alternate)*	1/3
6.	CG power & Industrial solutions Ltd	Shri A Sudhakaran (Principal) Shri Sandeep R. Bachkar (*Alternate*)	3/3
7.	Development Commissioner Micro, Small & Medium Enterprises	Shri S.K.Saini *(Principal)*	1/3
8.	Electrical Research & Development Association	Shri R.P. Singh *(Principal)* Dr. S. H. Chetwani *(Alternate)*	3/3
9.	Engineers India Limited, New Delhi	Shri Raman Sood*(Principal)* Shree Ravish K. Raman*(1st Alternate)* Shri S Srihari*(2nd Alternate)*	0/3
10.	Havell's India Pvt. Ltd.	Shri Anil Sukumar Akole*(Principal)* Shri Sassikumar J. *(Alternate)*	0/3
11.	Hindustan Electric Motors, Mumbai	Shri Sanjay P. Jadia*(Principal)*	3/3
12.	International Copper Association Ltd	Shri Abhishek Dhupar *(Principal)* Shri D Goswami*(Alternate)*	3/3
13.	IEEMA	Shri Ashok Kulkarni *(Principal)* Ms. Pragati Sohoni *(Alternate)*	3/3
14.	Indian Institute of Technology New Delhi	Prof Anil Verma*(Principal)* Dr. Pravin P Ingole*(Alternate)*	0/3
15.	Indian Pump Manufacturers' Association	Shri K.V. Karthik *(Principal)* Shri Anoop Agarwal *(1st Alternate)* Shri Utkarsh Chaya*(2nd Alternate)*	3/3

16.	Ingersoll Rand India Limited	Shri Kaushal Pandya (Principal) Shri Harsh Shukla(Alternate)	0/3
17.	Integrated Electric Ltd.	Dr Praveen Vijayragvan (Principal)	3/3
18.	In Personal Capacity	Shri Dilip Bhave (Principal)	3/3
19.	KSB Pumps Ltd	Shri Rajesh B Gote (Principal) Shri Uday Joshi (Alternate)	3/3
20.	Marathon Electric Motors (India) Ltd	Shri Rajiv Ranjan (Principal)	1/3
21.	M.N. Dastur	Shri S. Sampath (Principal) Shri K.B. Venkateswara Rao (Alternate)	0/3
22.	Nuclear Power Corporation of India Limited	Shri S K Tiwari (Principal) Dr Dhanashree V Vyawahare (Alternate)	2/3
23.	NTPC Ltd	Shri Rajesh Sharma(Principal)	1/3
24.	Steel Authority of India Ltd	Smt. Madhupriya (Principal)	0/3
25.	South India Engineering Mfrs. Association	Dr. R. Subramanian (Principal) Arunkumar(Alternate)	3/3
26.	Siemens	Shri Pradeep Ranade(Principal) Shri Prasad Hardikar(1st Alternate) Shri Ashish Shere (2nd Alternate)	3/3
27.	Scientific and Industrial Testing and Research Centre	Shri A M Selvaraj (Principal)	3/3
28.	SJVN	Shri R. K. Bansal (Principal)	0/3
29.	Testing Electrical Standards Lab	Shri Ankit Jain (Principal) Ms Mintej Jain (Alternate)	0/3
30.	ThyssenKrupp Industries (India) Pvt. Ltd.	Ms Charuta Vikram Mulay(Principal) Shri Vaijnath G. Sangekar (Alternate)	3/3
31.	Toshiba Mitsubishi-Electric Industrial Systems Corporation, Bengaluru	Shri Sudheer Tapaskar (Principal) Shri Manish Joshi(Alternate) Shri Venkatesulu Thumbur(Alternate)	0/3

ANNEX 5

Program of Work- ETD 15

Scope : To prepare standards on rotating electrical machines like induction, synchronous, motors, generators, dc machines and turbines including carbon brushes for electrical machines (with the exception of traction machines and rotating machinery coming under the purview of other Committees)

SI. No.	IS No.	Title	No. of Amendments	Degree of Equivalence
1	IS/IEC 41 : 1991	Field acceptance tests to determine the hydraulic performance of hydraulic turbines storage pumps and pump - Turbines	-	Identical under single numbering
2	IS 900 : 2019	Code of Practice for Storage Installation and Maintenance of Induction Motors Third Revision	-	Indigenous
3	IS 996 : 2009 IEC 34-1 (1969 BS 170: 1962 JIS 4203-1973 BS 1608 : 1966	Single phase a c induction motors for general purpose Third Revision	2	Identical under dual numbering
4	IS 1231 : 2019	Dimensions and Output Series of Foot Mounted Induction Motors Frame Numbers 56 to 315 L Fourth Revision	-	Modified/Technically Equivalent
5	IS 2223 : 1983	Dimensions of flange mounted AC induction motors	2	Modified/Technically Equivalent
6	IS 2253 : 1974 IEC Pub 34-7 (1972)	Designations for types of construction and mounting arrangements of rotating electrical machines First Revision	-	Identical under dual numbering
7	IS 2254 : 1985	Dimensions of vertical shaft motors for pumps Second Revision	-	Identical under dual numbering
8	IS 2968 : 1964 DIN 42923	Dimensions of slide rails for electric motors	1	Identical under dual numbering
9	IS 2972 (Part 1) : 1979	Specification for textile motors Part 1 loom motors First Revision	2	Indigenous
10	IS 2972 (Part 2) : 1979	Specification for textile motors Part 2 card motors First Revision	1	Indigenous
11	IS 2972 (Part 3) : 1979	Specification for textile motors Part 3 spinning frame motors First Revision	-	Indigenous
12	IS 4029 : 2010	Guide for testing three phase induction motors First Revision	-	Indigenous
13	IS 4665 (Part 1) : 1984	Specification for portable electric motor - Operated tools Part 1 general requirements and tests First Revision	1	Modified/Technically Equivalent
14	IS 4665 (Part 2) : 1984	Specification for portable electric motor - Operated tools Part 2 specific requirements for tools	-	Modified/Technically Equivalent

15	IS 4758 : 1968	Methods of measurement of noise emitted by machines	-	Modified/Technically Equivalent
16	IS 4889 : 1968	Methods of determination of efficiency of rotating electrical machines	3	Modified/Technically Equivalent
17	IS 5422 : 1996	Turbine type generators - Specification First Revision	-	Modified/Technically Equivalent
18	IS 6362 : 1995 IEC Pub 34-6 : 1991 zy	Designation of methods of cooling of rotating electrical machines First Revision	-	Identical under dual numbering
19	IS 7132 : 1973	Guide for testing synchronous machines	-	Modified/Technically Equivalent
20	IS 7306 : 1974	Methods for determining synchronous machine quantities from tests	-	Modified/Technically Equivalent
21	IS 7538 : 1996	Three - Phase squirrel cage induction motors for centrifugal pumps for agricultural application - Specification First Revision	3	Indigenous
22	IS 7572 : 1974	Guide for testing single - Phase AC and universal motors	-	Modified/Technically Equivalent
23	IS 8151 : 1976	Specification for single - Speed three - Phase induction motors for driving lifts	2	Modified/Technically Equivalent
24	IS 8223 : 1999	Dimensions and output series for rotating electrical machines First Revision	-	Modified/Technically Equivalent
25	IS 8789 : 2021	Values of performance characteristics for three-phase induction motors with degree of protection 2X	-	Indigenous
26	IS 9283 : 2013	Motors for submersible pumpsets - Specification Second Revision	-	Indigenous
27	IS 9320 : 1979	Guide for testing direct - Current DC machines	1	Modified/Technically Equivalent
28	IS 9582 (Part 1) : 1980	Specification for single - Phase electric motors for definite purposes Part 1 domestic laundry machine motors	1	Indigenous
29	IS 9628 : 1980 BS 5000 : Part 16 : 1972	Three-phase induction motors with type of protection n	-	Identical under dual numbering
30	IS 9670 : 1980	Specification for direct current micromotor for cassette tape recorders and other applications	-	Indigenous
31	IS 9919 : 1999	Guide for selection and use of carbon brushes in electrical rotating machines First Revision	-	Indigenous
32	IS 10534 : 1983	Method of measurement of airborne noise emitted by gas turbine installations	-	Modified/Technically Equivalent
33	IS 11537 : 1985	Specification for centrifugal switch for single - Phase induction motors	-	Indigenous

34	IS 12065 : 1987	Permissible limits of noise levels for rotating electrical machines	1	Modified/Technically Equivalent
35	IS 12066 : 1987	Specification for three - Phase induction motors for machine tools	-	Modified/Technically Equivalent
36	IS 12075 : 2008	Mechanical vibration of rotating electrical machines with shaft heights 56 mm and higher - Measurement evaluation and limits of vibration severity First Revision	-	Modified/Technically Equivalent
37	IS 12615 : 2018	Line operated three phase AC motors IE Code Efficiency classes and performance specification Third Revision	1	Modified/Technically Equivalent
38	IS 12642 : 1989	Brush - Holders for slip rings group R type RA - Specification	-	Modified/Technically Equivalent
39	IS 12998 (Part 1) : 1991 ISO 1680/1 :1986	Methods of measurement of airborne noise emitted by rotating electrical machinery Part 1 engineering method for free - Field conditions over a reflecting plane	-	Identical under dual numbering
40	IS 12998 (Part 2) : 1991 ISO 1680/2 :1987	Methods of measurement of airborne noise emitted by rotating electrical machinery Part 2 survey method	-	Identical under dual numbering
41	IS 13079 : 1991	Stepping motors - Specification	-	Modified/Technically Equivalent
42	IS 13364 (Part 1) : 1992	Ac generators driven by reciprocating internal combustion engines - Specification Part 1 alternators rated up to 20 kVa	-	Modified/Technically Equivalent
43	IS 13364 (Part 2) : 1992	Ac generators driven by reciprocating internal combustion engines - Specification Part 2 alternators rated above 20 kVa and up to 1250 kVa	1	Modified/Technically Equivalent
44	IS 13466 : 1992	Brushes for electrical machines - Specification	-	Modified/Technically Equivalent
45	IS 13525 : 1992	Flexible conductors for carbon brushes - Specification	-	Modified/Technically Equivalent
46	IS 13529 : 2021	Rotating Electrical Machines Part 26 Effects Of Unbalanced Voltages On The Performance Of Three-Phase Cage Induction Motors	-	Modified/Technically Equivalent
47	IS 13555 : 1993	Guide for selection and application of 3 - Phase AC induction motors for different types of driven equipment	-	Indigenous
48	IS 13584 : 1993	Brush materials for electrical machinery - Specification	-	Modified/Technically Equivalent

49	IS 13586 : 1993	Definitions and nomenclature for carbon brushes brush - Holders commutators and slip - Rings for electrical machinery	-	Modified/Technically Equivalent
50	IS 13937 (Part 1) : 1994 ISO 7574/1	Statistical methods of determining and verifying stated noise emission values of machinery and equipment Part 1 general considerations and definitions	-	Identical under dual numbering
51	IS 13937 (Part 2) : 1994 ISO 7574/2	Statistical methods of determining and verifying stated noise emission values of machinery and equipment Part 2 methods for stated values for individual machines	-	Identical under dual numbering
52	IS 13937 (Part 3) : 1994 ISO 7574/3	Statistical methods for determining and verifying stated noise emission values of machinery and equipment Part 3 simple Transition method for stated values for batches of machines	-	Identical under dual numbering
53	IS 13937 (Part 4) : 1994 ISO 7574/4	Statistical methods of determining and verifying stated noise emission values of machinery and equipment Part 4 methods for stated values for batches of machines	-	Identical under dual numbering
54	IS 14195 : 1994 IEC Pub 1015: 1990 z	Brush - Holders for electrical machines - Guide to the measurement of the static thurst applied to brushes	-	Identical under dual numbering
55	IS 14196 : 1994 IEC Pub 560 : 1977	Definitions and terminology of brush holders for electrical machines	-	Identical under dual numbering
56	IS 14197 : 1994 IEC Pub 193 : 1965	Code for model acceptance tests of hydraulic turbines	1	Identical under dual numbering
57	IS 14198 (Part 1) : 1994 IEC Pub 953-1(1990)	Rules for steam turbine thermal acceptance tests Part 1 method A - High accuracy for large condensing steam turbines	-	Identical under dual numbering
58	IS 14198 (Part 2) : 1994 IEC Pub 953-2(1990)	Rules for steam turbines thermal acceptance tests	-	Identical under dual numbering
59	IS 14205 (Part 1) : 1994 IEC Pub 45-1:1991	Steam turbine Part 1 specification	-	Identical under dual numbering
60	IS 14376 : 1996	Brush holders for electrical machines - Specification	-	Modified/Technically Equivalent
61	IS 14377 : 1996	Specification for three - Phase induction motors for fans used in air - Conditioning and ventilation	-	Modified/Technically Equivalent
62	IS 14568 (Part 2) : 1998 IEC 72-2 (1990)	Dimensions and output series for rotating electrical machines Part 2 frame numbers 355 to 1000 and flange numbers 1180 to 2360	-	Identical under dual numbering

63	IS 14569 : 1999	Commutators for electrical machines - Specification	-	Indigenous
64	IS 14578 : 1999	Three - Phase induction motors for use in nuclear power plants - Specification	1	Indigenous
65	IS 14582 : 2021	Single-phase small ac electric motors for centrifugal pumps for agricultural applications	-	Indigenous
66	IS 14889 : 2000	Copper tamping powder for carbon brushes - Specification	-	Indigenous
67	IS 15429 : 2004	Storage installation and maintenance of DC motors - Code of practice	-	Indigenous
68	IS 15664 : 2006 ISO 2314:1989	Gas turbines - Acceptance tests	-	Identical under dual numbering
69	IS 15665 : 2006 ISO 11086:1996	Gas turbines - Vocabulary	-	Identical under dual numbering
70	IS 15666 (Part 1) : 2006 ISO 3977-1	Gas turbines - Procurement Part 1 general introduction and definitions	-	Identical under dual numbering
71	IS 15666 (Part 2) : 2006 ISO 3977-2	Gas turbines - Procurement Part 2 standard reference conditions and ratings	-	Identical under dual numbering
72	IS 15666 (Part 3) : 2006 ISO 3977-3	Gas turbines - Procurement Part 3 design requirements	-	Identical under dual numbering
73	IS 15666 (Part 4) : 2006 ISO 3977-4	Gas turbines - Procurement Part 4 fuels and environment	-	Identical under dual numbering
74	IS 15666 (Part 5) : 2006 ISO 3977-5	Gas turbines - Procurement Part 5 applications for petroleum and natural gas industries	-	Identical under dual numbering
75	IS 15666 (Part 7) : 2006 ISO 3977-6	Gas turbines - Procurement Part 7 technical information	-	Identical under dual numbering
76	IS 15666 (Part 8) : 2006 ISO 3977-8	Gas turbines - Procurement Part 8 inspection testing installation and commissioning	-	Identical under dual numbering
77	IS 15666 (Part 9) : 2006 ISO 3977-9	Gas turbines - Procurement Part 9 reliability availability maintainability and safety	-	Identical under dual numbering
78	IS 15667 : 2006 ISO 19860:2005	Gas turbines - Data acquisition and trend monitoring system requirements for gas turbine installations	-	Identical under dual numbering
79	IS 15880 : 2009 IEC 60034-17	Three phase cage induction motors when fed from IGBT converters - Application guide	-	Identical under dual numbering
80	IS 15881 : 2009	Three phase cage induction motors specifically designed or IGBT converter supply - Specification	-	Indigenous

81	IS 15999 (Part 1) : 2021 IEC 60034-1: 2017	Rotating electrical machines - Part 1 Rating and performance	-	Identical under dual numbering
82	IS 15999 (Part 2/Sec 1) : 2011	Rotating electrical machines Part 2 method of tests Sec 1 standard methods for determining losses and efficiency from tests Excluding Machines For Traction Vehicles	-	Modified/Technically Equivalent
83	IS 15999 (Part 3) : 2016 IEC 60034-3 : 2007	Rotating Electrical Machines Part 3 Specific Requirements for Synchronous Generators Driven by Steam Turbines or Combustion Gas Turbines	-	Identical under dual numbering
84	IS 15999 (Part 4) : 2017 IEC 60034-4 : 2008	Rotating electrical machines Part 4 methods for determining synchronous machine quantities from tests	-	Identical under dual numbering
85	IS 15999 (Part 15) : 2017 IEC 60034-15 : 2009	Rotating Electrical Machines Part 15 Impulse Voltage Withstand Levels of Form-Wound Stator Coils for Rotating ac Machines	-	Identical under dual numbering
86	IS 15999 (Part 18/Sec 41) : 2018 IEC 60034-18-41: 201	Rotating electrical machines Part 18 partial discharge free electrical insulation systems Type I used in rotating electrical machines fed from voltage converters Sec 41 qualification and quality control tests	-	Identical under dual numbering
87	IS 15999 (Part 18/Sec 42) : 2018 IEc 60034-18-42 : 20	Rotating Electrical Machines Part 18 Partial Discharge Free Electrical Insulation Systems Type I Used in Rotating Electrical Machines Fed From Voltage Converters Section 41 Qualification and quality control tests	-	Identical under dual numbering
88	IS 15999 (Part 26) : 2016 IEC 60034-26 : 2006	Rotating Electrical Machines Part 26 Effects of Unbalanced Voltages on the Performance of Three-Phase Cage Induction Motors	-	Identical under dual numbering
89	IS/IEC 60034-5 : 2000	Rotating electrical machines Part 5 degrees of protection provided by the integral design of rotating electrical machines IP Code - Classification Second Revision	-	Identical under single numbering
90	IS/IEC 60034-8 : 2014 IEC 60034-8: 2014	Rotating Electrical Machines Part 8 Terminal Markings and Direction of Rotation Third Revision	-	Identical under dual numbering
91	IS/IEC 60034-27-4) : 2018 IEC 60034-27-4	Rotating Electrical Machines Part 27 Winding Insulation of Rotating Electrical Machines Section 4 Measurement of insulation resistance and polarization index	-	Identical under dual numbering

ANNEX 6
ETD 15 Rotating Machinery/ Pre 2000 Status

SI.No	IS No	Title	Based on IEC	Latest IEC	Status/Recommendation
1.	IS/IEC 41 : 1991	Field acceptance tests to determine the hydraulic performance of hydraulic turbines storage pumps and pump - Turbines			
2.	IS 2223 : 1983	Dimensions of flange mounted AC induction motors	IEC Pub 72 : 1971	60072-1991	DECIDED FOR WITHDRAWAL
3.	IS 2253 : 1974 IEC Pub 34-7 (1972)	Designations for types of construction and mounting arrangements of rotating electrical machines First Revision	IEC Pub 34-7 1972	IEC 60034-7:2022 Vaild	UNDER WC
4.	IS 2254 : 1985	Dimensions of vertical shaft motors for pumps Second Revision			
5.	IS 2968 : 1964 DIN 42923	Dimensions of slide rails for electric motors		DIN 42923	
6.	IS 2972 (Part 1) : 1979	Specification for textile motors Part 1 loom motors First Revision		Indigenous	
7.	IS 2972 (Part 2) : 1979	Specification for textile motors Part 2 card motors First Revision		Indigenous	DECIDED FOR WITHDRAWAL
8.	IS 2972 (Part 3) : 1979	Specification for textile motors Part 3 spinning frame motors First Revision		Indigenous	DECIDED FOR WITHDRAWAL
9.	IS 4665 (Part 1) : 1984	Specification for portable electric motor - Operated tools Part 1 general requirements and tests First Revision	CEE Publication 20-1973 BS 2769: 1964 P		Adoption of IEC 60745-1:2006. UNDER WC
10.	IS 4665 (Part 2) : 1984	Specification for portable electric motor - Operated tools Part 2 specific requirements for tools	CEE Pub 20 II-1975 BS 2769: 1964		IEC 60745 series covers different tools. UNDER WC
11.	IS 4758 : 1968	Methods of measurement of noise emitted by machines	ISO Recommendation 495		
12.	IS 4889 : 1968	Methods of determination of efficiency of rotating electrical machines	Publication 34-2	IEC 60034-2-1:2014	
13.	IS 5422 :	Turbine type generators - Specification First Revision	IEC Pub 34-3 1988	IEC 60034-3:2020 Vaild	UNDER WC

	1996				
14.	IS 7132 : 1973	Guide for testing synchronous machines	IEC Pub 34-1 1969 IEC Pub 344 (1967 IEEE 115-1965	This IEC Valid IEC 60034-1:2022	May be covered under IEC 60034-1
15.	IS 7306 : 1974	Methods for determining synchronous machine quantities from tests	IEC Publication 34-4 (1967	This is Valid IEC 60034-4-1:2018	IEC 60034-4-1 may be adopted.
16.	IS 7538 : 1996	Three - Phase squirrel cage induction motors for centrifugal pumps for agricultural application - Specification First Revision		Indigenous	UNDER REVISION
17.	IS 7572 : 1974	Guide for testing single - Phase AC and universal motors	IS : 4029-1967 AIEE Publication IEEE No.. 114-19.58 NEMA Standard M.G. 1	This Is IEC AIEE Publication IEEE No.. 114-19.58	
18.	IS 8151 : 1976	Specification for single - Speed three - Phase induction motors for driving lifts	BS 2655: Part 2. 1959		
19.	IS 9320 : 1979	Guide for testing direct - Current DC machines	GOST : 183-1966, GOST : 10159-1962		
20.	IS 9582 (Part 1) : 1980	Specification for single - Phase electric motors for definite purposes Part 1 domestic laundry machine motors			
21.	IS 9628 : 1980 BS 5000 : Part 16 : 1972	Three-phase induction motors with type of protection n	(BS 5000 : Part 16 : 1972)		BS EN IEC 60079-15 2019 Explosive atmospheres Part 15: Equipment protection by type of protection "n"
22.	IS 9670 : 1980	Specification for direct current micromotor for cassette tape recorders and other applications			
23.	IS 9919 : 1999	Guide for selection and use of carbon brushes in electrical rotating machines First Revision			
24.	IS 10534 : 1983	Method of measurement of airborne noise emitted by gas turbine installations	(ISO/DIS 6190	Withdrawn	DECIDED FOR WITHDRAWAL
25.	IS 11537 : 1985	Specification for centrifugal switch for single - Phase induction motors		Ingenious	Talked to Shri Rajeev Ranan, Marathon. He said no one is using these switches because of high maintenance and associated losses. People are opting for capacitor start and capacitor run motors. May be withdrawn or reprint after updating references.

26.	IS 12065 : 1987	Permissible limits of noise levels for rotating electrical machines		This is IEC of Pub. 34-9 1972	UNDER REVISION. GIVEN TO PANEL.
27.	IS 12066 : 1987	Specification for three - Phase induction motors for machine tools	IEMA: l-1978 IEMA	The based on IEMA: l-1978	DECIDED FOR WITHDRAWAL
28.	IS 12998 (Part 1) : 1991 ISO 1680/1 :1986	Methods of measurement of airborne noise emitted by rotating electrical machinery Part 1 engineering method for free - Field conditions over a reflecting plane	(ISO 1680/1 :1986)	Withdrawn	Revised edition of ISO 1680 covers requirement of both parts of IS 12998. Therefore, ISO 1680 may be adopted replacing both IS. UNDER WC
29.	IS 12998 (Part 2) : 1991 ISO 1680/2 :1987	Methods of measurement of airborne noise emitted by rotating electrical machinery Part 2 survey method	(ISO 1680/2 :1987)	Withdrawn	
30.	IS 13079 : 1991	Stepping motors - Specification	(BS 5000 : Part 60 : 1982)	Withdrawn	IEC 60034-20-1 may be adopted. UNDER WC
31.	IS 13364 (Part 1) : 1992	Ac generators driven by reciprocating internal combustion engines - Specification Part 1 alternators rated up to 20 kVa	IEC Pub 34-l-1983	This is IEC 60034-1:2022 Valid	
32.	IS 13364 (Part 2) : 1992	Ac generators driven by reciprocating internal combustion engines - Specification Part 2 alternators rated above 20 kVa and up to 1250 kVa	IEC Pub 34-l-1983	This is IEC Pub 34-1983 Valid	
33.	IS 13466 : 1992	Brushes for electrical machines - Specification	(IEC Pub 136 (1986 Pub 467 (1974) IEC Pub 773 (1983)		IEC 60773:2021
34.	IS 13525 : 1992	Flexible conductors for carbon brushes - Specification	(JIS C 2802 : 1970)		
35.	IS 13555 : 1993	Guide for selection and application of 3 - Phase AC induction motors for different types of driven equipment			

36.	IS 13584 : 1993	Brush materials for electrical machinery - Specification	IEC -Pub 413 : 1972 , IEC Pub 773 : 1983	Withdrawn	IEC 60773: 2021 Iec 60413: 1972
37.	IS 13586 : 1993	Definitions and nomenclature for carbon brushes brush - Holders commutators and slip - Rings for electrical machinery	(IEC Pub 276 (1968)	IEC 60276:2018	IEC 60276:2018 may be adopted. UNDER WC
38.	IS 14197 : 1994 IEC Pub 193 : 1965	Code for model acceptance tests of hydraulic turbines	(IEC Pub 193 : 1965)	IEC 60193:2019	IEC 60193:2019 may be adopted. UNDER WC
39.	IS 14198 (Part 1) : 1994 IEC Pub 953-1(1990)	Rules for steam turbine thermal acceptance tests Part 1 method A - High accuracy for large condensing steam turbines	(IEC Pub 953-1(1990)	This is IEC Pub IEC 60953-1:1990	Reprint
40.	IS 14198 (Part 2) : 1994 IEC Pub 953-2(1990)	Rules for steam turbines thermal acceptance tests	(IEC Pub 953-2(1990)	Withdrawn	IEC 60953-0:2022
41.	IS 14205 (Part 1) : 1994 IEC Pub 45-1:1991	Steam turbine Part 1 specification	(IEC Pub 45-1:1991)	IEC 60045-1:2020	UNDER WC
42.	IS 14376 : 1996	Brush holders for electrical machines - Specification	(IEC Pub 136 (l986)	valid	IEC 60136:1986/AMD1:1995
43.	IS 14377 : 1996	Specification for three - Phase induction motors for fans used in air - Conditioning and ventilation	(IEEMA 8 : 1987)		
44.	IS 14569 : 1999	Commutators for electrical machines - Specification		Indigenous	
45.	IS 14578 : 1999	Three - Phase induction motors for use in nuclear power plants - Specification		Indigenous	

ANNEX 7

Publication- TC 2 (Rotating Machinery)

S.NO	Reference	Title
1.	IEC 60034:2022 SER	Rotating electrical machines - ALL PARTS
2.	IEC 60034-1:2022	Rotating electrical machines - Part 1: Rating and performance
3.	IEC 60034-1:2022 RLV	Rotating electrical machines - Part 1: Rating and performance
4.	IEC 60034-2-1:2014	Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)
5.	IEC 60034-2-2:2010	Rotating electrical machines - Part 2-2: Specific methods for determining separate losses of large machines from tests - Supplement to IEC 60034-2-1
6.	IEC 60034-2-3:2020	Rotating electrical machines - Part 2-3: Specific test methods for determining losses and efficiency of converter-fed AC motors
7.	IEC 60034-3:2020	Rotating electrical machines - Part 3: Specific requirements for synchronous generators driven by steam turbines or combustion gas turbines and for synchronous compensators
8.	IEC 60034-4-1:2018	Rotating electrical machines - Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests
9.	IEC 60034-5:2020	Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification
10.	IEC 60034-5:2020 RLV	Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification
11.	IEC 60034-6:1991	Rotating electrical machines - Part 6: Methods of cooling (IC Code)
12.	IEC 60034-7:2020	Rotating electrical machines - Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code)
13.	IEC 60034-8:2007+AMD1:2014 CSV	Rotating electrical machines - Part 8: Terminal markings anddirection of rotation
14.	IEC 60034-8:2007	Rotating electrical machines - Part 8: Terminal markings and direction of rotation

15.	IEC 60034-8:2007/AMD1:2014	Amendment 1 - Rotating electrical machines - Part 8: Terminal markings and direction of rotation
16.	IEC 60034-9:2021 CMV	Rotating electrical machines - Part 9: Noise limits
17.	IEC 60034-9:2021	Rotating electrical machines - Part 9: Noise limits
18.	IEC 60034-11:2020	Rotating electrical machines - Part 11: Thermal protection
19.	IEC 60034-11:2020 RLV	Rotating electrical machines - Part 11: Thermal protection
20.	IEC 60034-12:2016	Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors
21.	IEC 60034-12:2016 RLV	Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors
22.	IEC 60034-14:2018 RLV	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity
23.	IEC 60034-14:2018	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity
24.	IEC 60034-15:2009	Rotating electrical machines - Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines
25.	IEC 60034-16-1:2011	Rotating electrical machines - Part 16-1: Excitation systems for synchronous machines - Definitions
26.	IEC TR 60034-16-2:1991	Rotating electrical machines - Part 16: Excitation systems for synchronous machines - Chapter 2: Models for power system studies
27.	IEC TS 60034-16-3:1996	Rotating electrical machines - Part 16: Excitation systems for synchronous machines - Section 3: Dynamic performance
28.	IEC 60034-18-1:2010	Rotating electrical machines - Part 18-1: Functional evaluation of insulation systems - General guidelines
29.	IEC 60034-18-21:2012	Rotating electrical machines - Part 18-21: Functional evaluation of insulation systems - Test procedures for wire-wound windings - Thermal evaluation and classification
30.	IEC 60034-18-31:2012	Rotating electrical machines - Part 18-31: Functional evaluation of insulation systems - Test procedures for form-wound windings - Thermal evaluation and classification of insulation systems used in rotating machines

31.	IEC 60034-18-32:2022 CMV	Rotating electrical machines - Part 18-32: Functional evaluation of insulation systems (Type II) - Electrical endurance qualification procedures for form-wound windings
32.	IEC 60034-18-32:2022	Rotating electrical machines - Part 18-32: Functional evaluation of insulation systems (Type II) - Electrical endurance qualification procedures for form-wound windings
33.	IEC TS 60034-18-33:2010	Rotating electrical machines - Part 18-33: Functional evaluation of insulation systems - Test procedures for form-wound windings - Multifactor evaluation by endurance under simultaneous thermal and electrical stresses
34.	IEC 60034-18-34:2012	Rotating electrical machines - Part 18-34: Functional evaluation of insulation systems - Test procedures for form-wound windings - Evaluation of thermomechanical endurance of insulation systems
35.	IEC 60034-18-41:2014+AMD1:2019 CSV	Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters - Qualification and quality control tests
36.	IEC 60034-18-41:2014	Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters - Qualification and quality control tests
37.	IEC 60034-18-41:2014/AMD1:2019	Amendment 1 - Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in electrical rotating machines fed from voltage converters - Qualification and quality control tests
38.	IEC 60034-18-41:2014/AMD1:2019/COR1:2020	Corrigendum 1 - Amendment 1 - Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in electrical rotating machines fed from voltage converters - Qualification and quality control tests
39.	IEC 60034-18-42:2017+AMD1:2020 CSV	Rotating electrical machines - Part 18-42: Partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters - Qualification tests
40.	IEC 60034-18-42:2017	Rotating electrical machines - Part 18-42: Partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters - Qualification tests
41.	IEC 60034-18-42:2017/AMD1:2020	Amendment 1 - Rotating electrical machines - Part 18-42: Partial discharge resistant electrical insulation systems (Type II) used in rotating electrical machines fed from voltage converters - Qualification tests
42.	IEC 60034-19:2014	Rotating electrical machines - Part 19: Specific test methods for d.c. machines on conventional and rectifier-fed supplies
43.	IEC TS 60034-20-1:2002	Rotating electrical machines - Part 20-1: Control motors - Stepping motors
44.	IEC 60034-22:2009	Rotating electrical machines - Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets
45.	IEC 60034-23:2019	Rotating electrical machines - Part 23: Repair, overhaul and reclamation
46.	IEC TS 60034-24:2009	Rotating electrical machines - Part 24: Online detection and diagnosis of potential failures at the active parts of rotating electrical machines and of bearing currents - Application guide
47.	IEC TS 60034-25:2022 CMV	Rotating electrical machines - Part 25: AC electrical machines used in power drive systems - Application guide
48.	IEC TS 60034-25:2022	Rotating electrical machines - Part 25: AC electrical machines used in power drive systems - Application guide
49.	IEC 60034-26:2006	Rotating electrical machines - Part 26: Effects of unbalanced voltages on the performance of three-phase cage induction motors
50.	IEC 60034-26:2006/COR1:2014	Corrigendum 1 - Rotating electrical machines - Part 26: Effects of unbalanced voltages on the performance of three-phase cage induction motors
51.	IEC 60034-27-1:2017	Rotating electrical machines - Part 27-1: Off-line partial discharge measurements on the winding insulation

52.	IEC TS 60034-27-2:2012	Rotating electrical machines - Part 27-2: On-line partial discharge measurements on the stator winding insulation of rotating electrical machines
53.	IEC 60034-27-3:2015	Rotating electrical machines - Part 27-3: Dielectric dissipation factor measurement on stator winding insulation of rotating electrical machines
54.	IEC 60034-27-4:2018	Rotating electrical machines - Part 27-4: Measurement of insulation resistance and polarization index of winding insulation of rotating electrical machines
55.	IEC TS 60034-27-5:2021	Rotating electrical machines - Part 27-5: Off-line measurement of partial discharge inception voltage on winding insulation under repetitive impulse voltage
56.	IEC 60034-28:2012	Rotating electrical machines - Part 28: Test methods for determining quantities of equivalent circuit diagrams for three-phase low-voltage cage induction motors
57.	IEC 60034-29:2008	Rotating electrical machines - Part 29: Equivalent loading and superposition techniques - Indirect testing to determine temperature rise
58.	IEC 60034-30-1:2014	Rotating electrical machines - Part 30-1: Efficiency classes of line operated AC motors (IE code)
59.	IEC TS 60034-30-2:2016	Rotating electrical machines - Part 30-2: Efficiency classes of variable speed AC motors (IE-code)
60.	IEC TS 60034-31:2021	Rotating electrical machines - Part 31: Selection of energy-efficient motors including variable speed applications - Application guidelines
61.	IEC TS 60034-32:2016	Rotating electrical machines - Part 32: Measurement of stator end-winding vibration at form-wound windings
62.	IEC 60034-33:2022	Rotating electrical machines - Part 33: Synchronous hydrogenerators including motor-generators - Specific requirements
63.	IEC TS 60034-34:2020	Rotating electrical machines - Part 34: AC adjustable speed rolling mill motors
64.	IEC 60072-1:2022	Rotating electrical machines - Dimensions and output series - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080
65.	IEC 60072-2:1990	Dimensions and output series for rotating electrical machines - Part 2: Frame numbers 355 to 1000 and flange numbers 1180 to 2360
66.	IEC 60072-3:1994	Dimensions and output series for rotating electrical machines - Part 3: Small built-in motors - Flange numbers BF10 to BF50
67.	IEC 60136:1986	Dimensions of brushes and brush-holders for electrical machinery
68.	IEC 60136:1986/AMD 1:1995	Amendment 1 - Dimensions of brushes and brush-holders for electrical machinery
69.	IEC 60276:2018	Carbon brushes, brush holders, commutators and slip-rings - Definitions and nomenclature
70.	IEC 60356:1971	Dimensions for commutators and slip-rings
71.	IEC 60413:1972	Test procedures for determining physical properties of brush materials for electrical machines
72.	IEC 60560:1977	Definitions and terminology of brush-holders for electrical machines
73.	IEC 60773:2021	Rotating electrical machines - Test methods and apparatus for the measurement of the operational characteristics of brushes

74.	IEC TR 60778:1984	Brush-holders for slip-rings, Group R - type RA
75.	IEC TR 61015:1990	Brush-holders for electrical machines. Guide to the measurement of the static thrust applied to brushes
76.	IEC TR 63021:2016	Rotating electrical machinery - Natural graphite brush for slip-ring in wound rotor-type induction motor - Application information
77.	IEC 88528-11:2004	Reciprocating internal combustion engine driven alternating current generating sets - Part 11: Rotary uninterruptible power systems - Performance requirements and test methods

TC2 Work Programme generated on 2022-11-10

S.NO	Project Reference	Title	Current Stage	Working Group
1.	PNW 2-2091 ED1	Detection of interturn short-circuits in rotor windings of cylindrical rotor synchronous generator	PRVN	PT 60034-27-7
2.	PNW TS 2-2102 ED1	Technical Specification for on-line partial discharge measurements of rotating machine windings supplied from an inverter	PRVN	
3.	IEC 60034-2-1 ED3	Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)	TCDV	WG 28
4.	IEC 60034-2-2 ED2	Rotating electrical machines - Part 2-2: Specific methods for determining separate losses of large machines from tests - Supplement to IEC 60034-2-1	TCDV	WG 28
5.	IEC 60034-2-3 ED2	Rotating electrical machines - Part 2-3: Specific test methods for determining losses and efficiency of converter-fed AC motors	TCDV	WG 28
6.	IEC 60034-12 ED4	Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors	CD	WG 12
7.	IEC 60034-15 ED4	Rotating electrical machines - Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines	PCC	MT 10
8.	IEC TS 60034-16-2 ED1	Rotating electrical machines - Part 16-2: Excitation systems for synchronous machines - Models for power system studies	CDM	MT 12
9.	IEC TS 60034-16-3 ED2	Rotating electrical machines - Part 16-3: Excitation systems for synchronous machines - Dynamic performance	CDM	MT 12
10.	IEC 60034-18-1 ED3	Rotating electrical machines - Part 18-1: Functional evaluation of insulation systems - General guidelines	CFDIS	MT 10
11.	IEC 60034-18-41 ED2	Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters - Qualification and quality control tests	ACD	MT 10
12.	IEC 60034-27-2 ED1	Rotating electrical machines - Part 27-2: On-line partial discharge measurements on the stator winding insulation of rotating electrical machines	PRVC	MT 10
13.	IEC 60034-27-7 ED1	Rotating electrical machines - Part 27-7: Insulation systems used in rotating electrical machines for sealed and moisture resistant winding type and quality control tests	CDM	PT 60034-27-7
14.	IEC 60034-30-3 ED1	Rotating electrical machines - Part 30-3 Efficiency classes of high voltage AC motors (IE code)	ACD	WG 31

15.	IEC 60034-35 ED1	Rotating electrical machines – Part 35: Technical requirements for electrical sheet metal and strip metal used in electrical machines	ACD	WG 12
16.	IEC TS 60034-38 ED1	Guidelines for condition-based evaluation and maintenance of cylindrical-rotor synchronous generators	ACD	WG 12
17.	IEC 60136 ED3	Dimensions, marking and testing of carbon brushes and dimensions of brush-holders for electrical machinery	CCDV	MT 14
18.	IEC 60413 ED2	Test procedures for determining physical properties of brush materials for electrical machines	ACD	MT 14

TC4 publications generated on 2022-11-10

S.NO	Reference	Title
1.	IEC 60041:1991	Field acceptance tests to determine the hydraulic performance of hydraulic turbines, storage pumps and pump-turbines
2.	IEC 60041:1991/COR1:1996	Corrigendum 1 - Field acceptance tests to determine the hydraulic performance of hydraulic turbines, storage pumps and pump-turbines
3.	IEC 60193:2019	Hydraulic turbines, storage pumps and pump-turbines - Model acceptance tests
4.	IEC 60308:2005	Hydraulic turbines - Testing of control systems
5.	IEC 60545:2021	Guidelines for commissioning and operation of hydraulic turbines, pump-turbines and storage pumps
6.	IEC 60609-1:2004	Hydraulic turbines, storage pumps and pump-turbines - Cavitation pitting evaluation - Part 1: Evaluation in reaction turbines, storage pumps and pump-turbines
7.	IEC 60609-2:1997	Cavitation pitting evaluation in hydraulic turbines, storage pumps and pump-turbines - Part 2: Evaluation in Pelton turbines
8.	IEC 60994:1991	Guide for field measurement of vibrations and pulsations in hydraulic machines (turbines, storage pumps and pump-turbines)
9.	IEC 60994:1991/COR1:1997	Corrigendum 1 - Guide for field measurement of vibrations and pulsations in hydraulic machines (turbines, storage pumps and pump-turbines)
10.	IEC 61116:1992	Electromechanical equipment guide for small hydroelectric installations
11.	IEC 61362:2012	Guide to specification of hydraulic turbine governing systems
12.	IEC TR 61364:1999	Nomenclature for hydroelectric powerplant machinery
13.	IEC TR 61364:1999/COR1:2000	Corrigendum 1 - Nomenclature for hydroelectric powerplant machinery
14.	IEC TR 61366-1:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering Documents - Part 1: General and annexes
15.	IEC TR 61366-2:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering Documents - Part 2: Guidelines for technical specifications for Francis turbines
16.	IEC TR 61366-3:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering documents - Part 3: Guidelines for technical specifications for Pelton turbines
17.	IEC TR 61366-4:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering Documents - Part 4: Guidelines for technical specifications for Kaplan and propeller turbines
18.	IEC TR 61366-5:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering Documents - Part 5: Guidelines for technical specifications for tubular turbines
19.	IEC TR 61366-6:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering Documents - Part 6: Guidelines for technical specifications for pump-turbines
20.	IEC TR 61366-7:1998	Hydraulic turbines, storage pumps and pump-turbines - Tendering Documents - Part 7: Guidelines for technical specifications for storage pumps
21.	IEC 62006:2010	Hydraulic machines - Acceptance tests of small hydroelectric installations
22.	IEC 62097:2019	Hydraulic machines, radial and axial - Methodology for performance transposition from model to prototype
23.	IEC 62256:2017 RLV	Hydraulic turbines, storage pumps and pump-turbines - Rehabilitation and performance improvement
24.	IEC 62256:2017	Hydraulic turbines, storage pumps and pump-turbines - Rehabilitation and performance improvement

25.	IEC 62270:2013	Guide for computer-based control for hydroelectric power plant automation
26.	IEC 62364:2019 RLV	Hydraulic machines - Guidelines for dealing with hydro-abrasive erosion in Kaplan, Francis and Pelton turbines
27.	IEC 62364:2019	Hydraulic machines - Guidelines for dealing with hydro-abrasive erosion in Kaplan, Francis and Pelton turbines
28.	IEC TS 62882:2020	Hydraulic machines - Francis turbine pressure fluctuation transposition
29.	IEC 63132-1:2020	Guidance for installation procedures and tolerances of hydroelectric machines - Part 1: General aspects
30.	IEC 63132-2:2020	Guidance for installation procedures and tolerances of hydroelectric machines - Part 2: Vertical generators
31.	IEC 63132-3:2020	Guidance for installation procedures and tolerances of hydroelectric machines - Part 3: Vertical Francis turbines or pump-turbines
32.	IEC 63132-4:2020	Guidance for installation procedures and tolerances of hydroelectric machines - Part 4: Vertical Kaplan or propeller turbines
33.	ISO 20816-5:2018	Mechanical vibration - Measurement and evaluation of machine vibration - Part 5: Machine sets in hydraulic power generating and pump-storage plants

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S.NO	Project Reference	Title	Current Stage	Working Group
1.	PWI 4-97	Hydraulic Machines - Technical Specification for Pressure Fluctuation Transposition - Part 3：Reversible Pump-turbine	PWI	
2.	IEC 60308 ED3	Hydraulic turbines - Testing of governing systems	PCC	WG 14
3.	IEC 61116 ED2	Electromechanical equipment guide for small hydroelectric installations	ACD	WG 25
4.	IEC 61362 ED3	Guide to specification of hydraulic turbine governing systems	PCC	WG 14
5.	IEC TS 63111 ED1	Hydraulic turbines, storage pumps and pump-turbines – Hydraulic transient analysis, design considerations and testing	CD	WG 36
6.	IEC 63132-5 ED1	Guide for installation procedures and tolerances of hydroelectric machines - Part 5: Bulb turbines and generators	AFDIS	WG 30
7.	IEC 63132-6 ED1	Guide for installation procedures and tolerances of hydroelectric machines - Part 6: Vertical Pelton turbines	AFDIS	WG 30
8.	IEC 63197 ED1	Terms and Definitions for Turbine Governing Systems	ACD	WG 14
9.	IEC/IEEE 63198-2775 ED1	Technical guidelines for smart hydroelectric power plant	CFDIS	WG 14
10.	IEC 63230 ED1	Standardized technical specifications governing fatigue of hydraulic turbine runners : from design to quality assurance	ACD	WG 37
11.	IEC 63293 ED1	Mechanical vibration - Measurement and evaluation of machine vibration - Machine sets in hydraulic power generating and pump-storage plants	ACD	WG 38

12.	IEC TS 63390 ED1	Technical Specifications for Digitalization of Operation and Maintenance in Hydropower Assets	ACD	WG 40
13.	IEC TS 63398 ED1	Technical Specification for Black Start of Hydropower Plant	ACD	WG 41
14.	IEC 63461 ED1	Pelton hydraulic turbines - Model acceptance tests	CDM	WG 35

TC5 publications generated on 2022-11-10

S.NO	Reference	Title
1.	IEC 60045-1:2020	Steam turbines - Part 1: Specifications
2.	IEC 60953-0:2022	Rules for steam turbine thermal acceptance tests - Part 0: Wide range of accuracy for various types and sizes of turbines
3.	IEC 60953-1:1990	Rules for steam turbine thermal acceptance tests. Part 1: Method A - High accuracy for large condensing steam turbines
4.	IEC 60953-3:2022	Rules for steam turbine thermal acceptance tests - Part 3: Thermal performance verification tests of retrofitted steam turbines
5.	IEC TR 63388:2021	Report on the development of cogeneration
6.	ISO 10494:2018	Turbines and turbine sets - Measurement of emitted airborne noise - Engineering/survey method

TC5 Work Programme generated on 2022-11-10

S.NO	Project Reference	Title	Current Stage	Working Group
1	PNW 5-254 ED1	Rules for steam turbine thermal acceptance tests - Part 4: Routine testing	PRVN	