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BUREAU OF INDIAN STANDARDS
AGENDA

Hydraulic Gates & Valves Sectional Committee, WRD 12	Twentieth Meeting

Day and Date	Time	Venue	Contact details
12 March 2021	1030 AM	CISCO WEBEX PLATFORM	wrd@bis.gov.in

Chairman:	Member Secretary:
Shri V K Maini, GM (D&E), NHPC	Shri Dushyant Prajapati, Sc D

Item 0 WELCOME AND INTRODUCTORY REMARKS

Item 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

Minutes of the 19th meeting of WRD 12 held on 17 Sept. 2019 was circulated to the members vide mail dated 09 Oct 2019. No comments have been received on the circulated comments.

The Committee may CONFIRM the minutes as circulated.

Item 2 COMPOSITION OF WRD 12

2.1 The present composition along with attendance details of last three sectional committee meeting of WRD 12 is given at Annex 1.

The committee may NOTE

2.3 As discussed during last meeting, mail and reminder were sent to the following organizations for their active participation/fresh nomination and continue their membership.

1. Central Electricity Authority, New Delhi -Mail sent to Chairperson on 24 Feb 21 via Member Hydro of CEA. Reply is still awaited.
2. Irrigation Research Institute, Roorkee, vide email dated24 Feb 21. Reply is awaited
3. Water resources Dept., Odisha, vide email dated 24 Feb 21. Reply is awaited.
4. Texmaco Ltd. (now as Texmaco Rail & Engineering Ltd.), Kolkata. Vide email dated 24 Feb 21. Reply is awaited.

The Committee may CONSIDER.

Item 3 PROGRAM OF WORK

All Indian Standards shall be reviewed periodically, at least once in five years by concerned Sectional Committee. The standards formulated by WRD 12 that are due for reaffirmation in 2019-20 are given below. The list of standards were circulated among all the members for their comments. Since no response were received, the Chairman

reaffirmed the following standards vide email dated 24 Feb 2020.

Sl. No.	IS No.	TITLE
1.	IS 10096 (Part 1 / Sec 2) : 2014	Recommendations for Inspection Testing and Maintenance of Radial Gates and Rope Drum Hoists Part 1 Inspection Testing and Assembly at the Manufacturing Stage Section 2 Rope drum hoists
2.	IS 4623 : 2000	Recommendations for Structural Design of Radial Gates
3.	IS 14177 : 1994	Guidelines for painting system for hydraulic gates and hoists
4.	IS 4410 (Part 16 / Sec 2) : 1981	Glossary of terms relating to river valley projects Part 16 Gates and valves Section 2 Valves
5.	IS 5620 : 2020	Recommendations for Structural Design Criteria for Low Head Slide Gates
6.	IS 6938 : 2005	Design of rope drum and chain hoists for hydraulic gates - Code of practice
7.	IS 9349 : 2006	Recommendations for structural design of medium and high head slide gates
8.	IS 10096 (Part 1 / Sec 1) : 2014	Recommendations for Inspection Testing and Maintenance of Radial Gates and Rope Drum Hoists Part 1 Inspection Testing and Assembly at the Manufacturing Stage Section 1 Gates
9.	IS 10096 (Part 2) : 1983	Recommendations for inspection testing and maintenance or radial gates and rope drum hoists Part 2 Inspection testing and assembly at the time of erection
10.	IS 11228 : 1985	Recommendations for design of screw hoists for hydraulic gates
11.	IS 11793 : 1986	Guidelines For Design Of Float-driven Hoisting Mechanism For Automatic Gated Control

The Committee may NOTE.

Item 4 STANDARDS FOR REVISION

4.1 Doc. No. WRD 12 (678) IS 4622: 2003 Recommendations for Structural Design of Fixed Wheel Gates (Fourth Revision)

The Document as finalized the Sectional Committee during its last meeting has been PRINTED.

The Committee may NOTE.

4.2 Recommendations for Structural Design of Medium and High Head Slide Gates IS 9349: 2006 for its third revision { Earlier Doc. WRD 12 (11587)}

The Committee during its last meeting decided to drop the document on amendment 1 to IS 9349 i.e. WRD 12 (11587) and take the standard under revision. The Committee constituted an ad hoc panel comprising of the following members and requested the members to convene a meeting and submit the draft document to BIS by 30 Nov 2019. The panel has been provided editable format for preparing the draft vide email dated 20 01 2021.

a) Shri Rajesh Kumar, NHPC, Convenor
b) Shri Saket Krishna, CWC
c) Dr. V Surya Anantapantula (P.E.S. Engineers P. Ltd.)

The Document is awaited.

4.3 Recommendation for Structural Design of Radial Gates IS 4623: 2000 (Fourth Revision) {Earlier Doc. No. WRD 12(682)}

After observing the considerable delay in finalizing the document from panel, the Committee during its last meeting decided to drop the document and constituted an ad hoc panel comprising of the following members to submit the modified draft w.r.t. technological advancements taken place in meanwhile. The Committee requested the panel to submit the draft latest by 30 Nov 2019 through a panel meeting. The Panel has been provided the editable format for preparing the draft vide email dated 24 Feb 2021.

1. Sh. Rakesh Kumar, NHPC (Convener)
2. Sh. Saket Krishna, CWC
3. Dr. V. Surya Anantapantula, (P.E.S. Engineers P. Ltd.)

The panel was requested vide BIS email dated 08 Nov 2019 to all panel members providing the document WRD 12(682) and comments received from NHPC and MERI. The draft is awaited.

The Committee may REVIEW.

4.4 WRD 12 (622) IS 11228 Recommendation for Design of Screw Hoists for Hydraulic Gates

The document was finalized in the 15th meeting of WRD 12. Subsequently the finalized document was approved by the Sectional Committee Chairman vide letter dated 14 02 2017 along with the incorporations of certain corrections in Fig. 2 and corrected clause **6.3.4** (incorporating the missing formulae).

It is observed that the standard under print stage is still not complete. It's been long since the document was finalized and the committee may review the finalized document further w.r.t. the changes suggested by the Chairman and any technological updation undergone since then.

The Committee may CONSIDER.

4.5 IS 14177: 1994 Guidelines for Painting System for Hydraulic Gates and Hoists (First Revision) {Earlier Doc. No. WRD 12 (11262)}

During the last meeting, the Committee noted that comments were long pending from the ad hoc Panel as constituted in 17th meeting. The Committee felt that the document was circulated as P-draft in 2017 and the same is still not complete. The Committee requested NHPC to submit the modified draft to BIS latest by 30 Nov 2019. NHPC was requested to submit the pending draft vide BIS email dated 08 Nov 2019 and 13 Jan 2021.The Comments have been submitted by NHPC vide email dated 28 01 2021 The Comments are placed at **ANNEX 3**. NHPC has been further

provided an editable and modified IS 14177 document for further updating along with international standards ISO 8501 and IS ISO 8502-2:2012 (superseded BS 4232). These international standards were utilized while framing this standard and now they itself have undergone revisions.

The Committee may CONSIDER.

5 NEW SUBJECTS UNDER CONSIDERATION

5.1 Recommendations for Structural Design Criteria for Stoplogs

{Earlier Document WRD 12 (14342)P}

(Approval of subject in Division Council is awaited)

The draft document on the subject was received from NHPC Ltd vide their letter dated 07/05/2019. After making few correction, the P-draft document was sent for circulation on 05/07/2019 to all members of WRD12 with the approval of the Chairman. The Committee during its last meeting deliberated on the circulated document and based on the observations of CDO Nasik and Sh. A.P. Pattanaik, it was decided to redraft the document. The Committee requested CDO Nasik to redraft the document and submit to BIS for circulation among all the members for their comments.

The modified draft provided by CDO Nasik was circulated to all the members (along with track mode changes) vide email dated 07 Nov 2019. Further comments have been received from NHPC on the CDO Nasik draft vide email dated 19 Nov 2019. NHPC has submitted the final draft after incorporating their comments in the draft submitted by CDO Nasik. The final draft received from NHPC is enclosed along with the email vide which this agenda has been circulated.

The Committee may CONSIDER.

ITEM 6 ANY OTHER ITEM

6.1 IS 7236: Part 1:1992 Penstock and turbine inlet butterfly valve for Hydro power stations and Systems Part 1 Criteria for structural and hydraulic design

BIS had received an RTI in reference to IS code 7326: Part 1: 1992, Annex C Test to be performed on the butterfly valve (refer relevant page no 8 as attached). The relevant extract of the standard is placed below:

ANNEX C

(*Clause* 8.1)

TESTS TO BE PERFORMED ON THE BUTTERFLY VALVE

C-1 PERFORMANCE TEST

C-1.1 After final assembly, each valve should be shop-operated three times or as agreed by the purchaser from the fully-closed to the fully-open position, and vice versa under no flow condition to demonstrate that the assembly is workable.

C-2 PRESSURE TESTS

C-2.1 All tests should be carried out with water as the test medium but other media may be as agreed by the user.

C-2.2 Each valve should be subjected to the following tests:

a) *Body Tests* — With both ends closed either by full end covers or by hollow cylindrical covers a hydrostatic pressure of one and half times the specified shut-off pressure including pressure rise should be applied. This pressure should be maintained at least for a period of 30 minutes. It should be ensured that there is no leakage through the body or any trunnion seals. The test should reveal that no structural damage is caused.

b) *Disc* — The disc should be hydraulically tested for duration of 30 min for a test pressure of 1 1/2 times the specified shut off pressure including pressure rise. The test should reveal no structural damage or leakage at any point.

c) *Seal Test* — Maximum shut-off pressure should be applied with one end open to the atmosphere and the disc in the closed position. The test should be done for a period of 30 min for maximum shut-off pressure with one end open to the atmosphere and the disc in the closed position.

C-3 PERMISSIBLE LEAKAGES

C-3.1 Maximum permissible leakages from downstream main rubber seal should not exceed 2 litres per minute per meter periphery of seal, when valve is new or reconditioned.

C-3.2 Maximum permissible leakages from upstream maintenance (isolating) seal should not exceed 6 litres per minute per meter periphery of seal.

The query received is :

1. In Annex C, clause C-2.2 b **Disc**: The test should reveal no structural damage or leakage at any point. In another clause C-3.1 (Permissible leakages) the maximum permissible leakages from downstream of main rubber seal should not exceed 2 litres per minute per meter periphery of seal, when valve is new or reconditioned. In the disc test what is mentioned is that there should not be any leakage at any point, means the disc has to be physically rigid to take a pressure of 1.5 times rated pressure. On the other hand, the permitted leakage rates are also defined on the same page. There is an ambiguity in both the statements, code cannot be contradictory on the same page. Please elaborate both, why it is so, which one we should follow during hydro testing?

2. During the hydro testing of body of a butterfly valve, how many pressure gauges are required to connect with the blind flanges and why?

3. In hydro testing of butterfly valves on which plane it should be tested whether HORIZONTAL plane or VERTICAL plane?

The Committee may CONSIDER for appropriate reply.

6.2 It is submitted before the Committee that the Competent Authority of BIS has desired for the revision of all those standards which are formulated before 1990's. It is requested before the Committee that standards which do not require significant changes/technical modification may be identified and taken up for revision. Where the standards do not undergo any significant changes and are non-controversial may even be considered by

the Committee for revision waiving of the WIDE CIRCULATION process in line to BIS RULES 2017 Section 22(4). Similarly, standards which would require technical modifications may be allotted to the member experts for preparation of draft documents so that the same can be further deliberated in the next meeting with its base document.

The following standards (apart from already under consideration by the Committee) are old published standards under the scope of this Sectional Committee.

IS No.	Title of the Standard
IS 11228:1985	Recommendations for design of screw hoists for hydraulic gates
IS 11793:1986	Guidelines for Design of Float-driven Hoisting Mechanism For Automatic Gated Control
IS 4410 : Part 16 : Sec 2: 1981	Glossary of terms relating to river valley projects Part 16 Gates and valves Section 2 Valves
IS 7326 : Part 3: 1976	Penstock and turbine inlet butterfly valves for hydropower stations and systems Part 3 Recommendations for operations and maintenance

6.3 Gender Responsive Standards

Standards have an important role in society as they support innovation and provide solutions to global challenges. However, recent research has shown that standards can have different outcomes on different genders, and often unintentional negative impacts for women. There are many examples such as safety belts, PPE, or even AI algorithms. Applying a gender lens to the standards development process by addressing specific needs of women and girls is key to ensure that standards are gender responsive and thereby relevant to all.

In 2016 the UNECE(United Nations Economic Commission for Europe) launched an initiative to help standards bodies develop standards that are gender responsive. ISO and IEC, together with many of their members, are undertaking a number of activities to support the UNECE initiative. This includes the creation of a Joint ISO/IEC Strategic Advisory Group (JSAG) on Gender responsive standards to develop tools and guidance to help committees understand and apply gender considerations when they develop and revise their standards. The Committee Member Organizations may also like to review their nominations

The Committee may NOTE.

ANNEX –I
(Item 2.1)

COMPOSITION OF HYDRAULIC GATES & VALVES SECTIONAL COMMITTEE, WRD12

Last 3 meetings	18th WRD12 – 06 Dec 2018	17th WRD12 – 23 Feb 2017	16th WRD12 – 29 Feb 2016

S. No.	NAME OF THE ORGANISATION	REPRESENTED BY	MEETINGS ATTENDED		
			17th	18th	19th
1.	NHPC LTD, FARIDABAD (I)	GENERAL MANAGER (D&E) (CHAIRMAN)	y	y	y
2.	[IN PERSONALCAPACITY], HYDERABAD (T)	SHRI N KANNAIAH NAIDU	x	x	x
3.	BHAKRA BEAS MANAGEMENT BOARD, PUNJAB (G)	DY. CHIEF ENGINEER, NANGAL MECH. CIRCLE EXE. ENGINEER, MECH. DIVISION (Alternate)	x	y	x
4.	BHARAT HEAVY ELECTRICALS LTD., BHOPAL (I)	SHRI J S HANSPAL SHRI HARISH KUMAR (Alternate)	y	y	y
5.	CENTRAL ELECTRICITY AUTHORITY, NEW DELHI (G)	SHRI R K RUSTOGI SHRI M K KHANDELWAL (Alternate)	x	x	x
6.	CENTRAL WATER & POWER RESEARCH STATION, PUNE (T)	SHRI A K AGARWAL SHRI RAJKUMAR (Alternate)	y	y	y
7.	CENTRAL WATER COMMISSION, NEW DELHI (G)	DIRECTOR, GATES (E&NE) DIRECTOR, GATES (NW&S)	y	y	y
8.	HIMACHAL PRADESH POWER CORPORATIONLTD., DISTT.MANDI (I)	DR POONAM BINJOLKAR ER. RAM KRISHNA KAUNDAL (Alternate)	y	x	y
9.	IIT ROORKEE, ROORKEE (T)	DR. K.S. HARI PROF. R.P. SAINI (Alternate)	x	x	x
10.	IN PERSONAL CAPACITY, SOLAN	PROF. GOPAL CHAUHAN	-	y	x
11.	IRRIGATION RESEARCH INSTITUTE, ROORKEE	CHIEF ENGINWEER (DESIGN) SUERINTENDING ENGINEER (Alternate)	y	x	x
12.	JAYPE E INFRA VENTURES, NOIDA (I)	SHRI V K GUPTA	y	y	x
13.	M/S PRECISION INFRATECH LTD, AHMEDABAD (I)	SHRI NALIN VIBHAKAR SHRI DHEERAJ VANIA (Alternate)	y	y	x
14.	NHPC LTD, FARIDABAD (I)	SHRI S P MUKHERJEE SHRI RAJESH KUMAR (Alternate) SHRI PUNIT MASIWAL (Alternate)	y	y	y
15.	NTPC LTD. , NEW DELHI	SH. NAVEEN CHANDRA PANT SH. SUJEET KUMAR (Alternate)	x	x	y
16.	WATER RESOURCES DEPARTMENT, GOVT. OF ODISHA	NOMINATION AWAITED SHRI BICHITRANADA DEO (Alternate)	x	x	x

17.	**P.E.S.ENGINEERS(P) LTD, HYDERABAD (I)**	**SHRI SVSS RAJU** **DR. V SURYA ANANTAPANTULA (Alternate)**	**x**	**y**	**y**
18.	**R.M.SINHA & CO., KOLKATTA (I)**	**SHRI SANJIT KUMAR SINHA** **SHRI DEBJIT SINHA(Alternate)**	**y**	**y**	**y**
19.	**SATLUJ JAL VIDYUT NIGAM LIMITED, SHIMLA (I)**	**SHRI ANISH KUMAR SHARMA**	**y**	**y**	**y**
20.	**TEXMACO LTD, KOLKATA (I)**	**SHRI UDAYAN BANERJEE** **SHRI BINAYAK BHATTACHARYA (Alternate)**	**x**	**x**	x
21.	**WATER RESOURCES DEPARTMENT, NASHIK (C)**	**SUPTG. ENGINEER (MECHANICAL)** **EXECUTIVE ENGINEER (G.O.-4) (Alternate)**	**y**	**y**	**y**
22.	**IN PERSONAL CAPACITY, BHUBANESHWAR**	**SHRI ABHAY PRASAD PATTANAIK**	**-**	**y**	**x**

"y" Present, "x" Absent, "NR" Not represented, "-" Nomination Awaited

(G) Government Organization, (I) Industry, (T) Technical Institution, (L) Laboratory, (C) Consumer

ANNEX – 2 (Item 3.1)

PROGRAMME OF WORK

WRD 12 **HYDRAULIC GATES AND VALVES**

SCOPE **STANDARDIZATION OF CRITERIA FOR SELECTION, DESIGN, CONSTRUCTION, MAINTENANCE, OPERATION AND TESTING OF GATES AND VALVES**

Standards Published

SI. No.	IS No.	TITLE	Reaffirm M-Y	No. of Amds
1.	IS 4410 (Part 16 / Sec 1) : 1999	Glossary of Terms Relating to River Valley Projects - Part 16 Gates and Valves - Section 1 Gates and Terms Related with Gates	Mar 2018	-
2.	IS 4410 (Part 16 / Sec 2) : 1981	Glossary of terms relating to river valley projects Part 16 Gates and valves Section 2 Valves	Feb – 2015	-
3.	IS 4410 (Part 23) : 1999	Glossary of Terms Relating to River Valley Projects - Part 23 Hoists Cranes and Other Related Terms	Mar 2018	-
4.	IS 4622 : 2020	Recommendations for Structural Design of Fixed-Wheel Gates	Dec 2018	2
5.	IS 4623 : 2000	Recommendations for Structural Design of Radial Gates	Feb 2019	-
6.	IS 5620 : 2020	Recommendations for Structural Design Criteria for Low Head Slide Gates (Third Revision)	Feb – 2015	-
7.	IS 6938 : 2005	Design of rope drum and chain hoists for hydraulic gates - Code of practice	Feb – 2015	2
8.	IS 7326 (Part 1) : 1992	Penstock and turbine inlet butterfly valves for hydropodwer stations and systems Part 1 Criteria for structural and hydraulic design	Mar-2018	-
9.	IS 7326 (Part 2) : 1992	Penstock and turbine inlet butterfly valves for hydropower stations and systems Part 2 Guidelines for design and selection of control equipment	Mar-2018	-
10.	IS 7326 (Part 3) : 1976	Penstock and turbine inlet butterfly valves for hydropower stations and systems Part 3 Recommendations for operations and maintenance	Mar 2018	-
11.	IS 7332 (Part 1) : 1991	Spherical Valves for Hydropower Stations and Systems - Part 1 Criteria for Structural and Hydraulic Design	Mar-2018	1
12.	IS 7332 (Part 2) : 1993	Spherical valves for hydropower stations and systems Part 2 selection of control equipment	Mar 2018	-

SI. No.	IS No.	TITLE	Reaffirm M-Y	No. of Amds
13.	IS 7332 (Part 3) : 1994	Spherical valves for hydropower stations and systems Part 3 Recommendations for operation and maintenance of spherical valves	Mar-2018	-
14.	IS 7718 : 2018	Recommendations for Inspection Testing and Maintenance of Fixed Wheel and Slide Gate Second Revision	-	-
15.	IS 9349 : 2006	Recommendations for structural design of medium and high head slide gates	Feb - 2020	-
16.	IS 10021 : 2000	Guidelines for De-icing System for Hydraulic Installations	Mar-2018	-
17.	IS 10096 (Part 1 / Sec 1) : 2014	Recommendations for Inspection Testing and Maintenance of Radial Gates and Rope Drum Hoists Part 1 Inspection Testing and Assembly at the Manufacturing Stage Section 1 Gates	Feb-2020	-
18.	IS 10096 (Part 1 / Sec 2) : 2014	Recommendations for Inspection Testing and Maintenance of Radial Gates and Rope Drum Hoists Part 1 Inspection Testing and Assembly at the Manufacturing Stage Section 2 Rope drum hoists	June 2019	-
19.	IS 10096 (Part 2) : 1983	Recommendations for inspection testing and maintenance or radial gates and rope drum hoists Part 2 Inspection testing and assembly at the time of erection	Feb - 2015	2
20.	IS 10096 (Part 3) : 2002	Recommendations for Inspection Testing and Maintenance of Radial Gates and Rope Drum Hoists - Part 3 After Erection	Feb-2018	1
21.	IS 10210 : 1993	Criteria for Design of Hydraulic Hoists for Gates	Feb-2018	1
22.	IS 11228 : 1985	Recommendations for design of screw hoists for hydraulic gates	Feb – 2020	-
23.	IS 11793 : 1986	Guidelines For Design Of Float-driven Hoisting Mechanism For Automatic Gated Control	Feb – 2020	-
24.	IS 11855 : 2017	Design and Use of Rubber Seals for Hydraulic Gates - Recommendations Second Revision	-	-
25.	IS 13041 : 2013	Recommendation for Inspection Testing and Maintenance of Hydraulic Hoist After Erection	Mar-2018	-
26.	IS 13591 : 1992	Criteria for Design of Lifting Beams	Dec 2019	-
27.	IS 13623 : 1993	Criteria for Choice of Gates and Hoists	Mar-2018	1

SI. No.	IS No.	TITLE	Reaffirm M-Y	No. of Amds
28.	IS 14177 : 1994	Guidelines for painting system for hydraulic gates and hoists	Dec-2018	-
29.	IS 15466 : 2004	Rubber Seals For Hydraulic Gates	Mar-2018	-

STANDARDS UNDER DEVELPOMENT:

1. **Preliminary Draft Standards: NIL**
2. **Drafts Standards in WC Stage: NIL**
3. **Draft Standards Completed WC Stage:**

Finalized Draft Indian Standard

SI. No.	Doc No	TITLE
1	WRD 12 (00622)	Recommendations for design of screw hoists for hydraulic gates first revision of IS 11228

Total Published Standards: 29
Total Standards Under development: 10

ANNEX-3
(Item 4.5)

Comment from NHPC on IS 14177 Guidelines for Painting system for Hydraulic Gates and Hoists

Sl. No. (1)	Name of Organization / Individual (2)	Clause/ Sub clause / Paragraph / Figure/Table commented (3)	Type of Comment (General / Technical / Editorial) (4)	Justification for change (5)	Proposed Change (6)
1	NHPC Ltd.	3rd Paragraph of "FOREWORD "	Editorial	Correction Serial numbers are missing in the list w.r.t extant IS code.	**1)** ISO-8501-I:1988 Preparation of …..... **2)** BS 4232: 1967 specification for …… **3)** Swedish standard SIS055900 Rust grades ……
2	NHPC Ltd.	Additional reference may be added in clause no. 2.	General	Suggestion	**1)** IS 14589: 1999 Zinc priming paint, epoxy based (Two Pack) **2)** IS 14948:2001 Paint coal tar epoxy, two pack, black and brown (base and hardner) **3)** IS 13467:1992 Chlorinated rubber for paints.
3	NHPC Ltd.	Clause no.2	Editorial	Correction Highlighted correction needs to be incorporated.	6586-1989 Recommended practices for metal spraying for protection of iron and steel.
Sl. No. (1)	Name of Organization / Individual (2)	Clause/ Sub clause / Paragraph / Figure/Table commented (3)	Type of Comment (General / Technical / Editorial) (4)	Justification for change (5)	Proposed Change (6)
4	NHPC Ltd.	Clause no. 3.1	Editorial	Correction	3.1 Location The painting…….

				Clause heading is missing w.r.t extant IS code.	
5	NHPC Ltd.	Clause no. 4.2	Editorial	Correction Clause heading is missing w.r.t extant IS code.	4.2 Types of Surface Preparation
6	NHPC Ltd.	Clause no. 4.2.1	Technical	Improvement IS 4683-1968 designated iron grit as G-C.	"Surfaces requiring blast cleaning should be sand/grit/shot blasted after fabrication with sand or coarse quartz or using iron grit grade G-C 40 to white metal prior to painting."
7	NHPC Ltd.	Clause no. 4.2.1	Editorial	Correction Highlighted correction needs to be incorporated.	Heavy deposits of grease or oil may be removed by the solvent like clean mineral, spirits, xylol or white gasoline, etc. prior to sand blasting
8	NHPC Ltd.	Clause no. 4.2.1.4	Editorial	Correction Highlighted correction needs to be incorporated.	The extent of residue should not be more than 60 percent of any single square having an area of 6.25 cm^2.
9	NHPC Ltd.	Clause no. 4.2.2	Editorial	Correction Highlighted correction needs to be incorporated.	After hand and power tool cleaning, the surface should be cleaned of loose dust and debris.
10	NHPC Ltd.	Clause no. 4.2.3	Technical	Suggestion In referred IS code 5905 (1989) and IS code 6586 – 1989 in preliminary draft, the surface	Delete clause no 4.2.3 ~~Within four hours of blasting the complete external surface of the skin plates shall be sprayed using thermal spraying method with pure aluminium/zinc to a thickness of not less than 100 microns. Immediately after~~

				preparation and painting	~~metalizing and in any case within four hours,~~
Sl. No. (1)	Name of Organization / Individual (2)	Clause/ Sub clause / Paragraph / Figure/Table commented (3)	Type of Comment (General / Technical / Editorial) (4)	Justification for change (5)	Proposed Change (6)
				system of iron and steel by metal spraying are mentioned.	~~primer coating as per cl. 5.1 shall be done followed by epoxy painting.~~ New clause is proposed and to be added in clause 5.2.1.2 4.“ Besides above, if the prepared surface is protected by metal spraying method then surface preparation and painting system shall be adopted as per IS code 5905 and 6586”.
11	NHPC Ltd.	Clause no. 5.1 (Para.8)	Editorial	Correction Highlighted correction needs to be incorporated.	After finish coating and curing, part should be reassembled as required for shipment and coating on bolts or connections that will not be removed in erection should be touched up.
12	NHPC Ltd.	Clause no. 5.2 (Para.2)	Editorial	Correction Highlighted correction is missing w.r.t extant IS code.	If due to practical reasons the finishing coat is applied in the field the finished coat should be applied within the time gap permitted by the paint manufacturer between the primer coat and finished coat.
13	NHPC Ltd.	Clause no. 5.2 (Para.3)	Editorial	Correction Highlighted correction needs to be incorporated.	Metal work adjacent to field weld, riveting or bolting where the shop paint coating has been damaged due to handling or due to heat should be cleaned thoroughly to expose the base metal and should be repainted.

14	NHPC Ltd.	Clause no. 5.2.1.2 (1)	Editorial	Correction: Highlighted correction needs to be incorporated.	Over the prepared surfaces one coat of Inorganic zinc silicate (preferably airless spray) should be applied giving a dry film thickness of 70 ± 5 microns.
Sl. No. (1)	Name of Organization / Individual (2)	Clause/ Sub clause / Paragraph / Figure/Table commented (3)	Type of Comment (General / Technical / Editorial) (4)	Justification for change (5)	Proposed Change (6)
15	NHPC Ltd.	Clause no. 5.2.1.2 (1)	Editorial	Correction: Highlighted correction needs to be incorporated.	Alternatively two coats of zinc rich primer (containing not less than 85% zinc on dry film) should be applied to give a total dry film thickness of 70 ± 5 microns.
16	NHPC Ltd.	Clause no. 5.2.1.2 (3)	Editorial	Correction Highlighted correction is missing w.r.t extant IS code.	……should be applied. Alternatively two coats of zinc rich primer (containing not less than 85% zinc on dry film) should be applied to give a total dry film thickness of 75 ± 5 microns.
17	NHPC Ltd.	Clause no. 5.2.1.3	Editorial	Correction: Highlighted correction needs to be incorporated.	Over the primer coats the following finished coats should be applied.
18	NHPC Ltd.	Clause no. 5.2.1.3 (2)	Editorial	Correction Highlighted correction is missing w.r.t extant IS code.	Each coat of paint should give a minimum dry film thickness of 65 ± 5 microns. The interval between coats should be 24 hours.
19	NHPC Ltd.	Clause no. 5.2.2.2	Editorial	Correction: Highlighted correction	……rust inhibitive wash at an rate approximately 30 ml/m^2 and allowed to dry for 24 hours…..

				needs to be incorporated.	
20	NHPC Ltd.	Clause no. 5.2.2.3(4)	Editorial	Correction: Highlighted correction needs to be incorporated.	All unmachined surfaces should be given one primer coat of chlorinated rubber based zinc phosphate primer to give a dry film thickness of 50±5 micros.