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# BUREAU OF INDIAN STANDARDS

**MINUTES**

| **NAME** |  | **No. of Meeting** | **Day** | **Date** | **Time** | **Venue** |
| --- | --- | --- | --- | --- | --- | --- |
| Rotating Machinery  Sectional Committee ETD 15 | | 36th | **Friday** | **27th September 2024** | 14:30 | **Virtual** |

| **CHAIRMAN** : Shri Mukesh Maravi | **MEMBER SECRETARY** : Mr. Jatin Tiwari |
| --- | --- |

### ITEM 0 GENERAL

**0.1 Welcome all members and chairman**

Members introduced themselves and the chairman welcomed all the members.

**Attendance list in Annexure-3**

### ITEM 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

* 1. The minutes of the 35st meeting of the Rotating Machinery Sectional Committee, ETD 15 **held on 20th June 2024 were confirmed**

### ITEM 2- COMPOSITION

Composition with attendance in last two meetings is in **Annexure-1**

**The committee noted the information.**

### ITEM 3- NEW ITEMS AND UPDATES

**3.1**. Request was presented before the SC for details of experts to form a working group to finalize the draft revision of Alternator standard revision IS 13364-1 and 2 , and IS 5422 , Turbo generators to form a working group to finalize draft for wide circulation. It was informed that the experts may be outside the committee as well. One manufacturer, Topland engines, has agreed to provide comments on the existing drafts

**DECISION- Working group shall be formed with experts from BHEL KC Panda, Chary Srinivasan A, member secretary, NIDEC, and topland engines.**

**3.2.** Need for Standard on small PMSM motors - Elin Motors.

**DECISION- These being small power motors the committee requested Elin motors to provide details of existing foreign standards, catalogs and circulate to the entire committee.**

**3.3.** As per directions of BIS, Meetings can be held in MoU institutes (full list is in **Annexure-2**). **There is no academia representation in the committee. Member secretary and H(ETD) requested the committee to recommend an institute** in which the next physical meeting may be held so that it is easy to travel and organize the meeting. This will help more academic experts participate in the standardization activity.

**DECISION-**

**1. Following institutes were shortlisted for contacting and exploring the possibility to hold the next committee meeting-**

1. **IIT bombay**
2. **IISc, Bengaluru**
3. **IIT Delhi**
4. **Nirma University, Ahmedabad**
5. **University of Visvesvaraya College of Engineering, Bengaluru**
6. **Indian Institute of Engineering Science and Technology, Shibpur, WB**

**H(ETD) informed that for the benefit of the students and academia, a seminar on the emerging challenges and opportunities in the field of rotating machines may be held in conjunction with the SC meeting.**

**3.4. Single numbering of IEC 60034 series**-

**DECISION-**

**H(ETD) informed the committee on the options in adoption of the IEC standard under single numbering and dual numbering and the reasons underlying the choice of these options. The committee deliberated on these options and consciously decide that IEC 60034 series may be adopted under single numbering due to the following reasons:**

1. **In the development of IEC 60034, Indian experts have already taken care of country specific requirements and there is no change required in the IEC Standards for adoption at national level.**
2. **There is added advantage of wider acceptance in the international markets of rotating machines of products tested and certified to IEC standards.**
3. **All manufacturers including those in the MSME segment in India are following the IEC 60034 series.**

**Additionally the committee agreed that India should actively participate in the development of IEC standards by nominating its experts and also actively commenting on the draft documents received from IEC. Decisions by IEC will also be circulated to the committee.**

**Once IEC is published it should not generally take more than 6 months to adopt it, on a need basis, as national interests would already have been taken care of while development of the IEC standard.**

### ITEM 4- ACTIONS ARISING OUT OF PREVIOUS MEETINGS

**MAJOR POINTS (Detailed table below)**

1. ETD department to take up with CMD to update the product manual of IS 12615.

2. Working groups to revise various standards mentioned due for revision, including relevant experts from outside the committee, are placed below, which was noted and approved by the committee

| **SI. No.** | **IS No.** | **TITLE** | **Progress/Status** | **ACTION TAKEN** |
| --- | --- | --- | --- | --- |
| 1 | IS 12065 : 1987 | Permissible limits of noise levels for rotating electrical machines | Standard Sent for printing |  |
| 2 | 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) | Pending for gazette, Publication is complete |  |
| 3 | IS 12615 : 2018 | Line operated three phase AC motors (IE Code) "Efficiency classes and performance specification" (Third Revision) | Amendment issued. Revision due , working group has to finalize draft incorporating more clarity in language , tables, referencing to IEC 60034- Shri Prasad Hardikar, Siemens- Convener  Shri Dilip Bhave, In personal capacity  Shri Praveen Vijayraghavan,Integrated Electric  Shri Ravi Singh, ERDA  V Krishnamoorthy, SITARC  Shri Praveen Kumar, IEEMA  Member secretary,ETD 15 | **1. ETD to take up with CMD to update the product manual. 2. Revision/amendment to be taken up simultaneously.** |
| 4 | IS 13364 (Part 1) : 1992 | Ac generators driven by reciprocating internal combustion engines - Specification: Part 1 alternators rated up to 20 kVa | P draft circulated , More inputs needed | **Working group shall be formed with experts below to complete drafts in 1 month - BHEL, convener - KC Panda, Chary Srinivasan A, member secretary,Mr Suresha, NIDEC, and Mr Varmora, topland engines.** |
| 5 | 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 | P draft circulated , More inputs needed | **Working group shall be formed with experts below to complete drafts in 1 month - BHEL,, convener - KC Panda, Chary Srinivasan A, member secretary,Mr Suresha, NIDEC, and Mr Varmora, topland engines.** |
| 6 | IS 13466 : 1992 | Brushes for electrical machines - Specification |  | **It was decided to complete the draft with the Working group below with time frame-2 month -1. Alok Bhuyan, Assam carbon, convener 2. P. Vijayraghvan, Integrated Electric 3. Member secretary. 4. D. Basak, Mersen** |
| 7 | IS 13525 : 1992 | Flexible conductors for carbon brushes - Specification |  | **It was decided to complete the draft with the Working group below with a time frame-2 month. Working group -1. Alok Bhuyan, Assam carbon,convenor 2. P. Vijayraghvan, Integrated Electric 3. Member secretary. 4. D. Basak, Mersen** |
| 8 | IS 13584 : 1993 | Brush materials for electrical machinery - Specification |  | **It was decided to complete the draft with the Working group below with a time frame-2 month. Working group -1. Alok Bhuyan, Assam carbon,convenor 2. P. Vijayraghvan, Integrated Electric 3. Member secretary. 4. D. Basak, Mersen** |
| 9 | IS 14376 : 1996 | Brush holders for electrical machines - Specification |  | **It was decided to complete the draft with the Working group below with a time frame-2 month. Working group -1. Alok Bhuyan, Assam carbon, convenor 2. P. Vijayraghvan, Integrated Electric 3. Member secretary. 4. D. Basak, Mersen** |
| 10 | IS 9919 : 1999 | Guide for selection and use of carbon brushes in electrical rotating machines (First Revision) |  | **It was decided to complete the draft with the Working group below with a time frame-2 month. Working group -1. Alok Bhuyan, Assam carbon , convener 2. P. Vijayraghvan, Integrated Electric 3. Member secretary. 4. D. Basak, Mersen** |
| 11 | IS 14377 : 1996 | Specification for three - Phase induction motors for fans used in air - Conditioning and ventilation | P draft being floated | **As there are no technical changes, the P draft may be floated with updated references.** |
| 12 | IS 14578 : 1999 | Three - Phase induction motors for use in nuclear power plants - Specification | P draft done | **Approved for WC** |
| 13 | IS 14582 : 2021 | Single-phase small ac electric motors for centrifugal pumps for agricultural applications | Mr. Anil Akole, and IPMA may update on this | **It was decided to complete the draft with the Working group below with a time frame-2 month. Working group -1. Anil Akole, convenor 2. KV Karthik, IPMA 3. Member secretary. 4. S. Jadia, Hindustan Motors** |
| 14 | IS 14889 : 2000 | Copper tamping powder for carbon brushes - Specification |  | **Archived; It was decided to complete the draft with the Working group below with a time frame-2 month. Working group -1. Alok Bhuyan, Assam carbon , convener 2. P. Vijayraghvan, Integrated Electric 3. Member secretary. 4. D. Basak, Mersen** |
| 15 | IS 15429 : 2004 | Storage, installation and maintenance of DC motors - Code of practice | P draft being floated | **As there are no technical changes, the P draft may be floated with updated references.** |
| 16 | IS 15880 : 2009 | Three phase cage induction motors when fed from IGBT converters - Application guide | IEC TS 60034-25:2022 WC is complete | **Approved for finalization and publication** |
| 17 | IS 2223 : 1983 | Dimensions of flange mounted AC induction motors | Sumit Tyagi, ABB may provide update | **It was decided to complete the draft with the Working group below with a time frame-15 days. Working group -1. Sumit Tyagi, ABB, convener 2. Mr. Pankaj Taneja, PICL 3. Member secretary. 4. S. Jadia, Hindustan Motors** |
| 18 | IS 2253 : 1974 | Designations for types of construction and mounting arrangements of rotating electrical machines (First Revision) | Standard published |  |
| 19 | IS 2254 : 1985 | Dimensions of vertical shaft motors for pumps (Second Revision) | IPMA may provide update | **It was decided to complete the draft with the Working group below with a time frame-1 month. 1. KV Karthik, IPMA, convener 2. Praveen Kumar, Rotomag 3. Member secretary. 4. S. Jadia, Hindustan Motors** |
| 20 | IS 2972 (Part 1) : 1979 | Specification for textile motors: Part 1 loom motors (First Revision) | ATIRA was contacted , other textile associations were also contacted but either no response was met or Input was that motors used are following mostly IEC standards or come with the assembly integrated into it. Hence standards may be withdrawn | **Decided that Document shall be archived. Associations may be informed again** |
| 21 | IS 2972 (Part 2) : 1979 | Specification for textile motors: Part 2 card motors (First Revision) | ATIRA was contacted , other textile associations were also contacted but either no response was met or Input was that motors used are following mostly IEC standards or come with the assembly integrated into it. Hence standards may be withdrawn | **Decided that Document shall be archived. Associations may be informed again** |
| 22 | IS 4029 : 2010 | Guide for testing three phase induction motors (First Revision) | P draft being prepared by Member secretary incorporating updates and corrections, will be floated | **As there are no technical changes, the P draft may be floated with updated references.** |
| 23 | IS 7572 : 1974 | Guide for testing single - Phase AC and universal motors | RAVI SINGH, ERDA may provide update | **It was decided to complete the draft with the Working group below with a time frame-1 month. Working group -1. Ravi Singh, ERDA , convener 2. Siemens 3. Member secretary. 4. S. Jadia, Hindustan Motors** |
| 24 | IS 8151 : 1976 | Specification for single - Speed three - Phase induction motors for driving lifts | Standard Published |  |
| 25 | IS 9283 : 2013 | Motors for submersible pumpsets - Specification (Second Revision) | Pending for gazette, Publication is complete | **It was decided to complete the draft with the Working group below with a time frame-3 month. Working group -1. KV Karthik, IPMA , convener 2. Praveen Kumar, Rotomag 3. Member secretary. 4. S. Jadia, Hindustan Motors to work on DC, PMSM motor efficiency level standard as well.** |
| 26 | IS 9320 : 1979 | Guide for testing direct - Current (DC) machines | WC complete | **Approved for finalization and publication** |
| 27 | IS 996 : 2009 | Single phase a.c. induction motors for general purpose (Third Revision) | WC comments incorporated as discussed in last meeting | **Approved for finalization and publication** |
| 28 | IS 15999 (Part 1) : 2021 | Rotating electrical machines - Part 1 : Rating and performance | IEC 60034-1:2022 WC complete; | **Approved for finalization and publication under single numbering** |
| 29 | IS 15999 (Part 2/Sec 1) : 2023 | Rotating Electrical Machines Part 2-1: Standard Methods for Determining Losses and Efficiency from Tests Excluding Machines for Traction Vehicles | IEC 60034-2-1:2024 WC complete | **Approved for finalization and publication under single numbering** |
| 30 | IS 5422:1996 | Turbine generators |  | **Working group shall be formed with experts below to complete drafts in 1 month - BHEL , convener -KC Panda, Chary Srinivasan A, member secretary,Mr Suresha, NIDEC, and Mr Varmora, topland engines.** |

### ITEM 5- INTERNATIONAL ACTIVITIES

5.1 **IR portal** was displayed to all the committee while explaining all the ballots are uploaded here and can be commented.

**DECISION-**

**1.Committee decided to circulate documents and decisions on comments file (CC file) from IEC from now on as well.**

**2. Committee noted the below points to participate in working groups and comment on the documents pending for voting and comments as well:**

**New Procedure for participation in IEC WGs**

The reformed procedure for participation in IEC WGs is

1. Circulate meeting notice and agenda with all members (through email or whatsapp group)
2. After all inputs have been gathered, one point of view/strategy may be formulated for meetings.
3. Points of view are put in meeting of working group
4. Circulate meeting minutes and agenda with all members (through email or whatsapp group). Take action on indigenous standards / new standards or update IEC adopted standards.
5. Voting and commenting on documents is also mandatory.

Documents pending for voting and comments:

| Reference | Title | Circulation date | Closing date |
| --- | --- | --- | --- |
| 2/2213/CD | IEC 60034-18-31 ED3: 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 | 2024-08-09 | 2024-10-04 |
| 2/2199/CDV | IEC 60034-15 ED4: Rotating electrical machines - Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines | 2024-07-26 | 2024-10-18 |
| 2/2204/CDV | IEC 60034-1 ED15: Rotating electrical machines - Part 1: Rating and performance | 2024-08-09 | 2024-11-01 |
| 2/2208/CDV | IEC 60072-2 ED2: Dimensions and output series for rotating electrical machines - Part 2: Frame numbers 355 to 1000 and flange numbers 1180 to 2360 | 2024-08-23 | 2024-11-15 |
| 2/2209/CDV | IEC 60034-30-1 ED2: Rotating electrical machines - Part 30-1: Efficiency classes of line operated AC motors (IE code) | 2024-08-30 | 2024-11-22 |

### ITEM 6- ANY OTHER BUSINESS

There being no other business, the meeting ended with a vote of thanks to the chair.

### ANNEXURE 1

**COMPOSITION**

Note - Attendance is counted organization wise. One organization's attendance is counted once only.

| S.No. | Organization | Member Name | Attendance |
| --- | --- | --- | --- |
| 1 | Bharat Heavy Electricals Limited, Bhopal | Shri Mukesh Kumar Maravi | 2/2 |
| 2 | Asea Brown Boveri Limited, Faridabad | Sumit Tyagi | 2/2 |
| 3 | Asea Brown Boveri Limited, Faridabad | Lokesh B M |  |
| 4 | Bharat Bijlee Limited, Mumbai | Shri Salil Kumar | 2/2 |
| 5 | Bharat Bijlee Limited, Mumbai | Bhagyashree Sanjay Pawar |  |
| 6 | Bharat Heavy Electrical Limited, New Delhi | Shri Krushna Chandra Panda | 0/2 |
| 7 | Bharat Heavy Electrical Limited, New Delhi | Shri P Dali Naidu |  |
| 8 | Central Electricity Authority, New Delhi | Jitesh Shrivas | 2/2 |
| 9 | Central Electricity Authority, New Delhi | Sh. Rishabh Gaur |  |
| 10 | Central Power Research Institute, Bengaluru | Shri S Prashob | 2/2 |
| 11 | Electrical Research and Development Association, Vadodara | Ravi Singh | 2/2 |
| 12 | Electrical Research and Development Association, Vadodara | Jitendra Tahilwani |  |
| 13 | Engineers India Limited, New Delhi | Shri Raman Sood | 0/2 |
| 14 | Engineers India Limited, New Delhi | Shree Ravish K. Raman |  |
| 15 | Havells India Limited, Noida | ANIL SUKUMAR AKOLE | 2/2 |
| 16 | Havells India Limited, Noida | Vinayak Atre |  |
| 17 | Hindustan Electric Motors, Mumbai | Shri Sanjay P. Jadia | 2/2 |
| 18 | Hindustan Electric Motors, Mumbai | Dilip Bhave |  |
| 19 | INTEGRATED ELECTRIC COMPANY PRIVATE LIMITED, Bengaluru | Shri Praveen Vijayraghavan | 2/2 |
| 20 | Indian Electrical and Electronics Manufacturers Association, New Delhi | Shri Seetharaman K. |  |
| 21 | Indian Electrical and Electronics Manufacturers Association, New Delhi | Shri Praveen kumar | 2/2 |
| 22 | Indian Pump Manufacturers Association, Mumbai | Shri Utkarsh. A. Chhaya |  |
| 23 | Indian Pump Manufacturers Association, Mumbai | Shri K.V. Karthik | 2/2 |
| 24 | Indian Pump Manufacturers Association, Mumbai | Shri ANOOP AGARWAL |  |
| 25 | International Copper Association India, Mumbai | K N Hemanth Kumar |  |
| 26 | International Copper Association India, Mumbai | Shri Jyotish Pande | 2/2 |
| 27 | International Copper Association India, Mumbai | Shri Mohit Gupta |  |
| 28 | NTPC Limited, New Delhi | Shri S. N. Tripathi |  |
| 29 | NTPC Limited, New Delhi | Shri BVVS Ganesh | 2/2 |
| 30 | Nuclear Power Corporation of India Limited, Mumbai | Shri Jayanth Kumar Boppa |  |
| 31 | Nuclear Power Corporation of India Limited, Mumbai | Shri Ritesh M. Chovatia | 2/2 |
| 32 | PICL India Private Limited, Faridabad | Rabindra Sahoo | 0/2 |
| 33 | PICL India Private Limited, Faridabad | PANKAJ TANEJA |  |
| 34 | Rotomag Motors and Controls Private Limited, Gujarat | SH UMESH BALANI | new |
| 35 | Scientific and Industrial Testing and Research Centre, Coimbatore | Dr. K ULAGANATHAN |  |
| 36 | Scientific and Industrial Testing and Research Centre, Coimbatore | Krishnamoorthy V | 2/2 |
| 37 | Siemens Limited, Mumbai | Shri Ashish Shere |  |
| 38 | Siemens Limited, Mumbai | Shri Prasad Hardikar | 2/2 |
| 39 | Southern India Engineering Manufacturers Association, Coimbatore | Dr. R. Subramanian |  |
| 40 | Southern India Engineering Manufacturers Association, Coimbatore | Shri S. ARUNKUMAR | 2/2 |
| 41 | Thyssenkrupp Industrial Solutions (India) Private Limited, Mumbai | Shri Vaijnath G. Sangekar |  |
| 42 | Thyssenkrupp Industrial Solutions (India) Private Limited, Mumbai | Charuta Vikram Mulay | 2/2 |
| 43 | Toshiba Mitsubishi-Electric Industrial Systems Corporation, Bengaluru | Mr. Sudheer Tapaskar |  |
| 44 | Toshiba Mitsubishi-Electric Industrial Systems Corporation, Bengaluru | Manish Joshi | 1/2 |

### ANNEXURE 2

MOU INSTITUTES LIST

| [**S.No**](http://s.no) | **Institution** | **Date of MoU** |
| --- | --- | --- |
| 1 | Birla Institute of Technology & Science, Pilani | 29-08-2023 |
|
| 2 | Manipal Academy of Higher Education, Manipal | 29-08-2023 |
|
| 3 | Indian Institute of Technology, Roorkee | 11-03-2022 |
|
| 4 | Indian Institute of Technology, Kanpur | 31-10-2022 |
|
| 5 | Indian Institute of Technology, Madras | 28-11-2022 |
|
| 6 | Indian Institute of Technology (ISM), Dhanbad | 31-10-2022 |
|
| 7 | Indian Institute of Technology-BHU, Varanasi | 28-11-2022 |
|
| 8 | Indian Institute of Technology, Indore | 28-11-2022 |
|
| 9 | Indian Institute of Technology, Guwahati | 16-02-2023 |
|
| 10 | Indian Institute of Technology, Gandhinagar | 16-02-2023 |
|
| 11 | Indian Institute of Technology, Patna | 28-11-2022 |
|
| 12 | National Institute of Technology, Rourkela | 31-10-2022 |
|
| 13 | National Institute of Technology, Tiruchirappalli | 28-11-2022 |
|
| 14 | National Institute of Technology, Calicut | 16-02-2023 |
|
| 15 | Malviya National Institute of Technology (MNIT), Jaipur | 28-11-2022 |
|
| 16 | Assam Engineering College, Guwahati | 04-08-2023 |
|
| 17 | Banasthali Vidyapith, Rajasthan | 04-08-2023 |
|
| 18 | Bhagalpur College of Engineering, Bhagalpur, Bihar | 04-08-2023 |
|
| 19 | Chandigarh College of Engineering and Technology, Chandigarh | 04-08-2023 |
|
| 20 | COEP Technological University, Pune | 04-08-2023 |
|
| 21 | Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT, Gandhinagar) | 04-08-2023 |
|
| 22 | Dr Babasaheb Ambedkar Technological University, Raigad | 04-08-2023 |
|
| 23 | Government College of Engineering, Nagpur | 04-08-2023 |
|
| 24 | Government College of Engineering, Amravati | 04-08-2023 |
|
| 25 | Guru Nanak Dev Engg. College, Ludhiana | 23-06-2023 |
|
| 26 | Indian Institute of Engineering Science and Technology, Shibpur, WB | 04-08-2023 |
|
| 27 | L D College of Engineering, Ahmedabad | 04-08-2023 |
|
| 28 | Madan Mohan Malviya University of Technology, Gorakhpur | 04-08-2023 |
|
| 29 | Maulana Azad National Institute of Technology (MANIT), Bhopal | 04-08-2023 |
|
| 30 | MBM University, Jodhpur | 04-08-2023 |
|
| 31 | National Dairy Research Institute, Karnal | 11-08-2023 |
|
| 32 | National Institute of Technical Teachers' Training and Research (NITTTR), Bhopal | 04-08-2023 |
|
| 33 | National Institute of Technology, Delhi | 04-08-2023 |
|
| 34 | National Institute of Technology, Agartala | 04-08-2023 |
|
| 35 | National Institute of Technology, Durgapur | 04-08-2023 |
|
| 36 | National Institute of Technology, Kurukshetra | 04-08-2023 |
|
| 37 | Parul University, Vadodara | 04-08-2023 |
|
| 38 | S V National Institute of Technology, Surat | 04-08-2023 |
|
| 39 | Veer Surendra Sai University of Technology (VSSUT), Burla, Odisha | 04-08-2023 |
|
| 40 | Vellore Institute of Technology (VIT), Chennai | 04-08-2023 |
|
| 41 | KLE Technological University, Hubli | 04-08-2023 |
|
| 42 | National Institute of Technical Teachers' Training and Research (NITTTR), Taramani, Chennai | 17-11-2023 |
|
| 43 | Govt College of Engineering and Technology, Jammu | 25-10-2023 |
|
| 44 | PSNA College of Engineering and Technology, Dindigul, Tamilnadu | 27-09-2023 |
|
| 45 | Sri Venkateswara College of Engineering, Chennai, Tamilnadu | 17-11-2023 |
|
| 46 | Vel Tech Multi Tech Dr Rangarajan Dr Sakunthala Engineering College, Chennai | 17-11-2023 |
|
| 47 | Sri Sai Ram Engineering College, Chennai | 17-11-2023 |
|
| 48 | SRM Institute of Science and Technology, Kattankulathur, Tamilnadu | 04-08-2023 |
|
| 49 | University of Visvesvaraya College of Engineering, Bengaluru | 04-08-2023 |
|
| 50 | Agricultural Engineering College and Research Institute, Coimbatore, Tamil Nadu | 04-08-2023 |
|
| 51 | Dr Shyama Prasad Mukherjee International Institute of Information Technology, Naya Raipur | 04-08-2023 |
|
| 52 | NIT Jalandhar | 07-10-2023 |
|
| 53 | Rajiv Gandhi University of Knowledge Technologies- RGUKT, AP IIIT, Nuzvid, Andhra Pradesh | 04-08-2023 |
|
| 54 | Institute of Technology, Nirma University, Ahemdabad | 14-12-2023 |
|
| 55 | Rajagiri School of Engineering, Kochi, Kerala | 19-12-2023 |
|
| 56 | Cochin University of Science and Technology, Kochi, Kerala | 19-12-2023 |
|
| 57 | NIT Mizoram | 17-11-2023 |
|
| 58 | College of Engineering, Andhra University, Visakhapatnam | 04-08-2023 |
|
| 59 | BMS Institute of Technology and Management, Yelahanka, Bengaluru | 20-12-2023 |
|
| 60 | Bundelkhand Institute of Engineering and Technology, Jhansi, Uttar Pradesh | 27-12-2023 |
|
| 61 | Shanti Lal Shah Engineering College, Bhavnagar, Gujarat | 05-12-2023 |
|
| 62 | Kurukshetra University, Kurukshetra | 11-01-2024 |
|
| 63 | Veermata Jijabai Technological Institute (VJTI), Mumbai | 11-01-2024 |
|
| 64 | National Institute of Technology, Jamshedpur | 12-01-2024 |
|
| 65 | National Institute of Technology, Sikkim | 12-01-2024 |
|
| 66 | Indian Institute of Technology, Kharagpur | 16-10-2023 |
|
| 67 | Gaya College of Engineering, Gaya | 04-08-2023 |
|
| 68 | Gujarat Technological University, Ahmedabad | 16-01-2024 |
|
| 69 | Birla Institute of Technology, Mesra, Ranchi, Jharkhand | 15-12-2023 |
|
| 70 | National Institute of Technology Raipur, Chhattisgarh | 24-01-2024 |
|
| 71 | Government Engineering College, Raipur | 24-01-2024 |
|
| 72 | National Institute of Technology, Uttarakhand | 25-01-2024 |
|
| 73 | Jorhat Engineering College, Jorhat, Assam | 04-08-2023 |
|
| 74 | National Institute of Technology, Patna | 12-01-2024 |
|
| 75 | Netaji Subhash University of Technology (NSUT), New Delhi | 05-01-2024 |
|
| 76 | Graphic Era Deemed to be University (GEU), Dehradun | 03-01-2024 |
|
| 77 | National Institute of Technology, Hamirpur, Himachal Pradesh | 07-02-2024 |
|
| 78 | Muzaffarpur Institute of Technology | 04-08-2023 |
|
| 79 | International Institute of Information Technology, Bhubaneswar | 30-01-2024 |
|
| 80 | Indian Institute of Technology, Jammu | 09-02-2024 |
|
| 81 | Indian Institute of Management, Mumbai | 28-02-2024 |
|
| 82 | National Institute of Advanced Manufacturing Technology, Ranchi | 04-08-2023 |
|
| 83 | National Institute of Technology, Srinagar, Jammu & Kashmir | 27-03-2024 |
|
| 84 | Indian Institute of Technology, Bombay | 13-09-2023 |
|
| 85 | G B Pant University of Agriculture and Technology, Pantnagar | 29-08-2023 |
|
| 86 | Thapar Institute of Engineering and Technology Patiala | 09-05-2024 |
|
| 87 | Bineswar Brahma Engineering College, Kokrajhar | 13-03-2024 |
|
| 88 | Biju Patnaik University of Technology, Odisha | 15-03-2024 |
|
| 89 | Uttar Pradesh Textile Technology Institute, Kanpur | 08-02-2024 |
|
| 90 | Indian Institute of Science | 03-07-2024 |
|
| 91 | Jadavpur University | 29-07-2024 |

### ANNEXURE 3

**ATTENDANCE LIST**

| **Sl No** | **Organization** | **Representatives** |
| --- | --- | --- |
| 1. | Bharat Heavy Electricals Limited, Bhopal | Shri Mukesh Kumar Maravi |
| 2. | Asea Brown Boveri Limited, Faridabad | Shri Sumit Tyagi |
| 3. | Bharat Bijlee Limited, Mumbai | Ms. Bhagyashree Sanjay Pawar |
| Shri Salil Kumar |
| 4. | Bharat Heavy Electrical Limited, New Delhi | Shri B. N. Jena |
| 5. | Electrical Research and Development Association, Vadodara | Shri Ravi Singh |
| 6. | Engineers India Limited, New Delhi | Shri Ravish K. Raman |
| 7. | Central Electricity Authority, New Delhi | Shri Jitesh Shrivas |
| 8. | Central Power Research Institute, Bengaluru | Shri S Prashob |
| 9. | Hindustan Electric Motors, Mumbai | Shri Sanjay P. Jadia |
| Shri Dilip Bhave |
| 10. | International Copper Association India, Mumbai | Shri Jyotish Pande |
| Shri Mohit Gupta |
| 11. | Indian Electrical and Electronics Manufacturers Association, New Delhi | Shri Seetharaman K. |
| Shri Praveen kumar |
| 12. | Integrated Electric Company Private Limited, Bengaluru | Shri Praveen Vijayraghavan |
| 13. | Indian Pump Manufacturers Association, Mumbai | Shri Utkarsh. A. Chhaya |
| 14. | NTPC Limited, New Delhi | Shri B V V Satya Ganesh |
| Shri S. N. Tripathi |
| 15. | Nuclear Power Corporation of India Limited, Mumbai | Shri Ritesh M. Chovatia |
| 16. | PICL India Private Limited, Faridabad | Shri Pankaj Taneja |
| 17. | Siemens Limited, Mumbai | Shri Ashish Shere |
| 18. | Southern India Engineering Manufacturers Association, Coimbatore | Shri S. Arun Kumar |
| Dr. R. Subramanian |
| 19. | Scientific and Industrial Testing and Research Centre, Coimbatore | Dr. K Ulaganathan |
| Shri Krishnamoorthy V |
| 20. | Thyssenkrupp Industrial Solutions (India) Private Limited, Mumbai | Ms. Charuta Vikram Mulay |
| Shri Vaijnath G. Sangekar |
| 21. | Toshiba Mitsubishi-Electric Industrial Systems Corporation, Bengaluru | Shri Sudheer Tapaskar |
|  | **Invitee** | |
| 22. | Bureau of Indian Standard | Shri Asit Kumar Maharana |
| 23. | Franklin Electric | Shri Ashish Deshpande |
| 24. | Aqua Group | Dr. C. Murugesan |
| 25. | Duke Pumps | Shri Lalit Patel |
| 26. | Kirloskar Oil Engines Limited | Ms Smita Nisal |
| 27. | Elin India | Shri Shamsher Singh |