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BUREAU OF INDIAN STANDARDS

AGENDA

Name of theCommittee	No. of Meeting	Day	Date	Tim e	Venue
Industrial Process Measurement and Control, ETD 18 Sectional Committee	**20th**	**Tuesday**	**23rd July 2024**	**10:30 AM**	**Hybrid Mode**

CHAIRMAN: Shri Rajiv Gupta **MEMBER SECRETARY**: Ms. Ankita Tripathi

Item 0 WELCOME AND OPENING REMARKS BY THE CHAIRMAN

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

1.1 The minutes of the last meeting (19th meeting) of the Industrial Process Measurement and Control, ETD 18, Sectional Committee held online on 15.11.2023, were circulated to the committee members on 18.12.2023. No comments have been received.

The Committee may formally confirm the minutes.

Item 2 COMPOSITION OF THE SECTIONAL COMMITTEE

2.1 The present composition of the Industrial Process Measurement and Control, ETD 18, Sectional Committee is given at **ANNEXURE 1.**

2.2 Balance in Composition, Effective Nominations, and Involvement of New Talent and Young Professionals. As per the BIS guidelines, Sectional Committees should represent all interest groups such as organized consumers/users, industry, technologist and regulatory bodies/NGOs, etc. However, consumer interests shall as far as possible, predominate. Where non-industry interests are less than 2/3, it may be reviewed. Stakeholders such as manufacturers/ service providers as well as consumer activists should as far as possible, represent industries association and organizations and not individual companies. Also, it may be desirable to induct and involve new people in the work of Sectional Committees with an aim to infuse fresh ideas and it is suggested that member organizations may like to keep this aspect in view while nominating their representations in the technical committees.

The Committee may note and discuss for addition of any other member organizations as per the relevancy of the subject.

2.3 Request for co-option has been received from following organization:

SI. No	Name	Organization	Remarks
1.	Dr. Awadhesh Kumar, Assistant Professor Electrical Engineering	Madan Mohan Malaviya University of Technology Gorakhpur	Dr. Kumar was the topper of the district Gorakhpur in High School with 80.4% marks and stood second among all the M. Tech. Students in his batch at NITTTR Chandigarh with 85.1% marks. During his Ph.D., he secured 10/10 CPI in MNNIT, Allahabad. He has published 82 research papers in reputed journals and conferences including 12 SCI indexed journals. He has delivered 30 expert

			lectures, organized 11 STC/STTP/FDP and attended 66 professional training workshops.
2.	Souradeep Mitra	Design engineeer	Worked in the Cable care/Ropeway industry for 15 years in design & installation of electrical & control system of cable cars in India & abroad with Damodar ropeways & Infra Ltd, & Conveyor & Ropeway services Pvt. Ltd. in Kolkata

Details of the above nominations are placed at **ANNEXURE 9.**
The committee may review.

2.4Status of participation of members in the previous two 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 of participation of committee members in the previous two meetings is given in **ANNEXURE 1.**

The committee members are requested to provide suggestions for improvement.

Item 3 ACTION ARISING OUT OF PREVIOUS MEETING

SI. No.	Item/ Subject	Decision Taken in the last meeting	Action/ Remarks
1.	Co-option	During the previous meetings, it was decided to coopt the following organizations in the committee: i. Pyrotech Electronic Pvt. Ltd ii. Institute of Design of Electrical Measurement Instrument Mumbai. iii. Reliance India Ltd, Mumbai. Shri Nandakumar to share contact details of Institute of Design of Electrical Measurement Instrument Mumbai and Reliance India Ltd, Mumbai. Shri Anindyo Ray to share contact details of the Pyrotech Electronic Pvt. Ltd. Cooption letters have been sent.	Nomination Awaited from the organizations. The committee to suggest relevant contact details to approach for Cooption
	Revision of the IS 9334 : 1986 and IS 8935 : 1985	The committee decided to adopt and wide circulate the IEC 61010-2-202 and 61010-1: 2010 It was also decided to send the email to relevant Industries to check whether they are referring the IS 9334: 1886 and IS 8935: 1985 or following the IEC 61010-2-202.	IEC 61010-2-202:2020 is under Printing.

2.		It was decided to align the following Indian Standards with the equivalent IEC standards and wide circulate them for the period of 2 Months. i. IEC 60519-4: 2021 Safety in installations for electro-heating and electromagnetic processing - Part 4: Particular requirements for arc furnace installations(Superseding IS 9080 (Part 4): 1981) ii. IEC 60240-1: 1992 Characteristics of electric infra-red emitters for industrial heating - Part 1: Short wave infra-red emitters(Superseding IS 10098: 1982) iii. IEC 60946: 1988 Binary direct voltage signals for process measurement and control systems(Superseding IS 12556: 1988) iv. IEC 60239:2005 :Graphite electrodes for electric arc furnaces - Dimensions and designation(Superseding IS 9050 : 1979) v. IEC 60779:2020 "Installations for Electroheating and Electromagnetic Processing – Test Methods for Electroslag Remelting Furnaces. (Superseeding IS 11692: 1986:Methods of tests for electro - Slag remelting furnaces)	The documents were vide circulated and No comments have been received. The documents may be finalized for printing.
3.	Status of Finalized Standards	The committee decided to finalize the following wide circulated drafts as no comments were received during the wide circulation period.	
		i. Doc ETD 18 (22819): Revision of IS 10189 : Part 2 : Sec 1: 1993: Industrial-process control valves - Part 2-1: Flow capacity - Sizing equations for fluid flow under installed conditions	Published
		ii. Doc ETD 18 (22822):Revision of IS 10215: 1982: Methods of tests for submerged - Arc furnaces	Published
		iii. Doc ETD 18 (22817) :Revision of IS 8493: 1977:Analogue DC voltage signals for industrial process measurement and control systems	Under Publication.
		iv. Doc ETD 18 (22557):IS/IEC 61010-2-202: 2020 Safety requirements for electrical equipment for measurement control and laboratory use - Part 2-202: Particular requirements for electrically operated valve actuators	Under Publication.
		v. Doc ETD 18 (22823):IS/IEC 60519-8: 2020:Safety in installations for electroheating and electromagnetic processing Part 8: Particular requirements for electroslag remelting furnaces(Superseding IS 11712:1986)	Published

		vi.	Doc ETD 18 (22818):Revision of IS 7722: 1975:Analogue pneumatic signals for process control systems	Published
		vii.	Doc ETD 18 (22821):Revision of IS 12306: 1987:Methods of test for direct arc furnaces	Published
		viii.	Doc ETD 18 (22816):Revision of IS 13673 : Part 4: 1998:Expression of performance of electrochemical analyzers: Part 4 standard for measuring oxygen dissolved in water	Published
		ix.	Doc ETD 18 (22824):Revision of IS 13263: 1992:Test methods of plasma equipment for electroheat applications	Published

Item 4 PRESENT POSITION OF WORK

The present programme of work of **Industrial Process Measurement And Control, ETD 18, Sectional Committee** is given in **ANNEXURE 2**.

The committee may note

Item 5 APPROVAL OF DRAFT INDIAN STANDARDS FOR FINALIZATION

The following documents were wide circulated and no comments have been received on the same. **The committee may finalize the documents for printing:**

S. No	New Document	Superseding IS
i.	ETD/18/24118 Identical to : IEC 60519-4: 2021 Safety in installations for electro-heating and electromagnetic processing - Part 4: Particular requirements for arc furnace installations	Superseding IS 9080 (Part 4): 1981): Safety requirements in electro - Heat installations: Part 4 particular requirements for arc furnace installations
ii.	ETD/18/24119 Identical to: IEC 60240-1: 1992 Characteristics of electric infra-red emitters for industrial heating - Part 1: Short wave infra-red emitters	Superseding IS 10098: 1982: General requirements for electric infra - Red emitters for heating purposes
iii.	ETD/18/24120 Identical to: IEC 60946: 1988 Binary direct voltage signals for process measurement and control systems	Superseding IS 12556: 1988: Specification for binary direct voltage signals for process measurement and control systems
iv.	ETD/18/24122: Identical to: IEC 60239:2005 :Graphite electrodes for electric arc furnaces - Dimensions and designation	Superseding IS 9050 : 1979: Nominal dimensions of cylindrical machined graphite electrodes with threaded sockets and connecting pins for use in electric arc furnaces
v.	ETD/18/22820 Identical to :IEC 60779:2020 “Installations for Electroheating and Electromagnetic Processing – Test Methods for Electroslag Remelting Furnaces	Superseeding IS IS 11692: 1986:Methods of tests for electro - Slag remelting furnaces)

Item 6 REVIEW/REAFFIRMATION OF INDIAN STANDARDS

6.1 Review of Standards - Taking up Revision of pre-2000 standards:
The status of Pre-2000 standard is placed at **ANNEXURE-3**

The committee may review

6.2 Reaffirmation of Indian standards:
As per BIS procedure, Indian Standards are to be reviewed which are 5 years old and are to be reaffirmed. As on date, the standards under ETD 18 that are due for reaffirmation are given at **ANNEXURE -5**

The committee may review.

Item 7 NEW SUBJECTS TAKEN UP FOR STANDARDIZATION

7.1 New Subjects
The Committee may suggest new subjects that can be taken up for standardization in the years 2024-25.

ITEM 8 INTERNATIONAL ACTIVITIES

8.1 India **is Participating member in IEC/TC 65, SC 65A, SC 65B and IEC/TC 27 Technical Committee** of the IEC.

The details of the committee and corresponding Membership status is given below:

S. No	Sub Committees	Title	India Membership Status
1	TC 65	Industrial-process measurement, control and automation	P Member
2	SC 65A	System aspects	P Member
3	SC 65B	Measurement and control devices	P Member
4	TC 27	Industrial electroheating and electromagnetic processing	P Member

The committee may kindly note and discuss

8.2 The programme of work of **IEC/TC 65, SC 65A, SC 65B and IEC/TC 27** is enclosed as **ANNEXURE – 6**

8.3 The details of voting for **IEC/TC 65, SC 65A, SC 65B and IEC/TC 27** since last meeting is given in **ANNEXURE-7.**

All Members are requested to kindly provide their comments on all the IEC documents being circulated for comments. As a P member we have obligation to cast ballot on each and every document received from the concerned IEC technical committee.

8.4 The next plenary meeting of IEC TC 65 is scheduled as per the details given below:

Title of TC/SC	Date of Meeting	Place of Meeting
TC65 plenary meeting	13.09.2024	Calgary , Canada (Face-to-face and Virtual)

Agenda for the meeting is enclosed at **ANNEXURE-10.**

BIS is in the process of preparing a tentative list of delegates for participation in the above meeting.

It may be noted here that, by taking active participation in IEC TC meetings ensures active role of Indian national Committee on the IEC platform as well as helps our country in the work of standard formulation in the field of Industrial-process measurement, control and automation. Furthermore, it will help in representing the National views of interest on the global platform.

The experts from the Sectional Committee, ETD 18 who are actively participating are thus eligible to send their nominations for taking part in the forthcoming IEC TC 65 meeting.

Members are requested to provide their nomination along with the details of technical comments given/proposed to be given on the IEC documents published by TC 65 relevant for India.

Please note that the expenses for attending the above-mentioned meeting shall be borne by your organization.

The committee may kindly note and discuss

ITEM 9 PROCESS REFORMS IN BIS

BIS has instituted several process reforms in respect of formulation of Indian Standards. It is essential that the members of Technical Committees are fully aware of these reform measures.

a) The Annual Programme of standardization(APS) for the year 2024-25

It is an important instrument and helps to plan for the entire year, the activities to be undertaken by the committee. It includes documents under development, meetings, new subjects to be taken up, etc.

The APS for the year 2024-25 for ETD 18 is placed at **ANNEXURE -8**

b) Compostion of the sectional Committee

i. Filling Gap of experts in the sectional committee
ii. Creation of standardardization cells in Industry Associations and Ministries.
iii. Nomination of expert/propfessional to a SC shall be sent by/with the approval of the Head of the Organization Cencerned alonf with his/her CV

c) Smart and Efficient SCs

1. On borading Programme for every newly inducted member
2. Signed declaration by each SC member
3. Lapse in membership if member remains absent from two consecutive meetings of the SC
4. Mandatory Commneting of P-draft through portal.

d) Annual Calendar of Technical Committee meetings

The item on date and place for the next meeting of the committee may be replaced with the title "Annual Calendar of Technical Committee meetings''

e) Closer examination of the New Work Item proposals received from IEC.

Participation in the development of international standards from an early stage helps to influence the standard as well as to understand why a specific requirement is being considered. It is therefore important that the New Work Item proposal received from ISO/ IEC are examined closely and a national viewpoint is prepared on the subject as early as possible.

f) The measures to ensure effective participation by Indian experts in IEC.

The committee may consider various aspects to increase participation in the IEC committees, be it obtaining P-

membership, nominating experts in WGs of national interest, voting on the ballots, participation in the meetings, etc. It is however important to measure effectiveness of our participation in international standardization work.

The Committee may CONSIDER the measures to ensure effective participation by the Indian experts at IEC level.

g) National and International events to be participated

Apart from participation in IEC meetings, the participation of BIS in other national or international importance events on the committee subject can facilitate in staying updated with the new and emerging trends in the field of work, networking and collaboration with relevant experts and stakeholders, influencing policy and decision making promoting standardization efforts, etc.
The committee may IDENTIFY national and international events wherein BIS should participate for the benefit of standard's work.

h) Scientific journals and periodicals to be subscribed

BIS has been subscribing scientific journals and periodicals to support standards work and maintaining these through our central library.
The committee may suggest scientific journals and periodicals which may be useful in standard development especially in the field of Fuses.

ITEM 10 MEMORANDUM OF UNDERSTANDING WITH EMINENT ACADEMIC INSTITUTES

Bureau of Indian Standards (BIS), has signed Memorandum of Understanding (MoU) with the following institutes of eminence for collaboration in the field of standardization and conformity assessment:

https://www.services.bis.gov.in/php/BIS_2.0/bisconnect/mou

The MOUs envisage cooperation in undertaking R&D projects for development of Indian Standards and introduction of Standardization in the curriculum.

The committee may NOTE.

ITEM 11 GUIDELINES FOR RESEARCH & DEVELOPMENT PROJECTS FOR FORMULATION AND REVIEW OF STANDARDS FOR INCLUSION OF EMPIRICAL DATA AND INSIGHTS.

11.1 Quality of a standard depends largely on the research data being considered while developing standards. Further, such data also provides insight on the modification required or incorporation of a specific requirement/parameter in a standard. It is presumed that during the development of a standard the members/ proposer will provide data in support of the proposal/ requirements. In some cases, it is seen that due to lack of such information, the standard does not meet the requirements of the market. BIS management has therefore offered support to committee for taking up research projects to collect empirical data and getting insight for the development of standard.

The committee may CONSIDER and IDENTIFY standards for which research project needs to be taken up.

Revised guidelines for research & development projects for formulation and review of standards has been issued.

Following are some of the salient features of these guidelines :

The sectional committee may consider the following points as a research & development project may include one or mix of the following:

a) Secondary research based on internet or published information including authentic data sources;

b) Survey based research (including industry visits) to ascertain prevailing market conditions and practices, standards in use, industry and consumer preferences, availability of infrastructure, technical capabilities, comparative trends, economic trends;

c) Ascertaining compliance to existing and proposed standards through testing, review of past test reports, other validation and verification checks; and

d) Basic and innovative research to establish normative criteria. Criteria may include performance, health, safety, environmental impact.

11.2 According to the guidelines, each technical committee is required to identify research projects related to their respective subject areas for the formulation of any new standard or revision of any existing standard. These projects will be awarded to academic institutions to carry out research and submit their report to the committee.

Committee members are requested to identify subjects related to the scope of the committee that require the formulation of new standards or the revision of existing ones and submit a brief overview of the research project.

11.3 The following R and D project was approved by the ETD 18 sectional committee.

Study of the technological advancement in the thermocouple pyrometers and different types of pyrometers used in the industry. The R and D will support the revision of the following standards

i. IS 2053 : 1974: Specification for thermocouple pyrometers

ii. IS 10639 : 1983: Specification for disappearing filament type, optical pyrometer

The R and D project has been granted to NIT, Trichy and has been commenced.

The committee may kindly note.

ITEM 12 DATE AND PLACE FOR THE NEXT MEETING

Annual Calendar of ETD 18

Sectional Committee	Q1	Q2	Q3	Q4
ETD 18	---	23-07-2024	19-12-2024	27-02-2025

The committee may kindly note

Item 13 ANY OTHER BUSINESS

ANNEXURE – 1

ETD 18 - INDUSTRIAL PROCESS MEASUREMENT AND CONTROL SECTIONAL COMMITTEE,

COMPOSITION

Sl. No.	Organization	Member Name	Role	Attendance out of Last 2 Meeting
1.	In Individual Capacity	Shri Rajiv Gupta	Chairperson	
2.	ABB India Limited, Bengaluru	Shri Venkatasubramanian Ramani S	Principal Member	1/2
		Shri Hemant Gupta	Alternate Member	
		Shri Vivek Malhotra	Alternate Member	
3.	Bharat Heavy Electrical Limited, New Delhi	Shri Punit Pratap Singh	Alternate Member	2/2
		Shri T. Sreedhar	Principal Member	
		Smt Priyanka	Alternate Member	
4.	Bosch Limited, Bengaluru	Shri Prashant Katkar	Principal Member	1/2
		Shri Adarshkumar Pandey	Alternate Member	
5.	Bureau of Energy Efficiency, New Delhi	Shri Kamran Shaikh	Alternate Member	1/2
		Ms Pravatanalini Samal	Principal Member	
		Dr. Alka Bharti	Alternate Member	
6.	CSIR - National Physical Laboratory, New Delhi	Shiv Kumar Jaiswal	Alternate Member	2/2
		Dr. Sanjay Yadav	Principal Member	
7.	Central Electricity Authority, New Delhi	Shri Deepanshu Rastogi	Principal Member	0/2
		Shri Ajit Kumar Ray	Alternate Member	
8.	Chemtrols Industries Private Limited, New Delhi	Shri Nandakumar Kalath	Principal Member	1/2
9.	Electronics Corporation of India Limited, Hyderabad	Shri Hardev Singh	Alternate Member	2/2
		Mr. Vaseem Ahmed	Principal Member	
		Mr. G Sampath Kuma	Alternate Member	
10.	Elico Limited, Hyderabad	Shri N. Raju	Alternate Member	1/2
		Shri T. V. Shiva K. Rao	Alternate Member	
		Mr. KVSN Raju	Principal Member	
11.	Engineers India Limited, New Delhi	Shri Mainak Nandi	Principal Member	2/2
		Shri Anindyo Ray	Alternate Member	
12.	FORBES	Shri Tushar A. Nazare	Alternate Member	1/2
		Shri Rajesh B. Kulkarni	Principal Member	
13.	Finder India Private Limited, Delhi	Shri Ashish Manchanda	Principal Member	1/2
14.	Fluid Control Research Institute, Palakkad	Shri M. Suresh	Principal Member	1/2
		Shri M P Dhanya	Alternate Member	
15.	MECON Limited, Ranchi	Shri Sujit Mandal	Principal Member	1/2
		Shri Prabir Kumar Mai	Alternate Member	
16.		Shri Debasish Ghosh	Principal Member	1/2

Sl. No.	Organization	Member Name	Role	Attendance out of Last 2 Meeting
	MN Dastur and Company Private Limited, Kolkata	Shri Dhiman Chandra Dhar	Alternate Member	
		Shri Arijit Sarkar	Alternate Member	
17.	National Federation of Engineers for Electrical Safety, Chennai	Shri Pratik Mahale	Principal Member	0/2
18.	Oil and Natural Gas Corporation Limited, New Delhi	Shri J.R. Martin	Alternate Member	1/2
		Shri C.R. Raju	Principal Member	
19.	Rashtriya Ispat Nigam Limited, Visakhapatnam	Shri Ravi Kanth Singudasu	Alternate Member	0/2
		Shri P Murali Mohan Kumar	Principal Member	
20.	Rockwin Flowmeter India Private Limited, Chennai	Shri Vishnu Prakash	Alternate Member	2/2
		Shri Shankar Mathur	Principal Member	
21.	Steel Authority of India Limited (SAIL), New Delhi	Shri Atanu Roy	Alternate Member	2/2
		Shri Ashish Jha	Principal Member	
22.	Vijayesh Instruments Private Limited, Pune	Shri Vishwas Kale	Principal Member	2/2
23.	Yokogawa IA Technologies India Private Limited, Bengaluru	Shri Satish K Balasubramanian	Principal Member	1/2
		Shri Hemant Singh	Alternate Member	
24.	In Personal Capacity	Shri Peush Mahajan	Alternate Member	0/2

ANNEXURE 2

INDUSTRIAL PROCESS MEASUREMENT AND CONTROL, ETD – 18 POW

Published Standards					
SI. No.	**IS No.**	**TITLE**	**Reaffirm M-Y**	**No. of Amds**	**Eqv.**
1	IS 10098 : 1982 Reviewed In : 2016 IEC 60240 : 1967	General requirements for electric infra - Red emitters for heating purposes	March, 2016	-	Modified/Technically Equivalent
2	IS 10122 : 1982 Reviewed In : 2021 IEC 60646 : 1979	Methods of tests for crucible induction furnaces	March, 2021	-	Modified/Technically Equivalent
3	IS 10189 (Part 1) : 2017 IEC 60534-1 : 2005 Reviewed In : 2021 IEC 60534-1 : 2005	Industrial - Process control valves: Part 1 control valve terminology and general considerations (First Revision)	October, 2021	-	Identical under dual numbering
4	IS 10189 (Part 2/Sec 1) : 2024 IEC 60534-2-1: 2011 IEC 60534-2-1: 2011	Industrial-Process Control Valves Part 2 Flow Capacity Section 1 Sizing Equations for Fluid Flow Under Installed Conditions (First Revision)		-	Identical under dual numbering

5	IS 10189 (Part 2/Sec 2) : 1993 Reviewed In : 2013 IEC Publication 534-2-2 (1980)	Industrial process control valves Part 2 flow capacity Section 2 sizing equations for compressible fluid flow under lnstalled conditions		-	Modified/Technically Equivalent
6	IS 10189 (Part 4) : 2016 IEC 60534-4 : 2006 Reviewed In : 2021 IEC 60534-4 : 2006	Industrial - Process control valves Part 4 inspection and routine testing	October, 2021	-	Identical under dual numbering
7	IS 10215 : 2024 IEC IEC 60683: 2011 IEC IEC 60683: 2011	Submerged-Arc Furnaces - Methods of Test (First Revision)		-	Identical under dual numbering
8	IS 10639 : 1983 Reviewed In : 2021 IEC 60181 - 1964	Specification for disappearing filament type, optical pyrometer	October, 2021	-	Modified/Technically Equivalent
9	IS 11222 : 1985 Reviewed In : 2015	Specification for dial, scales and indexes for indicating analogue measuring instruments	September, 2015	-	Indigenous
10	IS 11692 : 1986 Reviewed In : 2018	Methods of tests for electro - slag remelting furnaces	February, 2018	-	Indigenous
11	IS 12188 : 1987 Reviewed In : 2018	Specification for electric direct arc melting furnaces	February, 2018	-	Indigenous
12	IS 12306 : 2024 IEC 60676: 2011 IEC 60676: 2011	Direct Arc Furnaces - Methods of Test (First Revision)		-	Identical under dual numbering
13	IS 12434 : 1988 Reviewed In : 2013	Specification for coating/plating thickness tester, destructive type		-	Indigenous
14	IS 12554 (Part 1) : 1988 Reviewed In : 2013	Specification for non - destructive coating thickness testing instruments Part 1 eddy current instruments		-	Indigenous
15	IS 12554 (Part 2) : 1999 Reviewed In : 2013	Specification for non - destructive coating thickness testing instruments - Part 2 magnetic instruments		-	Indigenous
16	IS 12555 : 1988 Reviewed In : 2013	Guide for signal conditioning devices for process control systems		-	Indigenous
17	IS 12556 : 1988 Reviewed In : 2013	Specification for binary direct voltage signals for process measurement and control systems		-	Indigenous
18	IS 12579 : 1988 Reviewed In : 2013	Specification for base metal mineral insulated thermocouple cables and thermocouples		-	Indigenous
19	IS 13122 (Part 1) : 1993 Reviewed In : 2021	Transmitters for use in industrial process control systems - Specification: Part 1 methods for evaluating the performance	May, 2021	-	Indigenous

20	IS 13122 (Part 2) : 1991 Reviewed In : 2016	Transmitters for use in industrial process control systems - Specification: Part 2 guidance for installation, inspection and routine testing	May, 2016	-	Indigenous
21	IS 13211 : 1991 Reviewed In : 2016	Vapour pressure dial - Type thermometer - Specification	May, 2016	-	Indigenous
22	IS 13263 : 1992 IEC 60680 Reviewed In : 2013	Test methods of plasma equipment for electroheat applications		-	Indigenous
23	IS 13673 (Part 1) : 2021 IEC 60746-1 : 2003 IEC 60746-1 : 2003	Expression of Performance of Electrochemical Analyzers : Part 1 General		-	Identical under dual numbering
24	IS 13673 (Part 2) : 2021 IEC 60746-2 : 2003 IEC 60746-2 : 2003	Expression of Performance of Electrochemical Analyzers Part 2 pH Value (First Revision)		-	Identical under dual numbering
25	IS 13673 (Part 3) : 2021 IEC 60746-3 : 2002 IEC 60746-3:2002	Expression of Performance of Electrochemical Analyzers Part 3 Electrolytic Conductivity (First Revision)		-	Identical under dual numbering
26	IS 13673 (Part 4) : 2024 IEC 60746-4: 2018 IEC 60746-4: 2018	Expression of Performance of Electrochemical Analyzers Part 4 Standard for Measuring Oxygen Dissolved in Water (First Revision)		-	Identical under dual numbering
27	IS 13673 (Part 5) : 1999 Reviewed In : 2019 IEC 60746-5 : 1992	Expression of performance of electrochemical analyzers: Part 5 oxidation - Reduction potential or redox potential		-	Identical under dual numbering
28	IS 14254 (Part 1) : 2006 IEC 61131-1 Reviewed In : 2016 IEC 61131-1 (2003)	Programmable controllers: Part 1 - General information (First Revision)	March, 2016	-	Identical under dual numbering
29	14254 : 2021 IEC 61131-2 : 2017	Industrial-Process Measurement and Control - Programmable Controllers Part 2 Equipment Requirements and Tests (Second Revision)		-	Identical under dual numbering
30	IS 16923 (Part 1) : 2018 IEC 60584-1 : 2013 Reviewed In : 2023 IEC 60584-1 : 2013	Thermocouples Part 1 EMF Specifications and Tolerances (First Revision)	May, 2023	-	Identical under dual numbering
31	IS 16923 (Part 3) : 2023 IEC 60584-3: 2021 IEC 60584-3: 2021	Thermocouples - Part 3: Extension And Compensating Cables - Tolerances And Identification System		-	Identical under dual numbering
32	IS 2053 : 1974 Reviewed In : 2019	Specification for thermocouple pyrometers (First Revision)		-	Indigenous

33	IS 2711 : 1979 Reviewed In : 2018	Specification for direct reading pH meters (Second Revision)		1	Indigenous
34	IS 2806 : 1992 Reviewed In : 2018	Thermometry electrical resistance guide (First Revision)	April, 2018	-	Indigenous
35	IS 2848 : 2023 IEC 60751: 2022 IEC 60751: 2022	Industrial Platinum Resistance Thermometers And Platinum Temperature Sensors		-	Identical under dual numbering
36	IS 3624 : 1987 Reviewed In : 2018	Specification for pressure and vacuum gauges (Second Revision)	April, 2018	-	Indigenous
37	IS 3944 : 1982 Reviewed In : 2015	Method for determination of flow time by use of flow cups (First Revision)	September, 2015	-	Indigenous
38	IS 4309 : 1979 Reviewed In : 2013	Methods of measurement on direct reading PH meters (First Revision)	September, 2013	-	Indigenous
39	IS/IEC 60519-1 : 2020 IEC 60519-1: 2020 IEC 60519-1: 2020	Safety In Installations For Electroheating And Electromagnetic Processing - Part 1: General Requirements		-	Identical under single numbering
40	IS/IEC 60519-3 : 2005 IEC 60519-3: 2005 IEC 60519-3: 2005	Safety In Electroheat Installations - Part 3: Particular Requirements For Induction And Conduction Heating And Induction Melting Installations		-	Identical under single numbering
41	IS/IEC 60519-6 : 2022 IEC 60519-6:2022 IEC 60519-6:2022	Safety In Installations For Electroheating And Electromagnetic Processing - Part 6: Particular Requirements For High Frequency Dielectric And Microwave Heating And Processing Equipment		-	Identical under single numbering
42	IS/IEC 60519-8 : 2020 IEC 60519-8:2020 IEC 60519-8:2020	Safety in installations for electroheating and electromagnetic processing - Part 8: Particular requirements for electroslag remelting furnaces		-	Identical under single numbering
43	IS/IEC 60534-2-1) : 2011 NULL IEC 60534-2-1 : 2011	Industrial-Process Control Valves Part 2-1 Flow Capacity â€" Sizing Equations for Fluid Flow under Installed Conditions (First Revision)		-	Identical under dual numbering
44	IS/IEC 60534-2-3 : 2015 NULL Reviewed In : 2021 IEC 60534-2-3 : 2015	Industrial-Process Control Valves Part 2-3 Flow Capacity â€" Test Procedures (First Revision)	January, 2021	-	Identical under dual numbering
45	IS/IEC 61308 : 2005 IEC 61308: 2005 IEC 61308: 2005	High-Frequency Dielectric Heating Installations - Test Methods For The Determination Of Power Output		-	Identical under single numbering

46	IS/IEC 61508-0 : 2005 Reviewed In : 2019 IEC 61508-0:2005	Functional safety of electrical electronic/programmable electronic safety - Related systems: Part 0 functional safety and IEC 61508		-	Identical under single numbering
47	IS/IEC 61508-1 : 2010 IEC 61508-1 : 2010 IEC 61508-1 : 2010	Functional Safety of Electrical / Electronic / Programmable Electronic Safety-Related Systems Part 1 General Requirements (First Revision)		-	Identical under dual numbering
48	IS/IEC 61508-2 : 2010 IEC 61508-2 : 2010 IEC 61508-2:2010	Functional safety of electrical/ electronic/programmable electronic safety - Related systems: Part 2 requirements for electrical/electronic/ programmable electronic safety related systems (First Revision)		-	Identical under single numbering
49	IS/IEC 61508-3 : 2010 IEC 61508-3 : 2010 IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems : Part 3 Software requirements		-	Identical under single numbering
50	IS/IEC 61508-4 : 2010 IEC 61508-4 : 2010 IEC 61508-4:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems : Part 4 Definitions and abbreviations		-	Identical under single numbering
51	IS/IEC 61508-5 : 2010 IEC 61508-5 : 2010 IEC 61508-5:2010	Functional safety of electrical/electronic/programmable electronic safety - related systems : Part 5 Examples of methods for the determination of safety integrity levels		-	Identical under single numbering
52	IS/IEC 61508-6 : 2010 IEC 61508-6 : 2010 IEC 61508-6:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems : Part 6 Guidelines on the applications		-	Identical under single numbering
53	IS/IEC 61508-7 : 2010 IEC 61508-7 : 2010 IEC 61508-7:2010	Functional safety of electgrical/electronic/programmable electgronic safety-related systems : Part 7 Overview of techniques and measures		-	Identical under single numbering
54	IS/IEC 61511-1 : 2017 IEC 61511-1 : 2016 + AMD1 : 2017 IEC 61511-1:2017	Functional safety - Safety instrumented systems for the process industry sector : Part 1 Frameworks, definitions, system, hardware and software requirements		-	Identical under single numbering
55	IS/IEC 61511-2 : 2016 IEC 61511-2 : 2016 IEC 61511-2:2016	Functional safety - Safety instrumented systems for the process industry sector : Part 2 Guidelines for the application		-	Identical under single numbering

56	IS/IEC 61511-3 : 2016 IEC 61511-3 : 2016 IEC 61511-3:2016	Functional safety - Safety instrumented systems for the process industry sector: Part 3 guidance for the determination of the required safety integrity levels (First Revision)		-	Identical under single numbering
57	IS/IEC 62264-1 : 2003 Reviewed In : 2021 IEC 62264-1:2003	Enterprise - Control system integration: Part 1 models and terminology	January, 2021	-	Identical under single numbering
58	IS/IEC 62264-2 : 2004 Reviewed In : 2019 IEC 62264-2:2004	Enterprise - Control system integration: Part 2 object model attributes		-	Identical under single numbering
59	IS/IEC 62443-1-1) : 2009 IEC/TS 62443-1-1 : 2009 IEC62443-1-1:2009	Industrial Communication Networks Part 1 Network and System Security Section 1 Terminology, concepts and models		-	Identical under single numbering
60	IS/IEC 62443-2-4) : 2017 IEC 62443-2-4 : 2017 IEC62443-2-4:2017	Security for Industrial Automation and Control Systems Part 2: Section 4: Security Program Requirements for IACS Service Providers		-	Identical under single numbering
61	IS/IEC 62443-3-3) : 2013 IEC 62443-3-3 : 2013 IEC62443-3-3:2013	Industrial Communication Networks Part 3 Network and System Security Section 3 System security requirements and security levels		-	Identical under single numbering
62	IS/IEC 62443-4-1) : 2018 IEC 62443-4-1 : 2018 IEC 62443-4-1:2018	Security for Industrial Automation and Control Systems Part 4 Section 1 Secure Product Development Lifecycle Requirements		-	Identical under single numbering
63	IS/IEC 62443-4-2) : 2019 IEC 62443-4-2 : 2019 IEC62443-4-2:2019	Security for Industrial Automation and Control Systems Part 4 Sec 2 Technical Security Requirements for IACS Components		-	Identical under single numbering
64	IS 6804 : 1972 Reviewed In : 2013	Specification for glass electrodes for direct reading pH meter		-	Indigenous
65	IS 7358 : 1984 Reviewed In : 2015	Specification for thermocouples (First Revision)	September, 2015	-	Indigenous
66	IS 7722 : 2024 IEC 60382: 1991 IEC 60382: 1991	Analogue Pneumatic Signals for Process Control Systems (First Revision)		-	Identical under dual numbering
67	IS 7728 : 1984 Reviewed In : 2015	Specification for analogue dc current signals for process control systems (First Revision)	September, 2015	-	Indigenous
68	IS 8018 : 1976 Reviewed In : 2013	Specification for platinum and platinum alloy wires for thermocouple elements		-	Indigenous
69	IS 8493 : 1977		September, 2015	-	Indigenous

	Reviewed In : 2015	Analogue DC voltage signals for industrial process measurement and control systems			
70	IS 8495 (Part 1) : 1977 Reviewed In : 2013	Specification for ceramic components for thermocouples and resistance thermometers: Part 1 terminal blocks		-	Indigenous
71	IS 8784 : 1987 Reviewed In : 2018	Specification for thermocouple compensating cables (Second Revision)	April, 2018	-	Indigenous
72	IS 8824 (Part 2) : 1988 Reviewed In : 2015	Specification for electrical moisture meters	September, 2015	-	Indigenous
73	IS 8935 : 1985 Reviewed In : 2015	Specification for electric solenoid operated actuators (First Revision)	September, 2015	-	Indigenous
74	IS 8992 : 1978 IEC 60396 Reviewed In : 2016	Test methods for induction furnaces with submerged channels	March, 2016	-	Indigenous
75	IS 9021 : 1978 IEC 60398 Reviewed In : 2016	General test conditions for industrial electro - Heating equipment	March, 2016	-	Indigenous
76	IS 9029 : 1978 IEC 60397 Reviewed In : 2016	Methods of tests for batch furnaces with metallic heating resistors	March, 2016	1	Indigenous
77	IS 9050 : 1979 IEC 60239 Reviewed In : 2016	Nominal dimensions of cylindrical machined graphite electrodes with threaded sockets and connecting pins for use in electric arc furnaces	March, 2016	-	Indigenous
78	IS 9080 (Part 2/Sec 1) : 1979 Reviewed In : 2016	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 1 protection - In direct resistance heating installations	March, 2016	-	Indigenous
79	IS 9080 (Part 2/Sec 2) : 1980 Reviewed In : 2016	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 2 protection in indirect resistance heating installations	March, 2016	-	Indigenous
80	IS 9080 (Part 2/Sec 3) : 1981 IEC 60519-2 Reviewed In : 2016	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 3 protection in potassium and sodium nitrate nitrite bath furnaces	March, 2016	-	Indigenous

81	IS 9080 (Part 2/Sec 4) : 1981 Reviewed In : 2016	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 4 protection in installations used for drying varnishes and other similar products	March, 2016	-	Indigenous
82	IS 9080 (Part 4) : 1981 IEC 60519-4 Reviewed In : 2016	Safety requirements in electro - Heat installations: Part 4 particular requirements for arc furnace installations	March, 2016	-	Indigenous
83	IS 9334 : 1986 Reviewed In : 2016	Specification for electric motor operated actuators (First Revision)	May, 2016	-	Indigenous

Standards Under Develpoment

Projects Approved

SI. No.	Doc No	TITLE
-	-	-

Preliminary Draft Standards

SI. No.	Doc No	TITLE
-	-	-

Drafts Standards in WC Stage

SI. No.	Doc No	TITLE
-	-	-

Draft Standards Completed WC Stage

SI. No.	Doc No	TITLE
1	ETD 18 (22820) (IEC 60779: 2020)	Methods of tests for electro - Slag remelting furnaces
2	ETD 18 (24118) (IEC 60519-4: 2021)	Safety in installations for electroheating and electromagnetic processing - Part 4 Particular requirements for arc furnace installations
3	ETD 18 (24119) (IEC 60240-1:1992)	Characteristics of electric infra-red emitters for industrial heating - Part 1 Short wave infra-red emitters
4	ETD 18 (24120) (IEC 60946:1988)	Specification for binary direct voltage signals for process measurement and control systems
5	ETD 18 (24122) (IEC 60239:2005)	Graphite electrodes for electric arc furnaces - Dimensions and designation

Finalized Draft Indian Standard

SI. No.	Doc No	TITLE
-	-	-

Finalized Draft Indian Standards under Print	
SI. No.	**Doc No TITLE**
1	ETD 18 (22557) (IEC 61010-2-202:2020)
2	ETD 18 (22817) (IEC 60381-2:1978)
3	ETD 18 (22824) (IEC/TS 60680: 2008)

ANNEXURE-3

REVIEW OF PRE-2000 STANDARDS:

Pre 2000 carried over:

S. No	IS	Title	Status	Mode of Execution
1	IS 10098 : 1982	General requirements for electric infra - Red emitters for heating purposes Being Revised with Identical adoption of IEC 60240-1: 1992: Characteristics of electric infra-red emitters for industrial heating - Part 1: Short wave infra-red emitters	Completed WC	
2	IS 12556 : 1988	Specification for binary direct voltage signals for process measurement and control systems Being Revised with Identical adoption of IEC 60946: 1988 Binary direct voltage signals for process measurement and control systems	Completed WC	
3	IS 9050 : 1979	Nominal dimensions of cylindrical machined graphite electrodes with threaded sockets and connecting pins for use in electric arc furnaces	Completed WC	
4	IS 9080 (Part 4) : 1981	Safety requirements in electro - Heat installations: Part 4 particular requirements for arc furnace installations Being revised with Identical adoption of IEC 60519-4: 2021: Safety in installations for electro-heating and electromagnetic processing - Part 4: Particular requirements for arc furnace installations	Completed WC	
5	IS 11692 : 1986	Methods of tests for electro - Slag remelting furnaces Being revised with Identical adoption of IEC 60779:2020 “Installations for Electroheating and Electromagnetic Processing – Test Methods for Electroslag Remelting Furnaces	Completed WC	
7	IS 8493 : 1977	Analogue DC voltage signals for industrial process measurement and control systems Being Revised with Identical Adoption of IEC 60381-2:1978:	Under Publication	

8	IS 12579 : 1988	Specification for base metal mineral insulated thermocouple cables and thermocouples	To be aligned with IEC 61515: 2016 Mineral insulated metalsheathed thermocouple cables and thermocouples	
9	IS 8992 : 1978	Test methods for induction furnaces with submerged channels	--	ARP
10	IS 9334 : 1986	Specification for electric motor operated actuators (First Revision)	Please refer to **Annexure-4**	
11	IS 10639 : 1983	Specification for disappearing filament type, optical pyrometer		R and D given
12	IS 2053 : 1974	Specification for thermocouple pyrometers (First Revision)		R and D given

Pre-2000 Current:

S.No	IS	Title	Mode of execution	Status
2	IS 13673 (Part 5) : 1999	Expression of performance of electrochemical analyzers: Part 5 oxidation - Reduction potential or redox potential		Based on IEC standard: IEC 60746-5:1992 Latest IEC standard: IEC 60746-5:1992
3	IS 7728 : 1984	Specification for analogue dc current signals for process control systems (First Revision)		Based on IEC Darft 65A IEC 381(1971) and IEC 381(A))(1975) Current IEC standard: IEC 60381-1:1982
4	IS 9080 (Part 2/Sec 1) : 1979	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 1 protection - In direct resistance heating installations		Based on IEC 519-2(1975) **IEC 60519-2:2006**: SAFETY IN ELECTROHEAT INSTALLATIONS – Part 2: Particular requirements for resistance heating equipment **has been withdrawn** Scope: This part of IEC 60519 is applicable to the indirect resistance heating equipment and the direct resistance heating equipment specified in items a) and b) below respectively, operating in voltage bands 1 and 2. The object of this standard is the standardization of safety requirements for both indirect and direct resistance heating equipment **The Committee may suggest.**

5	IS 9080 (Part 2/Sec 2) : 1980	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 2 protection in indirect resistance heating installations		Based on IEC 519-2(1975) **IEC 60519-2:2006**: SAFETY IN ELECTROHEAT INSTALLATIONS – Part 2: Particular requirements for resistance heating equipment **has been withdrawn**
6	IS 9080 (Part 2/Sec 3) : 1981	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 3 protection in potassium and sodium nitrate nitrite bath furnaces		Based on IEC 519-2(1975) **IEC 60519-2:2006**: SAFETY IN ELECTROHEAT INSTALLATIONS – Part 2: Particular requirements for resistance heating equipment **has been withdrawn**
7	IS 9080 (Part 2/Sec 4) : 1981	Safety requirements in electro - Heat installations: Part 2 particular requirements for resistance heating equipment: Sec 4 protection in installations used for drying varnishes and other similar products		Based on IEC 519-2(1975) **IEC 60519-2:2006**: SAFETY IN ELECTROHEAT INSTALLATIONS – Part 2: Particular requirements for resistance heating equipment **has been withdrawn**
8	IS 10122 : 1982	Methods of tests for crucible induction furnaces	ARP	
9	IS 12434 : 1988	Specification for coating/plating thickness tester, destructive type	ARP	
10	IS 12554 (Part 1) : 1988	Specification for non - Destructive coating thickness testing instruments: Part 1 eddy current instruments	ARP	
11	IS 12554 (Part 2) : 1999	Specification for non - Destructive coating thickness testing instruments: Part 2 magnetic instruments	ARP	
12	IS 13211 : 1991	Vapour pressure dial - Type thermometer - Specification	ARP	
13	IS 8935 : 1985	Specification for electric solenoid operated actuators (First Revision)	ARP	
14	IS 9021 : 1978	General test conditions for industrial electro - Heating equipment	ARP	
15	IS 9029 : 1978	Methods of tests for batch furnaces with metallic heating resistors	ARP	
16	IS 12555:1988	Guide for Signal Conditioning devices for Process Control	ARP	

SL. No	IS	Title	Mode of Execution	Status
1	IS 11222 : 1985	Specification for dial, scales and indexes for indicating analogue measuring instruments.		
2	IS 12188 : 1987	Specification for electric direct arc melting furnaces		IEC 60519-4:2021: SAFETY IN INSTALLATIONS FOR ELECTROHEATING AND ELECTROMAGNETIC PROCESSING – Part 4: Particular requirements for arc furnace

				installations provides particular safety requirements for arc furnace installations. This standard is applicable to arc furnace installations such as: a) furnaces for direct arc heating, forming arcs between the electrode and metal such as the electric arc furnace using alternating current (EAF AC) or direct current (EAF DC), and the ladle furnace (LF); b) furnaces for arc-resistance heating forming arcs between the electrode and the charge material or heating the charge material by the Joule effect, such as the submerged arcresistance furnace using alternating current (SAF AC), or direct current (SAF DC).
3	IS 13122 (Part 1) : 1993	Transmitters for use in industrial process control systems - Specification: Part 1 methods for evaluating the performance		This standard is based on IEC 770:1984 which has been over a period of time replaced by IEC 62828-4:2020 IEC 62828-5:2020 IEC 62828-3:2018 IEC 62828-1:2017 IEC 62828-2:2017 Reference conditions and procedures for testing industrial and process measurement transmitters(Various Parts)
4	IS 13122 (Part 2) : 1991	Transmitters for use in industrial process control systems - Specification: Part 2 guidance for installation, inspection and routine testing		Please refer to the remarks at Sl. No. 3 above
5	IS 2806 : 1992	Thermometry electrical resistance guide (First Revision)		
6	IS 3624 : 1987	Specification for pressure and vacuum gauges (Second Revision)		
7	IS 3944:1902	Method for determination of flow time by use of flow cups (First Revision)		
8	IS 7358 : 1984	Specification for thermocouples (First Revision)		
9	IS 8018:1976	Specification for platinum and platinum alloy wires for thermocouple elements		
10	IS 8495(part 1):1977	Specification for ceramic components for thermocouples and resistance thermometers Part 1 terminal blocks		
11	IS 8784:1987	Specification for thermocouple compensating cables (Second Revision)		
12	IS 8824 (Part 2) : 1988	Specification for electrical moisture meters		

13	IS 2711 : 1979	Specification for direct reading pH meters (Second Revision)		
14	IS 4309 : 1979	Methods of measurement on direct reading PH meters (First Revision)		
15	IS 6804 : 1972	Specification for glass electrodes for direct reading pH meter		

ANNEXURE-4

COMMENTS ON IS 9334:1986: SPECIFICATION FOR ELECTRIC MOTOR OPERATED ACTUATORS

We received a proposal from the Mechanical Engineering Dept regarding superseding IS 9334:1986 with IS/ISO 22153:2020.

The standard was adopted from ISO and comes under MED 17 is **IS/ISO 22153:2020 Electric Actuators for Industrial Valves - General Requirements**

IS/ISO 22153:2020 which is equivalent and having more details and being adopted from ISO, , Members were requested to review IS 9334:1986 and examine if we can consider superseding this standard with IS/ISO 22153:2020.

The comments received from, Members is as follows:

S. No	Member	Comment
1	Dr. M Suresh Deputy Director Fluid Control Research Institute	With ref to trailing email, we accept the proposal of Mechanical Engineering dept regarding superseding IS 9334:1986 with IS/ISO 22153:2020
2	Mr. Shri Sujit Mandal, MECON Limited, Ranchi	IS/ISO 22153:2020 Electric Actuators for Industrial Valves - General Requirements' के मध्य नजर, 'IS 9334:1986 Specification for electric motor operated actuators (First Revision)' को हटाया जा सकता है|
3	Shri Peush Mahajan	I have always been propagating that ISO standards can be adopted where the related Indian standard do exist . However there may be specific requirements of Indian Industry or conditions which must be reviewed before adopting. To this extent , IS/ISO 22153:2020 standard is quite elaborate and should be adopted in place of IS 9334:1986 but after debating following requirements which are part of IS but find difference in ISO . For example; 1. power supply : Frequency variation requirement in IS is +/-3% while ISO is +/-2%. May decide as per IS ? 2. Actuator mounting - can be in any direction as per IS, no mention in ISO 3. Enclosure protection as per ISO is IP 67 but there is no mention of Explosion proof requirements in ISO while IS do indicate explosion proof requirement too when required 4. Type Tests requirement as per IS are more than those required by IS 5. No mention of field operating and settings requirements in ISO 6. Requirement of serial signals like MODBUS etc in addition to field bus It is therefore necessary that the adoption of ISO without considering above should be discussed before accepting ISO without any change. Regards Mahajan

4	Ashish Jha, SAIL	IS 9334:1986 standard for electric motor operated actuator is old and almost redundant after adoption and publishing of IS/ISO 22153:2020. IS 22153 is more comprehensive yet objective, inclusive of terms related to latest sensitivity in the usage like duty cycle, noise, repeatability etc. It has many advanced features like data logging, torque transmitter, fieldbus compatibility and address many other optional facilities. However old standards were having a special appendix on Nuclear radiation exposure related installations which may be addressed separately or with arrangement between supplier and purchaser. Hence In my humble opinion IS 9334: 1986 can be superseded in favor of IS 22153:2020.

The committee may discuss

ANNEXURE-5

Standards Due for Reaffirmation

Reaffirmation carried over 2023-24:

S. No	IS Number	Title	Status	Latest IEC standard
	IS 10189 (Part 2/Sec 2) : 1993	Industrial process control valves: Part 2 flow capacity: Sec 2 sizing equations for compressible fluid flow under lnstalled,conditions	Superseded by IS 10189 (Part 2/Sec 1) : 2024 (May be withdrawn)	
	IS 12556 : 1988	Specification for binary direct voltage signals for process measurement and control systems	Being revised with identical adoption of IEC 60946: 1988 Binary direct voltage signals for process measurement and control systems(WC Completed)	
	IS 13263 : 1992	Test methods of plasma equipment for electroheat applications	Being revised with identical adoption of IEC/TS 60680: 2008 (Under Print)	
	IS 12434 : 1988	Specification for coating/plating thickness tester, destructive type	ARP	
	IS 12554 (Part 1) : 1988	Specification for non - Destructive coating thickness testing instruments: Part 1 eddy current instruments	ARP	
	IS 12554 (Part 2) : 1999	Specification for non - Destructive coating thickness testing instruments: Part 2 magnetic instruments	ARP	

	IS 12555 : 1988	Guide for signal conditioning devices for process control systems		
	IS 12579 : 1988	Specification for base metal mineral insulated thermocouple cables and thermocouples		
	IS 13673 (Part 5) : 1999 IEC 60746-5 : 1992	Expression of performance of electrochemical analyzers: Part 5 oxidation - Reduction potential or redox potential		
	IS 2711 : 1979	Specification for direct reading pH meters (Second Revision)		
	IS 2806 : 1992	Thermometry electrical resistance guide (First Revision)		
	IS 3624 : 1987	Specification for pressure and vacuum gauges (Second Revision)		
	IS 4309 : 1979	Methods of measurement on direct reading PH meters (First Revision)		
	IS 6804 : 1972	Specification for glass electrodes for direct reading pH meter		
	IS 8018 : 1976	Specification for platinum and platinum alloy wires for thermocouple elements		
	IS 8495 (Part 1) : 1977	Specification for ceramic components for thermocouples and resistance thermometers: Part 1 terminal blocks		
	IS 8784 : 1987	Specification for thermocouple compensating cables (Second Revision)		

Reaffirmation(Current)

S. No	IS Number	Title	Status	Latest IEC standard
1.	IS 2053 : 1974	Specification for thermocouple pyrometers (First Revision)	R and D Given	

2.	IS/IEC 61508-0 : 2005	Functional safety of electrical electronic/programmable electronic safety - Related systems: Part 0 functional safety and IEC 61508		IEC TR 61508-0:2005
3.	IS/IEC 61508-1 : 2010 IEC 61508-1 : 2010	Functional Safety of Electrical / Electronic / Programmable Electronic Safety-Related Systems Part 1 General Requirements (First Revision)		IEC 61508-1:2010
4.	IS/IEC 61508-2 : 2010	Functional safety of electrical/ electronic/programmable electronic safety - Related systems: Part 2 requirements for electrical/electronic/ programmable electronic safety related systems (First Revision)		IEC 61508-2:2010
5.	IS/IEC 61508-3 : 2010	Functional safety of electrical/electronic/programma ble electronic safety-related systems : Part 3 Software requirements		IEC 61508-3:2010
6.	IS/IEC 61508-4 : 2010	Functional safety of electrical/electronic/programma ble electronic safety-related systems : Part 4 Definitions and abbreviations		IEC 61508-4:2010
7.	IS/IEC 61508-5 : 2010	Functional safety of electrical/electronic/programma ble electronic safety - related systems : Part 5 Examples of methods for the determination of safety integrity levels		IEC 61508-5:2010
8.	IS/IEC 61508-6 : 2010	Functional safety of electrical/electronic/programma ble electronic safety-related systems : Part 6 Guidelines on the applications of IEC 61508-2 and IEC 61508-3		IEC 61508-6:2010
9.	IS/IEC 61508-7 : 2010	Functional safety of electgrical/electronic/programm able electgronic safety-related systems : Part 7 Overview of techniques and measures		IEC 61508-7:2010
10	IS/IEC 61511-1 : 2017	Functional safety - Safety instrumented systems for the process industry sector : Part 1 Frameworks, definitions, system, hardware and application programming requirements		IEC 61511-1:2016+AMD1:2017

11	IS/IEC 61511-2 : 2016	Functional safety - Safety instrumented systems for the process industry sector : Part 2 Guidelines for the application		IEC 61511-2:2016
12	IS/IEC 61511-3 : 2016	Functional safety - Safety instrumented systems for the process industry sector: Part 3 guidance for the determination of the required safety integrity levels (First Revision)		IEC 61511-3:2016
13	IS/IEC 62264-2 : 2004	Enterprise - Control system integration: Part 2 object model attributes		IEC 62264-2:2013

Annexure-6
IEC TC 27, 65, 65A, 65B POW & Publication

TC 27 Publications		
Sl. No.	**Document Number**	**Title**
1.	IEC 60239:2005	Graphite electrodes for electric arc furnaces - Dimensions and designation
2.	IEC 60398:2015	Installations for electroheating and electromagnetic processing - General performance test methods
3.	IEC 60519-1:2020	Safety in installations for electroheating and electromagnetic processing - Part 1: General requirements
4.	IEC 60519-1:2020 RLV	Safety in installations for electroheating and electromagnetic processing - Part 1: General requirements
5.	IEC 60519-3:2005	Safety in electroheat installations - Part 3: Particular requirements for induction and conduction heating and induction melting installations
6.	IEC 60519-4:2021	Safety in installations for electroheating and electromagnetic processing - Part 4: Particular requirements for arc furnace installations
7.	IEC 60519-6:2022	Safety in installations for electroheating and electromagnetic processing - Part 6: Particular requirements for high frequency dielectric and microwave heating and processing equipment
8.	IEC 60519-7:2008	Safety in electroheat installations - Part 7: Particular requirements for installations with electron guns
9.	IEC 60519-8:2020	Safety in installations for electroheating and electromagnetic processing - Part 8: Particular requirements for electroslag remelting furnaces
10.	IEC 60519-11:2007	Safety in electroheat installations - Part 11: Particular requirements for installations using the effect of electromagnetic forces on liquid metals
11.	IEC 60519-12:2016	Safety in installations for electroheating and electromagnetic processing - Part 12: Particular requirements for infrared electroheating
12.	IEC 60676:2024	Industrial electroheating equipment - Test methods for direct arc furnaces
13.	IEC TS 60680:2008	Test methods of plasma equipment for electroheat and electrochemical applications
14.	IEC 60683:2011	Industrial electroheating equipment - Test methods for submerged-arc furnaces
15.	IEC 60703:2008	Test methods for electroheating installations with electron guns
16.	IEC 60779:2020	Installations for electroheating and electromagnetic processing - Test methods for electroslag remelting furnaces
17.	IEC TR 62157:2001	Cylindrical machined carbon electrodes - Nominal dimensions

18.	IEC/IEEE 62395-1:2024	Electrical resistance trace heating systems for industrial and commercial applications - Part 1: General and testing requirements
19.	IEC/IEEE 62395-2:2024	Electrical resistance trace heating systems for industrial and commercial applications - Part 2: Application guide for system design, installation and maintenance
20.	IEC 62693:2013	Industrial electroheating installations - Test methods for infrared electroheating installations
21.	IEC 62798:2014	Industrial electroheating equipment - Test methods for infrared emitters
22.	IEC 62798:2014/COR1:2014	Corrigendum 1 - Industrial electroheating equipment - Test methods for infrared emitters
23.	IEC TS 62996:2017	Industrial electroheating and electromagnetic processing equipment - Requirements on touch currents, voltages and electric fields from 1 kHz to 6 MHz
24.	IEC TS 62997:2017	Industrial electroheating and electromagnetic processing equipment - Evaluation of hazards caused by magnetic nearfields from 1 Hz to 6 MHz
25.	IEC 63078:2019	Installations for electroheating and electromagnetic processing - Test methods for induction through-heating installations

TC 65 Work Programme

Sl. No.	Project Reference	Title	Document Reference	Current Stage	Next Stage	Fcst. Publ. Date
1.	PNW 65-1032 ED1	Asset Administration Shell for industrial applications – Part 5: Interfaces	65/1032/NP	PRVN		2026-12
2.	IEC 60050-351 ED5	International Electrotechnical Vocabulary (IEV) - Part 351: Control technology	65/869/RR	ACD	CD	2025-09
3.	IEC 61010-2-201 ED3	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-201: Particular requirements for control equipment	65/1049/FDIS	PRVD		2024-08
4.	IEC 61010-2-203 ED1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-203: Particular requirements for industrial communication circuits and communication port interconnection	65/1054/FDIS	CFDIS	PRVD	2024-10
5.	IEC 62443-2-1 ED2	Security for industrial automation and control systems - Part 2-1: Security program requirements for IACS asset owners	65/1044/FDIS	BPUB	PPUB	2024-08
6.	IEC PAS 62443-2-2 ED1	Security for industrial automation and control systems – Part 2-2: IACS Security Protection	65/1051/DPAS	CDPAS	PRVDPAS	2024-09

7.	IEC TS 62443-6-2 ED1	Security evaluation methodology for IEC 62443 - Part 4-2: Technical security requirements for IACS components	65/932/CD	RDTS	CDTS	2024-12
8.	IEC TS 63069 ED1	Framework for safety and security	65/1018/CD	PCC		2025-07
9.	IEC 63131-1 ED1	Application function blocks and logic diagrams for Upstream Oil & Gas processes – System Control Diagrams – Part 1: General principles	65/919/NP	ACD	CD	2025-09
10.	IEC 63278-2 ED1	Asset Administration Shell for Industrial Applications – Part 2: Information meta model	65/992/CD	CDM		2025-08
11.	IEC 63278-3 ED1	Asset Administration Shell for Industrial Applications – Part 3: Security provisions for Asset Administration Shells	65/916/NP	ACD	CD	2025-08
12.	IEC 63278-4 ED1	Asset administration shell for industrial applications - Part 4: Use cases and modelling examples	65/1024/CD	PCC		2025-10
13.	IEC TR 63283-2 ED2	Industrial-process measurement, control and automation - Smart manufacturing - Part 2: Use cases	65/1019/CD	ADTR	TDTR	2025-04
14.	IEC TR 63283-4 ED1	Industrial-process measurement, control and automation – Smart Manufacturing – Part 4:Recommendations for the usage of new technologies	65/1040/CD	PCC		2025-04
15.	IEC TR 63283-5 ED1	Industrial-process measurement, control and automation – Smart manufacturing – Part 5: Market and innovation trends analysis	65/1008/DTR	BPUB	PPUB	2024-08
16.	IEC TR 63319 ED1	A meta-modelling analysis approach to smart manufacturing reference models	65/812/DTR	BPUB		2024-08
17.	IEC 63339 ED1	Unified reference model for smart manufacturing	65/1020/FDIS	PRVD		2024-08
18.	ISO 20140-5 ED2	Automation systems and integration - Evaluating energy efficiency and other factors of manufacturing systems that influence the environment - Part 5: Environmental performance evaluation data	65/1046/FDIS	PRVD		2024-08

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Sl. No.	Document Number	Title
1.	IEC 60381-1:1982	Analogue signals for process control systems. Part 1: Direct current signals
2.	IEC 60381-2:1978	Analogue signals for process control systems. Part 2: Direct voltage signals
3.	IEC 60382:1991	Analogue pneumatic signal for process control systems
4.	IEC 60946:1988	Binary direct voltage signals for process measurement and control systems
5.	IEC 61010-2-201:2017	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-201: Particular requirements for control equipment
6.	IEC 61010-2-201:2017 RLV	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-201: Particular requirements for control equipment
7.	IEC 61010-2-202:2020 RLV	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-202: Particular requirements for electrically operated valve actuators
8.	IEC 61010-2-202:2020	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-202: Particular requirements for electrically operated valve actuators
9.	IEC TS 61081:1991	Pneumatic instruments driven by associated process gas - Safe installation and operating procedures - Guidelines
10.	IEC 61506:1997	Industrial-process measurement and control - Documentation ofapplication software
11.	IEC 62419:2008	Control technology - Rules for the designation of measuring instruments
12.	IEC 62424:2016	Representation of process control engineering - Requests in P&I diagrams and data exchange between P&ID tools and PCE-CAE tools
13.	IEC TS 62443-1-1:2009	Industrial communication networks - Network and system security - Part 1-1: Terminology, concepts and models
14.	IEC TS 62443-1-5:2023	Security for industrial automation and control systems - Part 1-5: Scheme for IEC 62443 security profiles
15.	IEC 62443-2-1:2010	Industrial communication networks - Network and system security - Part 2-1: Establishing an industrial automation and control system security program
16.	IEC TR 62443-2-3:2015	Security for industrial automation and control systems - Part 2-3: Patch management in the IACS environment
17.	IEC 62443-2-4:2023	Security for industrial automation and control systems - Part 2-4: Security program requirements for IACS service providers
18.	IEC TR 62443-3-1:2009	Industrial communication networks - Network and system security - Part 3-1: Security technologies for industrial automation and control systems
19.	IEC 62443-3-2:2020	Security for industrial automation and control systems - Part 3-2: Security risk assessment for system design
20.	IEC 62443-3-3:2013	Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels
21.	IEC 62443-3-3:2013/COR1:2014	Corrigendum 1 - Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels
22.	IEC 62443-4-1:2018	Security for industrial automation and control systems - Part 4-1: Secure product development lifecycle requirements
23.	IEC 62443-4-2:2019	Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components
24.	IEC 62443-4-2:2019/COR1:2022	Corrigendum 1 - Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components
25.	IEC TS 62443-6-1:2024	Security for industrial automation and control systems - Part 6-1: Security evaluation methodology for IEC 62443-2-4
26.	IEC 62708:2015	Documents kinds for electrical and instrumentation projects in the process industry

27.	IEC 62832-1:2020	Industrial-process measurement, control and automation - Digital factory framework - Part 1: General principles
28.	IEC 62832-2:2020	Industrial-process measurement, control and automation - Digital factory framework - Part 2: Model elements
29.	IEC 62832-3:2020	Industrial-process measurement, control and automation - Digital factory framework - Part 3: Application of Digital Factory for life cycle management of production systems
30.	IEC TR 62837:2013	Energy efficiency through automation systems
31.	IEC TS 62872-1:2019	Industrial-process measurement, control and automation - Part 1: System interface between industrial facilities and the smart grid
32.	IEC 62872-2:2022	Industrial-process measurement, control and automation - Part 2: Internet of Things (IoT) - Application framework for industrial facility demand response energy management
33.	IEC 62881:2018	Cause and effect matrix
34.	IEC 62881:2018/COR1:2019	Corrigendum 1 - Cause and effect matrix
35.	IEC 62890:2020	Industrial-process measurement, control and automation - Life-cycle-management for systems and components
36.	IEC TR 63069:2019	Industrial-process measurement, control and automation - Framework for functional safety and security
37.	IEC PAS 63088:2017	Smart manufacturing - Reference architecture model industry 4.0 (RAMI4.0)
38.	IEC PAS 63131:2017	System control diagram
39.	IEC TS 63164-1:2020	Reliability of industrial automation devices and systems - Part 1: Assurance of automation devices reliability data and specification of their source
40.	IEC TR 63164-2:2020	Reliability of industrial automation devices and systems - Part 2: System reliability
41.	IEC 63278-1:2023	Asset Administration Shell for industrial applications - Part 1: Asset Administration Shell structure
42.	IEC TR 63283-1:2022	Industrial-process measurement, control and automation - Smart manufacturing - Part 1: Terms and definitions
43.	IEC TR 63283-2:2022	Industrial-process measurement, control and automation - Smart manufacturing - Part 2: Use cases
44.	IEC TR 63283-3:2022	Industrial-process measurement, control and automation - Smart manufacturing - Part 3: Challenges for cybersecurity
45.	IEC PAS 63325:2020	Lifecycle requirements for functional safety and security for IACS
46.	IEC 63376:2023	Industrial facility energy management system (FEMS) - Functions and information flows
47.	IEC PAS 63441:2022	Functional architecture of industrial internet system for industrial automation applications
48.	ISO 20140-5:2017	Automation systems and integration - Evaluating energy efficiency and other factors of manufacturing systems that influence the environment - Part 5: Environmental performance evaluation data

TC 65 A Work Programme						
Sl. No.	**Project Reference**	**Title**	**Document Reference**	**Current Stage Date**	**Next Stage**	**Fcst. Publ. Date**

1.	PNW TS 65A-1065 ED1	Functional safety of electrical/electronic/programmable electronic safety-related systems Part 2-1: Requirements for complex semiconductors	65A/1065/NP	2023-01		2024-05
2.	PNW TS 65A-1117 ED1	Information technology — Artificial intelligence — Guidance and requirements for uncertainty quantification in AI systems	65A/1117/NP	2024-05	PRVN	2027-08
3.	PNW 65A-1122 ED1	Systems engineering – System safety – Complex systems and defence applications Part 1 – Concepts, terminology and requirements	65A/1122/NP	2024-06	PRVN	2026-05
4.	IEC 61326-2-6 ED4	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment	65A/1102/CDV	2024-07	CFDIS	2024-12
5.	IEC 61326-2-7 ED1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-7: Particular requirements – Test configurations, operational conditions, test levels and performance criteria for field devices with Ethernet-APL interfaces	65A/1101/CD	2024-06	CCDV	2025-09
6.	IEC 61508-1 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (see Functional Safety and IEC 61508)	65A/1056A/CD	2023-02		2027-03
7.	IEC 61508-2 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems (see Functional Safety and IEC 61508)	65A/1057A/CD	2023-02		2027-03
8.	IEC 61508-3 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements (see Functional Safety and IEC 61508)	65A/1058A/CD	2023-02		2027-03

9.	IEC TS 61508-3-2 ED1	FUNCTIONAL SAFETY OF ELECTRICAL/ELECTRONIC/ PROGRAMMABLE ELECTRONIC SAFETY-RELATED SYSTEMS – Part 3-2: Requirements and guidance in the use of mathematical and logical techniques for establishing exact properties of software and its documentation	65A/1113/DTS	2024-06		2024-08
10.	IEC TR 61508-3-3 ED1	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3-3: Requirements for object-oriented software in safety-related systems	65A/1006/CD	2024-03		2025-02
11.	IEC 61508-4 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations (see Functional Safety and IEC 61508)	65A/1059A/CD	2023-02		2027-03
12.	IEC 61508-5 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 5: Examples of methods for the determination of safety integrity levels (see Functional Safety and IEC 61508)	65A/1060A/CD	2023-02		2027-03
13.	IEC 61508-6 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3 (see Functional Safety and IEC 61508)	65A/1061A/CD	2023-02		2027-03
14.	IEC TR 61508-6-1 ED1	IEC TR 61508-6-1 Treatment of hardware or software developed to ISO 26262		2024-04	TDTR	2025-04
15.	IEC 61508-7 ED3	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 7: Overview of techniques and measures (see Functional Safety and IEC 61508)	65A/1062A/CD	2023-02		2027-03
16.	IEC 61512-1 ED2	Batch control - Part 1: Models and terminology	65A/1108/CDV	2024-07	DECF DIS	2025-02
17.	IEC 63303 ED1	Human machine interfaces for process automation systems	65A/1115/FDIS	2024-07	PPUB	2024-08

18.	ISO/IEC TS 22440 ED1	Artificial intelligence - Functional Safety and AI systems - Requirements	65A/1100/NP	2023-10		2026-08

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Sl. No.	**Document Number**	**Title**
1.	IEC 60654-1:1993	Industrial-process measurement and control equipment - Operating conditions - Part 1: Climatic conditions
2.	IEC 60654-2:1979+AMD1:1992 CSV	Operating conditions for industrial-process measurement and control equipment. Part 2: Power
3.	IEC 60654-2:1979	Operating conditions for industrial-process measurement and control equipment. Part 2: Power
4.	IEC 60654-2:1979/AMD1:1992	Amendment 1 - Operating conditions for industrial-process measurement and control equipment. Part 2: Power
5.	IEC 60654-3:1983	Operating conditions for industrial-process measurement and control equipment - Part 3: Mechanical influences
6.	IEC 60654-4:1987	Operating conditions for industrial-process measurement and control equipment. Part 4: Corrosive and erosive influences
7.	IEC 61069-1:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 1: Terminology and basic concepts
8.	IEC 61069-2:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 2: Assessment methodology
9.	IEC 61069-3:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 3: Assessment of system functionality
10.	IEC 61069-4:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 4: Assessment of system performance
11.	IEC 61069-5:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 5: Assessment of system dependability
12.	IEC 61069-6:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 6: Assessment of system operability
13.	IEC 61069-7:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 7: Assessment of system safety
14.	IEC 61069-8:2016	Industrial-process measurement, control and automation - Evaluation of system properties for the purpose of system assessment - Part 8: Assessment of other system properties
15.	IEC 61326-1:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
16.	IEC 61326-1:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
17.	IEC 61326-2-1:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-1: Particular requirements - Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications
18.	IEC 61326-2-1:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-1: Particular requirements - Test configurations,

		operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications
19.	IEC 61326-2-2:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-2: Particular requirements - Test configurations, operational conditions and performance criteria for portable testing, measuring and monitoring equipment used in low-voltage distribution systems
20.	IEC 61326-2-2:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-2: Particular requirements - Test configurations, operational conditions and performance criteria for portable testing, measuring and monitoring equipment used in low-voltage distribution systems
21.	IEC 61326-2-3:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning
22.	IEC 61326-2-3:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning
23.	IEC 61326-2-4:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-4: Particular requirements - Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9
24.	IEC 61326-2-4:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-4: Particular requirements - Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9
25.	IEC 61326-2-5:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for field devices with field bus interfaces according to IEC 61784-1
26.	IEC 61326-2-5:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for field devices with field bus interfaces according to IEC 61784-1
27.	IEC 61326-2-6:2020 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment
28.	IEC 61326-2-6:2020	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-6: Particular requirements - In vitro diagnostic (IVD) medical equipment
29.	IEC 61326-3-1:2017 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - General industrial applications
30.	IEC 61326-3-1:2017	Electrical equipment for measurement, control and laboratory use - EMC requirements – Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications
31.	IEC 61326-3-2:2017 RLV	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-2: Immunity requirements for safety-related systems

		and for equipment intended to perform safety-related functions (functional safety) - Industrial applications with specified electromagnetic environment
32.	IEC 61326-3-2:2017	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 3-2: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - Industrial applications with specified electromagnetic environment
33.	IEC 61508:2010 CMV	Functional safety of electrical/electronic/programmable electronic safety-related systems - Parts 1 to 7
34.	IEC TR 61508-0:2005	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 0: Functional safety and IEC 61508 (see Functional Safety and IEC 61508)
35.	IEC 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (see Functional Safety and IEC 61508)
36.	IEC 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems (see Functional Safety and IEC 61508)
37.	IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements (see Functional Safety and IEC 61508)
38.	IEC TS 61508-3-1:2016	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3-1: Software requirements - Reuse of pre-existing software elements to implement all or part of a safety function
39.	IEC 61508-4:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations (see Functional Safety and IEC 61508)
40.	IEC 61508-5:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 5: Examples of methods for the determination of safety integrity levels (see Functional Safety and IEC 61508)
41.	IEC 61508-6:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3 (see Functional Safety and IEC 61508)
42.	IEC 61508-7:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 7: Overview of techniques and measures (see Functional Safety and IEC 61508)
43.	IEC 61511:2024 SER	Functional safety - Safety instrumented systems for the process industry sector - ALL PARTS
44.	IEC TR 61511-0:2018	Functional safety - Safety instrumented systems for the process industry sector - Part 0: Functional safety for the process industry and IEC 61511
45.	IEC 61511-1:2016+AMD1:2017 CSV	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and application programming requirements
46.	IEC 61511-1:2016 RLV	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and application programming requirements
47.	IEC 61511-1:2016	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and application programming requirements
48.	IEC 61511-1:2016/COR1:2016	Corrigendum 1 - Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and application programming requirements
49.	IEC 61511-1:2016/AMD1:2017	Amendment 1 - Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and application programming requirements

50.	IEC 61511-2:2016	Functional safety - Safety instrumented systems for the process industry sector - Part 2: Guidelines for the application of IEC 61511-1:2016
51.	IEC 61511-2:2016 RLV	Functional safety - Safety instrumented systems for the process industry sector - Part 2: Guidelines for the application of IEC 61511-1:2016
52.	IEC 61511-3:2016 RLV	Functional safety - Safety instrumented systems for the process industry sector - Part 3: Guidance for the determination of the required safety integrity levels
53.	IEC 61511-3:2016	Functional safety - Safety instrumented systems for the process industry sector - Part 3: Guidance for the determination of the required safety integrity levels
54.	IEC TR 61511-4:2020	Functional safety - Safety instrumented systems for the process industry sector - Part 4: Explanation and rationale for changes in IEC 61511-1 from Edition 1 to Edition 2
55.	IEC 61512-1:1997	Batch control - Part 1: Models and terminology
56.	IEC 61512-2:2001	Batch control - Part 2: Data structures and guidelines for languages
57.	IEC 61512-3:2008	Batch control - Part 3: General and site recipe models and representation
58.	IEC 61512-4:2009	Batch control - Part 4: Batch production records
59.	IEC 62682:2022 CMV	Management of alarm systems for the process industries
60.	IEC 62682:2022	Management of alarm systems for the process industries

TC 65 B Work Programme						
Sl. No.	**Project Reference**	**Title**	**Document Reference**	**Current Stage**	**Next Stage**	**Fcst. Publ. Date**
1.	IEC 61131-3 ED4	Programmable controllers - Part 3: Programming languages	65B/1229/CDV	AFDIS	DECFDIS	2025-01
2.	IEC 61285 ED4	Industrial-process control - Safety of analyser houses	65B/1225/RR	ACDV	TCDV	2025-08
3.	IEC 61298-1 ED3	Process measurement and control devices - General methods and procedures for evaluating performance - Part 1: General considerations	65B/1245/CD	ACDV	TCDV	2025-08
4.	IEC 61298-2 ED3	Process measurement and control devices - General methods and procedures for evaluating performance - Part 2: Tests under reference conditions	65B/1246/CD	ACDV	TCDV	2025-08
5.	IEC 61298-3 ED3	Process measurement and control devices - General methods and procedures for evaluating performance - Part 3: Tests for the effects of influence quantities	65B/1247/CD	ACDV	TCDV	2025-08
6.	IEC 61298-4 ED3	Process measurement and control devices - General methods and procedures for evaluating performance - Part 4: Evaluation report content	65B/1248/CD	PCC		2025-08

7.	IEC 61514 ED2	Industrial-process control systems - Methods of evaluating the performance of valve positioners with pneumatic outputs	65B/1256/CDV	CCDV	PRVC	2025-08
8.	IEC 61514-2 ED3	Industrial process control systems - Part 2: Methods of evaluating the performance of intelligent valve positioners with pneumatic outputs mounted on an actuator valve assembly	65B/1257/CDV	CCDV	PRVC	2025-08
9.	IEC 62828-1 ED2	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 1: General procedures for all types of transmitters	65B/1239A/RR	ACD		2025-10
10.	IEC 62828-2 ED2	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 2: Specific procedures for pressure transmitters	65B/1240A/RR	ACD		2025-10
11.	IEC 62828-3 ED2	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 3: Specific procedures for temperature transmitters	65B/1262/RR	ACD	CD	2026-01
12.	IEC TS 63165 ED1	Requirements for industrial water quality analyzer system – Photometry	65B/1253/DTS	PRVDTS		2024-08
13.	IEC 63206 ED1	Industrial-process control systems - Recorders - Testing and performance evaluation	65B/1254/FDIS	PRVD		2024-08

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Sl. No.	**Document Number**	**Title**
1.	IEC 60528:1975	Expression of performance of air quality infra-red analyzers
2.	IEC 60534-1:2023	Industrial-process control valves - Part 1: Control valve terminology and general considerations
3.	IEC 60534-1:2023 RLV	Industrial-process control valves - Part 1: Control valve terminology and general considerations
4.	IEC 60534-2-1:2011	Industrial-process control valves - Part 2-1: Flow capacity - Sizing equations for fluid flow under installed conditions
5.	IEC 60534-2-1:2011/COR1:2015	Corrigendum 1 - Industrial-process control valves - Part 2-1: Flow capacity - Sizing equations for fluid flow under installed conditions
6.	IEC 60534-2-3:2015	Industrial-process control valves - Part 2-3: Flow capacity - Test procedures
7.	IEC 60534-2-4:2009	Industrial-process control valves - Part 2-4: Flow capacity - Inherent flow characteristics and rangeability

8.	IEC 60534-3-1:2019	Industrial-process control valves - Part 3-1: Dimensions - Face-to-face dimensions for flanged, two-way, globe-type, straight pattern and centre-to-face dimensions for flanged, two-way, globe-type, angle pattern control valves
9.	IEC 60534-3-2:2001	Industrial-process control valves - Part 3-2: Dimensions - Face-to-face dimensions for rotary control valves except butterfly valves
10.	IEC 60534-3-3:1998	Industrial-process control valves - Part 3-3: Dimensions End-to-end dimensions for buttweld, two-way, globe-type, straight pattern control valves
11.	IEC 60534-4:2021	Industrial-process control valves - Part 4: Inspection and routine testing
12.	IEC 60534-4:2021 RLV	Industrial-process control valves - Part 4: Inspection and routine testing
13.	IEC 60534-5:2004	Industrial-process control valves - Part 5: Marking
14.	IEC 60534-6-1:1997	Industrial-process control valves - Part 6: Mounting details for attachment of positioners to control valves - Section 1: Positioner mounting on linear actuators
15.	IEC 60534-6-2:2000	Industrial-process control valves - Part 6-2: Mounting details for attachment of positioners to control valves - Positioner mounting on rotary actuators
16.	IEC 60534-7:2010	Industrial-process control valves - Part 7: Control valve data sheet
17.	IEC 60534-8-1:2005	Industrial-process control valves - Part 8-1: Noise considerations - Laboratory measurement of noise generated by aerodynamic flow through control valves
18.	IEC 60534-8-2:2011	Industrial-process control valves - Part 8-2: Noise considerations - Laboratory measurement of noise generated by hydrodynamic flow through control valves
19.	IEC 60534-8-3:2010	Industrial-process control valves - Part 8-3: Noise considerations - Control valve aerodynamic noise prediction method
20.	IEC 60534-8-4:2015	Industrial-process control valves - Part 8-4: Noise considerations - Prediction of noise generated by hydrodynamic flow
21.	IEC 60534-9:2007	Industrial-process control valves - Part 9: Test procedure for response measurements from step inputs
22.	IEC 60534-9:2007/COR1:2008	Corrigendum 1 - Industrial-process control valves - Part 9: Test procedure for response measurements from step inputs
23.	IEC 60546-1:2010	Controllers with analogue signals for use in industrial-process control systems - Part 1: Methods of evaluating the performance
24.	IEC 60546-2:2010	Controllers with analogue signals for use in industrial-process control systems - Part 2: Guidance for inspection and routine testing
25.	IEC 60584-1:2013	Thermocouples - Part 1: EMF specifications and tolerances
26.	IEC 60584-3:2021	Thermocouples - Part 3: Extension and compensating cables - Tolerances and identification system
27.	IEC TR 60668:1980	Dimensions of panel areas and cut-outs for panel and rack-mounted industrial-process measurement and control instruments
28.	IEC 60746-1:2003	Expression of performance of electrochemical analyzers - Part 1: General
29.	IEC 60746-2:2003	Expression of performance of electrochemical analyzers - Part 2: pH value
30.	IEC 60746-2:2003/COR1:2003	Corrigendum 1 - Expression of performance of electrochemical analyzers - Part 2: pH value
31.	IEC 60746-2:2003/COR2:2003	Corrigendum 2 - Expression of performance of electrochemical analyzers - Part 2: pH value
32.	IEC 60746-3:2002	Expression of performance of electrochemical analyzers - Part 3: Electrolytic conductivity
33.	IEC 60746-3:2002/COR1:2003	Corrigendum 1 - Expression of performance of electrochemical analyzers - Part 3: Electrolytic conductivity
34.	IEC 60746-4:2018	Expression of performance of electrochemical analyzers - Part 4: Dissolved oxygen in water measured by membrane-covered amperometric sensors
35.	IEC 60746-5:1992	Expression of performance of electrochemical analyzers - Part 5: Oxidation-reduction potential or redox potential

36.	IEC 60751:2022	Industrial platinum resistance thermometers and platinum temperature sensors
37.	IEC 60873-1:2003	Electrical and pneumatic analogue chart recorders for use in industrial-process systems - Part 1: Methods for performance evaluation
38.	IEC 60873-2:2004	Electrical and pneumatic analogue chart recorders for use in industrial process control systems - Part 2: Guidance for inspection and routine testing
39.	IEC TR 60877:1999	Procedures for ensuring the cleanliness of industrial-process measurement and control equipment in oxygen service
40.	IEC 61003-1:2016	Industrial-process control systems - Instruments with analogue inputs and two- or multi-position outputs - Part 1: Methods for evaluating performance
41.	IEC 61003-2:2016	Industrial-process control systems - Instruments with analogue inputs and two- or multi-position outputs - Part 2: Guidance for inspection and routine testing
42.	IEC 61115:1992	Expression of performance of sample handling systems for process analyzers
43.	IEC 61131:2024 SER	Programmable controllers - ALL PARTS
44.	IEC 61131-1:2003	Programmable controllers - Part 1: General information
45.	IEC 61131-2:2017	Industrial-process measurement and control - Programmable controllers - Part 2: Equipment requirements and tests
46.	IEC 61131-3:2013	Programmable controllers - Part 3: Programming languages
47.	IEC TR 61131-4:2004	Programmable controllers - Part 4: User guidelines
48.	IEC 61131-5:2000	Programmable controllers - Part 5: Communications
49.	IEC 61131-6:2012	Programmable controllers - Part 6: Functional safety
50.	IEC 61131-7:2000	Programmable controllers - Part 7: Fuzzy control programming
51.	IEC TR 61131-8:2017	Industrial-process measurement and control - Programmable controllers - Part 8: Guidelines for the application and implementation of programming languages
52.	IEC 61131-9:2022	Programmable controllers - Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)
53.	IEC 61131-10:2019	Programmable controllers - Part 10: PLC open XML exchange format
54.	IEC 61152:1992	Dimensions of metal-sheathed thermometer elements
55.	IEC 61207-1:2010	Expression of performance of gas analyzers - Part 1: General
56.	IEC 61207-2:2019	Expression of performance of gas analyzers - Part 2: Measuring oxygen in gas utilizing high-temperature electrochemical sensors
57.	IEC 61207-3:2019 RLV	Gas Analyzers - Expression of performance - Part 3: Paramagnetic oxygen analysers
58.	IEC 61207-3:2019	Gas Analyzers - Expression of performance - Part 3: Paramagnetic oxygen analysers
59.	IEC 61207-6:2014	Expression of performance of gas analyzers - Part 6: Photometric analyzers
60.	IEC 61207-7:2013	Expression of performance of gas analyzers - Part 7: Tuneable semiconductor laser gas analyzers
61.	IEC 61207-7:2013/COR1:2015	Corrigendum 1 - Expression of performance of gas analyzers - Part 7: Tuneable semiconductor laser gas analyzers
62.	IEC 61285:2015	Industrial-process control - Safety of analyser houses
63.	IEC 61297:1995	Industrial-process control systems - Classification of adaptive controllers for the purpose of evaluation
64.	IEC 61298-1:2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 1: General considerations
65.	IEC 61298-2:2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 2: Tests under reference conditions
66.	IEC 61298-3:2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 3: Tests for the effects of influence quantities

67.	IEC 61298-4:2008	Process measurement and control devices - General methods and procedures for evaluating performance - Part 4: Evaluation report content
68.	IEC 61499-1:2012	Function blocks - Part 1: Architecture
69.	IEC 61499-2:2012	Function blocks - Part 2: Software tool requirements
70.	IEC 61499-4:2013	Function blocks - Part 4: Rules for compliance profiles
71.	IEC 61514:2000	Industrial-process control systems - Methods of evaluating the performance of valve positioners with pneumatic outputs
72.	IEC 61514-2:2013	Industrial process control systems - Part 2: Methods of evaluating the performance of intelligent valve positioners with pneumatic outputs mounted on an actuator valve assembly
73.	IEC 61515:2016	Mineral insulated metal-sheathed thermocouple cables and thermocouples
74.	IEC 61518:2001	Mating dimensions between differential pressure (type) measuring instruments and flanged-on shut-off devices up to 413 BAR (41,3 MPa)
75.	IEC 61520:2000	Metal thermowells for thermometer sensors - Functional dimensions
76.	IEC 61520:2000/COR1:2017	Corrigendum 1 - Metal thermowells for thermometer sensors - Functional dimensions
77.	IEC TR 61831:2011	On-line analyser systems - Guide to design and installation
78.	IEC TR 61832:2015	Design and installation of on-line analyser systems - Guide to technical enquiry and bid evaluation
79.	IEC 61987-21:2015	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 21: List of Properties (LOP) of automated valves for electronic data exchange - Generic structures
80.	IEC 61987-22:2015	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 22: Lists of Properties (LOPs) of valve body assemblies for electronic data exchange
81.	IEC 61987-23:2015	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 23: Lists of Properties (LOPs) of actuators for electronic data exchange
82.	IEC 61987-24-1:2015	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 24-1: List of Properties (LOPs) of positioners and I/P converters for electronic data exchange
83.	IEC 61987-24-2:2017	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 24-2: List of properties (LOPs) of valve/actuator accessories for electronic data exchange
84.	IEC 61987-24-3:2017	Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 24-3: Lists of properties (LOPs) of flow modification accessories for electronic data exchange
85.	IEC TR 62010:2016	Analyser systems - Maintenance management
86.	IEC TS 62098:2000	Evaluation methods for microprocessor- based instruments
87.	IEC 62339-1:2006	Modular component interfaces for surface-mount fluid distribution components - Part 1: Elastomeric seals
88.	IEC TR 62432:2006	The rH index in aqueous and aqueous-organic media
89.	IEC TR 62434:2006	pH measurements in difficult media - Definitions, standards and procedures
90.	IEC TR 62456:2007	An electrochemical reference system for use in different solvent media - The decamethylated ferricinium/ferrocene redox couple
91.	IEC 62460:2008	Temperature - Electromotive force (EMF) tables for pure-element thermocouple combinations
92.	IEC TS 62492-1:2008	Industrial process control devices - Radiation thermometers - Part 1: Technical data for radiation thermometers
93.	IEC TS 62492-2:2013	Industrial process control devices - Radiation thermometers - Part 2: Determination of the technical data for radiation thermometers
94.	IEC 62703:2013	Expression of performance of fluorometric oxygen analyzers in liquid media

95.	IEC 62828-1:2017	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 1: General procedures for all types of transmitters
96.	IEC 62828-2:2017	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 2: Specific procedures for pressure transmitters
97.	IEC 62828-3:2018	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 3: Specific procedures for temperature transmitters
98.	IEC 62828-4:2020	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 4: Specific procedures for level transmitters
99.	IEC 62828-5:2020	Reference conditions and procedures for testing industrial and process measurement transmitters - Part 5: Specific procedures for flow transmitters
100.	IEC TR 62829-1:2019	Chemometrics for process analytical technologies - Part 1: General provisions, and methods for univariate statistics and chemometric processing of data
101.	IEC 62952-1:2016	Power sources for a wireless communication device - Part 1: General requirements of power modules
102.	IEC 62952-2:2016	Power sources for a wireless communication device - Part 2: Profile for power modules with batteries
103.	IEC 62952-3:2017	Power sources for a wireless communication device - Part 3: Generic energy harvesting adapter module
104.	IEC TR 62967:2018	Methods for calculating the main static performance indicators of transducers and transmitters
105.	IEC TS 63144-1:2020	Industrial process control devices - Thermographic cameras - Part 1: Metrological characterization
106.	IEC TR 63176:2019	Process analysis technology systems as part of safety instrumented systems
107.	IEC PAS 63312:2021	Technical specification for flame detector system of boiler

ANNEXURE 7

The details of voting for **IEC/TC 65, SC 65A, SC 65B and IEC/TC 27** since last meeting

Sl. No.	Document Number	Last Date	Comments
1.	65/1024/CD	08-12-2023	No comment
2.	65A/1104/Q	15-12-2023	Yes vote sent
3.	65A/1102/CDV	22-12-2023	In Favour
4.	65/1030/DTS	29-12-2023	In Favour
5.	27/1181/FDIS	26-01-2024	In Favour
6.	65/1036/Q	02-02-2024	Yes vote sent
7.	65/1038/Q	02-02-2024	Yes vote sent
8.	65/1032/NP	16-02-2024	In Favour
9.	65/1040/CD	08-03-2024	No comment
10.	65A/1110/Q	15-03-2024	Yes vote sent
11.	27/1183/FDIS	22-03-2024	In Favour
12.	65B/1253/DTS	29-03-2024	In favour
13.	27/1182A/FDIS	12-04-2024	In favour comment sent
14.	65/1044/FDIS	12-04-2024	In Favour

15.	65A/1108/CDV	03-05-2024	In Favour
16.	65/1046/FDIS	31-05-2024	In favour
17.	65A/1113/DTS	07-06-2024	In favour
18.	65A/1115/FDIS	07-06-2024	In favour
19.	65B/1254/FDIS	21-06-2024	In Favour
20.	65A/1118/Q	28-06-2024	Yes
21.	65A/1119A/Q	28-06-2024	Yes
22.	65/1047/Q	28-06-2024	Yes
23.	65/1049/FDIS	05-07-2024	In Favour
24.	65/1050/Q	05-07-2024	Yes

ANNEXURE 8

ANNUAL PROGRAM FOR STANDARDIZATION FOR ETD 18 FOR FY 2024-25

1. Meeting Calender:

Sectional Committee	Q1	Q2	Q3	Q4
ETD 18	---	23-07-2024	19-12-2024	27-02-2025

2. IEC Meetings:

Title of TC/SC	Date of Meeting	Place of Meeting
TC65 plenary meeting	13.09.2024	Calgary , Canada (Face-to-face and Virtual)

3. NWIP

NWIP Current(2024-25)

Inputs requested from the committee.

NWIP Carried Over(2023-24)

S. No	Subject	Committee	Priority Criteria	Status
1	Safety requirements for electrical equipment for measurement control and laboratory use - Particular requirements for electrically operated valve actuator ETD/18/22557	ETD 18	Grade 9- NWIPs taken from ISO/IEC level	Under Publication.

4. Review of pre-2000 Standards

As given in Annexure-3.

5. Standards Due for reaffirmation:

As given in Annexure-5.

ANNEXURE 9

Resume

Name: Mr. SOURADEEP MITRA
Father's name: Late Siddhartha Mitra
DOB: 22.12.1970
Permanent address : DL – 99, Sector -2 , Saltlake, Kolkata – 700091
Residential address : DL – 99, Sector -2 , Saltlake, Kolkata – 700091
Contact: Phone-9830294570; eMail: imsouradeepm@gmail.com
Educational Qualification: Bachelor of Engineering , Calcutta University.(1994)., AMIE

Professional experience :

- Worked as freelance engineer to Allen Bradley – 1995 – 2001.
- Worked as service engineer to Siemens – 2001 – 2006.
- Worked as Consultant to Damodar Ropeways & Construction Company Pvt.Ltd. – 2006 – 2010.
- Worked as DGM projects in Damodar Ropeways & Infra Ltd. 2010 – 2018.

Nature of Job:

I had been working in the field of Electrical, Electronics & Automation of industrial systems. My area of work is design, manufacturing, installation, commissioning & maintenance of electrical & automation systems for the above.

Projects Executed :

- Science city ropeway,
- Gangtok ropeway,
- Namchi ropeway,
- Trikut hill ropeway,
- Myhar ropeway,
- Pushkar ropeway,
- Dewas ropeway,
- Vaishnodevi ropeway,
- NainaDevi ropeway,
- Jammu Ropeway,
- Cargo ropeway in Ethiopia,
- Digha ropeway,
- Funicular Rail at SaptaSrungi Garh, Vani, Maharashtra.
- Complete design & execution of Dark Ride in Science city Kolkata.

Signature Date:
Place:

(Souradeep Mitra)

Curriculum Vitae

Dr. Awadhesh Kumar
Assistant Professor
Electrical Engineering
Madan Mohan Malaviya University of Technology
Gorakhpur-273010

KHA/4/11, **MMMUT Campus**
MMM University of Technology
Gorakhpur-273010
Contact no: 9235301645, 9452800414
Email ID:
akee@mmmut.ac.in
awadhesg26@gmail.com
awadhesh.g@rediffmail.com

Objective

- To be able to add new values and skills through constant learning in a dynamic environment.
- To become the best Teacher of Electrical Engineering in a relatively larger space.
- To add quality research works into my credit.
- To perform the assigned administrative responsibility with integrity.

Personal Details

- Date of Birth: 05-07-1974
- Father's Name: Shri Srikant Gupta
- Mother's Name: Late Smt. Lalmuni Devi
- Nationality: Indian
- Marital Status: Married
- Languages: Hindi, English, Sanskrit
- Mobile No.: 9235501645, 9452800414

Professional & Academic Qualifications

- **2017- Ph.D.** in Electrical Engineering with **CPI: 10/10** from Department of Electrical Engineering, Motilal Nehru National Institute of Technology, Allahabad, Uttar Pradesh [Thesis Supervisor: Prof. Dinesh Chandra, (Received MHRD fellowship)] [**NIRF Rank-48**].

- **2012**: **M.E.** (Instrumentation & Control) with **85.1%** from National Institute of Technical Teachers' Training and Research, Chandigarh, Punjab University, Punjab **(2nd Topper of 2008 batch in the Institute)** [**NIRF Rank-72**]

- **1998**: **B.E.** (Electrical & Electronics Engineering) with 72.5 % from Birla Institute of Technology, Mesra, Ranchi, Jharkhand [**NIRF Rank-38**]

- **1992**: Passed **12th** from CBSE Board with 70.4%, Jugaldevi Saraswati Vidya Mandir, Kanpur, Uttar

Pradesh

- **1990**: Passed **10th** from CBSE Board with 80.4%, Saraswati Shishu Mandir Higher Secondary School, Gorakhpur, Uttar-Pradesh.**[Topper of District Gorakhpur]**

Professional Experience

- **Teaching Experience: 19 Years, Post-Ph.D. Experience: 7 Years**

- From 4th January 2021-till date, Assistant Professor (Level-11, AGP-7000/-) in Electrical Engineering Department, Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh

- From 29th December 2014 to 3rd January 2021, Assistant Professor (Level-10, AGP-6000/-) in Electrical Engineering Department, Madan Mohan Malaviya University of Technology, Gorakhpur, Uttar Pradesh

- From 24th July 2012 to June 2017- Research Scholar in Electrical Engineering Department, Motilal Nehru National Institute of Technology, Allahabad, Uttar Pradesh

- From 16th July 2008 to 23rd July 2012 as Assistant Professor and Head in the Department, Electri &&Electronics Engineering**,** LDC Institute of of Technical Studies, Soraon, Allahabad, Uttar Pradesh

- From 26th July 2005 to 15th July 2008 as a Lecturer and Sr. Lecturer in the Department of Electrical and Electronics Engineering, United College of Engineering and Research, Naini, Allahabad, Uttar Pradesh

Administrative Responsibilities

Present Responsibilities

- **Associate Dean of Extension, Field Outreach and Alumni Relations** since 1st January 2024, and for the session 2023-24

- **Deputy Coordinator, University Standard Club, (As a part of MoU between Bureau of Indian Standards, MMMUT Gorakhpur),** since 09th November 2023**,** and for the session 2023-24

- **Coordinator, NSS, MMMUT, Gorakhpur** since March 2020, and for the sessions, 2020-21, 2021-22, 2022-23, 2023-24

- **University Nodal Officer, AISHE, MMMUT, Gorakhpur** for the sessions, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24

- **PG Convener, EED, MMMUT, Gorakhpur**, since 22nd April 2019, and for the sessions, 2020-21, 2021-22, 2022-23, 2023-24

- **Faculty Advisor, Electrical Engineers' Legation (EEL)** an Electrical Engineering student's society for the sessions, 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2023-24
- Member, Departmental Internal Quality Assurance Cell (DIQAC) since 09 February 2024, for the session 2023-24
- Departmental Nodal Officer Scholarship 2023-24
- O/C Circuit Lab, EED, MMMUT, Gorakhpur
- O/C Network Lab, EED, MMMUT, Gorakhpur
- Member of BOS, EED, MMMUT, Gorakhpur
- Member of ITRC Management and Development committee, MMMUT, Gorakhpur

Past Responsibilities

- Executive Committee Member of Advance Control and Dynamic Optimization Society, India from 30 October 2020 to October 2022.
- **Assistant Coordinator, Admission Cell**, MMMUT, Gorakhpur -2015-16, 2016-17
- **Hostel Warden, Tagore Bhavan**from January 2021 to February 2022, 2021-22
- **Hostel Superintendent, Raman Bhavan**, MMMUT, Gorakhpur, (March 2015-March2018), 2015-16, 2016-17, 2017-18
- **CTO, NCC** 2015-16, 2016-17
- **Member Campus Development Cell** in 2017-18
- **Member Women's Cell** in 2017-2018
- **I/C TEQIP, EED**, MMMUT, Gorakhpur 2018-19, 2019-20, 2020-21
- **O/C Computer Lab, EED**, MMMUT, Gorakhpur, since 2018 to 15 September 2021
- Departmental Member Training and Placement Cell 2015-16
- **Project Coordinator, UG**for2017-18, 2018-19, 2019-20
- O/C Design Lab-II, ITRC, MMMUT, Gorakhpur (2015-19)
- Member Departmental Purchase Committee 2019, 2020, 2021
- Member of Moderation committee-odd /even semester-2015-16, 2020-21, 2021-22
- Nodal Officer, EED for NAAC 2022-23

Awards/ Appreciation/ Achievements

- B.Tech. Project titled "**Charge while Drive**" selected by Council of Science & Technology CST, UP
- Certificate of Appreciation from Vice Chancellor, Madan Mohan Malaviya University of Technology, Gorakhpur for contribution in NAAC preparation which resulted in university graded as '**A**'
- Gorakhpur District Topper in High School

- NITTTR Chandigarh Institute 2nd highest marks obtained (85.1%) in M.E.
- Obtained 10/10 CPI in Ph.D. Course work
- Received MHRD scholarship for Ph.D. Course.
- Received Institute sponsorship for M.E. Course.
- Appreciation Letter with Cash Prize of 5000/- on 20th March 2009 in LDCITS, Allahabad for facilitating a quantum jump in Results of First Year by Prof. I.C. Agrawal, Director of LDCITS and former Director MNNIT Allahabad.
- Recognized among top five faculties in UCER, Allahabad.
- Experience of establishment of various labs in EED, LDCITS, Allahabad.
- Assisted in procurement under TEQIP-III for Measurement, Control, Electrical drives, Machine lab and Power system lab.
- Established Virtual Instrumentation lab in EED, MMMUT, Gorakhpur
- Secured 100% in an Online Quiz on "Basic Electrical Engineering "organized by Department of Electrical Engineering in association with IEEE Student Branch, AISSMS's IOIT, Pune during 25 May to 28 May 2020.
- Executive Member of Automatic Control & Dynamic Optimization Society (ACDOS) National Member Organization (NMO) of International Federation of Automatic Control (IFAC) since November 2020.

Research Index

- **Google Scholar Citations: 245**
- **h-index: 9**
- **i10-index: 7**

Projects Completed:01
Projects Submitted: 03 (CSTUP)

1. Project ID: 598, Project Title: Charge while driving selected for financial grant of Rs. 20,000/- under CSTUP – Engineering Student's Project Grant Scheme 2022-23
2. Project ID: 4422, Project Title: Impact of Integration of Renewable Energy and Electric Vehicles on Grid Stability, Grant Amount: 1536000/- CSTUP (Submitted)

Research Supervision:

1. Ph.D.: 02 Completed, 08 in Progress
2. M. Tech. Dissertation: 33 Completed, 03 in Progress

Publications in International Journals with reputed Indexing (SCI/ SCIE/ Scopus) :19

1. Dhananjay Gupta, Awadhesh Kumar and V. K. Giri, "Design and Investigations of MIT, FOMIT and Modified MIT Rule-Based MRAC for Non-interacting and Interacting Two-Tank Coupled Systems", International Journal of Automation and Control, Inderscience Publications, January2024. **(Accepted) (Scopus)**

2. Padmesh Singh, Awadhesh Kumar, Surya Bhusan Dubey and Pankaj Sahu, "Real Time Voltage Stability estimation under Contingencies by Generalized Curve Fit Method using PMU" Tuijin Jishu/Journal of Propulsion Technology, Vol. 44, No. 3, pp. 2413-2430, December, 2023, ISSN: 1001-4055**(Scopus).**

3. Dhananjay Gupta, Awadhesh Kumar and V. K. Giri, "Effect of Adaptation Gain and Reference Model in MIT and Lyapunov Rule-based Model Reference Adaptive Control for First and Second Order Systems", Transaction of the Institute of Measurement and Control, September 2023. **(Accepted) (SCIE)**

4. Vikas Patel, Awadhesh Kumar and V. K. Giri, "Fractional-Order Adaptive Sliding Mode Control with Disturbance Observer for Frequency Regulation in isolated Micro-grid", International Journal of Dynamics and Control, September 2023. **(Scopus).**

5. Brajesh Kumar Singh and Awadhesh Kumar and V. K. Giri, "Comprehensive Review of various Control Strategies for Quadrotor Unmanned Aerial Vehicles", FME Transactions, Vol. 51, No. 3, pp. pp. 298-316, May 2023, **(Scopus)**. ISSN: 1451-2092

6. Padmesh Singh, Awadhesh Kumar, Pankaj Sahu and Manu Kumar Singh, "Voltage Stability margin evaluation and enhancement using STATCOM," BandaotiGuangdian/Semiconductor Optoelectronics, Vol. 42, No. 1 (January2023), 830-836. ISSN: 1001-5868. **(Scopus)**

7. Brajesh Kumar Singh and Awadhesh Kumar "Attitude and position control with minimumsnap trajectory planning for quadrotor UAV" International Journal of Dynamics and Control, Vol.11, No.5, pp. 2342-2353 January 2023. DOI: 10.1007/s40435-022-01111-3. ISSN: 2195-2698 **(Scopus).**

8. Santosh Kumar Suman and Awadhesh Kumar, "Unstable System Approximants via Balancing in view of the Singular Perturbation Approximation", Journal of Institution of Engineering India Series B (2022). https://doi.org/10.1007/s40031-022-00841-4**(SCOPUS)**

9. Brajesh Kumar Singh and Awadhesh Kumar "Model Predictive Control using LPV approach for Trajectory Tracking of Quadrotor UAV with External Disturbances" Aircraft Engineering and Aerospace Technology.ISSN: 1748-8842. **(SCIE, IF 1.293).**

10. Santosh Kumar Suman and Awadhesh Kumar, "Investigation and Implementation of Model Reduction Technique for Large scale Dynamical Systems", Archives of Computational Methods in Engineering 2022, Vol. 29, pp. 3087-3108ISSN: 1134-3060, **14 January 2022.**DOI: https://doi.org/10.1007/s11831-021-09690-8**(SCIE,IF- 9.7)**

11. Santosh Kumar Suman and Awadhesh Kumar, "Computing Dominant Poles of High Dimensional

Transfer Functions Using Modified Clustering Method", IETE Journal of Research, Taylor &Francis, Vol. 69,Issue9,pp.6224-6246, ISSN:0377-2063,November 2021. DOI:https://doi.org/10.1080/03772063.2021.1996285,**(SCIE, IF-2.333)**

12. Santosh Kumar Suman and Awadhesh Kumar, "Reduced Order Modelling and Balancing Control of Bicycle Robot", FME Transactions, Vol. 49, No. 4, pp. 919-931, October 2021, ISSN: 1451-2092**(Scopus)**

13. Supriya Kaul, Nitesh Tiwari, Shekhar Yadav and Awadhesh Kumar, "Comparative Analysis and Controller Design for BLDC motor using PID and Adaptive PID Controller" Recent Advances in Electrical and Electronic Engineering Bentham Science Journal, August 2021. **DOI** : 10.2174/2352096514666210823152446, **ISSN (Online): 2352-0973(Scopus)**

14. Santosh Kumar Suman and Awadhesh Kumar, "Linear System of Order Reduction using a Modified Balanced Truncation Method", Circuits, Systems, and Signal Processing, Springer, Vol. 40, pp. 2741-2762,**Pub Date: 2021-01-03**, Issue date: June 2021, **DOI:** 10.1007/s00034-020-01596-3, ISSN No. 1531-5878 **(SCIE, IF 2.225**)

15. Santosh Kumar Suman and Awadhesh Kumar, "Reduction of Large-Scale Dynamical Systems by Extended Balanced Singular Perturbation Approximation", International Journal of Mathematical, Engineering and Management Sciences, Vol.-5, Issue-5, pp. 939-956. https://doi.org/10.33889/IJMEMS.2020.5.5.072ISSN: 2455-7749. (June-2020)**(Scopus)**

16. Richa and Awadhesh Kumar, "Dominant Pole based Approximation for Discrete time System", International Journal of Mathematical, Engineering and Management Sciences, Vol. 4, No. 1, pp. 56-65, ISSN: 2455-7749, 2019. DOI: https://dx.doi.org/10.33889/IJMEMS.2019.4.1-005**(Scopus)**

17. Santosh Kumar Suman and Awadhesh Kumar, "Model Order Reduction by Using Improved Approximation Techniques" Scientific Journal of King Faisal University, Vol.21, Issue-2, pp.80-87, https://doi.org/10.37575/b/eng/2246, , (Online First) Published. (December-2020) ISSN: 1658-0311 **(Scopus)**

18. Santosh Kumar Suman and Awadhesh Kumar, "Higher-Order Reduction of Linear System and Design of Controller", Scientific Journal of King Faisal University, https://doi.org/10.37575/b/eng/2235ISSN: 1658-0311, (Online First) Published. (May-2020) pp.1-16 (**Scopus**)

19. Santosh Kumar Suman and Awadhesh Kumar, "Investigation and Reduction of Large-Scale Dynamical Systems", WSEAS Transactions on Systems, ISSN / E-ISSN: 1109-2777 / 2224-2678, Volume 18, 2019, Art. #23, pp. 175-180, IET Inspec, American Mathematical Society **(AMS)**, Zentralblatt MATH. (July 2019)https://www.wseas.org/multimedia/journals/systems/2019/a425102-075

Publications in other Reputed International Journals: 23

20. Awadhesh Kumar and Dinesh Chandra, "Improved Modal Truncation Approximant: A hybrid Approach", Journal of Electrical Engineering, Vol. 22(1), pp. 8-15, ISSN-1582-4594, June-30, 2022. **(Scopus)**

21. Dhananjay Gupta and Awadhesh Kumar, “Numerical Methods of Optimization: A Review”, Journal of Control and Instrumentation, Vol.-12, issue-2, pp. 19-25, 2021, ISSN: 2229-6972 DOI:10.37591/JoCI (UGC listed)
22. Dhananjay Gupta, Santosh Kumar Suman and Awadhesh Kumar, “Control and Stabilization of Maglev System Using 2-DOF PID Controller and its Comparative Analysis with Other PID Controller”, Journal of Electronic Design Technology. Vol.-11, issue-2, pp.1–6, 2020**DOI:**https://doi.org/10.37591/joedt.v11i2.4161ISSN: 2321-4228
23. Santosh Kumar Suman and Awadhesh Kumar, “Model Order Reduction of Transmission Line Model”, WSEAS Transactions on Circuits and Systems, Vol.19, issue-7, pp. 62-68,2020. ISSN: 1109-2734, https://doi.org/10.37394/23201.2020.19.7 (March, 2020) (**Scopus**)
24. Santosh Kumar Suman and Awadhesh Kumar, "Model Reduction of Power System by Modified Balanced Truncation Method," Universal Journal of Control and Automation, Vol. 8, No. 3, pp. 41 - 52, 2020, ISSN: 2331-6500, https://doi: 10.13189/ujca.2020.080301
25. Santosh kumar Suman, Awadhesh Kumar, “Approximation of Large-scale dynamical systems for benchmark collection”, Journal of Mechanics of Continua and Mathematical Sciences, Vol. 14, No. 3, pp. 196-215 May-June 2019.ISSN: 2454-7190, https://doi.org/10.26782/jmcms.2019.06.00016 (May-June 2019)
26. Seema Chaudhary and Awadhesh Kumar, “Control of Twin Rotor MIMO System using PID and LQR Controller”. Journal of Aircraft and Spacecraft Technology, Science Publication, Vol. 3, No. 1, pp. 211-220, (ISSN Print: 2523-1200, ISSN Online: 2523-1197), June 2019, https://doi.org/10.3844/jastsp.2019.211.220
27. Dhananjay Gupta, Santosh Kumar Suman and Awadhesh Kumar, “Approximation Based Optimal Control Design Strategy for the Magnetic Levitation System”, Journal of Electronic Design Technology, vol. 10, Issue-1, pp 8-14: 2019, (ISSN: 2229-6980 – Online, ISSN: 2321-4228 – Print) **DOI:** https://doi.org/10.37591/joedt.v10i1.2515
28. Girijendra Tripathi, Awadhesh Kumar, “Balanced Truncation Based Reduction of Large-Scale system”, Journal of Multimedia Technology & Recent Advancement, vol-6, Issue-Feb-2019 **eISSN: 2349-9028**
29. Santosh Kumar Suman, Awadhesh Kumar and V.K. Giri, “An Application of Genetic Algorithms for the Real-Life Problems”, Invertis Journal of Science and Technology, Vol. 11, No. 4, pp. 178-188, October-December, 2018, ISSN: 2454-762X, DOI: 10.5958/2454-762X.2018.00023.9
30. Noor Ahmad and Awadhesh Kumar, “Design consideration for high power zero voltage zero current switching full bridge converter with transformer isolation and current doubler rectifier”, IOSR Journal of Electrical and Electronics Engineering, Volume: 11, Issue 3, Pages: 28-32, May-June 2016. DOI: 10.9790/1676-1103022832, e-ISSN: 2278-1676
31. Avadh Pati, Awadhesh Kumar and Dinesh Chandra, “Suboptimal Control Using Model Order Reduction”, Chinese Journal of Engineering, Hindawi Publishing Corporation, Volume 2014, Article ID 797581, December 2013 DOI: http://dx.doi.org/10.1155/2014/797581 **(Scopus)**
32. Aditya Dixit and Awadhesh Kumar, “Hybrid operation of Battery-Supercapacitor based Energy Storage System under variable operating conditions in Renewable Energy Resources Based Power System” International Advanced Research Journal in Science, Engineering and Technology, Vol.-8, Issue -6, pp. ----, June 2021, ISSN: 2394-1588.
33. Aditya Dixit and Awadhesh Kumar, “Applications of Energy Storage Systems in Power Systems with high penetration of RERs” International Advanced Research Journal in Science, Engineering and Technology, Vol. 8, Issue 6, pp. 741-747, June 2021, ISSN: 2394-1588.

34. Pooja Rai and Awadhesh Kumar, “Review on PLC SCADA based Automated System Control Applications and Challenges”, International Journal of Research and Development in Applied Science and Engineering, ISSN: 2454-6844, Vol. 21, Issue-1, 2021
35. Shweta Singh and Awadhesh Kumar, “Different MPPT Techniques in Solar Photovoltaic System: A Comprehensive Review”, i-manager’s Journal on Instrumentation and Control Engineering, Volume: 4, No. 1, Issue: Nov-Jan 2016, Pages: 32-39, 2016, ISSN: 2321-1148. **(ProQuest)**
36. Shweta Singh and Awadhesh Kumar, “Fuzzy logic based MPPT scheme for sepic converter in Solar Photovoltaic System”, i-manager’s Journal on power system Engineering, Volume: 4, No. 1, Issue: Feb-April, 2016, Pages: 23-31, 2016, ISSN: 2322-0376.**(ProQuest)**
37. Maneesh Kumar Gupta and Awadhesh Kumar, “Model Order Reduction using Chebyshev Polynomial, Stability Equation Method and Fuzzy C-Means Clustering”, i-manager’s Journal on Instrumentation and Control Engineering, Volume: 4, No. 2, Issue: Feb-Apr 2016, Pages :7-13, 2016, ISSN: 2321-1148. **(ProQuest)**
38. Maneesh Kumar Gupta and Awadhesh Kumar, “Model Reduction of Continuous and discrete system using Differentiation Method and many Clustering technique”, i-manager’s Journal on Instrumentation and Control Engineering, Volume: 4, No. 3, Issue: May-July 2016, Pages :27-33, 2016, ISSN: 2321-1148. **(ProQuest)**
39. Deepak Gupta and Awadhesh Kumar, “Approximation of Large Scale Systems by Balanced Truncation And Singular Perturbation Method”, i-manager’s Journal on Instrumentation and Control Engineering, Volume: 4, No. 2, Issue : Feb-Apr 2016, Pages : 14-20, 2016, ISSN: 2321-1148. **(ProQuest)**
40. Deepak Gupta and Awadhesh Kumar, “An Investigation into Model Order Reduction through Balancing Methods and their Error Norm”, International Journal of Emerging Technology and Advance Engineering, vol. 6, Issue no. 3 pp. 287-292, 2016, ISSN:2250-2459. **(Scopus)**
41. NikkuShahi and Awadhesh Kumar, “Model Order Reduction Using Krylov-Subspace Based Two-Sided Arnoldi Algorithm”, i-manager’s Journal on Instrumentation and Control Engineering, Volume: 4, No. 2, Issue: Feb-Apr 2016, Pages: 29-38, 2016, ISSN: 2321-1148. **(ProQuest)**
42. Nikku Shahi and Awadhesh Kumar, “Numerical Implementation of Two-Sided Arnoldi Algorithm”, i-manager’s Journal on Instrumentation and Control Engineering, Volume: 4, No. 2, Issue: August-October 2016, Pages: 1-6, 2016, ISSN: 2321-1148. **(ProQuest)**

Book Chapters: 05

1. Santosh Kumar Suman, Awadhesh Kumar and Shekhar Yadav, “Balance Truncation-Padè Approximation Method extended to Large-Scale Linear Dynamic Systems” Advances in Mathematics Research, Nova Science Publishers, Vol. 32, November 2022. ISBN: 979-8-88697-332-7
2. Santosh Kumar Suman and Awadhesh Kumar, “Determination of Order Reduction in Large Scale Linear Dynamical by using Improved Balancing Technique” New Approaches in Engineering Research, Book Publisher International, Vol.-13, pp. 24-38, 24 August, 2021 ISBN-13 (15) 978-93-91882-73-0 (Print), 978-93-91882-81-5 (eBook), DOI: https://doi.org/10.9734/bpi/naer/v13/12465D
3. Shantani Sinha, Santosh Kumar Suman and Awadhesh Kumar, “Color sensor-based object sorting Robotic Arm”, Algorithms for Intelligent Systems, V. K. Giri et al: Computing Algorithms with Applications in Engineering, pp. 169-180, ISBN: 978-981-15-2368-7, 487356_1_En (16) Springer

Nature Singapore Pte Ltd, published in March, 2020

4. Brajesh Kumar Singh and Awadhesh Kumar, "Stabilization and Control of Magnetic Levitation System using 2-Degree-of-Freedom PID Controller" Springer Nature Singapore Pte Ltd. 2019, A. Khare et al. (eds.), Recent Trends in Communication, Computing and Electronics, Lecture notes in Electrical Engineering 524, pp. 569-579, https://doi.org/10.1007/978-981-13-2685-1_54**(Scopus, Web of Science)**ISSN: 1876-1100
5. Gupta A., Mathew L., Chatterji S. (2014): V/f-Based Speed Controllers for an Induction Motor Using AI Techniques: A Comparative Analysis. In: Babu B. et al. (eds) Proceedings of the Second International Conference on Soft Computing for Problem Solving (SocProS 2012), December 28-30, 2012. Advances in Intelligent Systems and Computing, vol 236, pp. 1161-1171, Springer, New Delhi (Print ISBN: 978-81-322-1601-8) **(Scopus, DBLP)**

Edited/Published Books/ Proceedings: 02

6. Engineering Mathematics, Volume-I, Jagdamba Publishing Company, New Delhi, 2021, ISBN:978-93-85437-23-6
7. Awadhesh Kumar, "Proceedings of the National Conference onRecent Advances in Electrical and Electronics Engineering (RAEEE-2018)" Excel India Publishers, New Delhi, July 2018 (ISBN: 978-93-86724-91-5)

Publications in International Conference (Scopus Indexed): 19

1. Dhananjay Gupta, Awadhesh Kumar and Vinod Kumar Giri,"A Comparative Stability Analysis of Inverted Pendulum using MIT Rule, Fractional-Order MIT Rule and Modified MIT Rule-based MRAC",Second International Conference on recent trends in Management Engineering and Technology (ICMET), 22-23 December 2023.

2. Brajesh Kumar Singh and Awadhesh Kumar, "Dynamic Modelling and Control of Quadrotor Unmanned Aerial Vehicle System", 8th International Conference on Research Developments in Applied Science, Engineering and Management (AEM-2023), The Indian Council of Social Science Research (ICSSR), Punjab University Campus, Chandigarh, India, 30 July 2023.

3. Vaishnavi Gupta, Amarjeet Singh, Priyanjali, Dibyanshu Yadav, Arjun Dikshit, Tirumalsetty Chiranjeevi, Awadhesh Kumar and Raj Kumar Patel, "Design and Implementation of Snake detection cum Repellent Device", International Conference on IoT, Communication and Automation Technology (ICICAT-2023), Buddha Institute of Technology Gorakhpur, 23-24 June 2023. (Scopus)

4. Anjali Rai, Santosh Kumar Suman, Awadhesh Kumar, Shekhar Yadav, "Impact of Control Stability using LQR and Pole-placement for Ball & Beam System", 5th IEEE International Conference on Intelligent Computing and Control Systems (ICICCS-2021), pp. 543-547, Vaigai College of Engineering, Madurai, India, May 06-08, 2021Doi: 10.1109/ICICCS51141.2021.9432281, published in May 2021. https://doi.org/10.1109/ICICCS51141.2021.9432281**(Scopus)**

5. Santosh Kumar Suman and Awadhesh Kumar, "Model Reduction of Flexible-Missile Control Plant using BST via Schur Method", First Virtual International Conference on Latest Advancements &

Future Trends in Engineering, Science, Humanities & Management At: Dolphin (PG) College of Science & Agriculture, Chunni Kalan, Punjab, India, August 11-12, pp. 426-433, ISBN: 978-93-87793-54-5, 2020

6. Priyanka Shukla and Awadhesh Kumar, "Comparative Performance Analysis of Various Control Algorithms for Quadrotor Unmanned Aerial Vehicle System and Future Direction", International Conference on Electrical and Electronics Engineering (ICE3 2020), Madan Mohan Malaviya University of Technology, Gorakhpur, India, pp. 498-501, February 14-15, 2020.**(Scopus)**https://doi.org/10.1109/ICE348803.2020.9122868**(Scopus)**

7. Sanjay Kumar, Prashant Upadhyaya and Awadhesh Kumar, "Performance Analysis of Solar Energy Harnessing System using HOMER Energy software and PVSyst software", 2nd IEEE International Conference on Power Energy, Environment and Intelligent Control (PEEC-2019), pp.156-159, 18-19 October 2019, GL Bajaj Institute of Technology and Management, Greater Noida (UP), India.**(Scopus)**https://doi.org/10.1109/PEEIC47157.2019.8976665**(Scopus)**

8. Seema Chaudhary and Awadhesh Kumar, "Control of Twin Rotor MIMO System Using 1-Degree-of-Freedom, 2-Degree-of-Freedom PID and Fractional order PID Controller", 3rd IEEE International Conference on Electronics, Communication and Aerospace Technology (ICECA-2019), pp. 746-751, 12-14 June 2019, RVS Technical Campus, Coimbatore, Tamil Nadu, India, ISBN: 978-1-7281-0167-5**(Scopus)**https://doi.org/10.1109/ICECA.2019.8821923

9. Dhananjay Gupta, Santosh Kumar Suman and Awadhesh Kumar, "Optimal and Suboptimal Control Design Strategy for the Maglev System" 3rd International Conference on Trends in Electronics and Informatics, Tirunelveli, India, pp. 999-1002, 23-25, April 2019.**(Scopus)**https://doi.org/10.1109/ICOEI.2019.8862760

10. Brajesh Kumar Singh and Awadhesh Kumar, "Backstepping Approach based Controller Design for Magnetic Levitation System", 5th IEEE Uttar Pradesh Section International Conference (UPCON-2018), pp.1-6, 2-4 Nov 2018, MMMUT Gorakhpur,UPhttps://doi.org/10.1109/UPCON.2018.8596885**(Scopus)**

11. Gaya Prasad and Awadhesh Kumar, "A Comparison between Sliding mode Control and Feedback Linearization", 5th IEEE Uttar Pradesh Section International Conference (UPCON-2018), pp.1-5, 2-4 Nov 2018, MMMUT Gorakhpur, UP. **(Scopus)**https://doi.org/10.1109/SSST.1996.493510**(Scopus)**

12. Gaya Prasad and Awadhesh Kumar, "A Robust Sliding Mode Control For 2-Link Robotic Manipulator System", International Conference on New Technological Opportunities in Networking and Sciences-2018 (NEWTONS-2018), SIT Pithoragarh, Uttarakhand,08-10 June 2018.

13. Diwakar Singh and Awadhesh Kumar, "Comparison between TP and FAN Data Compression Techniques of ECG Signal" 1st IEEE International Conference on Electronics, Materials Engineering and Nano-Technology, IMENTech- 2017, pp.1-8, IEM Science city Kolkata, 28-29

April, 2017. **(Scopus)**https://doi.org/10.1109/IEMENTECH.2017.8077013**(Scopus)**

14. Manoj Kumar Maurya and Awadhesh Kumar, "Dimension Reduction and Controller design for Large Scale Systems using Balanced Truncation" IEEE International Conference on Electronics, Materials Engineering &Nano-Technology (IEMENTech-2017), IEM Science City, Kolkata, pp. 1-4, 28-29 April, 2017. **(Scopus)**https://doi.org/10.1109/IEMENTECH.2017.8076972**(Scopus)**

15. Shashi Kant Chaudhary and Awadhesh Kumar, "Approximation to an Unstable, MIMO Waste-Water Treatment Plant" IEEE International Conference on Electronics, Materials Engineering &Nano-Technology (IEMENTech-2017), IEM Science City, Kolkata, pp. 1-4, 28-29 April, 2017. **(Scopus)**https://doi.org/10.1109/IEMENTECH.2017.8076973**(Scopus)**

16. Shashi Kant Chaudhary and Awadhesh Kumar, "Hankel Norm Approximation of a Stable Non-Minimal System" IEEE International Conference on Electronics, Materials Engineering &Nano-Technology (IEMENTech-2017), IEM Science City, Kolkata, pp. 1-4, 28-29 April, 2017. ISBN:978-1-5386-1703-8**(Scopus) DOI:** 10.1109/IEMENTECH.2017.8076978**(Scopus)**

17. Shweta Singh, Vivekanand Rai, Kishan Bhushan Sahay and Awadhesh Kumar, "Simulation and Comparison of DVR and D-STATCOM for Voltage Sag Mitigation", 6th IEEE International Conference on Power System (ICPS-2016), IIT Delhi, pp. 1-6,4-6 March, 2016. **(Scopus)**

18. Awadhesh Kumar, Bhoomika Maurya and Dinesh Chandra "Dimension reduction and controller design for a waste-water treatment plant", IEEE International Conference on Power and Advanced Control Engineering(ICPACE- 2015), BNM Institute of Technology (BNMIT), Bangaluru, India, pp.413-417, 13-14 August 2015. **(Scopus)**

19. Awadhesh Kumar and Dinesh Chandra, "Improved Padé-Pole Clustering Approximant", International Conference on Computer Science and Electronics Engineering, Dubai, UAE,17-18 November2013.

Publications in National Conference (Published with ISBN): 07

1. Dhananjay Gupta, Awadhesh Kumar and Yogya Mehrotra, "Review of Numerical Methods of Optimization" Proceedings of the National Conference on Recent Advances in Electrical and Electronics Engineering (RAEEE-2018), Excel India Publishers, New Delhi, MMMUT, Gorakhpur, Uttar Pradesh, 16-17 March, 2018, pp. 136-138, (Print: ISBN: 978-93-86724-91-5, July 2018).
2. Sanjay Kumar and Awadhesh Kumar, "A Review on Solar PV System Design in India" Proceedings of the National Conference on Recent Advances in Electrical and Electronics Engineering (RAEEE-2018), Excel India Publishers, New Delhi, MMMUT, Gorakhpur, Uttar Pradesh, 16-17 March, 2018, pp. 176-178, (Print: ISBN: 978-93-86724-91-5, July 2018).
3. Gaya Prasad and Awadhesh Kumar, "Adaptive Control Strategy for a Robotic Manipulator System", Proceedings of the National Conference on Recent Advances in Electrical and Electronics Engineering (RAEEE-2018), Excel India Publishers, New Delhi, MMMUT, Gorakhpur, Uttar

Pradesh, 16-17 March, 2018, pp. 35-37, (Print: ISBN: 978-93-86724-91-5, July 2018).

4. Brajesh Kumar Singh and Awadhesh Kumar, "A Review on Different Control Strategies for Magnetic Levitation System", National Conference on Emerging Trends in Science, Technology and Management (ETSTM-2017), Ashoka Institute of Technology and Management, Varanasi,11-12 Nov 2017, (ISBN: 978-93-5281-325-4).
5. Richa and Awadhesh Kumar, "A technical Review on various Control and Optimization Strategies for Inverted Pendulum System", Proceedings of 3rd National Conference on Recent Advances in Science and Technology (NCRAST-2017), pp.373-377, SIT Pithoragarh, Uttarakhand,11-12 November 2017. (ISBN: 978-93-86724-77-9)
6. Gaya Prasad, Mohd. Saif and Awadhesh Kumar, "The state of art in Adaptive Control Technique", Proceedings of 3rd National Conference on Recent Advances in Science and Technology (NCRAST-2017), pp. 324-328, SIT Pithoragarh, Uttarakhand,11-12 November 2017. (ISBN: 978-93-86724-77-9)
7. Mohd. Saif, Gaya Prasad and Awadhesh Kumar, "Optimal Control of TRMS using FOPID controller", Proceedings of 3rd National Conference on Recent Advances in Science and Technology (NCRAST-2017), pp. 378-383, SIT Pithoragarh, Uttarakhand,11-12 November 2017. (ISBN: 978-93-86724-77-9)

Publications in National Conference (Others): 08

8. Mohd. Saif and Awadhesh Kumar, "Modelling and Controlling of a Non-linear Twin Rotor MIMO System with PID Controller", National Conference on Recent Advances in Electrical and Electronics Engineering (RAEEE-2018), MMMUT, Gorakhpur, Uttar Pradesh, 16-17March, 2018.
9. Deepak Gupta and Awadhesh Kumar, "Approximation of Single Input Single Output and Multiple Input Multiple Output systems by Different Model Reduction Techniques", National Conference on Recent Advances in electrical and Electronics Engineering (RAEEE-2018), MMMUT, Gorakhpur, Uttar Pradesh, 16-17 March 2018.
10. Shashi Kant Chaudhary & Awadhesh Kumar, "A Review on Design and Analysis of Controller for Cruise Control System", Proceedings of the National Conference on Electrical Power Technology, Management and IT Applications (EPTMITA-16), 2016, Madan Mohan Malaviya University of Technology, Gorakhpur, India, 23-24 September 2016.
11. Shiv Shankar Kumar & Awadhesh Kumar, "A Review to Modelling and its Approximation to Fractional Order Systems", Proceedings of the National Conference on Electrical Power Technology, Management and IT Applications (EPTMITA-16), 2016, Madan Mohan Malaviya University of Technology, Gorakhpur, India, 23-24 September 2016.
12. Manoj Kumar Maurya & Awadhesh Kumar, "A Note on Large Scale Systems and its Approximation", Proceedings of the National Conference on Electrical Power Technology, Management and IT Applications (EPTMITA-16), 2016, Madan Mohan Malaviya University of Technology, Gorakhpur, India, 23-24 September 2016.
13. Ateet Kumar Srivastava & Awadhesh Kumar, "Model Order Reduction of Interval Systems: A Critical Review", Proceedings of the National Conference on Electrical Power Technology, Management and IT Applications (EPTMITA-16), 2016, Madan Mohan Malaviya University of Technology, Gorakhpur, India, 23-24 September 2016.
14. Maneesh Kumar Gupta & Awadhesh Kumar, "Performance Analysis and Comparison of Reduced Order Systems using Chebyshev Polynomial, Improved Pole Clustering FuzzyC-Means Clustering

Techniques", Proceedings of the National Conference on Electrical Power Technology, Management and IT Applications (EPTMITA-16), 2016, Madan Mohan Malaviya University of Technology, Gorakhpur, India, 23-24 September, 2016.

15. Suneet Sahu, Awadhesh Kumar &KishanBhusan Sahay," Design of Power Quality Management Scheme Using Lab VIEW Virtual Instrument" National Conference on Advances in Electrical Engineering-2015 (RAEE-15), MMMUT, Gorakhpur.

Attended and presented papers in National/ International Conferences: 11

1. Dhananjay Gupta, Awadhesh Kumar and Vinod Kumar Giri,"A Comparative Stability Analysis of Inverted Pendulum using MIT Rule, Fractional-Order MIT Rule and Modified MIT Rule-based MRAC",Second International Conference on recent trends in Management Engineering and Technology (ICMET), 22-23 December 2023.
2. Brajesh Kumar Singh and Awadhesh Kumar, "Dynamic Modelling and Control of Quadrotor Unmanned Aerial Vehicle System", 8th International Conference on Research Developments in Applied Science, Engineering and Management (AEM-2023), The Indian Council of Social Science Research (ICSSR), Punjab University Campus, Chandigarh, India, 30 July 2023.

1. Vaishnavi Gupta, Amarjeet Singh, Priyanjali, Dibyanshu Yadav, Arjun Dikshit, Tirumalsetty Chiranjeevi, Awadhesh Kumar and Raj Kumar Patel, "Design and Implementation of Snake detection cum Repellent Device", International Conference on IoT, Communication and Automation Technology (ICICAT-2023), Buddha Institute of Technology Gorakhpur, 23-24 June 2023.
2. Gaya Prasad and Awadhesh Kumar, "A Robust Sliding Mode Control For 2-Link Robotic Manipulator System", International Conference on New Technological Opportunities in Networking and Sciences-2018 (NEWTONS-2018), SIT Pithoragarh, Uttarakhand,08-10 June, 2018.
3. Richa and Awadhesh Kumar, "A technical Review on various Control and Optimization Strategies for Inverted Pendulum System", 3rd National Conference on Recent Advances in Science and Technology (NCRAST-2017), SIT Pithoragarh, Uttarakhand,11-12 November, 2017.
4. Gaya Prasad, Mohd. Saif and Awadhesh Kumar, "The state of art in Adaptive Control Technique", 3rd National Conference on Recent Advances in Science and Technology (NCRAST-2017), SIT Pithoragarh, Uttarakhand,11-12 November, 2017.
5. Mohd. Saif, Gaya Prasad and Awadhesh Kumar, "Optimal Control of TRMS using FOPID controller", 3rd National Conference on Recent Advances in Science and Technology (NCRAST-2017), SIT Pithoragarh, Uttarakhand,11-12 November 2017.
6. Awadhesh Kumar and Dinesh Chandra, "Modal Truncation Approximant for Discrete Time Systems", 2nd IEEE sponsored International Conference on Control, Computing, Communication & Materials-2016 (ICCCCM-2016) held during 21-22 October 2016.
7. Attended the 2nd IEEE sponsored International Conference on Control, Computing, Communication & Materials-2016 (ICCCCM-2016) held during 21-22 October 2016.
8. Awadhesh Kumar, Bhoomika Maurya and Dinesh Chandra "Dimension reduction and controller design for a waste-water treatment plant", IEEE International Conference on Power and Advanced Control Engineering, 13-14 August, 2015 (ICPACE- 2015) **(Scopus)**
9. Participated as Volunteer in Students' Conference in Engineering and Systems (SCES-2014) organized by IEEE student Branch and Motilal Nehru National Institute of Technology, Allahabad held during 28-30 May 2014.

10. Awadhesh Kumar and Dinesh Chandra, "Improved Padé-Pole Clustering Approximant", International Conference on Computer Science and Electronics Engineering, Dubai, pp. 29-32, UAE,17-18 November,2013
11. Participated as distinguished reviewer in the technical review committee in an IEEE sponsored International Conference on Control, Computing, Communication & Materials-2013 (ICCCCM-2013) held during 03-04 August 2013.

Acted as Resource Person

(Conference/Workshop/STC organized, Expert lectures delivered, Session Chairs, Social activities organized etc.)

Conferences Organized:

1. As a Coordinator, 2-days TEQIP-III sponsored National Conference on "**Recent Advances in Electrical and Electronics Engineering (RAEEE-2018)**" in the Department of Electrical Engineering, MMMUT, Gorakhpur,16-17 March 2018. (Budget: 125000/-)

Workshop/ Short- Term Courses/ Faculty Development Programs/ Seminars Organized

1. As a **Deputy Coordinator**, organised **"Empowering through Standards: A comprehensive Sensitization workshop"**on 08th December 2023 by University Standard Club, MMMUT Gorakhpur and Bureau of Indian Standards, Lucknow under BIS-MMMUT MoU activities series.
2. As a **Convener**, one-week STTPon"**Recent Advances in Control Systems (RACS-2022)**" held during 25-29 November 2022 by Department of Electrical Engineering, MMMUT Gorakhpur and jointly sponsored by AICTE New Delhi & MMMUT Gorakhpur under AICTE-MMMUT MoU activities series. (3 Lacs)
3. As a **Coordinator**, one-week Online FDP on"**Examination Reforms**" during 26-30, March 2022in a joint Collaboration with AICTE New Delhi and MMM University Technology, Gorakhpur (Budget: 93000/-)
4. As a **Coordinator**, organized an Expert Lecture on the topic "**Buzz Words and Recent Trends in Automation**" by Prof. S. Chatterji, EED NITTTR Chandigarh and Mentor AICTE New Delhi on 26th November 2021 in Electrical Engineering Department, MMMUT Gorakhpur.
5. As a **Coordinator**, one-week AICTE Training and Learning (ATAL) Academy Online FDP in thrust area "Control Systems & Sensors Technology" on "**Recent Advances in Control Systems (RACS-2021)**" during 18-22, October 2021 at MMM University Technology, Gorakhpur (Budget: 93000/-)
6. As a **Coordinator**, one-week AICTE Training and Learning (ATAL) Academy Online FDP in thrust area "Control Systems & Sensors Technology" on "**Recent Advances in Control Systems (RACS-2020)**" during 17-21, October 2020 at MMM University Technology, Gorakhpur (Budget: 93000/-)
7. As a **Coordinator**, one-week online Faculty Development program on "**Power Electronics for Electrical Vehicles and Energy Systems (PEEVES-2020)**" organized jointly by Electrical

Engineering Department, MMMUT, Gorakhpur and SVNIT, Surat under twinning activity, financially sponsored by TEQIP-III, MMMUT, Gorakhpur, 28 September-03 October 2020. (Budget: 65000/-)

8. As a **Coordinator**, One-week TEQIP-III sponsored Short-Term Course on "**Emerging Trends in Smart Grid and Optimization Techniques (ETSGOT-2018)**" in the Department of Electrical Engineering, MMMUT, Gorakhpur,11-16 September 2018. (Budget: 1,40,000/-)

9. As a **Coordinator**, One-week TEQIP-II sponsored Short-Term Course on "**Recent Advances in Control and Energy Systems (RACES-2017)**" in the Department of Electrical Engineering, MMMUT, Gorakhpur, 25 February -03March 2017 (Budget: 4,31,000/-)

10. As a **Deputy Coordinator**, One-week TEQIP-II sponsored Short-Term Course on "**Recent Advances in Electrical Systems and Renewable Energy (RAERE-2016)**", 01-07, August 2016 (Budget: 2,50,000/-)

11. As a **Convener**, Workshop on "**Recent advances in Electrical Engineering Laboratories (RAEEL-2015)**" sponsored under TEQIP-II, in the Department of Electrical Engineering, MMMUT, Gorakhpur, 2nd December 2015 (Budget: 10,000/-)

12. As a **Convener**, Workshop on "**Energy efficiency in industrial, domestic and Transport sector**", 22-23 August 2015, Sponsored Jointly by PCRA and TEQIP-II, attended by 74 students and 45 faculty members. (Budget: 10,000/-)

Social Activities Organized:

1. Organized as **Associate Dean of Extension, Field Outreach and Alumni Relations** a **"One day Training Programme on Accessibility to PWDs"** in joint collaboration with CRC and MMMUT Gorakhpur on 24th January 2024.

2. Organized as **Associate Dean of Extension, Field Outreach and Alumni Relations** a **"Study-Trip to MMMUT Gorakhpur"** for the School Children of Rajkiya Model Inter College Mathiya Sriram Sewarahi Kushinagar on 4th January 2024 as a part of study trip to Higher Educational Institutions

3. Organized as **NSS Coordinator** "**Aayansh-Diwali celebration with Malviya Kids**" a stationary collection and distribution drive on the eve of Dipawali with students studying in Malaviya Shiksha Niketan at MMMUT Gorakhpur on 9th November 2023.

4. Organized as **NSS Coordinator** "**Meri Mati Mera Desh**" Abhiyan and Celebrated "**Kalash Yatra**" at MMMUT Gorakhpur on 13th October 2023.

5. Organized as **NSS Coordinator** "**Swacchatahi Sewa**" Abhiyan and Celebrated "**International Non-voilence Day**" at MMMUT Gorakhpur on 2nd October 2023.

6. Organized as **NSS Coordinator** "**Yoga Camp**" on 21.06.2023 at Chauri-ChauraSaheed Smarak Sthal Gorakhpur.

7. Organized as **NSS Coordinator "Padhe Gorakhpur Badhe Gorakhpur"** Abhiyan, started since 1st December 2022 in the eight schools of adopted villages by MMMUT Gorakhpur.

8. Organized as **NSS Coordinator** "**Blood Donation Camp**" on 01.12.2022 through GorakhnathBlood Bank Gorakhpur.

9. Organized as **NSS Coordinator** "**Pararth-2: A three-month Cloth collection and distribution drive**" from 01.12.2022 to 28.02.2023.

10. Organized as **NSS Coordinator** "**Blood Donation Camp**" on 29.09.2022 through Medical College Blood Bank Gorakhpur.

11. Organized as **NSS Coordinator** "**Swacchata Abhiyan**" in MMMUT Gorakhpur during 11-17 August 2022.

12. Organized as **NSS Coordinator** "**Two months Yoga Camp**" at MMMUT Gorakhpur from 21.04.2022 to 21.06.2022.

13. Organized as **NSS Coordinator** "**Pararth**: A one month Cloth collection and distribution drive" from 14.04.2022 to 14.07.2022.

14. Organized as **NSS Coordinator** "**Blood Donation Camp**" on 30.12.2021 through District Hospital Blood Bank Gorakhpur.

15. Organized as **NSS Coordinator** "**NSS Orientation cum Health Awareness program**" for first year students in IPNS-2021, on 23.12.2021.

16. As a **Convenor, "NSS Annual Function"** organized by National Service Scheme (NSS), MMMUT Gorakhpur on 28 September 2021.

17. As a **Convenor**, International Seminar on "**Managing the Stress and Anxiety during COVID-19 pandemic**" organized by National Service Scheme (NSS), MMMUT Gorakhpur during 2-3 September 2021.

18. As a **Convenor**, Seminar on World Water Day in collaboration with Institution of Engineers (India) Gorakhpur Local Chapter and NSS MMMUT Gorakhpur, on the theme "**Valuing Water**" on 22ndMarch 2021.

Departmental Activities Organized:

1. As a **Faculty Advisor**, ELECTRA-2023 a Departmental Activity by society Electrical Engineers Legation (EEL), 24-25 April 2023.

2. As a **Faculty Advisor**, ELECTRA-2022 a Departmental Activity by society Electrical Engineers

Legation (EEL), 23-24 March 2022.

3. As a **Faculty Advisor**, ELECTRA-2021 (Online)

4. As a **Faculty Advisor**, ELECTRA-2020 (Online)

5. As a **Faculty Advisor**, ELECTRA-2019 a Departmental Activity by society Electrical Engineers Legation (EEL), 11-13 January 2019.

6. As a **Faculty Advisor**, ELECTRA-2018 a Departmental Activity by society Electrical Engineers Legation (EEL)

Expert Lecture/ Invited Talks delivered: 28

1. Expert Lecture delivered on 20th January 2024 on the topic: "**Laboratory Practices and Electrical Safety Measures**", in a two days training programme for Laboratory staff "Recent Advancements in Electrical, Electronics Labs and Awareness of Latest Software (RAEEL-2024)" held during 19-20 January 2024 by Department of Electrical Engineering, MMMUT Gorakhpur.

2. Expert Lecturedeliveredon 13th June 2023 on the topic: "**Application of Optimization Techniques in Control System Design**", at Ashoka Institute of Technology and Management, Varanasi, Uttar Pradesh.

3. Expert Lecturedeliveredon 12th June 2023 on the topic: "**Application of Artificial Intelligence in Control System Design**", at Ashoka Institute of Technology and Management, Varanasi, Uttar Pradesh.

4. Expert Lecturedeliveredon15thFebruary 2023 on the topic: "**Particle Swarm Optimization: Concepts & Applications**", at Ashoka Institute of Technology and Management, Varanasi, Uttar Pradesh.

5. Expert Lecture deliveredon 3-4February 2023in a STTP on Recent Trends and Research Opportunities in Electrical & Electronics Engineering (RTROEEE-2023)" on the topic: "**Optimization Techniques: An IntroductiontoParticle Swarm Optimization Part-II**", at United College of Engineering & Research, Naini, Allahabad, Uttar Pradesh.

6. Expert Lecture delivered on 28th November 2022, on the topic, "**Modelling of Non-linear Control Systems**", in a STTP on "Recent Advances in Control Systems (RACS-2022)" held during 25-29 November 2022 by Department of Electrical Engineering, MMMUT Gorakhpur and jointly sponsored by AICTE New Delhi & MMMUT Gorakhpur under AICTE-MMMUT MoU activities series.

7. Expert Lecturedelivered on 24th January 2022, on the topic, "**Control Schemes in Electrical Vehicles**", in an online refresher Course "**Battery Energy Storage System & its Management" sponsored by AICTE-ISTE during 20/01/2022 to 26/01/2022**" by Department of Electrical Engineering, **KJ's Educational Institute Trinity College of Engineering & Research,**

Pune, Maharashtra.

8. Expert Lecture delivered on 18th October 2021, on the topic, "**Recent Advances and Challenges in Control Systems**", in an online FDP "Recent Advances in Control Systems-2021" held during 18-22 October 2021 by Department of Electrical Engineering, MMMUT Gorakhpur and sponsored by AICTE Training and Learning (ATAL) Academy.

9. Expert Lecture delivered on 12thOctober 2021 on the topic, "**Electrical Circuit Transients: An Analysis**", organised by Department of Electrical Engineering, Maharana Pratap Engineering College, Kanpur.

10. Expert Lecture delivered on 3rd September 2021 on the topic, "**Stress Management**", in the International Seminar on "**Managing Stress and Anxiety during COVID-19 Pandemic**" organised by National Service Scheme, MMMMUT Gorakhpur.

11. Expert Lecture delivered on 14thAugust 2021 on the topic, "**Concepts, Applications and Key Challenges in Control Technology**", organised by Institution of Engineers (India) Gorakhpur Local Chapter.

12. Expert Lecturedelivered on 22nd July 2021 on the topic **"Artificial Intelligence, Human Perception and Fuzzy Logic Control Systems**" in a Faculty Development Program on "Artificial Intelligence" organised by Electrical Engineering Department, Bansal Institute of Engineering and Technology, Lucknow during 19-25 July 2021.

13. Expert Lecture delivered on 2ndJuly 2021 on the topic "**Electrical Safety Measures at Workplace**" in National Electrical Safety week, 2021 at HPCL LPG Bottling Plant, Mehul Mumbai.

14. Expert Lecture delivered on 28thJune 2021, on the topic "**Concepts, Approaches and Key Challenges in Approximation**" in an AKTU sponsored, Online Faculty Development Program on "Advanced Control Strategies: Design and Applications (ACSDA-2021)" organised by Department of Electrical Engineering, Rajkiya Engineering College, Sonbhadra held during 28 June to 02 July 2021.

15. Expert Lecture delivered on 15th March 2021 on the topic "**Robust Control: Concepts and Approaches**" in an AICTE sponsored Short Term Training Programme (online) on Fractional Order Robust Control System Design (series III) under AQIS 2019-20 scheme organized by Department of Electrical and Electronics Engineering, Vardhman College of Engineering Hyderabad Telangana during 15-20March 2021.

16. Expert Lecture Delivered on 4thMarch 2021 on the topic, "**Engineers and Engineering: Towards a healthy Planet**", organised by Institution of Engineers (India) Gorakhpur Local Chapter.

17. Expert Lecture Delivered on08thJanuary 2021 on the topic, "**Stability Analysis: Linear System perspective with MATLAB Applications**", at Ashoka Institute of Technology and Management, Varanasi, UP.

18. Expert Lecture delivered on 24thDecember 2020 on the topic "**Smart Sensors: A Control Perspective**" in a TEQIP-III sponsored Short-Term Training Programme (online) on Machine Vision, Data Acquisition System and Smart Sensors organized by Department of Electrical Engineering, Rajkiya Engineering College, Banda UP during 21-25 December 2020.

19. Expert Lecture delivered on 28th November 2020 on the topic "**Suboptimal Control Design through Robust Reduction Technique**" in an AICTE sponsored Short Term Training Programme

(online) on Fractional Order Robust Control System Design (series II) under AQIS 2019-20 scheme organized by Department of Electrical and Electronics Engineering, Vardhman College of Engineering Hyderabad Telangana during 23-28 November 2020.

20. Expert Lecture delivered on 20thOctober 2020 on the topic "**Polynomial based Approximants**" in an online FDP Recent Advances in Control Systems held during 17-21 October, 2020 by Department of Electrical Engineering, MMMUT Gorakhpur and sponsored by AICTE Training and Learning (ATAL) Academy.
21. Expert Lecture delivered on 1st October 2020 on the topic "**Variable Frequency Transformer: An Introduction & Future direction**" in a TEQIP-III sponsored one-week Faculty development Program on "Power Electronics for Electric Vehicles and Energy Systems (PEEVES-2020)" jointly organized by Department of Electrical Engineering, SVNIT Surat and MMMUT Gorakhpur, during 28 September-03 October 2020.
22. Expert Lecture delivered on 2nd July 2020 on the topic "**Electrical Safety**" in National Electrical Safety week, 2020 at HPCL LPG Bottling PlantSahjanwa Gorakhpur.
23. Expert Lecture delivered on 19th October 2019 on the topic "**Variable Frequency Transformer: A conceptual Review**" in a TEQIP-III sponsored one-week National Workshop on "Electric Vehicles Need & Environment" jointly organized by Department of Electrical Engineering, Institute of Engineering and Technology, Dr. Ram Manohar Lohia Awadh University, Ayodhya& Dr. Ambedkar Institute of Technology, Bangalore during 16-20 October 2019.
24. Keynote Speech Delivered on 09thJune 2018 in an International Conference NEWTONS-2018 on: "**System Approximants: Concept and Approaches**", at Seemant Institute of Technology, Pithoragarh, Uttarakhand.
25. Expert Lecture Delivered on 04thMay 2018 in a Faculty Development Program on Power Theft & Energy Management (PTEM-2018) on the topic "**Power Theft: Issues and Mitigation Schemes**" and "**Optimization Techniques: An Introduction**", at United College of Engineering & Research, Naini, Allahabad, Uttar Pradesh.
26. Expert Lecture Delivered on28thAugust 2017 on the topic: "**Transients in Circuit Analysis with application to Power System**", at Ashoka Institute of Technology and Management, Varanasi, UP.
27. Expert Lectures Delivered on16thSeptember 2016 on the topic: "**MATLAB Simulation for Control Systems**", at Ashoka Institute of Technology and Management, Varanasi, Uttar Pradesh.
28. Expert Lectures Deliveredon 03rdAugust 2016 in a Short-term Course "Recent Advances in Electrical Systems and Renewable Energy (RAERE-2016)" on the topic "**Model Order Reduction: Concept and Approaches**", at MMMUT Gorakhpur.

Chaired Session in International/ National Conferences and other Outreach Activities

1. Chaired a Technical Session on 09.02.2024 in 5thIEEE International Conference on Computing, Power and Communication Technologies (IC2PCT-2024)" organized by Galgotia University, Greater Noida, during February, 09-10, 2024.
2. Worked as Technical Program Committee member and Reviewer in the Congress on Smart Computing Technologies (CSCT-2023) organized by Soft Computing Research Society and SAU Centre for Research and Innovative Learning (SCRIL) South Asian University, India held during 02-03 December 2023.

3. Acted as Judge on 20.10.2023 in the TechYuva-2023 organized by Buddha Institute of Technology Gorakhpur in association with AKTU Innovation Hub, Lucknow and technically co-sponsored by IEEE young Professional, UP Section during 19-20 October 2023.
4. Worked as Program Committee member and Reviewer in International Conference on "Artificial Intelligence: Theory and Applications (AITA-2023)" organized by ICFAI Business School (IBS) Bangalore, Off Campus center of ICFAI Foundation for Higher Education (IFHE) University India, during 11-12 August 2023.
5. Chaired a Technical Session on 30.07.2023 in 2023 IEEE World Conference on Applied Intelligence and Computing (AIC-2023)" jointly organized by Rajkiya Engineering College, Sonbhadra and Ashoka Institute of Technology and Management, Varanasi, technically sponsored by Soft Computing Research Society, during July,29-30, 2023.
6. Chaired a Technical Session on 24.06.2023 in IEEE sponsored International Conference on IoT, Communication and Automation Technology, jointly organized by Rajkiya Engineering College, Sonbhadra and Buddha Institute of Technology, Gorakhpur, during June 23-24, 2023.
7. Worked as Technical Program Committee member in 4th Electric Power and Renewable Energy Conference (EPREC-2023) held at Department of Electrical Engineering, National Institute of Technology Jamshedpur during 25-27 May 2023.
8. Worked as Program Committee Member and Reviewer in 3rdInternational Conference on Computational Intelligence (ICCI-2022)" held at Indian Institute of Information Technology, Pune, duringDecember 29-30, 2022.
9. Worked as Program Committee Member and Reviewer in 6th Joint Conference on Advances in Computational Intelligence (IJCACI-2022)" organized bySAU Centre for Research and Innovative Learning (SCIRIL), South Asian University, India &Jahangimagar University Bangladesh, duringOctober15-16, 2022.
10. Worked as Program Committee Member and Reviewer in 2022 IEEE World Conference on Applied Intelligence and Computing (AIC-2022)" organized byREC, Sonbhadra&technically supported by Soft Computing Research Society, duringJune17-19, 2022.
11. Served as primary evaluator in Toycathon, 2021 organized by Ministry of Education, I&B, MSME, Women & Child Development, Commerce & Industry, Textiles and AICTE, India
12. Chaired a Technical Session on 27.02.2021 in International Conference on Recent Advances in Science and Engineering (RASE-2021)" held at REC, SonbhadraduringFebruary26-27, 2021.
13. Chaired a Technical Session in International Conference on Electrical and Electronics Engineering (ICE3-2020)" held at MMMUT, Gorakhpur on September 14-15, 2020.
14. Chaired a Technical Session in International Conference on Computing Applications in Electrical and Electronics Engineering (ICCAEEE-2019) held at REC, Sonbhadra on 30-31 August 2019.
15. Chaired a Technical Session in International Conference on New Technological Opportunities in Networking and Sciences (NEWTONS-2018) held at SIT, Pithoragarh on 08-10 June 2018.
16. Chaired Technical Session-VIII on Control System Track in TEQIP-III sponsored National Conference "Recent Advances in Electrical and Electronics Engineering (RAEEE-2018)" held at MMMUT, Gorakhpur on March 16-17, 2018.
17. Chaired Technical Session-I on Electrical Power System & Power Electronics and Drives Track in TEQIP-III sponsored National Conference "Electrical Power Technology, Management and IT Applications (EPTMITA-2016)" held at MMMUT, Gorakhpur on September 23-24, 2016.
18. Chaired Technical Session IV on Control System & Miscellaneous Fields Track in TEQIP-III

sponsored National Conference "Electrical Power Technology, Management and IT Applications (EPTMITA-2016)" held at MMMUT, Gorakhpur on September 23-24, 2016.

Reviewer of Journals:

- IEEE Transactions on Circuits and Systems
- IEEE Transactions on Mechatronics
- ISA Transactions Journal - Elsevier
- Asian Journal of Control
- Transaction of Institute of Measurement and Control, SAGE Journals
- Intelligent Automation and Soft Computing
- WSEAS Transactions on Circuits and Systems
- International Journal on Electrical Engineering and Informatics
- Iranian Journal of Science and Technology, Transactions of Electrical Engineering, Springer

Reviewer of Conferences:

- Congress on Smart Computing Technologies, track CSCT-2023
- 3rd International Conference on Power Electronics & IoT Applications in Renewable Energy and its Control during 23rd-24th February 2024
- 5th International Conference on Communication and Intelligent Systems (ICCIS 2023) during December 16-17, 2023
- IEEE sponsored International Conference on IoT, Communication and Automation Technology, jointly organized by Rajkiya Engineering College, Sonbhadra and Buddha Institute of Technology, Gorakhpur, during June 23-24, 2023.
- 2022 IEEE Silchar Subsection Conference, IEEE SILCON-2022, 4-6 November 2022 (Hybrid Mode), National Institute of Technology Silchar
- 2nd International Conference on Power Electronics and IoT Applications in Renewable Energy and its Control (PARC-2022)
- 47th Annual Conference of the IEEE Industrial Electronics Society, Toronto, Canada 13-16 October,2021 (IECON-2021)
- 2nd Electric Power and Renewable Energy Conference, 28-30 May 2021 (EPREC-2021)
- 6th Students' Conference on Engineering & Systems (SCES-2020)
- International Conference on Power Electronics & IoT Applications in Renewable Energy and its Control (PARC-2020)
- International Conference on Electrical and Electronics Engineering (ICE3-2020)
- International Conference on Energy, Environment & Material Sciences (ICEEM-2019)
- International Conference on Computing Applications in Electrical & Electronics Engineering (ICCAEEE-2019)

- 2nd IEEE International Conference on Power Energy, Environment, and Intelligent Control (PEEIC-2019)
- International Conference on Sustainable Communication Networks and Application (ICSCN-2019)
- Fourth International Conference on Communication and Electronics Systems (ICCES-2019)
- IEEE Third International conference on Electronics, Communication and Aerospace Technology (ICECA-2019)
- International Conference on Recent Trends in Communication & Intelligent Systems (ICRTCIS-2019)
- 5th Students' Conference on Engineering and Systems 2019 (SCES-2019)
- 5th IEEE Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering, (UPCON-2018)
- New Technological Opportunities in Networking and Sciences (NEWTONS-2018)
- International Conference on Emerging Trends in Communication, Computing and Electronics (IC3E-2018)
- Recent Advances in Engineering, Technology and Computational Sciences (RAETCS-2018)
- International Conference on Innovations in Control, Communication and Information Systems (ICICCI-2017)
- 2nd International Conference on Control Computing Communication and Materials (ICCCCM-2016)
- 4th Students' Conference on Engineering and Systems 2015, (SCES-2015)
- International Conference on control computing communication and materials 2013 (ICCCCM 2013)
- Soft Computing for Problem Solving, 2012 (SocProS 2012)

Professional Membership/ Affiliation

- Executive Member of Automatic Control & Dynamic Optimization Society (ACDOS) for two years during 2020-22
- Professional Member of ACDOS
- International Federation of Automatic Control (IFAC) affiliate
- IEEE Professional Member (95002169)
- Professional member of IEEE Control System Society
- Professional Member of Institution of Engineers (IE) India
- Professional Member of International Association of Engineers (IAENG-286138) since 31st May 2021.

Curriculum Revision/ Syllabus Modification

- Curriculum designed for the Subject "Fuzzy Sets, Logic and Systems & Applications (BEE-47) Credit-5 course" w.e.f. academic session 2022-23 Even Semester.

- Curriculum designed for the Subject “Process Dynamics and Control (MEE-255) Credit-4 course” w.e.f. academic session 2022-23 Odd Semester.
- Curriculum designed for the Subject “Digital Control System (BEE-53) credit-4 course” modified code: BEE-53A credit 5 course, w.e.f. academic session 2021-22 Even Semester.
- Curriculum designed for NSS MMMUT Gorakhpur for the session 2021-22
- Modified and revised the syllabus of Subject “Modeling, Simulation and Evolutionary Techniques (MEE-104)” Modified code: MEE-104A w.e.f. academic session-2019-20.
- Modified and revised the syllabus of Subject “Network Analysis and Synthesis (BEE-14)” Modified code: BEE-14A w.e.f. academic session-2019-20.

MOOC’s Completed

- Completed NPTEL SWAYAM Course “Nonlinear Adaptive Control” through NPTEL online with elite certification.
- Completed NPTEL SWAYAM Course “Control Engineering” through NPTEL online with elite certification.

Subjects Teaching/ Taught in UG

- Basic Electrical Engineering, Principles of Electrical Engineering, Electrical Circuit Analysis
- Basic System Analysis
- Network Analysis & Synthesis
- Control Systems, Modern Control Systems, Advance Control Systems, Digital Control Systems
- Linear Dynamical Systems
- Fuzzy Sets, Logic and Systems & Applications

Subjects Teaching/ Taught in PG

- Modelling, Simulation and Evolutionary Techniques
- Process Dynamics and Control
- Optimization Techniques
- Digital Control System

Simulators Known

- MATLAB/SIMULINK
- LABVIEW

Question Paper Setter of Different Institutions

- Uttar Pradesh Technical University (UPTU), Lucknow
- Dr. A.P.J. Abdul Kalam Technical University (AKTU), Lucknow
- Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj
- Integral University, Lucknow
- Kamala Nehru Institute of Technology (KNIT), Sultanpur
- Uttarakhand Technical University (UTU), Dehradun
- VBS Purvanchal University Jaunpur
- Madan Mohan Malaviya University of Technology (MMMUT), Gorakhpur

Performance in Competitive Exams

- GATE-2006: Score 434, Percentile 97.86, AIR 835
- GATE-2001: Percentile Score 80.56, AIR 1146
- GATE-2000: Percentile Score 87.67, AIR 808
- GATE-1999: Percentile Score 78.18, AIR 1169
- IES-2005 : Qualified Written Exam & Appeared in Interview
- IES-2006 : Qualified Written Exam & Appeared in Interview

Professional Training/ Workshop/ Short Term Courses Attended (Less than one week)

1. One day Workshop on **"Empowering through Standards: A comprehensive Sensitization workshop"**on 08th December 2023 organized by University Standard Club, MMMUT Gorakhpur and Bureau of Indian Standards, Lucknow under BIS-MMMUT MoU activities series.
2. One day Workshop on **"NIRF: A Comprehensive Analysis"** on 7th October 2023 organized by IQAC, MMMUT Gorakhpur.
3. Online Technical Event**"Artificial Intelligence in Robotics"** organized by Department of Electronics and Communication Engineering, Kanpur Institute of Technology, Kanpur in association with IEEE WIE Affinity Group, UP Section, Indiaon September 23, 2021.
4. One day workshop on **"Power Quality Analysis and Energy Management in Smart Sustainable Cities"** organised by MMMUT Gorakhpur in association with fortiss GmbH held on 28 June 2021.
5. Live Workshop on **"Technology Commercialization"** organised by Turnip Innovations and facilitated by Prof. Man Singh, Dean Central University of Gujrat, on 15th February 2021.
6. Webinar entitled **"Engineering the Future in the Post-COVID Era"** delivered by Prof. S. K. Ramesh, Professor of Computer and Electrical Engineering, California State University Northridge USA and organised by IEEE student branch MNNIT Allahabad on 14th September 2020.
7. Webinar on "Aatm-Nirbhar Bharat", on the topic **"Role of Technological Institutions for Atma-Nirbhar Bharat"** organized by State Project Implementation Unit SPIU-UP, TEQIP-III, 9th July 2020.

8. One-day International Seminar on **"Ek Bharat Shreshtha Bharat: Dekho Apna Desh (Exhibiting the Saga of Indian Art, Heritage and Culture)"** hosted by the department of Humanities and Management Sciences MMMUT, Gorakhpur, 29th June 2020.
9. National Webinar on **"Role of Solar Energy in Clean Global Environment"** on World Environment Day, 05-June-2020.
10. Webinar on **"Relevance of IEEE standards in Teaching, Learning and Industry Collaborations"** on 4th June 2020.
11. Webinar on **"Virtual Labs"** jointly organized by MMMUT, Gorakhpur & Regional Centre REC Banda on 29th May 2020.
12. National webinar on **"COVID-19: From a CyberSecurity Lens"** jointly organized by ITCA and CSE Department, MMMUT, Gorakhpur on 29th May 2020.
13. Webinar on **"e-Learnig Program on Virtual Lab Practices"** organized by Nodal centre of Virtual labs BIT in association with regionalcentre REC Banda affiliated to Center of Virtual Labs IIT Kanpur on 27thMay 2020.
14. Webinar series on "Aatm-Nirbhar Bharat", on the topic **"Post COVID-19: Role of Science and Technology towards a self-Reliant India"** organized by IEEE India Council on 24th May 2020.
15. Webinar on **"Mathematical modelling and spread of COVID-19"** organized by Mathematics and Scientific Computing Department, MMMUT, Gorakhpur on 16th May 2020.
16. Online workshop on **"Interactive Teaching and Experiential Learning using MATLAB and Simulink"** delivered by Math-Works Expert on 13th May 2020 organized by the State Project Implementation Unit – Uttar Pradesh
17. Webinar on **"Impact of Electrical Vehicles in the post Covid world"** organized by IEEE India Council on 7th May 2020.
18. Webinar on **"Role of Digital Technology in Research and Technology"** organized at MMMUT, Gorakhpur on 5th May 2020.
19. 3 days **Malaviya Research Conclave-2020 (MRC-2020)** organized at MMMUT, Gorakhpur, 22-24 February 2020.
20. One day Training on **"IEEE Xplore Digital Library"** Conducted at MMM. University of Technology, Gorakhpur on 7th December 2019.
21. 2 days International Workshop on **"Energy management in Smart Sustainable Cities"** conducted by Electrical Engineering Department, MMMUT Gorakhpur during 30 November to 01 December 2019.
22. 2019 IEEE Region 10 International Workshop on **"Panel of Conference Organizers (POCO-2019)"** organized at MMMUT, Gorakhpur on 25 September 2019.
23. 3 days **Malaviya Research Conclave-2017 (MRC-2017)** organized at MMMUT, Gorakhpur, 08-11 July 2017.
24. 1-day workshop on **"Role of Local Chapters"** conducted by IIT Kanpur at MMMUT, Gorakhpur on 1st April 2017.
25. 3 days program on **"Communication and Presentation Skills"** organized by Engineering Staff College of India at MMMUT, Gorakhpur, 26-28 March 2017.
26. 3 days **"Pedagogical Training for Effective Teaching in Technical Education**" organized by Engineering Staff College of India at MMMUT, Gorakhpur, 21-23 March 2017.

27. 3 days hands-on workshop on **"Linear Integrated Circuits: A System Approach"** organized in collaboration with Sapience Consulting, under the Texas Instruments India University Program at MMMUT, Gorakhpur, 07-09 June 2016.
28. 1-day workshop on **"Green Energy for Sustainable Development: Role of Educational Institutions"** organized by MMMUT, Gorakhpur on 21st January 2016.
29. 2-days workshop on **"Emerging Trends in Smart Grid and Renewable Energy System (ETSGRES-15)"** organized by Department of Electrical Engineering, MMMUT, Gorakhpur, 08-09 December 2015.
30. 4-days TEQIP-II sponsored workshop on **"Faculty Development for Improved Competencies on Entrepreneurial Motivation Training"** organized at MMMUT, Gorakhpur, 30th October to 3rd November 2015.
31. 2-days **"State Level Faculty Interaction Seminar"** under the aegis of Department of Technical Education, Government of Uttar Pradesh, sponsored by World Bank TEQIP-II, organized at HBTI, Kanpur, 08-09 June 2015.
32. 3-days National Workshop on **"Sustainable, Affordable and Efficient Rural Electrification System"** organized by Department of Electrical Engineering, GBPUAT, Pantnagar (Uttarakhand) in collaboration with REC Ltd. New Delhi, 27th February to 1st March 2015.
33. Sensitization workshop on **"Intellectual Property Rights"** organized by IPR Cell at MNNIT, Allahabad, 06-07 February 2014.
34. National Seminar on **"Management of Change: shifting paradigm in business model"** organized by United Institute of Management, Allahabad 03 May, 2008.
35. National Seminar on **"Advances in Computing and its applications"** organized by United College of Engineering & Research, Allahabad 12-13 April 2008.
36. International Conference on **"Science, Technology & Society: 21st Century perspective"** organized by United College of Engineering & Research, Allahabad 23 November 2006.
37. 3 days' workshop on **"Emerging Challenges in Power Systems"** under TEQIP at HBTI, Kanpur, 28-30 October 2005.

Professional Training/ Workshop/ Short Term Courses Attended (One week)

38. One-week online FDP on "**Raspberry PI and its interfacing**" held during 27 February to 1 March 2023, organised by NITTTR Chandigarh
39. One-week STTPon"**Advances in Electric Vehicles and Energy Systems (AEVES-2022)**" held during 19-23December 2022 by Department of Electrical Engineering, MMMUT Gorakhpur and jointly sponsored by AICTE New Delhi & MMMUT Gorakhpur under AICTE-MMMUT MoU activities series.
40. One-week FDPon"**Recent Advances in Applied Mathematics and Mathematical Tools (RAAMMT-2022)**" held during 14-18December 2022 by Department of Mathematics and Scientific Computing, MMMUT Gorakhpur and jointly sponsored by AICTE New Delhi & MMMUT Gorakhpur under AICTE-MMMUT MoU activities series.
41. One-week workshop on "**Hands on Training on OPAL-RT (HTORT-2022)**" jointly organised by OPAL-RT Technologies Bangaluru, Karnataka and Electrical Engineering Department, Madan Mohan Malaviya University of Technology Gorakhpur during 27-30 September and 21-23

November 2022.

42. One-week short term course on **"Unpacking E-mobility technologies for India"** from November 20-24, 2021, organised by MNNIT Allahabad, Prayagraj under the scheme for promotion of Academic and Research Collaboration (SPARC) of Ministry of Education, Govt. of India for the project titled, "E-mobility: An Electricity Grid Perspective (P1542)"
43. One-week Online Faculty Development Programme on **"Control System and Sensors Technology"** during 21-25 September 2021, organized by Indian Institute of Information Technology, Nagpur sponsored by ATAL Academy.
44. One-week Online Faculty Development Programme on **"Energy Management and Planning in Smart cities for sustainable Development (EMPSSD-2021)"** during 20-24September 2021, organized by Department of Electrical Engineering, Rajkiya Engineering College, Sonbhadra, UP sponsored by ATAL Academy.
45. One-week online Faculty Development Program on **"Non-Linear Systems: Modelling and Control"** organised by Department of Electronics and Instrumentation Engineering, NIT Silchar during 1-5 March 2021.
46. Five-day Innovation series on Patent Search and filing conducted by Turnip Innovations on 16-20 February 2021.
47. One-week online Faculty Development Program on **"Control and Automation"** organised by Department of Avionics, Indian Institute of Space Science & Technology, Thiruvananthpuram, Kerla during 15-18 December 2020.
48. One-week Online Faculty Development Programme on **"Emerging Pedagogy in online Teaching Learning"** during 26-30 October 2020, jointly organized by Department of Applied Sciences, Electronics, Electrical Engineering and Computer Science, Rajkiya Engineering College, Sonbhadra, UP.
49. One-week AICTE Training and Learning (ATAL) Academy Online FDP on **"Control Systems & Sensors Technology"** during 21-25, September 2020 at Indian Institute of Information Technology, Nagpur.
50. One- week TEQIP-III sponsored Faculty Development Program on **"The art of Effective Teaching and Learning: ICT Integrated Pedagogy"** organized by the Department of Humanities and Management Science, Madan Mohan Malaviya University of Technology Gorakhpur, Uttar Pradesh, India, held from 14th -19thSeptember 2020.
51. One-week Online Faculty Development Programme on **"Recent Research Trends in Control, Instrumentation and Allied Engineering: A Multidisciplinary Approach (RRTCIA-2020)"**during 4-8 September 2020, organized by Department of Electronics and Instrumentation Engineering, National Institute of Technology, Silchar, Assam.
52. One-week Online Faculty Development Programme on **"Teaching and Learning of Advance Control Systems"** organized by the Department of Electrical Engineering in association with Teaching Learning Centre, NIT, Warangal, during 10-16 August 2020.
53. One- week Online Training Program on **"ICT Tools for Teaching, Learning and Administration"** organized by the Department of Electronics and Communication JK Institute of Applied physics and Technology University of Allahabad, Prayagraj 04-08 August 2020.
54. One-week Faculty Development Programme (Webinar) sponsored by TEQIP-III on **"Robotics and Control (RoboCon-2020)"** organized by the Electronics and Instrumentation Engineering Department, NIT, Silchar, 15-19 July 2020.

55. One Week TEQIP-III sponsored Short-Term Course on **"Nascent Research Methodology: Challenges and Various Analytical Tools & Techniques"**, Organized by Department of Humanities and Management Science, in collaboration with Sardar Vallabhbhai National Institute of Technology, Surat, Gujarat and Madan Mohan Malaviya University of Technology Gorakhpur, Uttar Pradesh, India, held from 24th -29th June 2020.
56. One-week TEQIP-III sponsored online pedagogical training program on **"Curriculum Design, Delivery and assessment for Outcome based Education"** organized at MMMUT, Gorakhpur during 11-16 May 2020.
57. One-week Faculty Development Programme sponsored by AKTU under TEQIP-III on **"Smart devices and Intelligent Systems (SDIS-2020)"** organized by Electronics Engineering Department, REC, Sonbhadra, 27-31 January 2020.
58. One Week Short Term Course on **"Smart Energy Systems: Operation and Control (SESOC-2019)"** jointly organized by Department of Electrical Engineering MMMUT Gorakhpur and SVNIT Surat held during December 17-22, 2019.
59. One-week Faculty Development Programme endorsed by AICTE/UGC/NBA on **"Selected Topics in Control System Theory-Fundamentals, Advances and Future Directions"** under the agies of Electronics & ICT Academy, MNIT, Jaipur,09-13 August 2018.
60. One-week TEQIP workshop on **"Dynamics and Control of Rotorcraft"** organized at IIT, Kanpur, 02-06 February 2018.
61. One-week TEQIP Short Course on **"Introduction to Robotics"** organized at IIT, Kanpur, 04-08 September 2017.
62. One-week TEQIP-II sponsored Short-Term Course on **"Modelling and Simulation of Microelectronics & Communication Devices and Circuits (MSMDC-2016)"** organized by Department of Electronics and Communication Engineering, MMMUT, Gorakhpur,16-22 December 2016.
63. One-week TEQIP-II sponsored workshop on **"Basic Pedagogy Training: Objective and outcome-based Education System- Transforming Engineering Education to match Global Needs"** organized by EQUATE, New Delhi at MMMUT, Gorakhpur, 12th to 16th June 2015.
64. One-week Short-Term Course on **"Modelling and Control of Power Converters (MACPC-2013)"**organized by Department of Electrical Engineering, MNNIT, Allahabad, 24-28 July 2013.
65. One-week Short-Term Course on **"Advanced Control Systems (ACS-2013)"** organized by Department of Electrical Engineering, MNNIT, Allahabad, 08-12 July 2013.
66. One-week National workshop sponsored by NBHM, DRDO, CSIR, INSA and MNNIT on **"Optimization Techniques & Their Applications (NWOTA-2013)"** organized by Department of Mathematics, MNNIT, Allahabad, 05-11 June 2013.

Professional Training/ Workshop/ Short Term Courses Attended (Two weeks or more)

67. 15 days Industrial Training at 400 KV substation Motiram Adda Gorakhpur from 26 July to 09 August 2021.
68. Two-week Online Faculty Development Programme on **"ICT Tools for Teaching, learning process and Institutes"** supported by MeitY, and jointly organized by the Electronics and ICT Academy, MNIT Jaipur, NIT Patna and PDPM IIITDM Jabalpur, 10-21 August 2020.

69. Two-week Online Faculty Development Programme on **"Advanced Optimization Techniques and Hands-on with MATLAB/SCILAB"** supported by MeitY, and jointly organized by the Electronics and ICT Academy, MNIT Jaipur, NIT Patna and PDPM IIIT DM Jabalpur, 13-24 July 2020.
70. 10-days MHRD/AICTE sponsored summer school on **"Process Instrumentation in Industries"** at UCER, Allahabad, 24 August-04 September 2009.
71. 10 days MHRD/AICTE sponsored summer school on **"Projects in Electrical and Electronics Engineering"** at UCER, Allahabad, 18-29 August 2008.
72. 30 days Vocational Training on **"Short Circuit Analysis and expansion of Power system of TELCO"** at TELCO, Lucknow.

Details of Ph.D. Supervision: 02 (Completed) 09 (In progress)

S. No.	Name of Student	Title/Broad Area	Status/Year
1.	Santosh Kumar Suman (Reg. No.-2018038005) Regular Full-Time	Approximation and Control Design of Large-scale Dynamical Systems Final Defense on **30.11.2021**	Completed November 2021
2.	Brajesh Kumar Singh (Reg. No.-2019038003) Regular Full-Time	Controller Design and Trajectory Planning for Quadrotor UAV System Final Defense on **10.09.2023**	Completed September 2023
3.	Dhanajay Gupta (Reg. No.-2020038002) Regular Full-Time	Investigations on Adaptive Control Schemes Dynamical Systems Co-Supervisor: Prof. V. K. Giri	Submission Awaited (2020)
In Progress			
1.	Deepak Gupta (Reg. No.-2019038008) Part-Time	Stability Analysis and Control Design for Nonlinear Dynamical Systems	In Progress (2019)
2.	Vikas Patel (Reg. No.-2020038011) Part-Time	Control Strategies for Integrated Solar and Wind Power Plants Supervisor: Prof. V. K. Giri	In Progress (2020)
3.	Padmesh Singh (Reg. No.-2020038007) Part-Time	Control Strategies for Power Systems networks	In Progress (2020)
4.	Vineet Kumar Tiwari (Reg. No.-2020038013) Part-Time	Investigations on Control Schemes for the Improved Performance of Hybrid Electric Vehicle Co-Supervisor: Dr. Shekhar Yadav	In Progress (2020)
5.	Jayant Kumar Sahni (Reg. No.-2020038004) Part-Time	Control Applications to Electrical Systems Supervisor: Dr. Shekhar Yadav	In Progress (2020)
6.	Somendra Bannerji (Reg. No.-202203800_) Part-Time	Control Applications to Electrical Systems Co-Supervisor: Prof. V. K. Giri	In Progress (2022)
7.	Neera Yadav (Reg. No.-202203800_) Part-Time	Control Investigations to Delay Systems Co-Supervisor: Prof. V. K. Giri	In Progress (2022)
8.	Roshan Chitranshi (Reg. No.-202203800_) Part-Time	Control Applications to Electrical Systems Co-Supervisor: Prof. V. K. Giri	In Progress (2022)

Details of M.Tech. Supervision:33 (Completed)			
S. No.	**Name of Student**	**Title/Broad Area**	**Status/Year**
1.	Ishita Jindal (Reg. No.-2021033202)	Optimized PID Controllers for Ball and Beam System	Completed (June 2023)
2.	Shivam Chaurasia (Reg. No.-2021033206)	Control Law Design for Inverted Pendulum Cart System	Completed (June 2023)
3.	Ankit Kumar Singh (Reg. No.-2020033204)	Fuzzy Logic Controller Design to stabilize a Standard 24V voltage on DC Solar Micro-grid	Completed (July 2022)
4.	JanmejayNagvanshi (Reg. No.-2020033206)	Modelling, Simulation and Comparative analysis of P&O and FLC based MPPT for Solar PV System	Completed (July 2022)
5.	Navneet Kumar Mishra (Reg. No.-2020033207)	Fuzzy Logic based MPPT for PV System and PID Controller based Battery Charging Hybrid System	Completed (July 2022)
6.	Aditya Kumar Dixit (Reg. No.-2019033201)	Modelling and Control of Hybrid Power System incorporating Battery Energy Storage System	Completed (June 2021)
7.	Anjali Rai (Reg. No.-2019033204)	Design and Implementation of Robust Controller for Ball and Beam System	Completed (June 2021)
8.	Himanshu Pathak (Reg. No.-2019033206)	Fuzzy Logic Controller Design for Load Frequency Control of Three- area Power System	Completed (June 2021)
9.	Pooja Rai (Reg. No.-2019033212)	Improved Boiler Automation System for Thermal Power Plant through PLC and SCADA	Completed (June 2021)
10.	Sonia Dwivedi (Reg. No.-2019033214)	Design of PID Controller for AVR System through various Optimization Techniques	Completed (June 2021)
11.	Anupama Gupta (Reg. No.-2018033204)	Controller Design for a 2-DOF Planar Robot using PID and SMC Control Strategy	Completed (2020)
12.	Jyoti Singh (Reg. No.-2018033205)	Speed Control of DC Motor with and without Time Delay	Completed (2020)
13.	Kaushal Mourya (Reg. No.-2018033206)	Comparative Performance Analysis of Various Controllers for A Rotary Inverted Pendulum System	Completed (2020)
14.	Priyanka Shukla (Reg. No.-2018033208)	Modelling and Simulation by using Sliding Mode Control based on Backstepping Technique of a Quadrotor UAV System	Completed (2020)
15.	Shivangi Agarwal (Reg. No.-2018033214)	Modeling and Simulation of a Variable Frequency Transformer	Completed (2020)
16.	Dhananjay Gupta	Optimal and Suboptimal Control design for Magnetic	Completed

	(Reg. No.-2017033205)	Levitation System	(2019)
17.	Girijendra Tripathi (Reg. No.-2017033206)	Balanced Truncation based Model Order Reduction and Controller Design	Completed (2019)
18.	Km. Seema Chaudhary (Reg. No.-2017033211)	An Investigation into Control Strategies for Twin Rotor MIMO Systems	Completed (2019)
19.	Sanjay Kumar (Reg. No.-2017033114)	Performance Analysis of Solar Energy Harnessing System	Completed (2019)
20.	Brajesh Kumar Singh (Reg. No.-2016033204)	Modelling and Control of Magnetic Levitation System: Backstepping Approach	Completed (2018)
21.	Richa (Reg. No.-2016033208)	An investigation into control and Optimization Strategies for Inverted Pendulum System	Completed (2018)
22.	Mohd. Saif (Reg. No.-2016033214)	Modelling, Simulation and Control of a Twin Rotor MIMO System	Completed (2018)
23.	Gaya Prasad (Reg. No.-2016033216)	Adaptive Control Design for a Robotic Manipulator System	Completed (2018)
24.	Ateet Kumar Srivastava (Reg. No.-2015033204)	Model Order Reduction and Controller Design for Continuous time Interval Systems	Completed (2017)
25.	Diwakar Singh (Reg. No.-2015033205)	ECG data Compression using FAN Technique	Completed (2017)
26.	Manoj Kumar Maurya (Reg. No.-2015033209)	Approximation of Large-Scale Systems using Balanced Truncation Technique and its Controller design	Completed (2017)
27.	Shiv Shankar Kumar (Reg. No.-2015033210)	Fractional System Approximation	Completed (2017)
28.	Shashikant Chaudhary (Reg. No.-2015033216)	Approximation to Non-minimal and unstable MIMO System using Hankel-Norm Reduction	Completed (2017)
29.	Deepak Gupta (Reg. No.-2014033202)	An analysis into Model Order Reduction for Linear Large-Scale Dynamical Systems using Balanced Realization Method	Completed (2016)
30.	Manish Kumar Gupta (Reg. No.-2014033204)	Model Reduction of Continuous and Discrete time systems using Differentiation method with Clustering Techniques	Completed (2016)
31.	Nikku Shahi (Reg. No.-2014033207)	Model Order Reduction using Krylov Subspace based Technique.	Completed (2016)

32.	Noor Ahmad (Reg. No.-2014033109)	Zero voltage zero current switching Full Bridge Converter with transformer isolation and Current Doubler Rectifier	Completed (2016)
33.	Shweta Singh (Reg. No.-2014033213)	Fuzzy Logic based MPPT scheme for SEPIC Converter in Photovoltaic System	Completed (2016)

Details of B.Tech. Project Guided: 24 (Completed), 05 (in progress)

S. No.	Name of Student	Title of the Project	Status/Year
1.	Shivansh Pandey, Harsh Yadav, Shivangi Tiwari and Suyashi Awasthi	Smart Walking Stick: A magical Eye	In Progress (2023-24)
2.	Yashi Yadav, Anupriya Kushwaha, Anupama Singh and Yatharth Singh	Smart Solar powered Lake Cleaner	In Progress (2023-24)
3.	Mahesh Chaube, Shivam Rai, Pragya Gupta and Anant Kumar Gautam	Smart Health Monitoring device	In Progress (2023-24)
4.	Anup Kumar Yadav, Anurag Ranjan PandeyVishal Kumar Singh and Rajkamal Rawat	Intelligent and Automatic Voltage Regulator	In Progress (2023-24)
5.	Navneet Patel, Akshat Sharma, Avinash Kumar Chaurasia Shruti Kumar	Smart Shopping Trolley	In Progress (2023-24)
6.	Km. Sristi Verma, Surbhi Srivastava, Tanya Shukla Jeevesh Narayan Rai and Durgesh Singh	Power Grid Synchronization Failure Detection Device	Completed (2023)
7.	Ratika Puri, Nitish Kumar, Shikhar Srivastava Sweta Sehgal and Ranjeet Kumar Verma	Adaptive Traffic Signal Control System	Completed (2023)
8.	Ankita Yadav, Animesh Srivastava, Abhishek Kumar Gupta Ashutosh Gupta and Faheem Ahmed	Design of Ultrasonic Blind Walking Stick (Third Eye)	Completed (2023)
9.	Harshwardhan Upadhyay, Ajay Raj Sharma, Arpit Agrahari and Aditya Kumar Singh	Charge while Driving Selected By CSTUP with Financial assistance of Rs. 20,000/-	Completed (2023)

	Harshit Agrahari		
10.	DevanshKatiyar, Devyani Singh, Dhruv Agrawal, Priyam Srivastav and Swati Singh	Advance Driver Assistance System (ADAS)	Completed (2022)
11.	Anshika Srivastava, Anushka Gautam, Apoorva Bharti and Devanshi Saxena	Design and Simulation of BLDC Motor based Unmanned Ariel Vehicle	Completed (2022)
12.	Kushagra Shukla, Piyush Rai, Namrata Srivastava, Farida Khatoon and Amrita Rai	IoT based Industry Protection using Arduino	Completed (2022)
13.	Shashank Dwivedi, Rajkumar, Ritesh Singh, Mohd. Danish and Shikhar Swaroop	Real-timeVehicleTracking with Biometric Security System	Completed (2021)
14.	Harsh Srivastava, Anusha, Harshika Chandra and Chandramani	Accident Alert, Detection and Anti-theft System using Arduino	Completed (2021)
15.	Santosh Jaiswal, Rohit Kumar Verma, Sanchit Singh and ShivamChaurasia	Intelligent Health monitoring System based on IoT	Completed (2021)
16.	Harsh Upadhyay et. al.	GSM based Power Theft Detection	Completed (2021)
17.	Ankur Prajapati, Anshul Verma, Kumar Abhinav and Abhisek Chand Upadhyay	RFID based Petrol Pump Automation	Completed (2021)
18.	Jyotika Agrawal, Avinash, Mukund Kumar Dubey, Nidhi Mishra and Govind Chaudhary	Energy Efficient Air Pollution Monitoring and Control System	Completed (2020)
19.	Akansha Barnwal, Akash Kumar Maurya, Aman Chaurasia, Praveen Kumar Gupta and Vandana Sharma	Real-time Bilateral visitor Counter	Completed (2020)
20.	Abhisek Kumar, Ruchika Singh, Sandeep Kumar and Shantani Sinha	Line Follower differential wheeled Robot using Arduino	Completed (2019)
21.	Ajit Kumar Tiwari, Aman Yadav,	Automatic Railway crossing Gate Control	Completed (2019)

	Ramendra Singh, Shiv Shankar and Saurabh Joshi		
22.	Jay Singh Chauhan, Kauts Singh Patel, Ketan Srivastava, Devesh Kumar and Santosh Pandey	Android Controlled Car	Completed (2019)
23.	Bhupendra Nath Pandey, Somya Pant, Tushar Srivastava and Vikas Kumar	GSM based wireless LED Display System	Completed (2018)
24.	Shivangi Srivastava, Surabhi Sharma, Mohammad Mehtab and Sandeep Kumar	GSM based Automatic Energy Meter reading with Load Control and Instant Billing	Completed (2018)
25.	Diksha Sharma, Snigdha Singh, Purish Tripathi and Nitish Singh	Remote Alignment of 3D Dish Positioning System by Android Application	Completed (2017)
26.	Pramod Kumar Bharti, Hariom Tiwari, Amit Kumar yadav and Akhilesh Yadav	Cell Phone Controlled Robotic Vehicle	Completed (2017)
27.	Shalvi Kanchan, Iram Parvaz, Akansha Manwal and Jyoti Singh	GSM based Irrigation Control System	Completed (2017)
28.	Pankaj Kumar, Vikas Ranjan, Pradeep Kumar Bharti and Manish Lal Srivastava	Speed Control of BLDC Motor	Completed (2016)
29.	Vishakha, Vishesha, Puja and Ajit Yadav	Harvesting of Solar Energy using Tracker System	Completed (2016)

References:

S. No.	**Name**	**Affiliation**	**Designation**	**Email ID**	**Contact No.**
1.	Prof. Dinesh Chandra	MNNIT Allahabad	Professor	dinuchandra@rediffmail.com	7408702888
2.	Prof. S. Chatterji	NITTTR Chandigarh	Professor	chatterjis@yahoo,com	9872301552
3.	Dr. Lini Mathew	NITTTR Chandigarh	Professor	lenimathew@yahoo.com	9876440458

4.	Prof. RadhakantPadhi	IISc Banglore	Professor	padhi@iisc.ac.in	9900583971
5.	Prof. V. K. Giri	MMMUT Gorakhpur	Professor	vkgee@mmmut.ac.in	9897792404

Declaration

All the above data and facts are true to the best of my knowledge.

Date 28-02-2024.
Place: Gorakhpur

(Awadhesh Kumar)

ANNEXURE 10

For IEC use only	65/1048/DA 2024-05-17

INTERNATIONAL ELECTROTECHNICAL COMMISSION

TC 65: INDUSTRIAL PROCESS MEASUREMENT, CONTROL AND AUTOMATION

Draft agenda for the TC65 plenary meeting to be held in Calgary (CA) the 2024-09-13 following the announcement by the IEC secretariat: 65/1025/AC

Friday March 13th: 8am to 12am and 1.30pm to 5pm MDT / Calgary Local Time

Friday March 13th: 2pm to 6pm and 7.30pm to 11pm UTC

		Documents
	Morning 8am to 12am	
1	Attendees naming convention and code of conduct	
2	Opening of the meeting, Roll call	
3	Approval of the agenda	65/1048/DA
4	Note the confirmation of the minutes of the meeting held in London	65/1010/RM
5	Information from IEC Secretariat	
6	Report from the Secretary on TC 65	
7	Report from WG 1	
8	Report from WG 12 (P&I diagrams, P&ID tools and PCE-CAE tools	
9	Report from JWG 13 (Safety requirements for industrial-process measurement, control, and automation equipment, excluding functional safety)	
10	Report from JWG 14 (Energy Efficiency)	
11	Report from WG 15 (Documents for process industry)	
12	Report from WG 16 (Digital Factory)	
13	Report from JWG 17 (System interface between industrial facilities and the smart grid (linked to JTC 1/SC 41))	
14	Report from WG 18 (Cause and Effect Table)	
15	Report from WG 19 (Life-cycle management for systems and products used in industrial-process measurement, control and automation)	
16	Report from WG 20 (Framework for functional safety and security)	
17	Report from JWG 21 (Smart Manufacturing Reference Model(s) (linked to ISO/TC 184))	
18	Report from WG 22 (Reliability of Automation Devices and Systems)	
19	Report from WG 23 (Smart Manufacturing Framework and Concepts for industrial-process measurement, control and automation)	
20	Report from WG 24 (Asset Administration Shell for Industrial Applications)	
21	Report from AG 4 (TC 65 Properties)	
22	Report from WG 10 (Security for industrial automation and control systems), including Profiles,	
23	To review the work program of TC 65 23.1 Project dates compilation 23.2 Stability dates review 23.3 Convenors approval 23.4 Liaisons review 23.5 Review of P-members participation 23.5 Review the Strategic Business Plan / 3-5 Year Projected Strategic Objectives	
	Afternoon 1:30pm to 5pm	
24	Report from SC 65A (System Aspects)	
25	Report from SC 65B (Measurement and control devices)	
26	Report from SC 65C (Industrial networks)	
27	Report from SC 65E (Devices and integration in enterprise systems)	
28	Report from JAG 25	

29	Report from JAG 26	
30	Report on the JAG 28	
31	Other and Liaison reports and representations i.e. IEC and ISO TCs, ACs	
	31.1 ISO TC 184	
	31.2 CLC TC 65X	
	31.4 ACSEC	
	31.5 ISO IEC JTC 1/SC 27	
	31.6 ISO IEC JTC 1/SC 41	
	31.7 ISO IEC JTC 1/SC 42	
	31.8 SYS Comm	
	31.9 SyC SM	
	31.3 ACOS	
	31.10 SC3D	
31	Any other business:	
30	Resolutions review of additional resolutions	
30	Date and place of next meeting	
31	Closing of the meeting	

Internal