



Bureau of Indian Standards

A Report on Mechanical Engineering Convention

Subject: - Report of **Annual Conventions of BIS** with Deans and HoDs of Mechanical Engg discipline of MoU partner Institutes

Venue : Hotel Sarovar Portico, Goa

Date : 20 & 21 September 2024

BIS organized a Convention for Deans and Heads of Departments (HoDs) of MoU Partner institutions of the Mechanical Engineering discipline. The event took place at Hotel Sarovar Portico on the 20 and 21 September 2024. 73 delegates from MoU partner institutes participated in the convention.

Day 1 (20/09/2024) - Sessions and Activities:

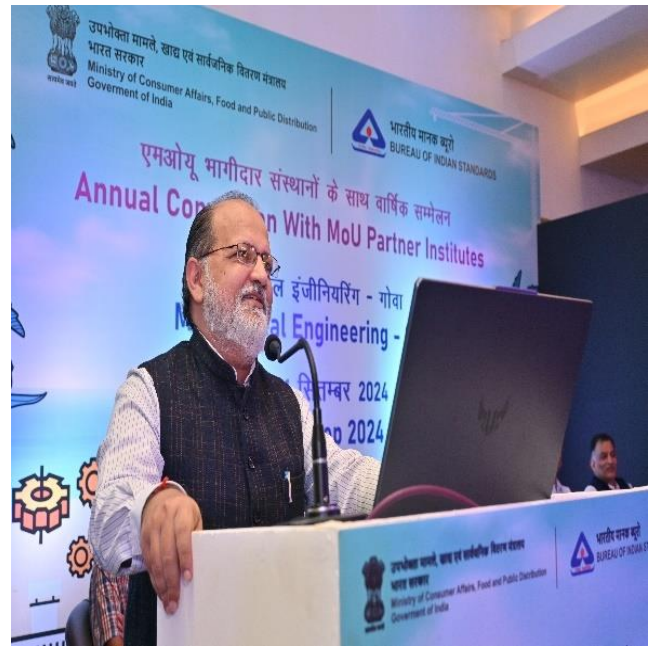
The event started with traditional Lamp lighting ceremony followed by rendering of Manak Geet.





Shri Praveen Khanna DDG (Sothern Region) welcomed all the delegates to the 2 day convention of BIS with Deans and HoDs of Mechanical Engg discipline of MoU partner Institutes and highlighted the critical role of academia in the standardization process. He informed that this is the fourth such convention in the series being conducted by BIS to strengthen the collaboration between BIS and Academia. He underscored the significance of contributions that academicians can make and how these collaborations can drive innovation, enhance the quality of research, and integrate academic insights into national and international standards.

Shri Sanjay Pant DDG Standardization BIS, HQ in his inaugural address outlined the organization's core functions and its critical role in developing and maintaining national standards. Shri Pant elaborated the involvement of stakeholders, comprehensive process of standards formulation thus explaining, the stages of formulation from the initial identification of standardization needs, preparation of draft standards, wide circulation for public comments till the final gazette notification. He further highlighted the importance of stakeholder engagement, including the participation of academia, in ensuring that standards are robust, inclusive, and effective including participation in R & D projects commissioned by BIS.



Shri Deepak Aggarwal, Scientist- F & Head, SCMD took a session on Standards Formulation. During the session he covered the processes and methodologies involved in developing and implementing standards, the role of various stakeholders, and the importance of standardization in ensuring quality and safety across different sectors. He also highlighted the contributions of BIS at international level in development of International Standards like (ISO/IEC). The role and importance of Indian Standards in conformity assessment schemes of BIS was explained which ensures best quality product and services as per the Indian standards; which lay down the requisite parameters as per the stated and implied needs of the customer encompassing latest technologies.

Shri K V Rao, Scientist- F & Head, MED gave live demonstration to the participants about BIS care application explaining all the features especially 'know your standards' which enables a user to view/download the required Standards by simply entering the IS No or the keyword for search. Shri Rao then conducted a group exercise aimed at identification of new subjects/area in the domain of Mechanical Engineering which can be taken up for Standardization in the near future.



Shri R. R. Singh, Scientist- F & Head, PGD in his presentation covered a wide range of activities and areas covered in standardization in the field of Mechanical Engineering. He detailed the processes of standards formulation, constitution and composition of Technical Committees, Positions vacant for Academia in respective TCs, significance of contributions of the stockholders in the Mechanical Engg, Production and General Engg as well as Transportation Engg Division Councils at national and international level. The areas where academia can contribute and are open for memberships from academic institutes were outlined and he urged the delegates for nominating members from their respective institutes.

Shri Mitra Sen Verma, Scientist-D, TED gave a presentation on role of BIS in standardization at international level and involvement of BIS as National Standards Body at ISO/IEC level. He also elaborated on the current New Work Item Proposals (NWIPs) in ISO/IEC where India can take up leadership role by engaging suitable experts from Academic Institutes as well as Industry. It was also highlighted that there is an immediate need of experts in various areas of mechanical engineering to respond to the documents received at various stages of international standards formulation. The process to submit new proposals internationally for formulation of New Standards was also explained to the delegates during session.





Shri Praseon Yadav, Scientist-C, MED gave a live demonstration of Digital Solutions available at BIS website. He showcased the latest digital initiatives and platforms especially the features of Academic Dashboard developed to streamline the standardization process and making it more accessible and efficient for the MOU partner institutes. He also illustrated how these tools are designed to facilitate greater participation from academia and other stakeholders by providing easy access to draft standards, enabling the submission of comments and suggestions, participation in R & D projects and offering a range of other interactive features to enhance collaboration.

Shri, Gaurav Jayswal, Scientist-C, TED gave presentation focusing on green mobility, which encompasses the development and implementation of standards for sustainable and environmentally friendly transportation solutions such as E-vehicles and Hydrogen based technology. He informed about the technologies used for production of green hydrogen, its storage, transportation and dispensation. He also highlighted the role and contribution of BIS in National Green Hydrogen Mission (NGHM) of Govt. of India, by developing standards on generation, storage, transportation and dispensation of Green Hydrogen. The benefits and challenges in green hydrogen fuel ecosystem were also explained to the participants.



Shri Kundan Giri, Scientist-C, MED gave a presentation on standardization in the field of Industrial Automation and Robotics wherein he informed about various type of robots and their applications. He informed the innovations in robotics, technological advancement, test methods and important role of standardization in the world of robotics.

He urged the delegates to go through the Programme of work related to the PGD committees and suggest new subject areas in this emerging field.

Sharing of experiences of BIS Activities at MoU Institutes:

The experience of MoU partner Institutes was shared as under:



Dr. Raman Bedi, Dean Academic, Dr. B R Ambedkar National Institute of Technology, Jalandhar expressed his satisfying experience with BIS after signing MoU. He informed that after MoU, they have organized many activities like formulation of standard clubs, quality connect, sensitization programmes to faculty as well as to the students etc. He was happy to share that 27 R & D projects were already awarded to NIT Jalandhar by BIS, which are underway. He appreciated the active efforts of BIS at various levels to strengthen quality ecosystem by sensitizing the young generation about the benefits of standardization.

Dr. A Rajendra Prasad, Dean, Sri Sai Ram Engineering College, Chennai gave presentation showcasing the dedicated efforts of BIS in the Institute. A credit course on standardization has been incorporated in the curriculum for the academic year 2024-25. He informed that institute has started standards clubs in every department and also all the other institutions in their group. His presentation included the photos and videos of various activities under standard clubs, sensitization to faculty and students, lectures on standards. He informed that students are now more aware about Indian Standards and their importance. He expressed his gratitude for the steps taken by BIS and assured full cooperation in the future.



Prof Somnath Chattopadhyaya, Professor and HoD, Mech. Engg., Indian Institute of Technology (ISM), Dhanbad appreciated the initiatives taken by BIS and actively holding the responsibility under MoU. He informed that ISM Dhanbad is presently carrying out 3 R & D projects in the field of mechanical engineering awarded by BIS. A team of BIS officers from Mechanical engineering departments i.e. MED, PGD and TED had visited IIT (ISM) in the month of May 2024 and gave insights of the standardization activity by these departments, to the faculty members. They have also interacted with start-ups and explained them regarding the availability of standards and certification procedures. The team has visited laboratories having 3D metal printing and several 'state of the art' test facilities as well.

Day 2 (21-09-2024) – Interaction and Field visit:

The second day of the convention focused on strengthening the collaboration between BIS and academic institutions, particularly in enhancing the existing Memoranda of Understanding (MoUs). The Keynote Address by Shri Sanjay Pant, DDG (Standardization-ii) focused on building a strategic roadmap for integrating BIS standards into academic research and curricula. He emphasized the significance of prioritizing Indian Standards (IS) in research papers and academic work, advocating for the use of Indian standards over international alternatives. He also underscored the crucial role academic institutions would play in actively promoting Indian standards through their research contributions, apart from active participation of faculty members in the standardization work.



Identification of New subjects/areas for Standardization:

In order to make programme more interactive and engaging an exercise session was conducted. During the session each of the participant was given a task to identify key areas where new standards are needed. Delegates engaged actively and pin-pointed following area for standardization.

Sl. No.	Institute	Name of Delegate	New Subject/area proposed for Standardization	Remarks
1.	Sri Venkateswara College of Engineering (SVCE), Sriperumbudur	Dr. R Ramesh <i>Professor/Dean(AD)</i>	1) Disposal of polymer composite components	Since disposal of polymer-based structures/ components/parts are very frequent after replacement in many products. This initiative helps environment and ecology control providing categorisation over polymeric material by which type of polymeric material it is made of and

				subsequently norms and standards to save ecology.
2.	IIT Bombay, Mumbai	Prof. Rakesh G Mote	2) Precision machine tools 3) Thermal management system for precision machining 4) Tooling for ultra-precision machining 5) Nano-cutting fluids – Safety	-
3.	BITS Pilani, Pilani Campus	Prof. P Srinivasan	6) Lab experimental setup for heat transfer 7) High temperature materials for solar thermal storage system 8) Creep testing of high temperature gas turbine blades 9) Thermal fatigue of polymers and plastics 10) Thermal management of EV batteries 11) Boiler component manufacturing 12) Boiler / Power plant inspection	-
4.	Thapar Institute of Engineering Technology, Patiala	Dr. Tarun K Bera	13) Exoskeleton robots 14) Obstacle avoidance of robots considering dynamics 15) Humanoid robots	-
5.	PSNA College of Engineering and Technology, Dindigul	Mr. Gowthaman J	16) Medical equipment such as Novo Fine pen 17) Insulin cartridges of same size 18) Shirt and pant sizes 19) Shoe/footwear sizes	

6.	Bundelkhand Institute of Engineering and Technology, Jhansi	Prof. NP Yadav <i>Professor and Head, Mechanical Engineering</i>	20) Heat pipe application for cooling of electronic component and other heat exchanger area	
7.	IIT Patna	Dr. Anirban Bhattacharya	21) Procedure for cross-tensile tests 22) Mechanical tests of fiber metal laminates 23) Testing methods of lap joints	
8.	Sri Sai Ram Engineering College, Chennai	Dr. N. Mani	24) Drones 25) Pen 26) Eraser	
9.	NIT Trichy	K Pannirselvam	27) Laboratory equipment used for engineering education and technical training 28) Code of practice for conduct of personal interviews ensuring transparency, uniformity and no favouritism 29) Code of practice for digitization of stock keeping and inventory management	
10.	BITS Pilani, Pilani Campus	Prof. Srikanta Routroy <i>HoD Mechanical</i>	30) Online examination system 31) 3D printing	
11.	Chandigarh College of Engineering and Technology, Chandigarh	Dr. Jatinder Madan <i>Prof. and Head, Mechanical Engineering</i>	32) Interchangeable packing material (such as glass jars/bottles) for sustainability/circular economy	
12.	Sri Venkateswara College of Engineering (SVCE), Sriperumbudur	Dr. S Ramesh Babu	33) Additive manufacturing 34) Stir casting 35) FRP composite 36) Aluminium composite	

13.	NIT Srinagar	Prof. GA Harmain <i>Professor (HAG) and Dean Faculty Welfare</i>	37) Fracture toughness (ASTM E399) 38) Propagating cracks (ASTM E647) 39) Crack closure phenomenon 40) Crack Tip Opening Displacement (CTOD)	
14.	NIT Srinagar	Prof. Adnan Qayoum <i>Professor and Head</i>	41) Environment friendly insulation materials 42) Measurement of thermophysical properties (like thermal conductivity of new materials)	This will help in the use of these new materials in building replacing conventional materials.
15.	VJTI, Mumbai	Dr. VM Phalle	43) Monorail standards	
16.	Sri Sai Ram Engineering College, Chennai	Dr. A Rajendra Prasad	44) Drones	In drones one standard available. But no design standards, size, and material standards not available.
17.	GB Pant University of Agriculture and Technology, Pantnagar	L Varshney <i>Prof and Head, Mechanical Engineering</i>	45) Different types of solar air heaters	
18.	BMS Institute of Technology & Management, Bengaluru	Dr. Nagamadhu M	46) Vibration testing standards 47) Dynamic mechanical analyser testing standards	
19.	PSNA College of Engineering and Technology, Dindigul	Dr. V Paramasivam <i>Professor/Mechanical Engg.</i>	48) Vegetables and fruits being sold in the open market 49) Meals served in hotels to be checked and standard and approved ingredients to be used for the preparation in hotels	More pesticides are being used more harmful chemicals may be taken along with food. This may be standardized by chemicals being used. Monitoring system/inspection methodology to be adopted to check the content of chemicals in products.

20.	Veer Surendra Sai University of Technology, Burla, Odisha	Prof. Debadutta Mishra <i>Dean, School of Mechanical Sciences</i>	50) Laser drilling process (for polymer matrix composites) 51) 3D printing of polymer matrix composites	
21.	Parul Uiversity, Vadodara	Prof. Imran Molvi	52) Process of fuel blending or mixing and its storage part	
22.	College of Engineering Andhra University, Visakhapatnam	Prof. Koonna Ramji	53) Power spectral density for Indian roads – Road undulation measurement	
23.	NIT Uttarakhand	Dr. Sanat Agrawal <i>Dean R&D</i>	54) Additive manufacturing or 3D printing 55) Computer-aided design (CAD)	<p>- There is an ISO standard on it. It is called ISO 10303 informally called 'STEP' standard for the exchange of product model data. This can be adopted as it is.</p> <p>There is "National Strategy of Additive Manufacturing" formed in Feb 2022. Therefore, it is desirable that we have a standard in India as well.</p> <p>- There is ANSI, DXF and IGES standard for CAD.</p>
24.	Rajagiri School Engineering and Technology, Kochi	Dr. Matthew Joseph <i>Head, ME Department</i>	56) Characterisation of paraffin wax for latent heat storage applications for electric vehicles battery thermal management system 57) Characterisation of nanofluids for heat transfer applications	
25.	NIT Jamshedpur	Dr. Ashok Kumar Mandal <i>Associate Dean, Research and Consultancy</i>	58) Musical instruments (Guitar, Violin, Sitar, Veena, table, Sarod, etc.) 59) Music therapy	<p>Justification:</p> <p>- Many low cost instruments does not have required structural strength / low life</p>

				<p>- Some instruments purchased are not acoustically good.</p> <p>- Music is a very intricate subject from Indian knowledge point of view. A wrong approach (incorrect sound/frequency) may cause deep disorder.</p> <p>Justification: Now a days there is growing demand of music therapy. It was a well-developed subject in India. Lost most of the things now. But again started developments. Many organizations are working on it. It needs standardization because chances of disorder due to wrong training is very much possible.</p>
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Suggestions by participants to make MoU more effective:

The keynote address was followed by an interactive session where participants gave their suggestions to improve the integration of BIS activities with MoU Institutions. The suggestions from various MoU partner Institutes are given as under:

Institutes	Suggestions
Prof. Rakesh g Mote- IIT Mumbai	<ul style="list-style-type: none"> • An Indian standard may be developed for methodology to carrying out research by research scholars and the same can be utilized by all the institutions in India. • Dissemination of awareness /standardization at grass root level for MSME • Online courses for students with e-certificate by BIS • Guest lecture at Institute • The duration of internship can match with the vacation of Institute
Prof. Vimlesh Kumar Soni- Maulana Azad National Institute of Technology (MANIT), Bhopal	<ul style="list-style-type: none"> • The AICT/UGC may be contacted to introduce mandatory course in technical institutions • A course may be registered in mooc.org which give online learning platform with 30 %

	credit course which can be earned by students
Prof. Somnath Chatterjee – Indian Institute of Technology (ISM), Dhanbad	<ul style="list-style-type: none"> • Need to develop one text book on specified subjects linking standards with text book syllabus • Online course for students through YouTube videos
Dr. Neeraj Aggarwal- Dr Babasaheb Ambedkar Technological University, Raigad	<ul style="list-style-type: none"> • Design a course for Post Diploma in Standardization • Case studies would be helpful in developing standards • Faculty of the institutes can be trained for taking classes on standards • Laboratory setup needs to be standardized for educational institutes
Dr. Anirban Bhattacharya - IIT Patna	Making academic dashboard user friendly to get specific area wise segregation of subjects to respond document under development for standardization
Dr. G Rajamohan- National Institute of Advanced Manufacturing Technology, Ranchi	<ul style="list-style-type: none"> • National Standards day may be celebrated in institutes on 6th January each year • “Elemental Aspects of Standardization” as a course may be integrated with technical course
Prof. Shrinivasan Periaswamy and Prof. Srikanta Routroy- Birla Institute of Technology & Science, Pilani	<ul style="list-style-type: none"> • ASTM standards should be replaced by Indian Standards in all the reference documents at Institute • Rigorous Implementation of Standards should be ensured • Process of becoming member may be shared with all in group
Prof. Asimava Roy Choudhary-IITK and Dr Dr. Anirban Bhattacharya - IITP	<ul style="list-style-type: none"> • A module may be developed to standardized research methodology • Industry can be included in conventions and sector wise convention may also be planned with all stakeholders
Dr. A Rajendra Prasad and Dr. N Mani-Sairam College Chennai	<ul style="list-style-type: none"> • BIS should conduct faculty training for conducting of technical sessions on standardization for students and research scholars • Establishing nodal centers in engineering colleges as well as schools to promote standardization awareness from the student level itself • Setting up testing facilities in engineering institutions; for utilization in the R & D projects as well as to support conformity assessment scheme of BIS
Prof. Koonam Ramji and Dr. Putti Srinivasa Rao, College of Engineering Andhra University, Visakhapatnam	<ul style="list-style-type: none"> • Showcasing the achievements • Support may be given to Innovation centers and startups

Asst. Prof. Manoj Kumar Sinha-NIT Kurukshetra	<ul style="list-style-type: none"> • Adequate training to be provided to teachers to make them available to teach standardization in institute • Each year of students of engineering should be sensitized
Dr Sanat Aggarwal-National Institute of Technology, Uttrakhand	HoDs to be proposed as TC members
Prof. Raman Bedi - NIT Jalandhar	MoU can be strengthened by collaborative efforts
Prof. Debadutta Mishra-VSSUT, Odisha	The international standards to be replaced with Indian Standards
Prof Kaushik M Patil-Nirma University, Ahmedabad	Duration of R & D Projects may be increased to 6 months
Prof Rajendra Dalu- Govt College of Engineering, Amravati	there should be 'Annual Activity plan' with each mou institution followed by six monthly progress review (online). This will help to keep the things on track.
Prof. Tarun K Bera Thapar Institute of Engineering and Technology	<ul style="list-style-type: none"> • In Mechanical Engineering, there are approximately 40 subjects. In each subject, there may be 6 to 8 chapters. If it is possible for the BIS officials to send the list of BIS codes for each subject separately, it will be easy for faculty members to explore the codes. • Application of codes by the engineering students is more important than to the sensitization among school children.
Dr KKJAIN, NITTTTR Bhopal	<ul style="list-style-type: none"> • Integrating BIS standards into the Mechanical Engineering curriculum. • Conducting FDP programs focused on BIS standards. • Facilitating industry projects aligned with BIS norms. • Organizing student competitions centered around standardization. • Promoting collaborative research and standard development initiatives.

Actionable Points and Key Takeaways:

1. The professors of MoU institutes may be actively involved in standards formulation activity based on their area of expertise. For this purpose, BIS may collect the information on areas of expertise from the participants to enable BIS to include faculty members in the technical committees.
2. A **Massive Open Online Course (MOOC)** is an online course designed for unlimited participation and open access via the web. This will serve the purpose of credit course on Standardization. To design MOOC course for uploading on NPTEL, a task force may be created including IIT Kanpur, IIT Bombay, IIT Patna or any other IIT as per the requirement.
3. Training of trainer's session of faculty may be taken up in MoU partner Institutes. The professors may be involved to design sessions for students in the identified areas as per their area of expertise.

4. To standardize research methodology being adopted by research scholars, we may start working on code of practice applicable in Research applications with a clear objective of conducting R & D to standardization. IIT Bombay may be made convener of task force and a letter may be sent to IITB for seeking their consent for involvement.
5. The WhatsApp group to be kept live and the information of documents under development in MED, PGD & TED to be shared with all institutes for their comments.
6. **Convergence Research based Standardization (CReSt):** A quarterly magazine collating the R & D projects, which can be translated into National Standards aimed at the welfare of the society at large can be published by BIS based on inputs from the faculty members/researchers of MoU Partner Institutes and BIS officers.

The convention concluded with a field visit for all the delegates. All participants expressed their gratitude to BIS for organizing such a well-executed event. This convention is expected to significantly benefit the collaboration between the organizations, serving the broad national interest in the future.