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Dam Safety Act, 2021
National Committee
on Dam Safety

Minutes of the
7th Meeting

31st July 2024
12:00 – 01:30 hours
2nd Floor Conference Room
Central Water Commission, New Delhi

Minutes of Meeting

The 7th meeting of National Committee on Dam Safety (NCDS) was held on 31st July 2024, under the chairmanship of Shri Kushvinder Vohra, Chairman, CWC & NCDS. The meeting was held in virtual mode. The list of participants is attached as **Annexure-1**.

At the outset of the meeting, Chairman, NCDS and CWC welcomed all the participants in the 7th meeting of NCDS. Chairman of the committee informed the committee members that the agenda for the meeting would be finalization of two (02) draft regulations framed by the NDSA under section **54(2)(b) "The vulnerability and hazard classifications criteria of specified dams under section 17 & under section 54(2)(s) "*The measures necessary to ensure dam safety by every owner of dam other that specified dam under sub-section (1) of section 46.*** Chairman of the committee invited all the participating States and Members of the NCDS and Senior Joint Commissioner (PR), DOWR, RD & GR for their suggestions/comments on the draft regulations. Thereafter, Chairman of the committee asked Member Secretary, NCDS to take up the agenda points. Accordingly, Shri Shiv Dutta Sharma, Member Secretary, NCDS presented the power-point presentation on the agenda points stated below: -

7.1 Status Regulations to be framed under section 54 of Dam Safety Act, 2021:

Member Secretary informed that out of 19 regulations that are to be framed, 17 have been approved by the committee & published in the Gazette of India. The remaining two (02) regulations will be discussed in this meeting.

7.2 Deliberations and Decision:

As per agenda items, the detailed deliberations held on the following two (2) Regulations:

i. **Regulation 54(2)(b) "The vulnerability and hazard classifications criteria of specified dams under section 17**
ii. **Regulation 54(2)(s) "*The measures necessary to ensure dam safety by every owner of dam other that specified dam under sub-section (1) of section 46.***

Decision: The above proposed two (02) regulations, i.e. (2) (b) & (2) (s) as per section 54 has been accepted with the minor modifications and approved by the committee. The final regulations are enclosed herewith as **Annexure-2**

Closing remarks by the Chairman NCDS:

At the end of the meeting, Chairman NCDS appreciated the contribution of the Committee members in finalization of two (02) regulations **54 (2) (b) & 54(2) (s)**.

The meeting ended with vote of thanks to the Chair.

Annexure-1

List of Participants

S.no.	Name	Designation
Chairman NCDS		
1.	Shri Kushvinder Vohra	Chairman CWC & Ex-Officio Secretary to the Govt. of India
Representative of Central Government		
2.	Shri Anil Jain	Chairman, NDSA
3.	Shri Sharvan Kumar	Chief Engineer, CEA, Ministry of Power
4.	Shri Manoj Kumar	SJC(PR), DoWR, RD & GR
5.	Ms. Neetu Chauhan	Director, Geological Survey of India
6.	Shri Swapan Kumar Manik	Scientist D,IMD
7.	Dr. Sweta Baidya	Consultant, NDMA
8.	Shri Abdul Hakeem K	Scientist, NRSC
9.	Shri B.S.Rao	Scientist, NRSC
10.	Shri Vijaya Raghavan	Scientist, NGRI
11.	Ms. Neetu Chauhan	Director, Geological Survey of India
12.	Shri Yogendra Pal Singh,	MOEF&CC
Representative of State Government/agencies		
13.	Shri T. K. Prijith Rekh	Chief Engineer , Andaman PWD
14.	Shri T.A.R Kumar	Chief Engineer, SDSO & Hydrology, Andhra Pradesh
15.	Shri Jayanta Kumar Das	GM(Civil),SDSO, Assam
16.	Shri Saurav Saikya	CGM(H&C), APGCL
17.	Shri Nand Kumar Jha	Chairman, State committee on Dam Safety, Bihar
18.	Shri Arun Badiye	SDSO, Chhattisgarh
19.	Shri M. D. Patel	Chief Engineer, WRD, Gujarat
20.	Shri Vijay Shankar	SDSO, Jharkhand
21.	Er.L.D. Ghani Lemai, EE,	WRD, Manipur
22.	Ms Adelyne Sunn	Chairman, SDSO, Meghalaya
23.	Shri A K Bera	Director, DSO, West Bengal
24.	Shri.Sudarshan S.Pagar	SDSO, Maharashtra
25.	Shri Manish Parihar	Chairman, SDSO, Rajasthan
26.	Shri Jaipal Singh	Chief Engineer, SDSO, Uttarakhand
27.	Shri S K Saha	Superintending Engineer,IRI, Roorkee
Special Invitee		
28.	Shri Rakesh Kashyap	Member (Technical Wing), NDSA
29.	Shri S S Bakshi	Director, CWC
30.	Shri R K Gautam	Director, CWC
31.	Shri M S Verma	Director (R),NDSA
32.	Shri Amitabh Meena	Director (T),NDSA
Member Secretary		
33.	Shri Shiv Dutta Sharma	Member (Policy & Research Wing), NDSA

Annexure-2

Regulation 54 (2) (b): *The vulnerability and hazard classifications criteria of specified dams under section 17.*

Section 17

The State Dam Safety Organization shall classify each dam under their jurisdiction as per such vulnerability and hazard classification criteria as may be specified by the regulations.

1. Criteria of Vulnerability Classification

The vulnerability of a dam is classified into three categories:

- **Category-I**: Deficiencies in dams which, if left unattended, may lead to failure.
- **Category-II**: Major deficiencies requiring prompt remedial measures.
- **Category-III**: None or minor deficiencies which are rectifiable.

Note: The above categories of Vulnerability Classification shall be carried out as per Part 2(c) of the Schedule-I of "Inspection, Instrumentation, Seismic Data, Risk Assessment and Evaluation of Specified Dam Regulation, 2024".

2. Criteria of Hazard Classification

Hazard Potential is possible adverse incremental consequences that result from the release of water or stored contents because of failure or incorrect operation of the dam or appurtenances. Hazard potential is Class-I, II, III and IV as defined in the table-1 below based on the consequences category.

Table 1. - Consequences Categories in the Proposed Dam Classification

Hazard Potential Class		Consequences Categories			
	Potential Consequences Index (P_{ci})*	Capital Value of Project	Potential for Loss of Life	Potential for Property Damage	Potential for Environmental and Cultural Impact
Class I	< 300	Low	None. Occasional or no incremental population at risk, no potential loss of life is expected. No inhabited structures.	Minimal. Limited economic and agricultural development.	None
Class II	< 300	Average	Minimal or low population at risk. No potential loss of life is expected even during the worst-case scenario of emergency management	Notable agriculture or economic activities. States highways and/or rail lines.	Minimal incremental damage. Short-Term or reversible impact (less than 2 years)

Hazard Potential Class		Consequences Categories			
	Potential Consequences Index (P_{ci})*	Capital Value of Project	Potential for Loss of Life	Potential for Property Damage	Potential for Environmental and Cultural Impact
Class III	300< P_{ci}< 600	Significant	Considerable. Several inhabited developments. Potential for loss of life highly dependent of the adequacy of warning and rescue operations.	Significant industry, commercial and economic developments. National and state highways and rail lines.	Limited. Impact have a mid-term duration (less than 10 years) with high probability of total recovery after mitigation measures
Class IV	>600	Critical	Extreme. High density populated areas. Potential for loss of life is too high even during the best scenario of emergency management	Highly developed area in terms of industry, property, transportation and lifeline features	Severe. Long-term impact/effects in the protected areas or cultural heritage sites with low probability of recovery.

**Potential Consequences Index (P_{ci}) is the aggregation of the four consequences categories based on "additive weighing" and "point index".*

Note:- Hazard Potential shall be carried out by referring the guideline titled as "Guidelines for Classifying the Hazard Potential of Dams" prepared by Central Water Commission.

Regulation 54(2)(s): ***The measures necessary to ensure dam safety by every owner of dam other than specified dams under section 46.***

The following necessary measures shall be taken to ensure the safety of dams other than specified dams, herein after called non-specified dams.

1. **Measures for non-specified dams having a height less than 3 meters above Natural River Bed**

   A. The owner of the non-specified dam shall be in accordance with provisions of section 4(s) of the Act.
   B. The State Dam Safety Organisations (SDSOs) shall create unique Identification Numbers (IDs) for such non-specified dams in their jurisdiction and maintain the database of such dams, provided by respective dam owners, as per the proforma given in **Schedule-I**.
   C. Every owner of the non-specified dam shall earmark sufficient and specific funds for maintenance and repairs of the non-specified dam.
   D. For new dam construction, every agency shall undertake the quality control measures as specified by "Quality Control Measures for Dam Construction Regulations, 2024".
   E. The dams, which shall be taken up after this regulation comes into force, shall be designed as per the latest relevant IS codes.

2. **Measures for non-specified dams having height equal to or more than 3 meters above Natural River Bed**

A. The owner of the non-specified dam shall be in accordance with provisions of section 4(s) of the Act.
~~B.~~ The State Dam Safety Organisations (SDSOs) shall create unique Identification Numbers (IDs) for such non-specified dams in their jurisdiction and maintain the database of such dams, provided by the respective dam owners, as per the proforma given in **Schedule-I.**
C. The dam owners of such non-specified dams shall carry out at least one inspection during a year, preferably between January and May. Inspection of a Non-specified dam shall be recorded in the following manner:

   i. Every non-specified Earthen/Rockfill dam inspection shall be recorded in the Form specified in **Annexure-I.**
   ii. Every non-specified Concrete/Masonry dam inspection shall be recorded in the Form specified in **Annexure -II**.
   iii. In addition to Annexure I / II, for every non-specified dam having hydro-mechanical components, inspection shall also be recorded in the Form specified in **Annexure -III**.
   iv. A copy of the inspection report shall also be forwarded to the concerned SDSO.
   v. The special inspections shall also be carried out immediately in case of any sign of distress or unusual behaviour is noticed in the dam, at any time.
   vi. Dam owner shall take remedial measures as per advice of technical experts received after the inspection.

D. Every owner of the non-specified dam shall earmark sufficient and specific funds for maintenance and repairs of the non-specified dam and implement the recommendations of the State Dam Safety Organisation.
E. For new dam construction, every agency shall undertake the quality control measures as specified by "Quality Control Measures for Dam Construction Regulations, 2024".
F. The dams, which shall be taken up after this regulation comes into force, shall be designed as per the latest relevant IS codes.

Schedule-I

Salient Features of Non-Specified Dam

1. Unique ID of the Dam:

2. Name of the Dam:

3. Dam Owner:

4. Type of Dam:

5. Maximum Height of Dam (from natural river bed):

6. Length of Dam:

7. Location (Latitude & Longitude):

8. Nearest City/ Town:

9. District:

10. State:

11. Year of Construction:

12. Name of Stream, River:

13. Purpose of Dam (Irrigation/Drinking water supply/Other):

14. Designed Spillway Capacity (Cubic Meter Per Second):

Annexure-I

Inspection Form For a Non-Specified Earthen/ Rockfill Dam (height ≥ 3 M)

Dam Name:_____ Dam ID_____

Inspection Date:_____ Type of Inspections: _____

Name of head of the team:_____ Other Participants: _____

Was the spillway flowing? If yes, what was the water depth over the spillway sill?

_____

If no, how far was the water below the spillway sill level? _

_____

Was the low-level outlet open? If yes, what was the approximate discharge rate?

_____

Table-1

IS/ARE THERE ANY APPARENT	PREVIOUS INSPECTION			CURRENT INSPECTION		
CRACKS	Y	N	NA	Y	N	NA
1. Embankment cracks on the crest?						
2. Embankment cracks on the upstream slope?						
3. Embankment cracks on the downstream slope?						
VEGETATION GROWTH AND DEBRIS						
4. Excessive vegetation growth on embankments/crest?						
5. Vegetation or debris blocking the spillway channel?						
STRUCTURAL PROBLEMS						
6. Settlement on the crest?						
7. Slough, slides or bulges on the upstream slope?						
8. Slough, slides or bulges on the downstream slope?						
9. Slough, slides or bulges on the reservoir shore?						
10. Slough, slide or erosion of spillway channel?						
11. Sinkhole on crest?						
12. Sinkhole on the upstream slope?						

IS/ARE THERE ANY APPARENT	PREVIOUS INSPECTION			CURRENT INSPECTION		
STRUCTURAL PROBLEMS	Y	N	NA	Y	N	NA
13. Collapse on the downstream slope?						
14. Displaced or broken-down riprap armour?						
SEEPAGE						
15. Wet areas or seepage on downstream slope or toe?						
16. Ponded water at the downstream toe?						
17. Wet areas or seepage along downstream abutments?						
18. Occurrence of piping phenomenon?						
ANIMAL ACTIVITY						
19. Signs of livestock traffic across dam embankment?						
20. Rodent burrows in dam embankment?						
OUTLET PROBLEMS						
21. Outlet operating problems?						
22. Deterioration of the outlet conduit?						
SPILLWAY PROBLEMS						
23. Spillway blockage?						
24. Downstream spill channel blockage?						
Any other Component/ Indicator not mentioned above that may be relevant						

Comment on any problems, concerns or deficiencies found:

Note:

1. In case of any "Yes" for current inspection in Table-1, the project authority shall take remedial measures as per advice of technical experts.
2. In case of any "Yes" for both current and previous inspection in Table-1, the matter should immediately be referred to the highest level of said project for further necessary action for the safety of the dam.

Signature

Annexure-II

Inspection Form for a Non-Specified Concrete/Masonry Dam (height ≥ 3 M)

Dam Name: _____ Dam ID _____

Inspection Date: _____ Type of Inspection _____

Name of head of the team: _____ Other Participants: _____

Was the spillway flowing? If yes, what was the water depth over the spillway sill?

_____

If no, how far was the water below the spillway sill level?

_____

Was the low-level outlet open? If yes, what was the approximate discharge rate?

_____

Table-1

Are the following components/ indicators of your dam in ***UNSATISFACTORY CONDITION?*** Yes or No?

CONDITION OF COMPONENT	**PREVIOUS INSPECTION**			**CURRENT INSPECTION**		
	Y	N	NA	Y	N	NA
CONCRETE/MASONRY STRUCTURE						
1.Dam Alignment						
2.Joint filler material						
3.Concrete/Masonry material						
4.Drains						
5.Public safety signs						
OUTLET						
1.Outlet Pipe						
2.Energy Dissipater						
3.Stilling Basin						
4.Drains						
5.Outlet Channel						
6.Measuring Weir						
7.Outlet Controls						
8.Gates						
SPILLWAY						
1.Debris Boom						
2.Entrance						
3.Sill						
4.Apron						
5.Walls						
6.Upstream Channel						
7.Downstream Channel						
8.Upstream Channel Slope						
9.Gates						
ANY OTHER COMPONENT NOT MENTIONED ABOVE That May Be Relevant						

Table-2

Were any of the following *POTENTIAL PROBLEM INDICATORS* found?

INDICATOR	CONCRETE/MASONRY STRUCTURE						OUTLET						SPILLWAY					
	PREVIOUS INSPECTION			CURRENT INSPECTION			PREVIOUS INSPECTION			CURRENT INSPECTION			PREVIOUS INSPECTION			CURRENT INSPECTION		
	Y	N	NA	Y	N	NA	Y	N	NA	Y	N	NA	Y	N	NA	Y	N	NA
a) Seepage																		
b)External Erosion																		
c) Cracks																		
d) Settlement																		
e)Horizontal Movement																		
f) Excessive Debris																		
g) Vegetation																		

Comment on any problems, concerns or deficiencies found:

Note:-

1. In case of any "Yes" for current inspection, the project authority shall take remedial measures as per advice of technical experts.
2. In case of any "Yes" for both current and previous inspection, the matter should immediately be referred to the highest level of said project for further necessary action for the safety of the dam.

Signature

Annexure-III

Inspection of HM Components in Dams:

1. Is the Gate operation smooth & trouble-free without much noise? Y/N
2. Is there excessive vibration in gate and structure during operation? Y/N
3. If yes, at what gate opening & water level --------
4. Is Stoplog/Bulkhead/maintenance gate available? Y/N
5. Is DG set or power backup available at dam sites for gate operation? Y/N
6. Is the painting of gates & hoists satisfactory? Y/N

Whether Condition of below mentioned HM components is **UNSATISFACTORY**?

	PREVIOUS INSPECTION			**CURRENT INSPECTION**		
Component	**Yes**	**No**	**NA**	**Yes**	**No**	**NA**
Radial Gates:						
1. Gate Leaf, Arms and girders						
2. Rubber Seals						
3. Guide Rollers						
4. Trunnion						
5. Embedded parts like sill beam & wall plate						
Vertical Lift Gates						
1. Embedded Parts						
2. Gate Leaf						
3. Rubber Seals						
4. Wheel						
5. Guide Shoes						
Rope Drum Hoist and gantry cranes						
1. Wire Rope						
2. Turn Buckles & Rope Socket						
3. Pulley						
	PREVIOUS INSPECTION			**CURRENT INSPECTION**		
Component	**Yes**	**No**	**NA**	**Yes**	**No**	**NA**
4. Line Shaft						
5. Gear & Pinion						
6. Brakes						
7. Plummer Block and Bearings						

8. Worm gear reducer						
9. Electric Motors						
10. Electrical connections						
11. Structure, frame						
Hydraulic Hoist & HPU						
1. Hydraulic cylinder						
2. Piping/Hoses						
3. Oil tank						
4. Pressure line filter and return line filter						
5. Pressure Switches and relief valves						
6. Pump motor						
7. Electrical connections						

Note: Add separate sheet of this, if required, to cover other Gate Structures on the Dam, like Intake Gates, Valves, etc..

Additional Comments:

1. In case of any "Yes" for current inspection, the project authority shall take remedial measures as per advice of technical experts.
2. In case of any "Yes" for both current and previous inspection, the matter should immediately be referred to the highest level of said project for further necessary action for the safety of the dam.

Signature