BUREAU OF INDIAN STANDARDS
(WATER RESOURCES DEPARTMENT)
AGENDA

Reservoirs and Lakes Sectional Committee, WRD 10			**24th Meeting**
Day and Date	**Time**	**Venue**	**Contact details**
Monday, 05th February, 2023	11:00 A.M.	Hybrid (Physical+Virtual) For Physical Participation: National Institute of Hydrology, Roorkee, Uttarakhand	**wrd@bis.gov.in**
For virtual participation: Click here to join https://bismanak.webex.com/bismanak/j.php?MTID=ma552cc154ff35aaf09d434203379b3aa			
CHAIRPERSON: DR. M. K. GOEL, DIRECTOR, NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE		**MEMBER SECRETARY:** SHRI NAVDEEP YADAV, ASSISTANT DIRECTOR, WRD, BIS	

ITEM 0 WELCOME AND INTRODUCTORY REMARKS

ITEM 1 CONFIRMATION OF THE MINUTES OF THE PREVIOUS MEETING

The 23rd meeting of WRD 10 was held on 22nd June 2023 and the minutes duly approved by the Chairperson were circulated vide BIS email dated 10 July 2023. No comments have been received on the circulated minutes.

The Committee may CONFIRM the minutes as circulated.

ITEM 2 COMPOSITION OF THE SECTIONAL COMMITTEE

2.1 The present composition and attendance of the last three meetings of the Committee is given at Annex 1.

The Committee may REVIEW.

2.1.1 In the last meeting, the Committee requested Prof. Arun Kumar to provide the contact details of a potential expert in the J & K Lakes and Waterway Development Authority, Srinagar, who can be contacted for nomination. In this regard, the nomination letter was sent vide BIS email dated 10 Aug 2023 & 05 Jan 2024. The Reply is still awaited.

The Committee may DECIDE.

2.1.2 In the last meeting, the Committee decided to recommend to WRDC for removal of the organization Andhra Pradesh Engineering Research Labs Hyderabad. The matter will be placed in the next WRDC meeting.

The Committee may NOTE.

2.2 The following fresh nomination has been received from member organization:

S. No.	Organization	Nomination
1	CENTRAL WATER COMMISSION, NEW DELHI	SHRI MD. FAIZ, DIRECTOR, HYD. (C) SHRI AMITHABH MEENA, DIRECTOR R O (ALTERNATE)
2	CENTRAL WATER AND POWER RESEARCH STATION, PUNE	MR. P. S. KUNJEER, SCIENTIST D DR. V.M. PRABHAKAR, SC C (ALTERNATE) MR. NISHCHAY MALHOTRA, SCIENTIST-B (ALTERNATE)
3	NATIONAL WATER DEVELOPMENT AGENCY, NEW DELHI	MR. R K JAIN CHIEF ENGINEER HQ MR. S.C. AWASTHI SUPERINTENDING ENGINEER-III(ALTERNATE)
4	DHI (INDIA) WATER & ENVIRONMENT PVT LTD, NEW DELHI	DR SHRESTH TAYAL, HEAD OF WATER RESOURCES – INTERNATIONAL DEVELOPMENT MR MANISH KUMAR, SENIOR MANAGER – MIKE (ALTERNATE-I) MS. JEBA GRACE J, WATER RESOURCE ENGINEER (ALTERNATE-II)

The Committee may NOTE.

ITEM 3 SCOPE AND PROGRAMME OF WORK

3.1 The present scope and programme of work under this Committee are given in Annex 2**.**

The Committee may NOTE.

3.2 Standards National Action Plan (2022 – 27)

Field	Subject Area	Priority
Ground Water	Aquifer Storage and Recovery Techniques	Medium
	Guidelines for Aquifer mapping	Medium
	Impact assessment techniques for artificial recharge structures	Medium

	Guidelines for surface runoff harvesting using Small Structures	Medium
	Ground Water Harvesting Using Unconventional Measures	Medium
	Groundwater Flow Monitoring	Medium
Coastal Zone Water Managem ent	Control of Salt Water Intrusion	Medium
	Preventions of Coastal Hazards	Medium
	Coastal Erosion Protection	Medium
	Anti-Erosion Works in Coastal area	Medium
Disaster Mitigation and Managemen t	Glacial Lakes Outburst Floods	Medium
	Anti – Erosion Works on River Course	Medium
	Design and Construction of Fuse Plug to Facilitate Breaching	Medium
	Flood Forecasting Using Real-Time Reservoir Inflow	Medium
	Flood Map of India	Medium
	River Morphology and Flood Plain Study	Medium
Hydro Structure Construction, Operation maintenance	Standardization on Dams Safety Management, Planning and Rehabilitation	High
	Life Cycle Assessment of Dams	High
	Sediment Management and disposal	Medium
	Guidelines on Performance of Old or Existing Hydraulic Structures	Medium
	Guidelines on Treatment of Defects in the Foundation of Masonry and Concrete Dam	Medium
	Optimization and Simulation of Reservoir Operation	Medium
	Dam Safety Protocol and Retrofitting	High
	Dam Break Analysis	High
	Roller Compacted Dams	Medium
	Rubber Dams	Medium
	Adit Gates Design	Medium
	Ventilation of Underground Power Houses	Medium
	Performance Monitoring of Hydraulic Structures	Medium
	Piano key Weirs	Medium
	Installation, Maintenance and Operation of Instruments in Tunnels	Low
	Standards on Geological investigations in Himalayan Region	Low
	Efficient Use of Water Resources	High
	Interlinking of Rivers	High

Water Resources Management	Standards on Artificial Ponds/ Lakes	Medium
	Canal Automation	Medium
	Water Use Efficiency	High
	Inland Water Transportation Design	Medium
	Rejuvenation of Traditional Water Resources	High
	Water Audit	Medium
	Piped Irrigation Network	Medium
	Seepage Losses in Reservoirs	Medium
	Evaporation Control in Canals	Medium
	Integrated watershed management	Medium
Environment Impact Assessment	Environment and Social Impact on River Training Works	Medium
	Climate Resilient Water Security	Medium
	Assessment of Environmental Flow	Medium
	Conservation of aquatic ecosystems in reservoirs and lakes	Medium

3.4.1 In the last meeting, the Committee deliberated and observed the following standards from above subjects identified in SNAP 2022-27 are relevant to this sectional committee and decided to request the members to provide their views on including them as new subjects. In this regard, no views were received.

1. Efficient Use of Water Resources
2. Standards on Artificial Ponds/ Lakes
3. Rejuvenation of Traditional Water Resources.

The Committee may NOTE and DECIDE.

ITEM 4 DRAFT INDIAN STANDARDS UNDER PRINTING

4.1 Doc. No. WRD 10 (18947) Revision of IS 14654:1999 Minimizing evaporation losses from reservoirs – Guidelines

{Earlier Doc. No. WRD 10 (12301)}

The document is under printing stage and sent to the WRDC Chairperson for approval. The WRDC Chairperson raised the following comment for inclusion in the draft document. Subsequently, it was also circulated among the committee members for their comments. However, no comments have been received.

“The subject matter for the maximum extent/percentage coverage of Reservoir Area by Solar Panels and the kind of area which can be covered, may be explored. However, while finalising all the aspects such as the Flora and Fauna, aquatic life, environment, Tourism, navigation and the safety of the Hydraulic structures should be considered.”

The Committee may NOTE & DECIDE.

4.2 Doc. No. WRD 10(16243) Measurement and control of sediments in natural lakes - Guidelines

The document was published on 11 Dec 2023 as IS 19027 Measurement and control of sediments in natural lakes - Guidelines. The members of the Committee were apprised about the Gazette of the document vide BIS email.

The Committee may NOTE.

ITEM 5 DRAFT STANDARDS FOR FINALIZATION

5.1 Revision of IS 7323: 1994 Guidelines for Operation of Reservoirs

The Committee in the last meeting deliberated on the comments received from NHPC and resolved all the comments except comments with S.No. 3, 4, 8 where the Committee desired more inputs. The committee requested BIS to circulate the working draft along with the unresolved comments to all the members of the committee for further input. In this regard, comments were circulated vide BIS email dated 10 Aug 2023 and 30 Nov 2023. No inputs have been received on the circulated comments. The unresolved comments from the last meeting are placed in Annex 3.

The Committee may NOTE and DECIDE.

ITEM 6 DRAFT STANDARDS COMPLETED WIDE CIRCULATION

6.1 Revision of IS 8237:1985 Code of Practice for Protection of Slope for Reservoir Embankments

As decided by the committee in the last meeting, the document was issued in wide circulation vide BIS email dated 21 Aug 2023 by incorporating resolved comments of CWC. Comments have been received from SSNNL on the wide circulation draft which were placed in Annex 5.

The Committee may NOTE and DECIDE.

ITEM 7 DRAFT STANDARDS UNDER REVISION

7.1 Revision of IS 12182: 1987 Guidelines for Determination of Effects of Sedimentation in Planning and Performance of Reservoirs

In the last meeting, the Committee requested CWC & NHPC to provide their inputs on the draft document which includes resolved comments from THDC. As decided, inputs were requested vide BIS email dated 10 Aug 2023. In this regard, inputs have been received from NHPC vide email dated 26 Dec 2023 and are placed in Annex 4.

The Committee may NOTE and DECIDE.

7.2 Revision of IS 6939: 1992 Methods for determination of evaporation from reservoirs

In the last meeting, The Committee discussed the pending inputs from Prof V. Jagannatha and NIH on the draft document. Prof Jagannatha and NIH have agreed to provide their inputs to BIS within a one-month period. In this regard, reminder was sent requesting inputs vide BIS email dated 10 Aug 2023 and 30 Nov 2023. Prof. Jagnnatha V has provided a research paper as attached with the agenda documents.

The Committee may NOTE and DECIDE.

7.3 Revision of IS 15840: 2009 Determination of volume of water and water level in lakes and reservoirs

In the last meeting, the Committee deliberated on the pending inputs and decided to recirculate the document to all the members of the Committee for input. No inputs have been received. Further, the document is the adoption of ISO/TR 11330 and is under revision in ISO/TC 113/SC 1/WG 6 under the Convenorship of Mrs. Neena Isaac, CWPRS. As you are aware the Secretariat of ISO/TC 113 is with WRD, BIS (India), and the next meeting of the ISO TC 113/SC1 is scheduled between 22 to 27 April 2024 in Delhi, India. It was informed that Mrs. Neena Isaac will superannuate in March 2024 and the Committee has to recommend a new Convener for the working group in the SC meeting.

The Committee may NOTE & DECIDE.

7.4 Revision of IS 5477 Part 1: 1999 Fixing the capacities of reservoirs methods Part 1 general requirements

In the last meeting, the Committee deliberated and decided to take up the revision of IS 5477 Part 1:1999 Fixing the capacities of reservoirs methods Part 1 general requirements and requested NIH and NHPC to review the standard and submit their comments for revision. In this regard, inputs have been received from NHPC which are placed in Annex 6.

The Committee may NOTE and DECIDE.

ITEM 8 NEW SUBJECTS FOR STANDARDIZATION

8.1 Guidelines for flushing sediments from reservoirs (New Subject approved by DC in its 13th meeting in June 2010)

During the last meeting, as decided by the committee, BBMB was requested to provide their input. Furthermore, letter was sent to CE (BSL), BBMB vide email dated August 10, 2023, December 7, 2023, and January 3, 2024, requesting their input. Inputs are still awaited.

The Committee may NOTE and DECIDE.

8.2 Methods for determination of seepage losses from reservoirs (New Subject approved by DC in its 17th meeting in June 2021)

In the last meeting, the committee decided to request NIH to submit their inputs on the document. In this regard, reminder was sent vide BIS email dated 10 Aug 2023.

Inputs are still awaited. The committee may NOTE and DECIDE.

8.3 Methods for control of seepage losses from reservoirs

In the last meeting Committee decided to incorporate 'Methods for control of seepage losses from reservoirs' as new subject in the scope of the committee. The Chairman agreed that NIH will review and provide comments on the draft document. Inputs received from Dr. A. L. Ramanathan were circulated and inputs were requested vide BIS email dated 26 Oct 2022 & 12 Jan 2023. The inputs are still awaited.

The Committee may NOTE and DECIDE.

8.4 Desilting methods including guidelines for silt removal in upstream projects (New Subject approved by DC in its 17th meeting in June 2021)

In the last meeting, the Committee requested NIH to share the table of contents of the document. Further, the Committee requested CWPRS and NHPC to provide their inputs based on the inputs received from NIH. In this regard, an email requesting inputs was sent dated 10 Aug 2023. The inputs are still awaited.

The Committee may NOTE and DECIDE.

ITEM 9 RESEARCH & DEVELOPMENT PROJECTS FOR FORMULATION AND REVIEW OF STANDARDS

BIS has realized the indispensable role of research and development (R&D) projects in the standardization process. Hence, BIS has started a scheme of awarding R&D projects for standards formulation. The guidelines for the same have been circulated with the agenda.

The Committee may NOTE.

ITEM 10 ANY OTHER BUSINESS

9.1 Date and Venue for the Next Meeting.

ANNEX 1
(Item 2)

COMPOSITION OF RESERVOIRS AND LAKES SECTIONAL COMMITTEE, WRD 10

SCOPE: ***Standardization of criteria for planning, design, operation, maintenance and other related aspects of reservoirs/lakes***

Last 3 meetings	**20th Meeting – 18 Nov. 2020**	**21st meeting- 21st Dec-2021**	**22nd Meeting – 10th Oct 2022**

SL. No.	**NAME OF THE ORGANISATION**	**REPRESENTED BY**	**MEETINGS ATTENDED**		
			21st	**22nd**	**23rd**
1	NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE	DIRECTOR (NIH) [Presently DR. SUDHIR KUMAR] [CHAIRMAN]	Y	Y	Y
2	ANDHRA PRADESH ENGINEERING RESEARCH LABS, HYDERABAD	NOMINATION AWAITED	X	X	X
3	BHAKRA BEAS MANAGEMENT BOARD, CHANDIGARH	SHRI H. L. KAMBOSH (DY. CHIEF ENGINEER)	Y	Y	Y
4	CENTRAL WATER AND POWER RESEARCH STATION, PUNE	Mr. P. S. KUNJEER, Scientist D DR. V.M. PRABHAKAR, SC C (Alternate) Mr. NISHCHAY MALHOTRA, SCIENTIST-B (Alternate)	Y	X	Y
5	CENTRAL WATER COMMISSION, NEW DELHI	Mr. MD. FAIZ Director, Hyd. (C) SHRI AMITHABH MEENA, DIRECTOR R O (Alternate)	Y	X	X
6	DHI GROUP INDIA, NEW DELHI	DR SHRESTH TAYAL, Head of Water Resources – International Development MR MANISH KUMAR, Senior Manager – Mike (Alternate-I)	X	X	X

		MS. JEBA GRACE J, Water Resource Engineer (Alternate-II)			
7	INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY	PROF. V. JYOTHIPRAKASH, CIVIL ENGINEERING	–	Y	Y
8	INDIAN INSTITUTE OF TECHNOLOGY ROORKEE, ROORKEE	PROF ARUN KUMAR, HRED PROF. SUMIT SEN, HYDROLOGY (Alternate)	Y	Y	Y
9	IRRIGATION RESEARCH INSTITUTE, ROORKEE	SHRI DINESH CHANDRA, CE SHRI SHANKAR KUMAR SAHA SUPERINTENDING ENGINEER (Alternate)	Y	Y	Y
10	J&K LAKES AND WATER WAY DEVELOPMENT AUTHORITY, SRINAGAR	EXECUTIVE ENGINEER	X	X	X
11	MINISTRY OF IRRIGATION, SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE, VADODARA, GUJARAT	SHRI K V RATHOD ASSISTANT SECRETARY SHRI N K BHANDARI SECRETARY (Alternate)	Y	X	Y
12	NARMADA AND WATER RESOURCES, WATER SUPPLY & KALPSAR DEPTT., GUJARAT	SHRI R.M.PATEL, CHIEF ENGINEER & DIRECTOR MRS. D. N. PRADHAN, RESEARCH OFFICER, NARMADA HYDRAULICS DIVISION (Alternate)	Y	Y	Y
13	NATIONAL HYDROELECTRIC POWER CORPORATION, FARIDABAD	MS. MANJUSHA MISHRA, DEPUTY GENERAL MANAGER (CIVIL) SHRI PRAVEEN KUMAR JAIN, DEPUTY GENERAL MANAGER MS. ANKUR SHARMA DM CIVIL (Alternate)	Y	Y	Y
14	NATIONAL INSTITUTE OF HYDROLOGY, ROORKEE	DR M K GOEL SCIENTIST ‘F’ DR S D KHOBRAGADE SCIENTIST ‘F’(Alternate)	Y	Y	Y

15	NATIONAL REMOTE SENSING CENTRE, HYDERABAD	DR V VENKATESHWAR RAO SHRI ABDUL HAKEEM Head, (Alternate)	Y	Y	Y
16	NATIONAL THERMAL POWER CORPORATION LIMITED, NEW DELHI	SHRI. RAKESH SHARMA MANAGER (DESIGN) , HYDROPOWER DR. A. K. SINGH (Alternate)	X	X	X
17	NATIONAL WATER ACADEMY, PUNE	SHRI ASHOK KUMAR KHARYA, CHIEF ENGINEER SHRI S N PANDE, DIRECTOR (Alternate)	Y	X	Y
18	NATIONAL WATER DEVELOPMENT AGENCY, NEW DELHI	Mr. R K Jain CHIEF ENGINEER HQ Mr. S.C. AWASTHI SUPERINTENDING ENGINEER-III(Alternate)	Y	X	X
19	SARDAR SAROVAR NARMADA NIGAM LIMITED, GANDHINAGAR	C. V. NADPARA, DIRECTOR (CANALS) R. G. KANOONGO	Y	X	X
20	SATLUJ JAL VIDYUT NIGAM LIMITED	SHRI VINAY GULERIA, MANAGER SUDHA DEVI, MANAGER (Alternate)	X	X	Y
21	TEHRI HYDROELECTRIC DEVELOPMENT CORPORATION LIMITED, RISHIKESH	SHRI VIRENDRA SINGH AGM (OMS-HM & EM) SHRI. ATUL KUMAR SINGH DGM (OMS-CIVIL) (Alternate)	Y	X	Y
22	UVCE BANGALORE UNIVERSITY	DR. INAYATHULLA M, PROF. CIVIL ENGINEERING	–	Y	Y
23	WATER AND POWER CONSULTANCY SERVICES LIMITED	DR. A K SHARMA CHIEF (PROJECT) DIRECTOR SHRI A STEPHEN LEO, GENERAL MANAGER (Alternate)	Y	Y	Y
24	WATER RESOURCES DEPARTMENT, ANDHRA PRADESH	SHRI A. SURI BABU SUPTDG. ENGINEER	X	X	X
25	WATER RESOURCES DEPARTMENT, M.P., BHOPAL	SHRI B.C. PURANDARE CHIEF ENGINEER SHRI S R UIKEY (Alternate)	X	X	X

26	WATER RESOURCES DEPARTMENT, MAHARASHTRA	SHRI. RAJESH M. MORE, SE (DAM) SHRI A. P. KOHIKAR DG (DTHRS) (Alternate)	X	X	Y
27	MAHARASHTRA ENGINEERING RESEARCH INSTITUTE, NASHIK	MR. YASHAVANTRAO BHADANE SE (DAM SAFETY)	Y	X	X
28	WATER RESOURCES DEPARTMENT, ODISHA	CHIEF ENGINEER (D&R) DIRECTOR (HEADWORKS) (*Alternate*)	X	X	X
29	WATER RESOURCES DEPARTMENT, GOVT. OF PUNJAB	SHRI PAWAN KAPOOR SHRI. K. K. GUPTA CE (DAM RSDD) (*Alternate*) SHRI N.K JAIN CHIEF ENGINEER (*Alternate*)	Y	X	X
30	WETLANDS INTERNATIONAL SOUTH ASIA	DR. RITESH KUMAR, DIRECTOR MR. HARSH GANAPATHI TECHNICAL OFFICER – WATER MANAGEMENT (*Alternate*)	X	Y	X
31	IN PERSONAL CAPACITY	DR. RAMANATHAN, PROFESSOR	Y	X	X
32	IN PERSONAL CAPACITY	PROF. M L KANSAL, IIT ROORKEE	–	X	X
33	IN PERSONAL CAPACITY	DR. JAGANNATHA V	–	Y	Y

ANNEX 2

(Item 3.1)

Program of Work

SCOPE: Standardization of criteria for planning, design, operation, maintenance and other related aspects of reservoirs/lakes.

STANDARDS PUBLISHED

Sl. No	IS No.	Title
1.	IS 4410 Part 6 : 2022	Glossary of terms relating to river valley projects Part 6 reservoirs Second Revision
2.	IS 5477 Part 1 : 1999	Fixing the capacities of reservoirs methods Part 1 general requirements First Revision
3.	IS 5477 Part 2 : 2020	Methods for Fixing the Capacities of Reservoirs Part 2 Dead Storage Second Revision
4.	IS 5477 Part 3 : 2002	Fixing the capacities of reservoirs - Methods Part 3 live storage First Revision
5.	IS 5477 Part 4 : 2019	Methods for fixing the capacities of reservoirs Part 4 surcharge storage First Revision
6.	IS 6518 : 2017	Guidelines for control of sediment in reservoirs Second Revision
7.	IS 6939 : 1992	Methods for determination of evaporation from reservoirs First Revision
8.	IS 7323 : 1994	Operation of reservoirs - Guidelines First Revision
9.	IS 8237 : 1985	Code of practice for protection of slope for reservoir embankment First Revision
10.	IS 12182 : 1987	Guidelines for determination of effects of sedimentation in planning and performance of reservoirs
11.	IS 13665 : 2017 ISO 6421 : 2012	Hydrometry - Methods for assessment of reservoir sedimentation First Revision
12.	IS 14654 : 1999	Minimising evaporation losses from reservoirs - Guidelines
13.	IS 15472 : 2004	Guidelines for planning and design of low level outlets for evacuating storage reservoirs
14.	IS 15840 : 2009	Determination of volume of water and water level in lakes and reservoirs

ANNEX 3

(Item 5.1)

Sl. No.	Committee/ Organization/ Individual	Clause/ Sub-clause Paragraph Figure/ Table	Type of Comment General/ Technical/ Editorial	Comments (Justification For Change)	Proposed Change	Decision in the 22nd meeting
3.	NHPC	**Clause/ Sub-clause 4.1.1**	Technical	Something specific may be mentioned for principal of operation of single purpose reservoirs created for hydropower generation.	A New sub-clause 4.1.1(c) may be created and detailed as below: c) Hydropower-- Generally reservoirs created for hydropower projects are small and meant for generation of power with sufficient pondage for supplying water for meeting diurnal or weekly fluctuation of demand. For effective flood and sediment management reservoir water levels are maintained near Minimum Draw Down Level MDDL during high flow periods (monsoon). Though there is some loss of head but keeping in view the effectiveness in sediment management leading to extended useful life of reservoir, this operational methodology is very useful especially for reservoirs located in Himalayan region. During low flow periods reservoir water level fluctuates between FRL and Minimum Draw Down	The Committee deliberated and requested all the members for inputs on the proposed change. The Committee decided to deliberate in the next meeting based on the inputs received.

					Level (MDDL) depending upon inflow and power requirement.	
4.	NHPC	**Clause/ Sub-clause 4.1.2.1 (b)**	Technical	The extent of "Flood Control Zone" definition may be defined.	The Flood Control Zone may be defined as: **Flood control zone** — This is the storage space earmarked as temporary storage for absorbing high flows for alleviating down-stream flood damages. This should be space emptied as soon as possible to negotiate next flood event. This zone is generally between Full Reservoir Level (FRL) and a pre- defined level between FRL & MDDL / Dead Storage level (DSL).	The Committee deliberated and decided to request CWC to share their views on the proposed change which can be deliberated in the next meeting.
8.	NHPC	Clause / Sub-clause 6.3	Technical	The real time operation of hydropower reservoirs in Himalayan region requires implementation of Early Warning.	A new **subclause 6.3 (h)** may be inserted as: Hydropower Projects located at Himalayan regions are most vulnerable for multiple kind of disasters such as Landslides, Cloudburst, Flash floods, Earthquakes, Avalanches, Glacial Lake Outburst Flood (GLOF), and Landslide Lake Outburst Flood (LLOF)etc. To reduce the risk to the life and property due to such disasters a comprehensive Early Warning System (EWS) need to be implemented. CEA has Prepared SOPs for Early Warning System (Dec 2021 & Jun 2022) and circulated it to all the developers for implementation.	The Committee deliberated and decided to request CWC to share their views on the proposed change which can be deliberated in the next meeting.

ANNEX 4

(Item 6.1)

TITLE: IS: 12182 – 1987 “GUIDELINES FOR DETERMINATION OF EFFECT OF SEDIMENTATION IN PLANNING AND PERFORMANCE OF RESERVOIR”

Sl. No.	Committe/ Organization/ Individual	Clause/ Subclause Paragraph Figure/Table	Type of Comment General/ Technical/ Editorial	Proposed Change	Decision of the Sectional Committee
1	NHPC Limited	Clause 3.1 (d)	General	“Sedimentation in upper portion of the reservoir may change the back water profile from what it would have been put for sedimentation”. May be written as “**Sedimentation in upper portion of the reservoir may change the back water profile”**	

2	NHPC Limited	Clause 4.1 (b)	General	Likely effects …… dam face **or near dam spillway & Intake**	
3	NHPC Limited	Clause 4.2.2.4	General	Sediment observation data (see IS: 189O-1968*) is to be replaces with **"Sediment observation data (see IS: 4890-1968 reaffirmed in 2001)"**	
4	NHPC Limited	Clause 4.2.2.4	General	**While calculating sediment yield from reservoir resurvey, any kind of reservoir operation or sediment management strategies such as sluicing / flushing should be taken care of.**	
5	NHPC Limited	Clause 4.2.3	General	Distribution of sediment Volume- Once…….. methods, **for large reservoir.**	

6	NHPC Limited	Clause 5.1.2	General	Hydra-power should be replaced with **Hydro-power.**	
7	NHPC Limited	Clause 8.2.1	General	The word **silt** in the last line of the para shall be replaced with **sediment.**	
8	NHPC Limited	Appendix A Para A-1.1	General	**Gunnar Brunet** shall be replaced with **Gunnar Brune or Gunnar M Brune**	
9	NHPC Limited	Appendix A Para A-2.2	General	Percentage of incoming sediment passing through as read from the Fig 2 corresponding to above sedimentation index = 15 percent. **(This 15 percent does not match with the curve as Fig 2.)**	

ANNEX 5
(Item 6.3)

Doc WRD 10 (23313)	**IS 8237**
Title: PROTECTION OF SLOPE FOR RESERVOIR EMBANKMENT -CODE OF PRACTICE	

Sl. No.	**Name of the commenter/ Commenting organization**	**Clause/ Sub clause/ Paragraph/ Figure/Table**	**Type of Comment General/Technical/ Editorial**	**Comments (Justification For Change)**	**Proposed Change**	**Decision of the Sectional Committee**
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	SSNNL. GANDHINAGAR	Clause 2 References	Editorial	IS 9429:1999 It is repeated	May not be necessary to mention again.	
2	SSNNL. GANDHINAGAR	Clause 8.2.1	Grammatical	The minimum thickness of dumped rock riprap and average rock size shall be shown in Table 2	It may be, The minimum thickness of dumped rock riprap and average rock size shall be **as** shown in Table 2.	

ANNEX 6

(Item 3.3)

TITLE: IS: 5477 (part 1) – 1999 " FIXING THE CAPACITIES OF RESERVOIRS - METHODS"

Sl. No.	Committee/ Organization/ Individual	Clause/ Sub clause/ Paragraph/ Figure/Table	Type of Comment General/ Technical/ Editorial	Proposed Change	Decision of the Sectional Committee
1	NHPC Limited	Whole document	General	Word **'silt'** should be replaced by **'sediment'** at all the relevant places of the document. Similarly, **'silting'** may be replaced by **'sedimentation'.**	
2	NHPC Limited	Para 4.1.2	General	It is mentioned that Sill level of the lowest outlets for any reservoir is fixed from Minimum drawdown level on considerations of efficient turbine in case of Power Generation Purpose. **Considerations for Sedimentation aspects should be looked into.**	
3	NHPC Limited	Para 5.2	General	The basis of mentioning minimum contour interval of 2.5 m is not known.	

4	NHPC Limited	Para 5.3	General	It is suggested to add **'Brune's Curve'** and **'Churchil's Curve'** name after mentioning Fig 1 and Fig 2.	
5	NHPC Limited	Para 5.8	General	Relevance of para 5.8 fixing the capacity of reservoirs is not clear. If sedimentation aspects is to be mentioned, all the other aspects related to sedimentation may be mentioned along with density currents.	
6	NHPC Limited	Para 5.9	General	**"interval rate of return'** may be replaced by **'internal rate of return'**	
7	NHPC Limited	Para 5.9	General	It is mentioned that **"spillway capacity has to be adequate to pass the inflow design flood", Glacial lake outburst flood (GLOF)** aspects may also be considered to decide spillway capacity.	