Govt of India
Ministry of Jal Shakti
DoWR, RD&GR
National Dam Safety Authority

Policy & Research Wing,
6th Floor (S), Sewa Bhawan,

RK Puram, Sector-1, New Delhi- 110066

Sub: **Minutes of the meeting of 6th National Committee on Dam Safety meeting held on 03.07.2024 at CWC, HQ, Sewa Bhawan, New Delhi - reg.**

Sir/ Madam,

I am directed to forward herewith a copy of the approved minutes of the 6th meeting of the National Committee on Dam Safety (NCDS) held on 3rd July 2024 in virtual mode at Committee Room, CWC, 2nd Floor, Sewa Bhawan, New Delhi.

Encl: Copy of approved Minutes

Signed by Shiv Dutta Sharma
Date: 12-07-2024 10:22:43

Yours Sincerely,

(S D Sharma)
Member (Policy & Research)
Phone: 011-26104083

सत्यमेव जयते

Dam Safety Act, 2021
National Committee
on Dam Safety

Minutes of the
6th Meeting

3rd July 2024
11:00 – 12:30 hours
2nd Floor Conference Room
Central Water Commission, New Delhi

Minutes of Meeting

The 6th meeting of National Committee on Dam Safety (NCDS) was held on 3rd July 2024, under the chairmanship of Sh. 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 6th meeting of NCDS. Chairman of the committee informed the committee members that the agenda for the meeting would be finalization of one (01) draft regulation framed by the NDSA 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.

After the detailed deliberations, the committee agreed to modify the draft regulations by incorporating following:-

1. Salient features of the non-specified dams in the regulation.
2. Relaxing the specific qualification criteria for engineers to be employed for the purpose of investigation
3. Earmark sufficient funds for maintenance and repairs of the non-specified dams.
4. Non-specified dams may be categorized based on "Height above Natural Ground Surface" instead of Maximum Water Level.

The final regulation is enclosed herewith as **Annexure-2**.

The meeting ended with vote of thanks to the Chair.

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Annexure-1

List of Participants

S.no.	Name	Designation
Chairman NCDS		
1.	Sh. Kushvinder Vohra	Chairman CWC & Ex-Officio Secretary to the Govt. of India
Representative of Central Government		
2.	Sh. Anil Jain	Chairman, NDSA
3.	Sh. A S Goel	Member (D&R), CWC
4.	Sh. P K Shukla	Chief Engineer, Central Electricity Authority, Ministry of Power
5.	Sh. Manoj Kumar	SJC(PR), DoWR, RD & GR
6.	Dr. Sweta Baidya	Consultant, NDMA
7.	Sh. Abdul Hakeem	Scientist, NRSC
8.	Dr. Shravan Kumar Muppa	Scientist DGM, IMD
9.	Dr. Vijaya Kumar	Scientist, NGRI
10.	Ms. Neetu Chauhan	Director, Geological Survey of India
Representative of State Government/agencies		
11.	Sh. M. D. Patel	Chief Engineer, WRD, Gujarat
12.	Sh. Sibasish Padhi	Chief Engineer, Dam Safety, Odisha
13.	Sh. Deepak Jasrotia	Dy. Chief Engineer, Directorate of Energy, Himachal Pradesh
14.	Sh. Sanjeev Lohani	GM (Civil), UJVNL
15.	Sh. Shaik Shahid	AGM, AHPCL
16.	Ms. A. Sunn	Additional Chief Engineer, SDSO, Meghalaya
17.	S. Jamatia	Dy. General Manager, SDSO, Tripura
18.	Sh. A K Bera	Director, DSO, West Bengal
19.	Sh. N G Baser	Deputy Secretary, Maharashtra
20.	Sh. Vinay Chauhan	Director Dam, Jaipur, Rajasthan
21.	Sh. Navin Kumar Srivastava	Head In Charge, SDSO, Bihar

Special Invitee		
22.	Sh. Rakesh Kashyap	Member (Technical), NDSA
Member Secretary		
23.	Sh. S.D.Sharma	Member (Policy & Research), NDSA

Annexure-2

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 Ground Surface**

   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 as per the proforma given in **Schedule-I**. The database shall include the Latitude and Longitude of the Dam.
   C. The dam owners of such non-specified dams shall carry out inspections of such dams through appropriate officers/staff.
   D. The inspection shall be carried out once a year, preferably between January and May. The inspection report would contain a note on the safety of the dam and its appurtenant structures including hydro-mechanical parts and should be submitted to the dam owner for taking necessary measures suggested in the report. The proforma for the inspection report for such non-specified dams is at **Annexure-I.**
   E. All dam owners of such dams shall submit the annual inspection report of such dams to the concerned SDSO. The special inspections shall also be carried out immediately in case of any sign of distress or unusual behaviour is noticed in the Dam.
   F. For dam construction, every agency shall undertake the quality control measures as specified by “Quality Control Measures for Dam Construction Regulations, 2024”.
   G. 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 whenever provided.

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

   The owner of the non-specified dam shall be in accordance with provisions of section 4(s) of the Act.

   A. The State Dam Safety Organisations (SDSOs) shall create a unique Identification Numbers (IDs) for such non-specified dams in their jurisdiction and maintain the database of such dams as per the proforma given in **Schedule-I.** The database shall include the Latitude and Longitude of the Dam.
   B. The dam owners of such non-specified dams shall carry out inspections of such dams through appropriate officers/staff. The dam safety inspection shall cover the dam and its appurtenant structure.
   C. The dam owners of such non-specified dams shall carry out inspections. 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-II.**
      ii. Every non-specified Concrete/Masonry dam inspection shall be recorded in the Form specified in **Annexure -III**.
      iii. In addition to Annexure II / III, for every non-specified dam having hydro-mechanical components, inspection shall also be recorded in the Form specified in **Annexure -IV**.

iv. The inspections shall be carried out at least once a year, preferably between January and May. The filled inspection form shall be submitted to the concerned SDSO and the same shall be kept with the dam owner.

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.

D. For dam construction, every agency shall undertake the quality control measures as specified by "Quality Control Measures for Dam Construction Regulations, 2024".

E. Qualified Engineers are to be employed for the purpose of investigation, design, and construction of dams other than specified dams.

Any construction or alteration of a dam shall be undertaken subject to investigation, design, and construction being done by competent engineers having the qualification and experience as specified in the table below:

Sl. No.	Designation	Qualification and experience
(1)	(2)	(3)
1.	Survey or Investigation Engineer	Graduation or Diploma in Civil Engineering or Geology from a recognised University or Institution, possessing a minimum of two years experience in survey investigation of Water Resource Projects.
2.	Dam Design Engineer (Concrete or Masonry or Earth or Rockfill Dam, as the case may be)	Graduation in Civil Engineering from a recognised University or Institution, possessing a minimum of two years experience in Planning and Design of Concrete or Masonry or Earth or Rockfill Dam, as the case may be.
3.	Geologist	Graduation in Geology from a recognised University or Institution, possessing a minimum of two years of field experience in Geological investigations of Concrete or Masonry or Earth or Rockfill Dam, as the case may be.
4.	Hydrologist	Graduation in Civil Engineering from a recognised University or Institution, possessing a minimum of two years experience in Hydrology related areas.
5.	Hydro Mechanical Engineer	Graduation in Civil or Mechanical Engineering from a recognised University or Institution, possessing a minimum of two years experience in the design or execution of Hydromechanical works in Water Resources projects.
6.	Electrical Engineer	Graduation in Electrical Engineering from a recognised University or Institution, possessing a minimum of two years experience in the design or execution of Electrical works in Water Resources projects.
7.	Material or Quality control Engineer	Graduation in Civil Engineering from a recognised University or Institution, possessing a minimum of two years experience in quality control aspects of Concrete or Masonry or Earth or Rockfill Dams, selection of quarry or material, etc.
8.	Dam construction or rehabilitation Engineer (Concrete or Masonry or Earth or Rockfill Dam, as the case may be)	Graduation in Civil Engineering from a recognised University or Institution, possessing a minimum of two years experience in the construction or rehabilitation of Concrete or Masonry or Earth or Rockfill Dam, as the case may be.

F. The dams shall be designed as per the latest relevant IS codes.

G. 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.

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:

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:

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

Annexure-I

Inspection Form for Non-Specified Dam (height < 3M)

Dam Name _____ Dam ID: _____

Inspection Date:_____ Type of Inspections: _____

Inspected by: _____ Other Participants: _: _____

Embankment structure						
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?						
STRUCTURAL PROBLEMS						
4. Settlement on the crest?						
5. Slough, slides or bulges on the upstream slope?						
6. Slough, slides or bulges on the downstream slope?						
7. Slough, slides or bulges on the reservoir shore?						
8. Slough, slide or erosion of spillway channel?						
9. Sinkhole on crest?						
10. Sinkhole on the upstream slope?						
11. Collapse on the downstream slope?						
12. Displaced or broken-down riprap armour?						
SEEPAGE						
13. Wet areas or seepage on downstream slope or toe?						
14. Ponded water at the downstream toe?						
15. Wet areas or seepage along downstream abutments?						
16. Any other component not mentioned above						

CONCRETE/MASONRY STRUCTURE

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

INDICATOR	PREVIOUS INSPECTION			CURRENT INSPECTION		
	Y	N	NA	Y	N	NA
1.Alignment						
2.Joint Filler						
3.Concrete/masonry						
4.Drains						
5.Public safety signs						
6. Seepage						
7. External Erosion						
8. Cracks						
9. Settlement						
10. Horizontal Movement						
11. Excessive Debris						
12. Gates						
13. Any other component not mentioned above						

Comment on any problems, concerns, or deficiencies found:

Note: The inspection report shall be submitted to the dam owner for taking necessary measures suggested in the report.

Signature

Annexure-II

Inspection Form For a Non-Specified Earthen 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. Floating debris?						
6. Vegetation or debris blocking the spillway channel?						
STRUCTURAL PROBLEMS						
7. Settlement on the crest?						
8. Slough, slides or bulges on the upstream slope?						
9. Slough, slides or bulges on the downstream slope?						
10. Slough, slides or bulges on the reservoir shore?						
11. Slough, slide or erosion of spillway channel?						
12. Sinkhole on crest?						

13. Sinkhole on the upstream slope?						
14. Collapse on the downstream slope?						
15. Displaced or broken-down riprap armour?						
SEEPAGE						
16. Wet areas or seepage on downstream slope or toe?						
17. Ponded water at the downstream toe?						
18. Wet areas or seepage along downstream abutments?						
ANIMAL ACTIVITY						
19. Signs of livestock traffic across dam embankment?						
20. Rodent burrows in dam embankment?						
21. Beaver dams in reservoir or across spillway channel?						
OUTLET PROBLEMS						
22. Outlet operating problems?						
23. Deterioration of the outlet conduit?						
24. Hole in conduit?						
SPILLWAY PROBLEMS						
25. Spillway blockage?						
26. Channel blockage?						
27. Inadequate capacity?						
ANY OTHER COMPONENT/ INDICATOR NOT MENTIONED ABOVE						

Comment on any problems, concerns or deficiencies found:

Note:

1. In case of any “Yes” for current inspection in Table-1, the matter should immediately refer to dam owner to appoint a dam safety expert to look into the problem and suggest remedial measures.

2. In case of any "Yes" for both current and previous inspection in Table-1, the matter should immediately refer to the highest level in the project for the deemed fit action for the safety of the dam.

Signature

Annexure-III

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 *SATISFACTORY CONDITION*? Yes or No?

INDICATOR	**CONCRETE/MASONRY STRUCTURE**					
	PREVIOUS INSPECTION			**CURRENT INSPECTION**		
	Y	N	NA	Y	N	NA
1.Alignment						
2.Joint Filler						
3.Concrete/masonry Condition						
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.Channel						
7.Channel Slopes						
8.Gates						
ANY OTHER COMPONENT NOT MENTIONED ABOVE						

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 “No” for current inspection in Table-1, the matter should immediately refer to maintenance team of the Project and dam owner for the immediate rehabilitation.
2. In case of any “No” for both current and previous inspection in Table-1, the matter should immediately refer to the highest level in the project.
3. In case of any “Yes” for current inspection in Table-2, the matter should immediately refer to dam owner to appoint a dam safety expert to look into the problem and suggest remedial measures.
4. In case of any “Yes” for both current and previous inspection in Table-2, the matter should immediately refer to the highest level in the project for the deemed fit action for the safety of the dam.

Signature

Annexure-IV

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

Condition of below mentioned HM components shall be examined:

Radial Gates:					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Gate Leaf, Arms and girders	Check skin plate, girders, and stiffeners for pitting, scaling and corrosion			
		Check for corrosion of joints between (1) arms & girders (2) girders & skin plate or stiffeners (3) stiffeners & skin plate			
		Check lifting bracket and lifting pins for its soundness			
		Check welding joints of arm, girders, bracings, skin plate for cracks and other defects			
		Check bolted joints for tightness			
2	Rubber Seals	Checked for damage, leakages etc.			
3	Guide Rollers	Checked for free rotation of guide rollers			
4.	Trunnion	Check for creaking noise from trunnion during operation. If yes, lubricate. In case sound persists, investigate			
		Check weld between yoke girder and tie flats or tie rods			
		Check soundness of thrust blocks			

		Check for accumulation of water in yoke girder and thrust block. If so, drain			
5	Embedded parts like sill beam & wall plate	Check for damage, excessive pitting, welding damage			
Vertical Lift Gates					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Embedded Parts	Check for damage, excessive pitting, welding damage			
		Check for damage to concrete behind wheel/ slide track			
2	Gate Leaf	Check skin plate, girders, and stiffeners for pitting, scaling and corrosion			
		Check for corrosion of joints between (1) girders & skin plate or stiffeners (2) stiffeners & skin plate			
		Check lifting bracket and lifting pins for its soundness			
		Check welding joints of girders, bracings, skin plate for cracks and other defects			
3	Rubber Seals	Checked for damage, twist, deformation, leakages etc.			
4	Wheel	Check the wheels for easy rotation. Lock plates are properly bolted			
5	Guide Shoes	Checked for any Damage and misalignment			

Rope Drum Hoist and gantry cranes					
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Wire Rope	Check for damaged strands			
		Check for lubrication			
		Check for unequal tension			
2	Turn Buckles & Rope Socket	Check for any sign of failure /damage/ rusting			
		Check for lubrication of turn buckle threads			
3	Pulley	Check for rotation. Lubricate bush & pin, if required			
4	Line Shaft	Check for straightness and alignment			

5	Gear & Pinion	Check for uneven wear, cracks & defects			
		Check for lubrication			
6	Brakes	Check for damaged or worn-out brake lining of EM brakes			
		Check for oil and smooth operation of thruster brake			
7	Plummer Block and Bearings	Check for damage			
		Check for lubrication			
8	Worm gear reducer	Check for oil levels			
		Check for tightness and wear of coupling			
9	Electric Motors	Measure the current drawn by electric motor			
		Check for undue vibrations/ sound			
10	Electrical connections	Check all electrical connection of hoist motor, brake, starter, limit switch, etc. for loose connection, proper insulation			
11	Structure, frame	Check all bolted joints for tightness and welding joints for cracks or other defects			

4.	**Hydraulic Hoist & HPU**				
S.No.	**Component**	**Inspect for**	**Condition**	**Action**	**Remarks**
1	Hydraulic cylinder	Check for leakage from seals at rod end.			
2	Piping/Hoses	Check for tightness and leakage			
3	Oil tank	Check for oil level. It should be above the minimum level when gate is in closed position			
		Check for oil viscosity and contamination.			
4	Pressure line filter and return line filter	Check for clogging			
5	Pressure Switches and relief valves	Check for pressure settings			
6	Pump motor	Check for alignment and excessive noise/sound.			
7	Electrical connections	Check for damages, loose connections			

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

Additional Comments:

Note: The inspection report shall be submitted to the dam owner for taking necessary measures suggested in the report.

Signature