



Dam Safety Act, 2021
**National Committee
on Dam Safety**

Minutes of the 1st Meeting

02 August 2022
11:00 – 17:00 hours
209, 2nd Floor Conference Room
Central Water Commission, New Delhi

Ministry of Jal Shakti
Government of India
NDSA Secretariat
New Delhi

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Dam Safety Act, 2021

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Ministry of Jal Shakti, Government of India, New Delhi

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Conference Room, CWC, New Delhi

Minutes

Present

S.No.	Affiliation	Sh/Shri
Chairman		
1	Chairman, Central Water Commission Ministry of Jal Shakti, Government of India	R. K. Gupta
Members		
(a) Representatives of the Central Government		
2	Chairman, National Dam Safety Authority, Ministry of Jal Shakti, Government of India	J. Chandrashekhara Iyer
3	Member (Design & Research), Central Water Commission, Ministry of Jal Shakti, Government of India	J. Chandrashekhara Iyer
4	Member (Hydro), Central Electricity Authority, Ministry of Power, Government of India	M A K P Singh
5	Representative of Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti, Government of India -Joint Secretary, RD& PP	Anand Mohan
6	Representative of National Disaster Management Authority, Ministry of Home Affairs, Government of India, -Joint Secretary, NDMA	Harsh Gupta
7	Representative of Ministry of Environment, Forest & Climate Change, Government of India -Scientist 'E'	Yogendra Pal Singh
8	Representative of Director General, India Meteorological Department Ministry of Earth Science, Government of India -Scientist 'C'	S K Manik
9	Representative of Director General, Geological Survey of India Ministry of Mines, Government of India -Director, DGCO	S N Bhagat
10	Representative of Director, National Remote Sensing Centre, ISRO Department of Space, Government of India; -Deputy Director, RSAA, NRSC	V. Venkateswar Rao
11	Representative of Director, National Geophysical Research Institute Ministry of Science and Technology, Government of India -Chief Scientist, NGRI	N Purnachandra Rao
(b) Representatives of the State Governments		
12	Group I : Andhra Pradesh, Engineer-in-Chief (Irrigation), WRD	Narayana Reddy Chinnaganta
13	Group II : Himachal Pradesh, Engineer-in-Chief, Jal Shakti Vibhag	Sanjeev Kaul
14	Group III : Arunachal Pradesh, Chief Engineer (Mon), DHPD	R K Joshi
15	Group IV : Manipur, Add. Chief Engineer-I WRD	Remmei Alimei
16	Group V : Bihar, Engineer-in-Chief, Irrigation Creation, WRD	Ishwar Chandra Thakur
17	Group VI : Gujarat, Chief Engineer (NG) & Add. Secretary	M D Patel
18	Group VII : Rajasthan, Director (Dam), ID&R, Jaipur	Manish Parihar

(c) Specialists in Dam Safety and allied fields		
19	Specialist Chairman, HP Electricity Regulatory Commission	D. K. Sharma
20	Specialist Institute Chair Professor, Dept of Civil Engineering, IIT Madras	C. V. R. Murty
Secretary		
21	Representative of Member (Policy and Research), National Dam Safety Authority, Ministry of Jal Shakti, Government of India -Director, NDSA Secretariat	Sarbjit S Bakshi

The *National Committee on Dam Safety* discussed the *Agenda Items* (copy enclosed) and took the following decisions:

S.No.	Item	page
1.0 WELCOME		
1.0.1	Chairman	
	<p>On behalf of the NCDS, the Chairman extended a warm welcome to all the Members to the 1st Meeting of NCDS. He briefed the committee on the dam safety scenario in India. He informed that as per the National Register of Large Dams, the country has 5,334 large dams of which, 411 are under construction. Majority of these dams are owned, controlled, operated and maintained by the State Governments, and a small percentage is with the CPSUs, Boards and Private Sector Organizations. Primarily, the dam owners are responsible to undertake regular surveillance, inspections, operation and maintenance of the dams, and to take necessary measures to ensure safety of the dams. He urged the dam owners to earmark sufficient funds for carrying out the inspections, rehabilitation and maintenance works. He stated that active participation and cooperation of all stakeholders is paramount for successful operationalization of the provisions of the Dam Safety Act, 2021. He requested all Members to share their valuable technical inputs and the way forward towards putting in place best practices in Dam Safety Management in the country.</p> <p>Considering that the Committee is required to evolve dam safety policies and recommend necessary regulations, the Chairman conveyed that only the designated members and authorized representatives of the States as per the Gazette Notification should attend the meeting.</p> <p>Then, the Chairman requested Chairman, National Dam Safety Authority (NDSA), to present an overview of dam safety activities in India. The Chairman, NDSA, presented the same and highlighted the initiatives of Government of India and Central Water Commission in dam safety, the schemes of Central Government for rehabilitation of dams, and the highlights of Dam Safety Act, 2021.</p> <p>He then requested Sh Sarbjit S Bakshi, Director NDSA secretariat to take up one by one the Agenda points for the discussions of the Committee Members.</p>	

1.1 POLICY MATTERS		
1.1.1	Enactment of the <i>Dam Safety Act, 2021</i>	
	The NCDS noted the matter.	
1.1.2	Constitution of <i>National Committee on Dam Safety</i>	
	The NCDS noted the matter.	
1.1.3	Establishment of <i>National Dam Safety Authority</i>	
	The NCDS noted the matter.	
1.1.4	Status of Notification of: (a) <i>State Committees on Dam Safety, and</i> (b) <i>State Dam Safety Organizations</i>	
	NCDS noted the matter. The Chairman advised NDSA to pursue with the Chief Secretary and Principal Secretary (Water Resources) of the States, which have not yet constituted the SCDS or not yet established the SDSO, to comply expeditiously with the relevant provisions of DSA 2021.	
1.1.5	Functions of <i>National Committee on Dam Safety</i>	
	The NCDS noted the matter.	
1.1.6	Formulation of <i>RULES and REGULATIONS under Section 54 of Dam Safety Act, 2021</i>	
	<p>The Members were informed that under Section 54 of the Dam Safety Act 2021, the Regulations and Rules have to be framed by the NCDS. Pending the 1st Meeting of NCDS (to save time), a Regulations and Rules Sub-Committee was constituted for the same under the Chairmanship of Member (Policy & Research), NDSA, with the approval of the Chairman, NCDS. The NCDS ratified the said approval accorded by the Chairman.</p> <p>The Chairman, NDSA, proposed that that a legal expert could be co-opted in the said Sub-Committee, to seek legal opinion and understanding on the draft Rules and Regulations being prepared. The NCDS agreed with the said proposal.</p> <p>The draft Regulations and Rules being framed by the said Sub-Committee shall be submitted to the scientific Sub-Committees of the NCDS (discussed in Agenda Item 1.5.1 of this meeting). After vetting of these regulations by the said scientific Sub-Committees, the same will be placed before the NCDS for approval of their technical content. Thereafter, the Regulations and Rules shall be recommended to the Ministry of Jal Shakti for its approval.</p> <p>A roadmap was agreed to by the NCDS, wherein Regulations and Rules Sub-Committee will prepare on top priority the Regulations on 7 matters out of the 19 listed in Section 54 (2) of DSA, 2021, namely items:</p> <ul style="list-style-type: none"> (c) the details and form pertaining to the maintenance of log books or database under sub-section (1) of section 18; (d) the qualifications, experience and training of the individuals responsible for safety of specified dams under section 23; (e) the employment of competent engineers and their qualifications and 	

	<p>experience for the purpose of investigation, design and construction of specified dams under sub-section (3) of section 26;</p> <p>(g) the level of competent engineers for the dam safety units under section 30;</p> <p>(h) the guidelines and check-lists for inspection of specified dams under clause (a) of sub-section (3) of section 31;</p> <p>(o) time interval for updating the emergency action plan under clause (b) of sub-section (1) of section 36;</p> <p>(q) the mandatory review of design flood of existing specified dams under clause (b) of sub-section (2) of section 38;</p>	
1.1.7	Dissolution of ALL National Committees related to Dam Safety and other Inter-State Sub-Committees existing prior to enactment of The Dam Safety Act, 2021	
	<p>The matter was deliberated, and the NCDS approved recommending the dissolution of the National Committee of Dam Safety and all other Inter-State Sub-Committees related to Dam Safety, which were formed prior to the enactment of the DSA 2021.</p>	
1.2 DAM SAFETY		
1.2.1	Technical Documentation - National Registry of Specified Dams	
	<p>The NCDS advised NDSA to establish a comprehensive database of all the specified dams in the country. In this regard, the salient information mentioned in Annexure 1.7 of the Agenda Papers of this meeting of NCDS shall also be collected from all SDSOs of each specified dams under their jurisdiction. Also, the NDSA shall obtain and compile from the State Governments and Dam Owners a detailed record of all failures and distresses, if any, in the said dams. Further, it was emphasized that the state-of-the-art technology be leveraged for this technical documentation, with a dynamic module that will be continually be updated by the NDSA, SDSOs and Dam Owners.</p> <p>It was suggested that to expedite the matter and to avoid the duplicity of cost & works, DHARMA, a web based tool, developed by CWC may be got updated & modified to meet the requirements of NDSA, for maintaining data repository of Dams.</p> <p>The Chairman also requested NDSA to prepare a list of all dams where NDSA is required to perform the role of Dam Safety Organisation</p>	
1.2.2	Comprehensive Dam Safety Evaluation Procedures for:	
	<p>After due discussion, the NCDS unanimously approved the matter as proposed.</p> <p>The Chairman stated that many guidelines have been prepared under the DRIP scheme. But, these guidelines need to be examined and updated by the scientific Sub-Committees (discussed in Agenda Item 1.5.1 of this meeting). Until such time these guidelines are revised suitably and the</p>	

	<p>associated Regulations and Rules are in place, the State Governments and CPSUs shall utilize the existing guidelines and begin comprehensive Evaluation of the dams under their jurisdiction.</p> <p>The NCDS sought each State Governments and CPSUs to submit to NDSA a detailed road map on the proposed strategy and methodology that they propose to adopt for undertaking the comprehensive Dam Safety Evaluation of Dams in their jurisdiction. The document shall list the proposed experts, organizations, institutes, agencies, etc., to be engaged for such studies, along with their past experience in the subject. The State Governments and CPSUs shall submit these documents through their respective SDSOs and SCDSs. All matters related to dam safety, but not limited to those listed in the Agenda Item, shall be addressed in the said document. NDSA shall place the documents before the NCDS for consideration, after due discussion on the said documents.</p>	
1.2.3	Emergency Action Plan and Disaster Management Initiatives	
	<p>The Chairman, NCDS directed States to ensure that all Dam Owners, based on the Dam Break Analysis, shall prepare an Emergency Action Plan for each dam after due consultation with all stakeholders.</p> <p>(1) As per Section 36(1), every owner of the dam shall:</p> <ul style="list-style-type: none"> (a) Prepare Emergency Action Plan before allowing the initial filling of the reservoir and thereafter update such plans at regular intervals; and (b) in respect of the dam which is constructed and filled before the commencement of this Act, prepare Emergency Action Plan within five years from the date of commencement of this Act and thereafter update such plans at regular intervals as may be specified by the regulations. <p>(2) The Emergency Action Plan shall:</p> <ul style="list-style-type: none"> (a) Lay down the procedures to be followed for the protection of persons and property upstream or downstream of the specified dam in the event of an actual or imminent dam failure or to mitigate the effects of the disaster; (b) Include therein: <ul style="list-style-type: none"> i. the type of emergencies, which are likely to occur in the operation of any reservoir; ii. identification of the likely catastrophic flood in the event of any dam failure, along with probable areas, population, structures and installations likely to be adversely affected due to flood water released from the reservoir; iii. warning procedures, inundation maps and advance preparations for handling efficiently and in the best possible manner the likely adverse situations especially to avoid loss of 	

	<p>human life;</p> <p>iv. such other matters which may having regard to the geographical conditions, size of the dam and other relevant factors as may be necessary.</p> <p>(3) The Emergency Action Plan shall be put into action as and when conditions arise which are hazardous or likely to be hazardous to a specified dam or potentially hazardous to public safety, infrastructure, other property or to the environment.</p> <p>(4) Every owner of the specified dam shall, while preparing and updating the emergency action plan, undertake a consultation process with all disaster management agencies and other Departments of the State entrusted with disaster management and relief in the area likely to be affected and owners of other dams in the immediate vicinity likely to be affected, so as to bring coordination and transparency and allay any unwarranted fear on dam safety issues.</p>	
1.2.4	Operation and Maintenance	
	<p>The Chairman, NCDS directed States to ensure in compliance to provisions of section 28 of the Act, that. ,</p> <p>(1) Every owner of the specified dam shall provide operation and maintenance establishment for the specified dam, and shall ensure that sufficient number of trained operation and maintenance engineers or technical persons is posted at each such dam.</p> <p>(2) Every owner of the specified dam shall ensure that a well-documented Operation & Maintenance (O&M) Manual is kept at each of the specified dams and are followed at all times. O&M Manual shall include reservoir operation rule curves.</p>	
1.3 CONCERNS ON SPECIFIC DAMS		
1.3.1	Reports of Safety related to specific dams submitted by State Committees on Dam Safety	
	<p>Chairman, NCDS directed States to ensure that, the owner for each specified dam, within the operation and maintenance establishment, provide a dam safety unit consisting of such competent levels of engineers in compliance to relevant provisions of the Act.</p>	
1.4 SAFETY INSPECTION AND DATA COLLECTION		
1.4.1	Establishment of Dam Safety Unit	
	<p>Chairman, NCDS directed States to ensure that, the owner for each specified dam, within the operation and maintenance establishment, provide a dam safety unit consisting of such competent levels of engineers in compliance to relevant provisions of the Act.</p>	
1.4.2	Pre- and Post-Monsoon Inspection of Dams	
	<p>The Chairman, NDSA expressed serious concerns on the state of pre-</p>	

	<p>monsoon inspections reported by the States to CWC. The Chairman, NCDS directed the States to ensure that every owner of a specified dam shall undertake every year, through their dam safety unit, a pre-monsoon and post-monsoon inspections in respect of each such dam. Furthermore,</p> <p>(a) Every owner of a specified dam shall inspect or cause to be inspected every specified dam by the dam safety unit, during and after every flood, earthquake or any other natural or man-made calamities, or if any sign of distress or unusual behaviour is noticed in the dam.</p> <p>(b) Every owner of a specified dam shall:</p> <p>(i) Carry out all inspections referred to in sub-section (1) and sub-section (2) in accordance with the guidelines and check-lists as may be specified by the regulations;</p> <p>(ii) Station, at each of the specified dam site throughout the monsoon period, such engineers and other technical personnel, as may be decided, in consultation with the State Dam Safety Organisation: Provided that the engineers and other technical personnel shall be required to be stationed at their respective dam sites during entire period of emergency following any other natural or man-made calamity that may create distress conditions in the dam; and</p> <p>(iii) Forward the inspection report by the dam safety unit to the State Dam Safety Organisation, which shall analyse the report and submit comments on the deficiency and remedial measures, if any, to the owner of the specified dam.</p> <p>The Chairman, NCDS directed that pre and post monsoon inspections of the dams shall be carried out in a time bound manner and reports submitted to NDSA. As the regulations /guidelines for carrying the inspections are under formulation by NDSA, till such time the existing format/check list issued by CWC may be followed for inspections.</p>	
1.4.3	Instrumentation of Dams, establishment of hydro-meteorological Station & Installation of seismological stations	
	<p>The Chairman, NCDS directed States ensure that every owner of a specified dam shall have a minimum number of such instruments at each specified dam, and installed in such manner as may be specified by the regulations for monitoring the performance of such dam.</p> <p>(a) Every owner of the specified dam shall maintain a record of readings of the instrumentations referred to in sub-section (1) and forward the analysis of such readings to the State Dam Safety Organisation, in the form, manner and at such interval as may be specified by the regulations. Further, as per the Act, Seismic Instrument station shall be installed in accordance with the Section 34 and Section 38 (2)(c) of the Act.</p> <p>(b) According to Section 33 (1), every owner of a specified dam shall:</p> <p>(i) Establish a hydro-meteorological station in the vicinity of each specified dam capable of recording such data as may be specified by the regulations; and</p>	

	<p>(ii) Collect, compile process and store data referred to in sub-section (1) at a suitable location</p> <p>(c) According to Section 34 (1), in the case of every specified dam, having a height of 30 metres or above or falling under such seismic zone, as may be specified by the regulations, the owner of the specified dam shall:</p> <p>(i) Establish a seismological station in the vicinity of each such dam for recording micro and strong motion earthquakes and such other data as may be specified by the regulations; and</p> <p>(ii) Collect, compile process and store data referred to in sub-section (1) at such suitable location and in such manner as may be specified by the regulations.</p>	
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1.5 SUB-COMMITTEES

1.5.1	Formation of Sub-Committees	
	<p>After seeking clarifications and due deliberations, it was considered that the spectrum of issues involved in ensuring Dam Safety is vast and technical. Therefore it was decided to constitute national level technical think tanks to:</p> <ol style="list-style-type: none"> (1) Identify the issues & needs, discuss contentious issues in light of the state-of-the-art, steer activities (including R&D studies), and facilitate the implementation of dam safety initiatives in their domain areas; (2) Provide valuable inputs for the NCDS to take evidence-based decisions on the technical matters; and (3) Address all technical aspects that lead towards ensuring dam safety of about 5,334 existing specified dams (as registered in National Register of Large Dams, 2019). <p>Further, the proposed Sub-Committees under the NCDS will be charged to:</p> <ol style="list-style-type: none"> (1) Deliberate on the subject of dam safety and guide the NCDS on possible policies to be taken forward for the dam safety in India; (2) Build collaborations with similar bodies worldwide to adapt and establish relevant international good practices in India; and (3) Prepare and finalize the guidelines on the subject matter based on the state-of-the-art technology and established national and international practices. <p>In turn, the NCDS will examine and take decisions based on the considered inputs provided by these technical Sub-Committees. Accordingly, it was opined that nine Sub-Committees of the National Committee on Dam Safety shall be formed to address the following aspects of Dam Safety:</p>	

S.No.	Sub-Committee on	Domain Areas of the Sub-Committee (but not limited to)
1	Dam Safety Management	Dam Break Analysis Downstream Inundation Risk Classification Disaster Management Actions Dam Safety Management Approach
2	Hydraulic Safety	Upstream Precipitation Water Catchments Overtopping of Dams
3	Hydrological Safety	Reservoir Capacity Silting mechanisms and profiles De-silting need and techniques
4	Structural Engineering and Earthquake Safety	Seismic Hazard Assessment Structural Analysis Structural Design Structural Vulnerability Structural Risk Assessment Structural Safety Evaluation Earthquake Instrumentation Continued Operations of: (a) Appurtenant Structures, and (b) Penstocks and Outlets
5	Geological, Geophysical and Geotechnical Safety	Dam Foundation Reservoir Rim Stability
6	Hydro-Mechanical and Electrical Systems Safety	Locking of Gates Spillways and Energy Dissipaters Outlets Water Level Monitoring Hydro-power Generation Grid Failure Flooding of Power Stations
7	Monitoring and Instrumentation	Sensors: Monitoring of Dams Technical Software: GIS, Flood Routing, Dam Break Analysis, Seismic Structural Analysis, etc. Telemetry: Wireless & Wired Systems, Computer Sensors, etc.
8	R&D and Standards Development	Scrutiny of R&D Proposals on specific domains received for funding from Industry, academia & research organizations Research through Doctoral Programs
9	Capacity Development	Human Resource Requirement Resource Persons & Master Trainers

		Resource Materials Model Curriculum for degree programs Training of Engineers in different subjects (Post-Graduate Diploma Programs in Dam Safety; 1-day Sensitization Programs on specific themes)	
<p>Further, each Sub-Committee of the National Committee on Dam Safety shall examine the Technical Questions received on Specific Dams and provide considered inputs to the National Committee on Dam Safety.</p> <p>In each of the proposed Sub-Committee, there shall be a member from States/Dam owners also. For this the NDSA may seek list of experts from the States/Dam owners.</p> <p>The Chairman, NCDS further directed NDSA to seek nominations from the State Governments and Dam owners as domain experts in each of the Sub-Committees. The NCDS directed NDSA to compile a list of potential domain experts from R & D Organisations, Academia and Industry. The constitution of the sub-committees shall be finalized by the Chairman, NCDS, along with Chairman, NDSA and the two specialist Members of the NCDS.</p>			
1.6 ANY OTHER AGENDA WITH THE PERMISSION OF CHAIR			
1.6.1	Sh DK Sharma Expert Member requested all the States to take part in upcoming International Dam Safety Conference scheduled to held on 10-12 October, 2022 at Jaipur.		
1.7 CLOSING COMMENTS			
1.7.1	Members		
	<i>Any other items, with the permission of the Chairman before the Meeting</i>		
	Shri D. K. Sharma, the specialist Member of NCDS, proposed that as mandated in DSA 2021, the NCDS and NDSA shall review periodically the externally aided scheme DRIP.		
1.7.2	Chairman		
	<p>The Chairman informed that the initially NCDS should have frequent meetings and the next meeting shall be held in the month of September/October 2022 and that the next meeting may be hosted by a State Government preferably by Kerala. The Chairman desired that NDSA to host its own website and to form a logo at the earliest. He also requested Member (D&R), CWC to arrange a presentation by Project Director, DRIP in the next meeting of NCDS. The <i>Chairman</i> thanked all <i>Members</i> for their active participation in the meeting, and hoped that they will continue to contribute to the agenda of NCDS of dam safety in India. Also, he thanked the <i>Secretariat of NDSA</i> for its commitment to the cause of NCDS, and thereby to the safety of dams in India.</p>		