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BUREAU OF INDIAN STANDARDS

MINUTES

TENTH MEETING OF DEPENDABILITY OF ELECTRONIC, ELECTRICAL COMPONENTS, EQUIPMENT AND SYSTEMS SECTIONAL COMMITTEE, LITD 02

DATE & TIME	VENUE (Through WEBEX)
Date :28th Sept 2022 **Day : Wednesday** **Time : 1430 h**	Meeting link: https://bisindia.webex.com/bisindia/j.php?MTID=m9744e01f18515aa1a01ba8cf2f769af8 Meeting number : 2515 469 3731 Password : Depend
1. Chairman: Dr. R. Muthukumar	2. Member Secretary: Shri Bipin Jambholkar

3.	Dr. Gopika Vinod	Bhabha Atomic Research Centre (BARC)
4.	Shri Vipul Garg	Bhabha Atomic Research Centre (BARC)
5.	Shri Basavaraj Javali	Cornet Technology India Pvt. Ltd.
6.	Shri K.Sankarasubramanian	CFR/ETDC
7.	Dr. S.Velmourougan	CFR/ETDC
8.	Dr. Santosh Kumar. A	GE T&D India Limited
9.	Prof. S K.Chaturvedi	Indian Institute of Technology, Kharagpur
10.	Mr. Tahir Kamal Khan	Nuclear Power Corporation of India Limited (NPCIL)
11.	Shri H Wadhwa	Voluntary Organization in Interest of Consumer Education (VOICE)

REGRETS

12.	Ms. L. Srivani,	Indira Gandhi Centre for Atomic Research (IGCAR)
13.	Shri Dheenadhayalan R	Indira Gandhi Centre for Atomic Research (IGCAR)
14.	Ms. Vibha Hari	Nuclear Power Corporation of India Limited (NPCIL)
15.	Mr. M Basha	LRDE, DRDO

ITEM 0 WELCOME

0.1 Member Secretary welcomed all members present in tenth meeting of LITD 02 on behalf of BIS. He informed about the progress of the Committee and said that that most of the old Indian Standards are revised or superseded as per latest technologies and is being aligned with the latest International Standards. He also informed that LITD 02 has adopted 28 out of 57 IEC TC 56 Standards. He thanked the Chair and all members for their active participation in Committee work. He regretted that meeting is taking place after a year time and assured the members that in future, BIS will try to improve meeting frequency to 3-4 months.

0.2 The Chairman, Dr.R.Muthukumar, Director, Electronics Test & Development Centre / Centre for Reliability (CFR), Chennai welcomed the committee members on behalf of ETDC & CFR, Chennai. He requested all members to give comments/suggestion on Committee Documents and hope that future meeting will be conducted in Hybrid mode. He suggested BIS to conduct meeting more frequently.

ITEM 1 FORMAL CONFIRMATION OF THE MINUTES OF THE LAST MEETING

1.2 The Committee formally confirmed the minutes of its last meeting circulated vide BISDG letter No. LITD 02/A-2.9 dated 12 July 2021.

ITEM 2 REVIEW OF COMPOSITION OF SECTIONAL COMMITTEE LITD 02

2.1 The Committee reviewed the Composition of Reliability of Electronic and Electrical Components and Equipment Sectional Committee, LITD 02 given in Annex A.

2.2 The Committee noted the co-option request from following organization/individuals:

a) Mr. Anand Gharpure- Sonic Multitech Pvt. Ltd.
b) Mr. Chandra Shekhar- M/s Indinatus India Pvt Ltd

2.2.1 The Committee decided to include Mr. Anand Gharpure and Mr. Chandra Shekhar in additional mailing list of the LITD 02, so that they can receive all the draft documents circulated by the BIS. Based on their input their co-option request will be considered in future.

2.3 The Committee asked BIS to write to all members who has not attended the last three meetings of LITD 02.

ITEM 3 DRAFT STANDARDS FOR FINALIZATION

3.1 Based on the decision taken during last meeting, following draft standards were circulated in wide circulation for comments.

Sl. No	Draft Indian Standard	Circular No. and Date	Decision
1	Doc. No LITD 02 (19531) IS/IEC 61123: 2019 **Reliability testing Compliance test plans for success ratio (***Superseding IS 8161 (Part 5): 2011***)** ICS: 03.120.01; 03.120.30; 21.020	LITD 02/ Dt 20th May 2022	Approved for printing as single no. Indian Standard.
2	Doc. No LITD 02 (19532) IS/IEC 62506: 2013 **Methods for product accelerated testing** ICS 03.120.01; 21.020	LITD 02/ Dt 25th May 2022	-do-
3	Doc. No LITD 02 (19534) IS/ IEC 62628 : 2012 **Guidance on software aspects of dependability** ICS 03.120.01	LITD 02/ Dt 25th May 2022	-do-
4	Doc. No LITD 02 (19537) IS/IEC 62402: 2019 **Obsolescence Management** (*Superseding IS 16958 : 2018*) ICS 21.020	LITD 02/ Dt 25th May 2022	-do-
5	Doc: LITD 02 (19538) IS/IEC 61709:2017 **Electric components Reliability Reference conditions for failure rates And stress models for conversion** (*Superseding IS 7354 (Part 3): 2011*) ICS 31.020	LITD 02/ Dt 25th May 2022	-do-
6	Doc: LITD 02 (19539) IS/IEC 62508 : 2010 Guidance on human aspects of dependability (Superseding IS 11743:1986)	LITD 02/ Dt 25th May 2022	The point wise discussion on each comments submitted by BARC is as follows
It was informed that IEC 62508 is under revision at IEC and may be published by early 2024. Committee Document (CD) is already available. Hence, if India Comments on Document, it will be definitely be taken into consideration in next IEC TC 56 meeting. Comment No. 1. : SPAR-H: Standardized Plant Analysis Risk HRA. On Prof. S K.Chaturvedi suggestion, it was decided that BARC will recheck whether acronym *HRA* needs to be expanded. They will also share the relevant document. Comment 2, 3 & 4 : BARC will submit a short note. Based on their comments, clarification will be sought from MT 21 (Maintenance Team of IEC 62508) of IEC TC 56. Chairman sought from BARC whether the comment is specific to Nuclear industry as regards to malicious act under HRA. The Comments will be further processed in consultation with the Chairman and based on his recommendation, the Document will be recirculated in Wide circulation for a period of one-month.			

ITEM 4 PRESENT POSITION OF WORK AND REVIEW OF STANDARDS

4.1 The Committee noted the POW given at Annex B (Page 10-11) of the Agenda.

4.1.1 The Committee noted the revised Title and Scope of the LITD 02 which was approved in the last meeting. The Title and Scope were revised to align the Committee with latest working model of IEC TC 56 "Dependability.

4.2. In accordance with BIS procedure, Committee reviewed 12 Indian Standards which are due for reaffirmation/revision/withdrawal.

4.2.1 The Committee recommended to withdraw following Indian Standard given below to LITDC :

SL. No.	IS No Title	Reason for recommendation of withdrawal of Indian Standards to LITDC
1	IS 9185 (Part 1): 1979 Endurance (Life) test for electronic and electrical components Part 1 thermal endurance	1. Endurance test details are given in Components Standards like IEC 60115-1 / IEC 60384-1 etc , which has been adopted by BIS as IS 5786 (Part 1): 2018/ IS 7305 : 2018 or other Component Standards. 2. Members were of the opinion that the requirements of endurance test be included in the component standard itself; 3. Most Indian and International Standards referred in the IS have either been withdrawn or replaced by other Standards. 4. Methods referred in the Standard are obsolete and no longer relevant. 5. Endurance test should be part of component qualification standard as all test conditions are different for different components. 6. **Hence it was proposed that IS 9185 (Part 1) : 1979 be withdrawn;**
2	IS 9185 (Part 2): 1979 Endurance (Life)Test for electronic and electrical components Part 2 mechanical endurance	1. Endurance test details are given in Components Standards like IEC 60115-1 / IEC 60384-1 etc , which has been adopted by BIS as IS 5786 (Part 1): 2018/ IS 7305 : 2018 or other Component Standards. 2. Members were of the opinion that the requirements of endurance test be included in the component standard itself; 3. Most Indian and International Standards referred in the IS have either been withdrawn or replaced by other Standards. 4. Methods referred in the Standard are obsolete and no longer relevant. 5. Endurance test should be part of component qualification standard as all test conditions are different for different components. 6. **Hence it was proposed that IS 9185 (Part 2) : 1979 be withdrawn;**

4.2.2 The Committee decided to reaffirm the following Standards:

Sl. No.	IS.No. & Title	Date of Reaffirmation
1.	IS 8161 (Part5) : 2011 Guide for equipment reliability testing: Part 5 Compliance test plans for success ratio (First Revision) **NOTE:** Doc. No. LTID 02 (19531) is finalized. Standard is reaffirmed till IS/IEC 61123: 2019 is published, which will supersede IS 8161 (Part 5): 2011	June 2022
2.	IS 11743:1986 Guide on human safety in design, manufacture, use and maintenance of electronic equipment **NOTE:** Doc. No. LTID 02 (19539) has completed WC, after comment resolution it will be recirculated in WC. Standard is reaffirmed till IS/IEC 61123: 2019 is published, which will supersede IS 11743:1986.	June 2022

3.	IS 15444 (Part 1) : 2012 Reliability Stress Screening Part 1 Repairable Assemblies Manufactured In LOTS (*First Revision*)	Aug 2022
4.	IS 15474 (Part 1) : 2019 Dependability Management Part 1 Guidance for Management and Application	Dec 2022
5.	IS 15474 (Part 3/Sec 14) : 2019 Dependability Management Part 1 Guidance for Management and Application	Dec 2022
6.	IS/IEC 60605-6 : 2007 Equipment Reliability Testing Part 6 Tests for the Validity and Estimation of the Constant Failure Rate and Constant Failure Intensity [*Superseding 1) IS 8161 (Part 6/Sec 1) : 1983 & 2) IS 8161 (Part 6/Sec 2) : 1987)*]	Aug 2022
7.	IS/IEC 60706-2 : 2006 Maintainability of Equipment Part 2 Maintainability Requirements and Studies During the Design and Development Phase[*Superseding 1) IS 9692 (Part 1) : 1980, 2) IS 9692 (Part 2) : 1980, 3) IS 9692 (Part 3) : 1981, 4) IS 9262 (Part 5) : 1985*]	Aug 2022
8.	IS/IEC 60706-5 : 2007 Maintainability of Equipment Part 5 Testability and Diagnostic Testing [*Superseding IS 9692 (Part 4) : 1987*]	Aug 2022
9.	IS/IEC 60706-6 : 2007 Equipment Reliability Testing Part 6 Tests for the Validity and Estimation of the Constant Failure Rate and Constant Failure Intensity [*Superseding 1) IS 8161 (Part 6/Sec 1) : 1983 and 2) IS 8161 (Part 6/Sec 2) : 1987)*]	Aug 2022
10	IS/IEC 61124 : 2012 Reliability Testing — Compliance Tests for Constant Failure Rate and Constant Failure Intensity [*Superseding IS 8161 (Part 7) : 2012*]	Oct 2022

4.3 The Committee gone through the list of standards published by IEC /TC 56 are given in Annex C (Pg 12-13) and decided that following six IEC Standard may be relevant to Indian Industry.

4.3.1 Hence, it was decided that a small Panel will review following IEC Standards and give their recommendations within 30 days whether it may be further processed for adoption.

Sl. No	IEC.No. & Title	Members
1.	IEC 61649:2008 Weibull analysis	a) Prof. S K.Chaturvedi, IIT- Kharagpur, Convener b) Dr. Gopika Vinod, BARC
Brief Scope: This International Standard provides methods for analysing data from a Weibull distribution using continuous parameters such as time to failure, cycles to failure, mechanical stress, etc. This standard is applicable whenever data on strength parameters, e.g. times to failure, cycles, stress, etc. are available for a random sample of items operating under test conditions or in-service, for the purpose of estimating measures of reliability performance of the population from which these items were drawn. This standard is applicable when the data being analysed are independently, identically distributed. In this standard, numerical methods and graphical methods are described to plot data, to make a goodness-of-fit test, to estimate the parameters of the two- or three-parameter Weibull distribution and to plot confidence limits. Guidance is given on how to interpret the plot in terms of risk as a function of time, failure modes and possible weak population and time to first failure or minimum endurance.		
2	IEC 61703:2016 Mathematical expressions for reliability, availability, maintainability and maintenance support terms	a) Shri Basavaraj Javali, Cornet Technology India Pvt. Ltd., Convener b) Dr. R.Muthukumar, CFR
Brief Scope: This International Standard provides mathematical expressions for selected reliability,availability, maintainability and maintenance support measures defined in IEC 60050-192:2015. To account for mathematical constraints, this standard splits the items between the individual items considered as a whole (e.g. individual components) and the systems made of several individual items. It provides general considerations for the mathematical expressions for systems as well as individual items but the individual items which are easier to model are analysed in more detail with regards to their repair aspects.		

3.	IEC 62308:2006 Equipment reliability - Reliability assessment methods	Dr. R.Muthukumar, CFR, Convener
Brief Scope: This International Standard describes early reliability assessment methods for items based on field data and test data for components and modules. It is applicable to mission, safety and business critical, high integrity and complex items. It contains information on why early reliability estimates are required and how and where the assessment would be used. Finally, it details methods for reliability assessment and the data required to support the assessment. To estimate durability (life time or wear-out), the physics-of-failure method is used. Three types of assessment are discussed in detail: – the similarity approach; – models for durability analysis; – handbook methods.		
4.	IEC 62429:2007 Reliability growth - Stress testing for early failures in unique complex systems	a) Prof. S K.Chaturvedi, IIT- Kharagpur, Convener b) Dr. R.Muthukumar, CFR
Brief Scope: This International Standard gives guidance for reliability growth during final testing or acceptance testing of unique complex systems. It gives guidance on accelerated test conditions and criteria for stopping these tests. "Unique" means that no information exists on similar systems, and the small number of produced systems means that information deducted from the test has limited use for future production.		
5.	IEC 62550:2017 Spare parts provisioning	a) Prof. S K.Chaturvedi, IIT- Kharagpur, Convener b) Dr. R.Muthukumar, CFR c) Dr.S.Velmourougan, CFR
Brief Scope: This document describes requirements for spare parts provisioning as a part of supportability activities that affect dependability performance so that continuity of operation of products, equipment and systems for their intended application can be sustained. This document is intended for use by a wide range of suppliers, maintenance support organizations and users and can be applied to all items.		
6.	IEC 62740:2015 Root cause analysis (RCA)	Dr. R.Muthukumar, CFR, Convener
Brief Scope: This International Standard describes the basic principles of root cause analysis (RCA) and specifies the steps that a process for RCA should include. This standard identifies a number of attributes for RCA techniques which assist with the selection of an appropriate technique. It describes each RCA technique and its relative strengths and weaknesses.		

4.3.2 If Panel recommends that the above-mentioned Standard (s) are suitable for adoption, same will be circulated in Wide Circulation for a period of 60 days.

ITEM 5 INTERNATIONAL ACTIVITIES

5.1 It was decided by Committee to upgrade India Membership from O-Member to P-Member.

5.2 Committee noted the list of standards published by IEC /TC 56 as given in Annex C (Pg 12-13).

5.2.1 The Committee noted that India has adopted of 28 IEC Standards out of 57 IEC TC 56 Standards as Indian Standards.

5.2.3 The Committee noted the list of TC 56 Working Documents as given in Annex D (Pg 14-15).

5.3 The Committee noted the list of ***Subcommittee(s) and/or Working Group(s)*** under IEC/TC 56 and nominated following Experts in each WG(s) of TC 56:

Working Groups	Title	**Expert**
WG 1	Dependability terminology	1) Dr. R. Muthukumar 2) Prof. Sanjay Kumar Chaturvedi, IIT-Kharagpur 3) Shri Bipin Jambholkar
WG 2	Dependability techniques	1) Prof. Sanjay Kumar Chaturvedi, IIT-Kharagpur 2) Dr Gopika Vinod, BARC 3) Dr. Vibha Hari, NPCIL 4) Shri K.Sankarasubramanian,ETDC 5) Shri P Dandapani, ETDC
WG 3	Management and Systems	1)Dr. R.Muthukumar , ETDC 2) Ms.R.Radhika, CFR 3) Dr.S.Velmourougan, CFR 4) Shri.V.Jambulingam, CFR 5) Dr. Santosh Kumar. A, GE T&D
WG 4	Information System	1) Ms.R.Radhika, CFR 2) Shri.V.Jambulingam, CFR 3) Dr.S.Velmourougan, CFR

5.3.1 Committee requested all member organization to nominate expert from India in IEC/TC 56. It will put India in global map of Dependability and also they can access all the documents related to IEC themselves.

ITEM 6 WTO-TBT ENQUIRY POINT

6.1 The committee noted the information as given in Item 5 of the agenda.

ITEM 7 ELECTRONICS AND INFORMATION TECHNOLOGY GOODS (REQUIREMENTS FOR COMPULSORY REGISTRATION) ORDER, 2012

7.1 The committee noted the information as given in Item 7 of the agenda.

7.2 The following three standards of LITD are mandatory requirements under Compulsory Registration Scheme.(Please see http://crsbis.in/BIS/)

a) IS 616 : 2010 Audio, Video and similar electronic apparatus - Safety requirements (Fourth revision)

b) IS 13252 : 2010 IT Equipment – Safety Requirements (Second Revision)

c) IS 16333 (Part 3): 2017 Mobile Phone Handsets Part 3: Indian Language Support for Mobile phone handsets – Specific Requirements

ITEM 8 INFORMATION ON E-SALE OF STANDARDS BY BIS

8.1 The committee noted that all Indigenous Standard published by BIS are available free of cost at BIS website. However, adopted Standard need to be purchased as per copy write issues.

ITEM 9 NATIONAL INSTITUTE FOR TRAINING IN STANDARDISATION (NITS)

9.1 The Committee noted the information as given in Item 9 of the agenda.

9.2 The Committee requested BIS to share the Schedule of Training program of NITS. They also requested BIS to include Reliability Training program.

9.3 Dr. Muthukumar, informed that CFR regularly organizes training program on Reliability and they can organize joint training program in co-ordination with BIS to include Standardization work also.

Item 10 STANDARDIZATION ROADMAP AND STRATEGIC BUSINESS PLAN

10.1 In the last meeting the Committee has revised the TITLE and Scope of the LITD 02.

10.2 The Committee also identified important Standards need to be formulated for dependability/reliability work.

10.3 BARC requested all members to devise methods to spread awareness about Dependability/reliability testing.

10.4 It was decided that all members will share a brief for Standardization roadmap for Dependability.

ITEM 11 DATE AND PLACE FOR THE NEXT MEETING

11.1 It was decided to hold physical cum hybrid meeting within next 3-4 months preferably in Mumbai/Chennai.

ITEM 11 ANY OTHER BUSINESS

11.1 Meeting ends with vote of thanks to Chairman and all members.