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BUREAU OF INDIAN STANDARDS

DRFAT AGENDA

Name of the Committee	No. of Meeting	Day	Date	Time	Venue
Rotating Machinery Sectional Committee ETD 15	33rd	Friday	17th Nov 2023	11.00 AM	WebEx (Online)

CHAIRMAN : Shri Mukesh K Maravi **MEMBER SECRETARY** : Ms. Neha Agarwal

Item 0 GENERAL

0.1 Welcome and Opening Remarks by the Chairman

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

1.1 The minutes of the 32nd meeting of Rotating Machinery Sectional Committee, ETD 15 held on 27th June 2023 were circulated vide BISDG letter no. ETD 15/A-2.32 dated 22 July 2023.

No comments received.

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

Item 2 COMPOSITION OF ROTATING MACHINERY SECTIONAL COMMITTEE, ETD 15

2.1 The present composition of the Sectional Committee ETD 15 is given in Annexure 1.

The committee may review.

2.2 Duties and Responsibilities of Technical Committee Members – Signing of Declaration

During the review of standardization activities under 16 Division Councils, the Competent Authority of the Bureau of Indian Standards has decided that each of the members of a Technical Committee shall sign a declaration concerning the duties and responsibilities of the member of a Technical Committee in the form prescribed by BIS.

The members shall note and send signed declaration, if not already sent.

Item 3 IDENTIFICATION OF RESEARCH AND DEVELOPMENT PROJECTS FOR FORMULATION AND REVIEW OF STANDARDS

BIS vide email dated 18 October 2023 circulated the new 'Guidelines for Research & Development Projects for Formulation and Review of Standards' (copy enclosed) (Annex 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 using the enclosed template for Terms of Reference (ToR).

ToR on the following subjects are proposed:

a) Title of the project: Revision of IS 7538: 1996 'Three - Phase squirrel cage induction motors for centrifugal pumps for agricultural application – Specification'
b) Title of the project: Revision of IS 7572: 1974 'Guide for testing single - Phase AC and universal motors'
c) Title of the project: Revision of IS 9283: 2003 'Motors for Submersible pump sets – Specification
d) Title of the project: Revision of IS 9320: 1979 'Guide for testing direct - Current (DC) machines'.
e) Title of the project: Revision of IS 12075: 2008 'Mechanical Vibration of Rotating Electrical Machines with Shaft Heights 56 Mm and Higher - Measurement Evaluation and Limits of Vibration Severity'

Detailed Term of Reference (ToR) is placed at Annex 3. The committee may approve.

Item 4 DATE AND PLACE FOR THE NEXT MEETING

Item 5 ANY OTHER BUSINESS

ANNEX 1

Composition

S.No.	Organization	Member Name	Member Email	Mobile	Role
1.	Bharat Heavy Electricals Limited, Bhopal	Shri Mukesh Kumar Maravi	mkmaravi@bhel.in	9425604719	Chairperson
2.	Asea Brown Boveri Limited, Faridabad	Shri Sumit Tyagi	sumit.tyagi@in.abb.com	9811235377	AM
		Shri Lokesh B M	lokesh.b.m@in.abb.com	9901490175	PM
3.	Bharat Bijlee Limited, Mumbai	Shri Salil Kumar	salil.kumar@bharatbijlee.com	9867407257	PM
		Shri Bhagyashree Sanjay Pawar	bhagyashree.pawar@bharatbijlee.com	9870105374	AM
4.	Bharat Heavy Electrical Limited, New Delhi	Shri Krushna Chandra Panda	kcpanda@bhel.in	9490746762	PM
		Shri P Dali Naidu	dalinaidu@bhel.in	9490473788	AM
5.	CG Power and Industrial Solutions, Mumbai	Shri A. Sudhakaran	sudhakaran.achuthan@cgglobal.com	9168129444	PM
		Shri Prashant Ankalhope	prashant.ankaikhope@cgglobal.com		AM
		Shri Bhupendra Nema	Bhupendrs.nema@cgglobal.com		AM
6.	Central Electricity Authority, New Delhi	Shri Prabhjot Singh Sahi	prabhjot.sahi@nic.in	9872611236	PM
		shri Jugal Kishor	jk.kishor@gov.in	7889086619	AM
		Shri Reetesh Tiwari	reeteshtiwari.cea@nic.in, hetdcea@nic.in	7042866022	AM
7.	Central Power Research Institute, Bengaluru	Shri S Prashob	prashob@cpri.in	8089025027	PM
8.	Development Commissioner Micro-Small and Medium Enterprises	Shri S K Saini	sunilk.saini@nic.in	9205321086	PM
9.	Electrical Research and Development Association, Vadodara	Shri Ravi Singh	ravi.singh@erda.org	9978940998	PM
		Shri Jitendra Tahilwani	j.tahilwani@erda.org		AM
10.	Engineers India Limited, New Delhi	Shri S Srihari	srihari.s@eil.co.in	9717855711	AM
		Shri Raman Sood	raman.sood@eil.co.in	9818688709	PM
		Shree Ravish K. Raman	ravish.raman@eil.co.in	9953198847	AM
11.	Havells India Limited, Noida	SH ANIL SUKUMAR AKOLE	anil.akole@havells.com	9766358333	PM
		Sassikumar J.	sassi.j@havells.com	9773839191	AM
12.	Hindustan Electric Motors, Mumbai	Shri Sanjay P. Jadia	spjadia@hindmotors.com, spjadiahmm@gmail.com	9820026739	PM
		Shri Dilip Bhave	dilipnbhave@gmail.com		AM
13.	Indian Electrical and Electronics Manufacturers Association, New Delhi	Shri K. Seetharaman	k.seetharaman@ieema.org	9980004982	PM
		Shri Praveen kumar	praveen.kumar@rotomotive.com		AM
14.	Indian Institute of Technology Delhi, New Delhi	Prof .Anil Verma	anilverma@chemical.iitd.ac.in	1126597304	PM
		Dr. Pravin P Ingole	ppingole@chemistry.iitd.ac.in		AM
15.	Indian Pump Manufacturers Association, Mumbai	Shri Utkarsh Chaya	be@watermanpump.com, president@indianpumps.org	9978900506	AM
		Shri K.V. Karthik	karthik@deccanindustries.com, siema@siema.org	9894296960	PM
		Shri ANOOP AGARWAL	anoop.agarwal@pluga.com	7226052757	AM

16.	Ingersoll Rand India Limited, Ahmedabad	Shri Kaushal Pandya	kaushal_pandya@irco.com	9978995544	PM
		Shri Harsh Shukla	harsh.shukla@irco.com	9924483098	AM
17.	Integrated Electric Limited, Gurugram	Dr. Praveen Vijayraghavan	praveen1@int-elec.com		PM
18.	International Copper Association India, Mumbai	Shri K N Hemanth Kumar	hemanth.kumar@copperalliance.org	9582236644	PM
		Shri Jyotish Pande	jyotish.pande@copperalliance.org	9810023544	AM
		Shri Sanjay Namdeo	Sanjay.namdeo@copperalliance.org		AM
19.	KSB Pumps Limited, Pune	Shri Rajesh B Gote	rajesh.gote@ksb.com	9881266160	PM
		Shri Dattatray Katkar	dattatray.katkar@ksb.com	8424005635	AM
20.	Marathon Electric Motors (India) Limited, Kolkata	Shri Rajiv Ranjan	rajiv.ranjan@marathonelectric.com	9903900820	PM
21.	NTPC Limited, New Delhi	Shri S. N. Tripathi	shaktintripathi@ntpc.co.in	9650999688	AM
		Shri BVVS Ganesh	bvvsganesh@ntpc.co.in	9650999581	PM
22.	Nuclear Power Corporation of India Limited, Mumbai	SHRI S K TIWARI	sanjivtiwari@npcil.co.in	9820749030	PM
		Dr Dhanashree V Vyawahare	vdhanashree@npcil.co.in, dhanashree.vyawahare@gmail.com	9833238025	AM
23.	Scientific and Industrial Testing and Research Centre, Coimbatore	Shri A. M. Selvaraj	jd@sitarc.com, sitarcinfo@sitarc.com	9487600473	PM
		Dr. K Ulaganathan	director@sitarc.com	9487740473	PM
		Shri V. Krishnamoorthy	sitarcinfo@sitarc.com		AM
24.	Siemens Limited, Mumbai	Shri Ashish Shere	ashish.shere@siemens.com	9833954795	AM
		Shri Pradeep Ranade	pradeep.ranade@siemens.com		PM
		Shri Prasad Hardikar	prasad.hardikar@siemens.com		AM
25.	Southern India Engineering Manufacturers Association, Coimbatore	Dr. R. Subramanian	rama.smani@gmail.com		PM
		Shri Arun Kumar	arunkumars@deccanindustries.com	9865809696	AM
26.	Steel Authority of India Limited (SAIL), New Delhi	Shri Madhupriya	madhu.priya@sailcet.co.in	8986880489	PM
27.	Testing Electrical Standards Laboratory and R&D Institute Private Limited, Gandhinagar	Shri Ankit Jain	akj@teslacentre.co.in	7203025333	PM
		Shri Mintej Jani	mintej.jani@teslacentre.co.in	7203025335	AM
28.	Thyssenkrupp Industrial Solutions (India) Private Limited, Mumbai	Shri Vaijnath G. Sangekar	vaijanath.sangekar@thyssenkrupp.com	7030210168	AM
		Shri Charuta Vikram Mulay	charuta.mulay@thyssenkrupp.com	9001101814	PM
29.	Toshiba Mitsubishi-Electric Industrial Systems Corporation, Bengaluru	Shri Sudheer Tapaskar	Sudheer.tapaskar@tmeic.in	7042342266	PM
		Shri Manish Joshi	manish.joshi@tmeic.in	9810172546	AM
		Shri Venkatesulu Thumbur	Venkatesulu.Thumbur@tmeic.in		AM

Annex - 2

GUIDELINES FOR RESEARCH & DEVELOPMENT PROJECTS FOR FORMULATION AND REVIEW OF STANDARDS

1 INTRODUCTION

Bureau of Indian Standards (BIS), as the National Standards Body of India is responsible for formulating Indian Standards for products, processes and services. In the pursuit of this endeavour, it has so far developed more than 22000 Indian Standards. Action Research and Research & Development Projects have always been part of the standardization process. However, there has been a growing realisation in the context of the increasing diversification, innovation and complexities in the manufacturing sector and evolution of services and also due to the fast pace of changes in the manufacturing and services landscapes, research & development projects have to be made an integral part of the standardization process. The idea is that in principle no standard should be developed without intensive and insightful research work, which is not confined only to the review of the existing literature and focus group discussions on the subject chosen for standardization, but also covers the detailed field level study of the existing processes and practices in product manufacturing and service delivery. This requires a large network of domain area experts to carry out the research & development work. The existing network encompasses only a small segment of experts, who are either associated with technical committees as members or belong to some R&D organizations. The Memorandum of Understanding with the premier educational institutions imparting technical and professional education opens the window to the opportunities to expand this network substantially by utilizing the intellectual capital that resides with the faculty and the research scholars in these institutions. This association is conceived not only as a way to promote research & development work necessary for standards formulation but also to enrich the research ecosystem in these educational institutions.

2 OBJECTIVES

Objectives of this Scheme are to:

2.1 support and commission research & development projects to generate knowledge, empirical data and insights that would help in formulating new standards and updating & upgrading the existing Indian standards;

2.2 expand the network of domain area experts to carryout research & development projects in the areas related to standardization and conformity assessment; and

2.3 enrich the research ecosystem in the educational institutions imparting technical and professional education.

3 RESEARCH & DEVELOPMENT PROJECTS

3.1 Research & development projects under these guidelines are described as follows:

A project aimed at comprehensive, in depth and incisive study of a product, process or service or all taken together in respect of a subject under standardization, encompassing literature review, analysis of the data from secondary sources, collection and analysis of data from primary sources and stakeholder consultations.

3.2 The duration of a project shall not exceed six months counted from the date of the award of the project to acceptance of the final report by the Sectional Committee concerned, provided that the Sectional Committee must not take more than one month to give its decision on the final report. Further provided that the time taken by the Sectional Committee for giving its decision shall not be counted. The Sectional Committee may extend the duration but for not more than 2 months in special circumstances, the reasons for which shall be recorded in the minutes of meeting of the Sectional Committee.

3.3 The upper limit for expenditure for a project shall be Rs 10 lakhs (including taxes) only.

3.4 BIS will publish a list of research & development projects along with Terms of Reference (ToR) on Standardization portal or any other suitable digital platform.

3.5 If any organization or an expert on behalf of an institute wants to propose a research & development project on any new and emerging area in which they have expertise, they can do so through the same platform for the consideration of the Sectional Committee.

4 TERMS OF REFERENCE (ToR)

4.1 The ToR of Research& development project shall be prepared by the Sectional Committee concerned, and shall contain:

a) Title, background and objectives of the study;
b) Expected research methodology (brief information, for example, survey, testing, industry visits, etc.);
c) Scope of study;
d) Outline of the tasks and final deliverables expected from the Proposers;
e) Methods of review, schedule for submitting the 1st draft report and project completion report;
f) Any support or inputs to be provided to the Proposer; and
g) Maximum duration of project and timelines for submission of proposal.

4.2 While preparing the Terms of Reference (ToR) 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.

5 APPROVAL OF COMISSIONING OF THE RESEARCH AND DEVELOPMENT PROJECTS

5.1 There shall be a Review Committee for approving the projects recommended by the Sectional Committee. The composition of Review Committee shall be as follows:

DDG (SCMD)	: Chairperson
DDG (Standardization) concerned	: Member
DDG (Certification)	: Member
DDG (Labs)	: Member
Officer in-charge for research works in SCMD	: Member Secretary

5.2 The Head of Technical Department concerned and Member Secretary of the Sectional Committee shall apprise the review committee about the project and explain the rationale behind the proposed research & development project.

6 ELIGIBILITY CRITERIA

6.1 The following shall be eligible for carrying out research & development projects under the Scheme:

a) Academic institutions & universities having MoU with BIS and faculties and research scholars thereof;
b) Member(s) of Technical Committees of BIS.

6.2 Faculties and research scholars shall submit proposals through their institute. Members of technical committees belonging to any association/organization shall submit the proposals through their association/organization. Members of technical committees in personal capacity can submit their proposals directly to BIS, however if carrying out a research & development project requires collaboration with any institution/organization, concurrence of the same shall also be submitted.

7 PROCEDURE FOR APPLICATION

7.1 Submission of Proposal

7.1.1 Applications for undertaking research & development projects shall be submitted in the manner prescribed by the Bureau and within the prescribed timelines,

7.1.2 Proposer(s) shall submit their proposal in a "single stage - two envelope bid system" consisting of separately sealed "Technical and Financial proposals". The Technical Proposal shall be submitted as per format prescribed in **Annex A** and the Financial Proposal shall be submitted in the format prescribed as per **Annex B**, clearly specifying expected expenditure against each element such as manpower, equipment (shall not include computer hardware and software), travelling, testing, consumables, stationery, overheads, etc.

7.1.3 There shall be maximum one proposal from one institute on a given subject.

7.1.4 No contractual obligation whatsoever shall arise until a formal agreement is signed and executed between the Bureau and the Proposer.

7.2 The proposals shall inter-alia consist of the following:

7.2.1 In respect of the research & development projects put up by the Bureau:

a) Details of the Project team along with the organization/institution associated with;
b) The CV of the Project leader and expert/expert(s) to be associated with the project and a letter from organization authorizing Project Leader and expert/expert(s) to undertake the research as proposed.
c) A write up on the understanding of the scope and objectives of the project.
d) Methodology (sampling size, if applicable) to be adopted for the proposed study with a clear road map and time plan for completion of the project;
e) Stage wise timelines for completion of the project.

7.2.2 In respect of research & development projects proposed by any expert/organization:

a) Details of the Project team along with the organization/institution associated with;
b) The CV of the Project leader and expert/expert(s) to be associated with the projects and a letter from organization authorizing Project Leader and expert/expert(s) to undertake the study as proposed.
c) Objective that will be achieved and scope of the project clearly highlighting the need of such study and what would be the final deliverable;
d) Methodology (sampling size if applicable) to be adopted for the proposed study with a clear road map and time plan for completion of the project;
e) Details of infrastructure facilities available for the project, in the institution and additional facilities required (if any) for carrying out research.

f) Stage wise timelines for the completion of the project

7.3 The Head of the concerned institution while forwarding the application and nominating the project leader shall certify that:

a) the core facilities (land, buildings, laboratory, manpower and other infrastructure etc.) are available and will be provided to the Project Leader to work on the proposed project,
b) the organization will discharge all its obligations, particularly in respect of management of the financial assistance given, and
c) no other funding is being received/sought for the project proposed to be sanctioned by BIS.

8 PROCEDURE FOR APPROVAL WITHIN BIS

8.1 There shall be a Research Evaluation Committee (REC) to evaluate the proposals received, the composition of which shall be as follows:

DDG (PRT) : Chairperson
Head (CMD) concerned : Member
Head (LPPD) : Member
Head of the Technical Department concerned : Member
Director Finance : Member
Two Experts from the Sectional Committee concerned : Members
Head (SCMD) : Member Secretary

*The experts shall be nominated by the Sectional Committee and the nominated members shall give a declaration to the effect that there is no conflict of interest with respect to the project.

8.2 The evaluation and selection will be as per Quality and Cost Based Selection (QCBS) method (Rule 192, GFR 2017) which is explained in **Annex C**.

8.3 The criteria for evaluation of technical proposal shall be as under:

Sl No.	**Criteria**	**Max. Marks**	**Score by REC**
1	Profile of key individual/individuals to be associated with the research project	**10**	
2	Experience of the individual/organisation in conducting research projects in the relevant discipline	**20**	
3	Understanding of Scope, Objectives and deliverables	**15**	
4	Methodology	**30**	
5	Work plan/Execution strategy	**15**	
6	Chapterisation, contents and lay out of the proposed report	**10**	
	TOTAL	**100**	

Note: REC may call for a presentation by the proposers if deemed necessary.

8.4 The minimum qualifying marks shall be 70. All the proposals with marks below 70 shall be considered rejected.

8.5 REC may refer back, advise changes for reconsideration or reject any proposal.

8.6 REC shall open the financial proposals (bids) within 7 days from completion of technical evaluation.

8.7 A final score sheet of all the proposers shall be made as detailed in **Annex C** and the proposer getting the highest combined score shall be selected for awarding the project.

8.8 The member secretary (REC) shall send the selected proposals to DG/DDG Standardization concerned, as per their delegated powers, for consideration and approval for sanction of the project.

8.9 After the approval of project, the member secretary (REC) shall inform the concerned technical department and the proposer regarding the decision.

8.10 After the sanction of fund is approved, the draft agreement (prepared in line with model agreement given at **Annex D**, to be modified on case-to-case basis) shall also be prepared by the Member Secretary (Sectional Committee), clearly highlighting the payment term. The Head (Technical Department) shall sign the agreement on behalf of BIS in all cases.

8.11 In case the proposer to whom the project is awarded declines to take up the project, the Research project shall be awarded to the proposer getting the next highest combined score among the qualified proposers.

9 SIGNING OF AGREEMENT AND ISSUING OF SANCTION LETTER

9.1 After receipt of duly signed agreement from the proposer and after the receipt of the approval of competent authority, a sanction letter shall be issued by the concerned Head (Technical Department) to the organization/individual member. The project would be considered to have commenced from the date the sanction letter is issued.

10 FUNDING

10.1 The mode of payment for Research & development projects shall be as follows:

a) First instalment up to a maximum of 30 percent of the total approved project cost would be released after approval of the project.
b) Second instalment to the extent of 50 percent of the approved estimated cost would be released on the submission of progress report along with the report on utilization of the 75 percent of the fund and acceptance of the same by the Sectional Committee.

c) The balance amount shall be released after submission of the final project report along with utilization certificate for the fund released and its acceptance by the Sectional Committee.

10.2 Release of each instalment is subject to satisfactory progress, required stage - wise deliverables and submission of the Utilization Certificate (UC) as per Form GFR12-A of GFR 2017 along with the statement of expenditure (SoE) issued by the Competent Authority.

11 PROGRESS REPORT AND MONITORING OF PROJECT

11.1 The relevant Sectional Committees of BIS will monitor the progress of project to ensure that the project is progressing as per the planned arrangement. However, member secretary of the concerned Sectional Committee under overall coordination of HoD would be the controlling/link officer for Research & Development projects and would constantly monitor the progress of the project every 30-45 days. Any delay in implementation of project should be duly justified by the Project leader and shall be put up to Research Evaluation Committee (REC) for approval.

11.2 The Sectional Committee shall review and give its acceptance of the progress reports submitted, within 3 weeks.

12 SUBMISSION OF FINAL PROJECT REPORT (FPR)

12.1 The FPR must be detailed and should include information about:

a) the original objective(s) of the project,
b) how far these objective(s) have been achieved, and
c) how the results will benefit the development of the national standard(s) and
d) a copy of final working draft of the concerned standard(s) (wherever applicable)
e) include clear inferences, recommendations regarding their use in the proposed standards,
f) all references used, raw data of surveys, sampling, testing and experiments,
g) undertaking that all the information presented is authentic.

12.2 FPR received in BIS would be put up to the concerned Sectional Committee, which will take necessary action for preparation/revision of standard appropriately. The Project leader shall assist in the disposal of comments received on the research project, draft standard and for the preparation of the finalized draft, as may be desired by the Sectional Committee.

12.3 The proposer shall submit the Project Completion Report (PCR), within one month of completion of project along with the Utilization Certificate of the fund released as per Form GFR 12-A of GFR 2017 and the statement of expenditure (issued by the Competent Authority -in case of Govt. organization / Charted Accountant in case of private organization).

13 RESULTS OF RESEARCH & DEVELOPMENT

13.1 Project Leader(s) would be encouraged to publish the results of research & development. While doing so, acknowledgement to the effect that financial assistance was received from BIS should be made in the research paper(s) published. BIS should be acknowledged in similar type of other published work/press reports.

13.2 One re-print of each research paper(s) published as a result of the work done under the BIS funds shall be sent to BIS as and when published**.**

14 INTELLECTUAL PROPERTY RIGHTS

14.1 Ownership of any intellectual property, including but not limited to confidential information, know-how, patents, copyrights, design rights, rights relating to computer software, and any other industrial or intellectual property rights, developed solely by Proposer shall be vested with that Party.

14.2 Ownership of any intellectual property, including but not limited to confidential information, know-how, patents, copyrights, design rights, rights relating to computer software, and any other industrial or intellectual property rights, developed solely by the Bureau shall be vested with that Party.

14.3 The Intellectual Property arising out as an outcome of research project undertaken under these guidelines shall be vested with Bureau.

15 OPERATION OF FUNDS

15.1 The utilization certificate of the funds received in previous instalment (if any) to BIS should be annexed with the Statement of all equipment, books, etc purchased out of the funds certified by the Head of the organization. The name, description of the equipment, cost in rupees, date of purchase, and the name of the supplier to be given in the list. The main purpose/function of the equipment may also be mentioned against each item.

15.2 Any unspent balance lying with the organization should be refunded to BIS after the finalization of the draft immediately, by means of demand draft or online transfer.

15.3 The Head of the concerned standardization department of BIS shall ensure that the project leader submits the utilization certificate in the manner prescribed in Form GFR 12-A of GFR 2017.

15.4 Head of the Standardization department shall also ensure that the operation of funds is monitored strictly as specified in Annex E. Further the Project Leader is also fully aware and shall adhere to the obligations of his/her as given in this procedure.

16 OTHER REQUIREMENTS

16.1 Organizations receiving financial assistance for research & development projects from BIS would have to maintain separate accounts for each research project.

16.2 In the event of a Project Leader’s absence from his normal place of duty for two months at a stretch, the Head of the organization would need to immediately nominate an Alternate Project

Leader(s) to supervise the implementation of the project and such a name has to be approved in advance by BIS. In any event, a Project Leader shall give prior notice to BIS of his intention to stay away from the project.

16.3 Items of equipment, etc should be purchased on the basis of the established rules and procedures of the entity/organization.

16.4 Stock register of all equipment, books, etc purchased out of the funds shall be maintained.

16.5 Any capital-intensive equipment/devices purchased using financial assistance from BIS for research & development projects shall be allowed to be retained by the proposer for their research activity etc.

16.6 The organization shall have to ensure that expenditure with respect to TA/DA are made only as per their own norms but under no circumstances the executive/business class air travel or stay in a five-star hotel is made. The overhead expenses should not be more than 20 percent of the cost of the project.

16.7 The Project Leader must ensure that the concerned organization's newsletter would carry information on the activities and accomplishments of the various projects funded by the BIS.

17 TERMINATION OF PROJECT:

The research & development project can be terminated in case of any of the following:

a) the approval of research & development project may be treated as withdrawn, if the sanctioned research & development project does not commence within one month from the date of receipt of the sanction letter, unless otherwise authorized by BIS;
b) A Proposer may request for the withdrawal of a research & development project even after commencement of the project. In such case the entire fund given till that date shall be refunded to the Bureau; and
c) if the Proposer fails to submit Progress report/Completed Project report within the prescribed timelines.

The REC shall take decision on all cases of termination.

18 RESOLUTION OF DISPUTES

Dispute Resolution: In case of any dispute that cannot be resolved amicably, it shall be referred to Sole Arbitrator appointed by the Director General of the Bureau of Indian standards, whose decision shall be final and binding upon both the parties. The provisions of the Arbitration and Conciliation Act, 1996, as amended from time to time, shall be applicable.

ANNEX 3

TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the project:** Revision of IS 7538: 1996 'Three - Phase squirrel cage induction motors for centrifugal pumps for agricultural application – Specification'

2. **Background:**

   This standard covers three phase squirrel cage induction motors for centrifugal pumps for agricultural applications and where the power supply variation is between +6 and -15 percent of the rated voltage.

3. **Scope for R&D:**

   The primary objective of this research and development (R&D) project is to comprehensively revise IS 7538. The scope of this R&D project encompasses the following:

   a. Review and assessment of the existing IS 7538 standard to identify areas in need of modification and enhancement.
   b. Development of updated and standardized testing methods and procedures for three - Phase squirrel cage induction motors for centrifugal pumps for agricultural application.
   c. Incorporation of modern testing techniques and equipment in line with technological advancements and international best practices.
   d. Alignment of the revised standard with international motor testing standards and norms.

4. **Expected Deliverables:**

   a. A draft version of the revised IS 7538, incorporating updated specifications for three-phase squirrel cage induction motors for agricultural centrifugal pumps
   b. Reports from accredited testing laboratories to validate the accuracy and reliability of the revised testing methods.

5. **Research Methodology:**

   The project will involve the following research methodologies:
   - Comprehensive Review: A detailed examination of the existing IS 7538 standard, including an assessment of areas in need of modification, modernization, and alignment with international norms.
   - Technical Updates: Collaboration with experts in motor testing and technology to develop and refine testing methods that encompass both conventional and modern motor technologies.
   - Testing and Validation: Rigorous testing of the testing methods, conducted in collaboration with accredited testing laboratories, to validate accuracy and reliability.

6. **Criteria for Identification of Proposer to conduct Research work:**

- Proposer shall be a technologist with experience in Design, Installation and Maintenance of induction motors
- Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS.

Note: The acceptance of proposal is subjected to the approval of Sectional Committee and Screening Committee of BIS based on the BIS norms.

7. <u>Timeline and Method of Progress Review:</u>

The review will be carried out in each month along with consultation of other experts if required. Testing and verification after 3 months, the first draft after 2 months and the final draft along-with report at the end of 6 months.

8. <u>Support BIS will Provide:</u>

- BIS will provide access to latest editions of standards, magazines, Research Journals etc. required

for the project.

- BIS will also provide details of manufacturers, labs, etc.

TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the project:** Revision of IS 7572: 1974 ‘Guide for testing single - Phase AC and universal motors’

2. **Background:**

   This guide covers methods for conducting the tests for single-phase ac and universal motors as covered by IS 996.

3. **Scope for R&D:**

   The primary objective of this research and development (R&D) project is to comprehensively revise IS 7572: 1974, which serves as a 'Guide for Testing Single-Phase AC and Universal Motors.' The scope of this R&D project encompasses the following:

   e. Review and assessment of the existing IS 7572: 1974 standard to identify areas in need of modification and enhancement.
   f. Development of updated and standardized testing methods and procedures for single-phase AC and universal motors.
   g. Incorporation of modern testing techniques and equipment in line with technological advancements and international best practices.
   h. Alignment of the revised standard with international motor testing standards and norms.

4. **Expected Deliverables:**

   c. A draft version of the revised IS 7572: 1974, incorporating updated methods and standards for the testing of single-phase AC and universal motors.
   d. Reports from accredited testing laboratories to validate the accuracy and reliability of the revised testing methods.

5. **Research Methodology:**

   The project will involve the following research methodologies:

   - Comprehensive Review: A detailed examination of the existing IS 7572: 1974 standard, including an assessment of areas in need of modification, modernization, and alignment with international norms.
   - Technical Updates: Collaboration with experts in motor testing and technology to develop and refine testing methods that encompass both conventional and modern motor technologies.
   - Testing and Validation: Rigorous testing of the testing methods, conducted in collaboration with accredited testing laboratories, to validate accuracy and reliability.

6. **Criteria for Identification of Proposer to conduct Research work:**

- Proposer shall be a technologist with experience in Design, Installation and Maintenance of single phase induction motors
- Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS.

Note: The acceptance of proposal is subjected to the approval of Sectional Committee and Screening Committee of BIS based on the BIS norms.

7. <u>Timeline and Method of Progress Review:</u>

The review will be carried out in each month along with consultation of other experts if required. Testing and verification after 3 months, the first draft after 2 months and the final draft along-with report at the end of 6 months.

8. <u>Support BIS will Provide:</u>

- BIS will provide access to latest editions of standards, magazines, Research Journals etc. required for the project.
- BIS will also provide details of manufacturers, labs, etc.

TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the project:** Revision of IS 9283: 2003 'Motors for Submersible pump sets – Specification

2. **Background:**

   This standard specifies the performance characteristics such as rated output, minimum full load speed, minimum starting torque, nominal efficiency etc. for single phase and three phase 2 pole motors of different bore Sizes and maximum Outside diameter.

3. **Scope for R&D:**

   IS 9283 has been taken up for revision to include efficiency levels EL 1, EL 2, EL 3 & EL 4 for submersible motors to improve overall efficiency of the system (motor & pump). This research aims to verify efficiency levels and other performance parameters included in the revised draft of IS 9283.

4. **Expected Deliverables:**

   Verifying the efficiency levels and performance parameters included into the revised draft to ensure transparency and to enhance the accuracy and relevance of the standards.

5. **Research Methodology:**

   The project will involve the following research methodologies:
   - Testing and verifying the values of different efficiency levels and performance parameters for single-phase and three-phase 2-pole motors with varying bore sizes and maximum outside diameters
   - Exploring the manufacturing base of the product in the country with focus on the role of MSMEs and Start-ups.
   - Visit to at least two manufacturing units and a laboratory to understand the manufacturing processes and technologies in use for production and quality control.
   - Submission of the test reports summarizing the methodology, results, conclusions, and recommendations for verification of efficiency levels and other performance parameters

6. **Criteria for Identification of Proposer to conduct Research work:**

   - Proposer shall be a technologist with experience in Design, Installation and Maintenance of submersible pump-sets
   - Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS.

   Note: The acceptance of proposal is subjected to the approval of Sectional Committee and Screening Committee of BIS based on the BIS norms.

7. Timeline and Method of Progress Review:

The review will be carried out in each month along with consultation of other experts if required. Testing and verification after 3 months, the first draft after 2 months and the final draft along-with report at the end of 6 months.

8. Support BIS will Provide:

- BIS will provide access to latest editions of standards, magazines, Research Journals etc. required for the project.
- BIS will also provide details of manufacturers, labs, etc.

TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the project:** Revision of IS 9320: 1979 'Guide for testing direct - Current (DC) machines'.

2. **Background:**

   This standard covers method for conducting and reporting the tests for dc machines except traction machines, marine service, air transport and mill type motors. This standard applies to direct current generators and motors rated 0·3 kW and higher.

3. **Scope for R&D:**

   The primary objective of this research and development (R&D) project is to comprehensively revise IS 9320. The scope of this R&D project encompasses the following:

   i. Review and assessment of the existing IS 9320 standard to identify areas in need of modification and enhancement.
   j. Development of updated and standardized testing methods and procedures for DC machines
   k. Incorporation of modern testing techniques and equipment in line with technological advancements and international best practices.
   l. Alignment of the revised standard with international motor testing standards and norms.

4. **Expected Deliverables:**

   e. A draft version of the revised IS 9320, incorporating updated specifications for DC machines
   f. Reports from accredited testing laboratories to validate the accuracy and reliability of the revised testing methods.

5. **Research Methodology:**

   The project will involve the following research methodologies:
   - Comprehensive Review: A detailed examination of the existing IS 9320standard, including an assessment of areas in need of modification, modernization, and alignment with international norms.
   - Technical Updates: Collaboration with experts in motor testing and technology to develop and refine testing methods that encompass both conventional and modern motor technologies.
   - Testing and Validation: Rigorous testing of the testing methods, conducted in collaboration with accredited testing laboratories, to validate accuracy and reliability.

6. **Criteria for Identification of Proposer to conduct Research work:**

   - Proposer shall be a technologist with experience in Design, Installation and Maintenance of DC motors

- Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS.

Note: The acceptance of proposal is subjected to the approval of Sectional Committee and Screening Committee of BIS based on the BIS norms.

7. <u>Timeline and Method of Progress Review:</u>

The review will be carried out in each month along with consultation of other experts if required. Testing and verification after 3 months, the first draft after 2 months and the final draft along-with report at the end of 6 months.

8. <u>Support BIS will Provide:</u>

- BIS will provide access to latest editions of standards, magazines, Research Journals etc. required for the project.
- BIS will also provide details of manufacturers, labs, etc.

TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the project: Revision of IS 12075: 2008** 'Mechanical Vibration of Rotating Electrical Machines with Shaft Heights 56 Mm and Higher - Measurement Evaluation and Limits of Vibration Severity'

2. **Background:**

   This standard specifies the test and measurement conditions of and fixes the limits for the level of vibration severity of an electrical machine when measurements are made on the machine alone at a testing department under properly controlled conditions. With the increasing demand for electrical machines having better performance, it has become imperative, among other things, to lay emphasis on machines with minimum possible vibrations during running.

3. **Scope for R&D:**

   The primary objective of this research and development (R&D) project is to comprehensively revise IS 12075. The scope of this R&D project encompasses the following:

   m. Review and assessment of the existing IS 12075 standard to identify areas in need of modification and enhancement.
   n. Development of updated and standardized methods for the measurement and evaluation of mechanical vibration in rotating electrical machines.
   o. Incorporation of modern testing techniques and equipment in line with technological advancements and international best practices.
   p. Alignment of the revised standard with international mechanical vibration measurement and severity limits standards and norms.

4. **Expected Deliverables:**

   g. A comprehensive revised draft for IS 12075: 2008, incorporating updated methods and standards for the measurement, evaluation, and limits of vibration severity in rotating electrical machines.
   h. Reports from accredited testing laboratories to validate the accuracy and reliability of the revised testing methods.

5. **Research Methodology:**

   The project will involve the following research methodologies:
   - Comprehensive Review: A detailed examination of the existing IS 12075: 2008 standard, including an assessment of areas in need of modification, modernization, and alignment with international norms.
   - Technical Updates: Collaboration with experts in mechanical vibration measurement and technology to develop and refine measurement and evaluation methods that encompass both

conventional and modern rotating electrical machines.

- Compliance Assessment: Ensuring the revised standards align with international mechanical vibration measurement and severity limits standards and practices, emphasizing accuracy, reliability, and technological relevance.
- Testing and Validation: Rigorous testing of the measurement and evaluation methods, conducted in collaboration with accredited testing laboratories, to validate accuracy and reliability.

6. Criteria for Identification of Proposer to conduct Research work:

- Proposer shall be a technologist with experience in Design, Installation and Maintenance of rotating electrical machines.
- Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS.

Note: The acceptance of proposal is subjected to the approval of Sectional Committee and Screening Committee of BIS based on the BIS norms.

7. Timeline and Method of Progress Review:

The review will be carried out in each month along with consultation of other experts if required. Testing and verification after 3 months, the first draft after 2 months and the final draft along-with report at the end of 6 months.

8. Support BIS will Provide:

- BIS will provide access to latest editions of standards, magazines, Research Journals etc. required for the project.
- BIS will also provide details of manufacturers, labs, etc.