

## **Minutes of the twenty-third meeting of National Committee on Dam Safety (NCDS) held in CWC, New Delhi on 13.3.2002.**

The twenty third meeting of the National Committee on Dam Safety (NCDS) was held on 13 March 2002 in Central Water Commission, New Delhi under the Chairmanship of Shri Suresh Chandra, Chairman, CWC & NCDS.

The list of officers/representatives of various States/Organizations who attended the meeting is given in Annex I.

At the outset the Chairman welcomed the members & representatives of the States / Organizations participating in the meeting. While emphasizing the importance of dam safety in our country, he stated that the main objective of the Committee is to monitor Dam Safety Procedures, to oversee dam safety activities in various States and suggest improvements and also to act as a forum for exchange of views on techniques adopted for remedial measures to relieve distress. The States which are not members of the Committee should take steps to become members and, in the meantime, may take necessary action through the Dam Safety Cells in their States. After a brief introduction, Chairman asked the Chief Engineer, DSO, CWC and Member Secretary, NCDS to take up the agenda items. The item wise deliberations are as follows:

### **23.1.0 Confirmation of the minutes of the 22<sup>nd</sup> meeting of NCDS**

Draft Minutes of the 22<sup>nd</sup> meeting were sent to all the members of NCDS and State Dam Safety Cells vide CWC letter No.3/19/NCDS/2000/DSM/ 948-89 dated 17.5.2001. Some comments received in response were incorporated in the minutes and circulated to the committee for confirmation. The minutes of 22nd meeting as circulated were confirmed.

### **23.2.0 Information on proposed Dam Safety Assurance & Rehabilitation Project (DSARP) Phase II.**

23.2.1 Chief Engineer, DSO, CWC explained about the modified proposal of DSARP Phase-II submitted to Ministry of Water Resources. The proposal, covering 11 States and 101 large dams recommended for remedial measures, also includes some aspects of Disaster Management Programme. The present position regarding clarification sought by the Planning Commission/MOWR on the above proposal was informed to the Committee. Member-Secretary also informed that another proposal "Dam Safety Rehabilitation in India" consisting of 12 States (which includes all the States under DSARP Phase II) is under finalization in CWC for funding under a Central Plan

Scheme, in case the above proposal (DSARP Phase-II) is not accepted by the World Bank. All the participating States were requested to make provisions in their respective Plan funds after details of the scheme are intimated to them.

### **23.3.0 Review of National Scenario**

23.3.1 The State representatives were requested to apprise the committee of fresh cases of dams in distress and the following cases were discussed.

23.3.2 Regarding dam breach in Pratappur dam, the member from Gujarat informed that tender has been floated for repair of the dam.

On rehabilitation measures of earthquake affected structures, the member from Gujarat reported that two Dam Safety Review Panels - DSRP-I for Kachchh region and DSRP-II for Saurashtra region - have been constituted. Besides these, a core/coordination group has also been set up for interaction between the DSRPs. The panels have inspected selected dams in both the regions.

Regarding Bargi Project, the member from Madhya Pradesh informed that due to failure of stoplog gates behind which work on penstock power house was being carried out and due to sudden rise in the level of water in the reservoir, large amount of water gushed into the Canal Power House of Bargi Project. One helper and one Sub-Engineer who were working there died. .

The member from Uttar Pradesh reported regarding safety review of Rihand and Matatila dams in the State. He proposed underwater inspection of Rihand dam as in the case of Hirakud dam. Comprehensive safety review by CWC as a consultancy work has been advised for both the dams. The same is under process.

Regarding Anathode dam the representative from Kerala State Electricity Board reported that revised terms and conditions of CWC for suggesting and providing designs for suitable seepage prevention measures on consultancy basis is under consideration with the Board.

23.3.3 No other fresh cases or damage due to earthquake were reported from the States/Organizations.

All were requested to report such incidents to DSO, CWC without fail in future.

**23.4.0 Progress of implementation of the recommendation of "Report on Dam Safety Procedures"**

23.4.1 The State/Organization representatives were requested to apprise the committee on the progress of implementation of the recommendations of "Report on Dam Safety Procedures".

23.4.2 The States of Bihar, Karnataka, Madhya Pradesh, Maharashtra and Uttar Pradesh have submitted a brief report giving the achievements on implementation of the recommendations of "Report on Dam Safety Procedures". No hurdles except fund problem were reported by the States for achievement of progress.

**23.5.0 Dam Safety Legislation**

23.5.1 The State of Tamil Nadu and Madhya Pradesh proposed some changes in the revised Draft Act. The suggestion of Government of Tamil Nadu to define "Reservoir" as "Water spread" instead of Basin in col. 3 (3) of modified draft act was accepted by the committee. The copies of the proposal of Tamil Nadu and comparative statement of modified draft act and the draft sent by Madhya Pradesh were circulated during the meeting. The modified Draft Act submitted by the Dam Safety Organization (DSO) of Madhya Pradesh contained suggestions for several changes in the Draft Act circulated by MOWR. Chairman requested all the members to offer their comments on the proposal of Government of Madhya Pradesh, keeping in view that the modified draft act has been prepared in CWC after incorporating the comments received from States /Organizations and the same has been approved by the Ministry of Water Resources and vetted by Ministry of Law, Government of India.

**23.6.0 Preparation of emergency action plans and inundation maps for d/s area**

23.6.1 The State/Organization representatives were requested to apprise the committee on the progress made on preparation of Emergency Action Plan (EAP)/ Inundation maps.

23.6.2 No significant progress has been made on this item since the 22<sup>nd</sup> meeting. The present status as reported is given below.

Andhra Pradesh	Field Chief Engineers have been informed to take up the work on priority.
Bihar	Field Chief Engineers have been informed to expedite the matter.
Gujarat	Dam break analysis for 3 dams has been completed of which 2 are of National Importance (NI).
Karnataka	Field Chief Engineers have been informed of this matter.
Kerala	No report received.
Madhya Pradesh	Decision has been taken to do EAP schemes giving priority to N.I.dams.
Maharashtra	The State has compiled EAP for 90 dams including 2 N.I.dams.
Orissa	Work initiated for 2 dams (one N.I.dam).
Rajasthan	EAP completed for 9 dams of which one is a N.I.dam.
Tamil Nadu	Engaging consultant for the work under process.
Uttar Pradesh	Field Chief Engineers have been informed to take up the work.
West Bengal	No report received.
Jharkhand	2 N.I.dams now come under the State after bifurcation. EAP has to be prepared.
Chhattisgarh	To be reported.
Uttaranchal	To be reported.
BBMB	EAP has to be prepared in co-ordination with Punjab State.
DVC	To be reported.

NHPC No report received.

K.S.E.B. Initiated hydraulic model studies for this purpose.

Chairman emphasized that EAP must be prepared for all the dams at the stage of commissioning of the dam itself. Since India has about 4000 dams, all efforts must be made by the States/Organizations concerned to complete these works at the earliest. He also advised the authorities of Bhakra Beas Management Board and Punjab Govt. to sort out any dispute amicably.

### **23.7.0 Preparation of data book, Completion Reports, Operation & Maintenance Manual**

The State/Organization representatives were requested to apprise the committee on the progress of this work.

23.7.1 The State-wise position of preparation of data books of NI dams is given below:

1.	Andhra Pradesh	3 dams out of 3 NI dams
2.	Bihar	No NI dams, both the dams are under DVC
3.	Gujarat	2 dams out of 2 NI dams
4.	Karnataka	11 out of 12 NI dams
5.	Maharashtra	4 dams out of 4 NI dams
6.	Madhya Pradesh	3 dams out of 3 NI dams
7.	Orissa	5 dams out of 5 NI dams
8.	Rajasthan	1 dam out of 1 NI dam
9.	Tamil Nadu	2 dams out of 2 NI dams
10.	Uttar Pradesh	4 dams out of 4 NI dams
11.	Chhattisgarh	Nil out of one NI dam
12.	Jharkhand	2 dams out of 2 NI dams (under DVC)
13.	Uttaranchal	Nil out of one NI dam
14.	West Bengal	1 dam out of 1 NI dam
15.	BBMB	2 dams out of 2 NI dams
16.	NHPC	2 dams out of 2 NI dams
17.	K.S.E.B.	5 dams out of 5 NI dams

23.7.2 No report on National Importance dams under construction has been received. All States/Organizations were requested to initiate

action for preparation of data books for the dams of National Importance which are under construction also.

- 23.7.3 Chairman emphasized the importance of preparation of completion reports of the projects. During safety review of dam, such type of document provides vital information. He requested States / Organizations to prepare the same, giving priority in the first phase to dams of NI. As per the information received from the States, the status of preparation of completion reports of the dams is as follows :

Andhra Pradesh	Nil out of 158
Bihar	Nil out of 61 (including 4 dams of DVC)
Gujarat	3 out of 466
Karnataka	14 out of 188 (taken up works for 6 dams)
Kerala (Irrigation)	1 out of 19
Madhya Pradesh	1 out of 946 (taken up work for 15 dams)
Maharashtra	70 out of 1229
Orissa	2 out of 131
Rajasthan	12 out of 122
Tamil Nadu	13 out of 84
Uttar Pradesh	123 out of 123
West Bengal	Nil out of 22
Chhattisgarh	to be reported
Jharkhand	to be reported
Uttaranchal	to be reported
BBMB	3 out of 3
DVC	Information not received.
NHPC	Nil out of 6
Kerala (Electricity Board)	5 out of 33

### 23.8.0 Preparation of Operation and Maintenance Manual

Present status on preparation of O&M manuals is given below :

1. Andhra Pradesh	-	3 dams out of 58 dams
2. Bihar	-	Nil
3. Chhattisgarh	-	To be reported
4. Gujarat	-	Taken up work for 11 dams out of 466 (2 NI dams)
5. Jharkhand	-	To be reported
6. Karnataka	-	Nil
7. Kerala	-	Nil

8. Madhya Pradesh	-	9 dams (out of 946 dams) Taken up for 21 gated dams and 12 other large dams
9. Maharashtra	-	113 dams (out of 1229 dams) (2 NI dams)
10. Orissa	-	20 dams (out of 131 dams)
11. Rajasthan	-	All dams with ungated spillways (100 dams) and 22 gated dams
12. Tamil Nadu	-	All dams (out of 84 dams)
13. Uttar Pradesh	-	All dams (out of 123 dams)
14. West Bengal	-	Nil
15. Uttaranchal	-	To be reported
16. BBMB	-	All dams (out of 3 dams)
17. NHPC	-	2 dams (out of 6 dams) [Guidelines for operation of other structures under the Organization have been prepared]
18. DVC	-	All 4 dams
19. KSEB	-	All dams (33 dams)

All the States/Organizations that have yet to complete/initiate this work were requested to take up and complete the work on priority.

### **23.9.0 Periodical inspection of dams and report on dam safety activities in the States**

23.9.1 The State/Organization representatives were requested to apprise the committee on the progress on preparation of the report.

23.9.2 The Status of preparation of reports of periodical inspection of dams as reported by State Governments is as follows :

Andhra Pradesh	-	Report for 2001 under finalization
Bihar	-	Report for 2001 will be submitted in April 2002.
Gujarat	-	Report for 2001 is under finalization
Karnataka	-	Report for 2000 is under preparation
Kerala (Irrigation)	-	No report received
West Bengal	-	No report received so far
Chhattisgarh	-	To be submitted

Jharkhand	-	To be submitted
Uttaranchal	-	To be submitted
NHPC	-	Report for 2001, to be submitted.
DVC	-	To be submitted
KSEB	-	The report for 2001 is under preparation.

The other States/Organizations have furnished the requisite information and the reports of periodical inspection received by DSO, CWC are given below:

Madhya Pradesh	-	Report for 2000
Maharashtra	-	Report for 2000
Orissa	-	Report for 2000
Rajasthan	-	Report for 2001
Tamil Nadu	-	Report for 2001
Uttar Pradesh	-	Report for 2000
BBMB	-	Report for 2001

All the States/Organizations were requested to submit a consolidated report (both pre- and post-monsoon) for all the dams properly bound for the year 2001 by April 2002. The period of inspection may be followed strictly and the report may be submitted in the prescribed proforma. Performance report of hydrological and dam instruments are also to be included in the report.

### **23.10.0 Safety review of large dams (once in ten years)**

23.10.1 The State/Organization representatives were requested to apprise the committee regarding the safety review of dams once in ten years by an independent DSR Panel.

23.10.2 The status of progress made on formation of DSR Panels and safety review of dams reported in the meeting by States/Organizations is given below:

Andhra Pradesh	5 State Dam Safety inspection teams have been constituted. A copy of the constitution of the teams may be supplied to DSO, CWC.
Bihar	DSRP formed. As per the new set up of the State, Safety review report prepared for 15 dams.
Gujarat	Reconstitution of DSRP is under process.



	Inspection is being carried out in absence of DSRP.
Karnataka	Inspection of dam is under progress with three DSRPs already constituted.
Kerala (Irrigation)	Expert Committee constituted in September 2000 No progress reported. Members from all the disciplines are to be included in the DSRP.
Maharashtra	Set up 6 regional committees. Completed review for 18 dams (4 NI dams) out of 753 dams identified in the State. Copy of the DSRP may be sent.
Madhya Pradesh	Panel of experts constituted. As per the re-organization after bifurcation of the State, 22 dams of the categories are in the State. 18 dams inspected.
Orissa	Approval for DSRP awaited from Government of Orissa.
Rajasthan	The period of the existing DSRP was not extended beyond 9/2000 (DSARP-I) due to funds problem.
Tamil Nadu	Approval for DSRP awaited from Government of Tamil Nadu.
Uttar Pradesh	DSRP has been constituted. 12 dams under distress are inspected. A copy of DSRP may be submitted.
West Bengal	DSRP to be formed.
Chhattisgarh	To be reported.
Jharkhand	To be reported.
Uttaranchal	To be reported.
BBMB	Formation of DSRP is not as per the norms.
DVC	To be reported.
NHPC	To be reported.
KSEB	Formation of DSRP is under consideration.

The States/Organizations were requested to form the State DSR Panels and to carry out safety review of dams without further delay. A copy of the constitution of DSR Panel may be supplied to DSO, CWC.

The States of Rajasthan, Maharashtra, Uttar Pradesh expressed the problem of funds to carry out the safety review of dams. Chairman suggested that as per the recommendations mentioned in the

“Report of Dam Safety Procedures” and pre-requisite for World Bank aid, the safety review of large dams (once in ten years) is must. Therefore, funds are to be somehow managed for the same by the State Governments/Organizations concerned.

### **23.11.0 Monitoring safety of inter-State dams by sub-committees of NCDS**

The Status of monitoring of safety of Interstate dams by Sub-committee constituted by NCDS was reviewed by the Committee. The status of different Sub-committees, as informed by the representatives of State Governments, is as under :

Mahanadi River System	Two meetings have been held. Last meeting was held on 23.6.2000. As per the new set up Mahanadi River system is between Chhattisgarh and Orissa States. Chairman advised Govt. of Orissa's representative to look into the matter and latest progress may be intimated.
Parambikulam Aliyar Project	Two meetings have so far been held. Last meeting was held in 1992. Though Tamil Nadu had proposed to disband the Committee, it was decided not to disband, since Kerala being the d/s State is required to take part in the safety inspection of dams. The member from Tamil Nadu again stressed on disbanding the committee. As Kerala is the d/s State, Kerala has to monitor the safety of the area of the State. The State of Tamil Nadu was requested to co-operate in this aspect. The State of Kerala may convene the next meeting immediately.
Subarnarekha River System	Three meetings held so far. (last one on 24.7.98). The representative of Government of Orissa informed that 3 meetings

fixed after 1998 were not held. Chairman suggested that all the three States should co-ordinate and do the needful to monitor the safety aspect of Subarnarekha River System. The representative of Orissa Govt. indicated that the meeting would be fixed in consultation with the Chief Engineers of Governments of Bihar and West Bengal shortly.

### **23.11.0 Setting of hydrological units in the States for review of hydrology of existing dams**

23.11.1 The State/Organization representatives were requested to apprise the committee on the progress of setting up/strengthening of hydrology units.

23.11.2 Status of setting up of hydrology units as reported in the meeting by the States/Organizations is as follows:

a) Status of setting up of hydrology units in the following States/ Organizations was reported :

1. Andhra Pradesh	A post of Executive Engineer for hydrology division under Dam Safety Organization has been sanctioned.
2. Maharashtra	A permanent hydrology unit is already working under the Dam Safety Organization. However, a separate independent unit has to be established.
3. Orissa	Separate unit available
4. Uttar Pradesh	Establishing of the unit is under progress.
5. BBMB	Separate unit available
6. DVC	Separate unit available
7. NHPC	Separate unit available
8. KSEB	Hydrology unit established and commenced work.

b) Following States informed that the existing units in their State have been strengthened for carrying out hydrology review of large dams:

1. Bihar
2. Gujarat
3. Karnataka
4. Madhya Pradesh
5. Rajasthan

c) Action has been initiated by the following States for strengthening of existing hydrology units but progress has not been intimated:

1. Kerala (Irrigation)
2. Tamil Nadu
3. West Bengal

The States of Chhattisgarh, Jharkhand and Uttaranchal were also requested to give the present position.

In the cases of hydrology review by CWC, Chief Engineer (HSO), CWC stated that the hourly rainfall data and rainfall/run off relationship data must be made available while referring the case to CWC. In case of Matatila dam in U.P., the required data is not received even after regular requests. Concurrent rainfall – runoff data are required at least for two years for hydrology review of the project. The representative of Bihar stated that they do not have any such data.

Chairman opined that if data is not available with the State, IMD may be approached for the purpose. In case of small catchments where no observation stations are available, the same may be discussed with Director (Hyd.), CWC and a via media may be arrived for hydrology review of the project. Further he desired that hydrology review of existing dams should not suffer for want of independent hydrology unit in the State.

#### **23.12.0 Instrumentation for dams**

23.12.1 Instrumentation is one of the important items in a dam, as it provides a tool for continuous monitoring of the behaviour of the dam. The Chairman desired to know the performance of instruments installed in the dams from the representatives of the State Governments/Organizations. While Maharashtra and other States reported regarding non-functioning of instruments in most

of the dams, Director (Instrumentation), CWC stated that vibrating wire type instruments have come up and results of such instruments are very good. The instruments installed in Chamara and Salal Dams are functioning well as indicated by the representative of NHPC. Chairman suggested that problem relating to nonfunctioning of the instruments may be reported to Director (Inst.), CWC who will make a visit to such projects and suggest measures to replace the old instruments by new one wherever possible.

23.12.2 Status of instrumentation in terms of existing dams where instruments are working and readings are being recorded as per latest information given during the meeting is as below.

1.	Andhra Pradesh	-	3 dams
2.	Bihar	-	Nil
3.	Gujarat	-	25 dams
4.	Karnataka	-	44 dams
5.	Kerala (Irrigation)	-	5 dams
6.	Madhya Pradesh	-	25 dams
7.	Maharashtra	-	95 dams
8.	Orissa	-	17 dams
9.	Rajasthan	-	33 dams
10.	Tamil Nadu	-	19 dams
11.	Uttar Pradesh	-	6 dams
12.	West Bengal	-	Not reported
13.	BBMB	-	3 dams
14.	NHPC	-	2 dams
15.	KSEB	-	4 dams
16.	DVC	-	Not reported

The States of Chhattisgarh, Jharkhand and Uttaranchal were also requested to submit the report.

#### Status of analysis of data by the State Governments.

<u>State</u>	<u>Data analysis done for</u>
Gujarat	- 11 dams out of 25 dams under finalization
Karnataka	- 20 dams out of 44 dams
Maharashtra	- 25 dams out of 95 dams
Tamil Nadu	- Study given to consultants
Uttar Pradesh	- Work has been entrusted to design unit.

The remaining States/Organizations did not submit information on analysis of data.

23.12.3 Information received on installation of standard meteorological instruments are given below:

1. Bihar	Installed at 1 dam
2. Karnataka	Installed at 71 dams
3. Tamil Nadu	Installed at 17 dams
4. Rajasthan	Installed at 125 dams
5. Maharashtra	Installed at 281 dams
6. BBMB	Installed at 3 dams
7. NHPC	Installed at 3 dams

The remaining States/Organizations did not give information on this item.

All States/Organizations were requested to include performance report of meteorological and dam instruments in the Annual Status Report of dam safety activities.

#### **23.13.0 National Register of Large Dams**

23.13.1 Chairman requested all the members of States/Organizations to correction/alterations/suggestions on the data which has been sent to them by DSO, CWC for vetting or their concurrence latest by the end of April 2002 so that the publication of National Register of Large Dams can be taken up at the earliest.

#### **23.14.0 National Performance of Dams Programme (NPDP)**

23.14.1 Chairman requested all the members of States/Organizations to do the needful for setting up of their websites on performance of dams without having reservation regarding transparency of data. He also indicated that if the data are available on website, this will help in convincing the organizations who are against the construction of large dams. All the members agreed to this proposal.

#### **23.15.0 Membership of newly formed States of Chhattisgarh, Jharkhand and Uttaranchal**

23.15.1 It was informed by CE(DSO), Member-Secretary that MOWR have agreed in principle to the membership of these three newly formed states and formal orders would be issued soon. Chairman desired that this may be pursued with the Ministry of Water Resources.

Chairman also suggested that the other existing States/Organizations having significant number of large dams may

also come forward to join the Committee and get benefited from the deliberations on Dam Safety Procedures adopted in our country.

### **23.16.0 Any other item with the permission of the Chair**

The following issues were raised by the member from the State of Maharashtra and were discussed under this item. These were (1) Non Performance of instruments in dams (2) Heavy leakage in the drainage gallery and unsatisfactory working of dewatering pumps (3) leaching and choking of drainage pipes in dams (4) fixation of Probable Maximum Flood (PMF) for dams (5) Provision of stop log gates which have not at all been used in many projects and the need for providing the same (6) Providing mobile crane instead of Goliath crane.

Chairman agreed that all these problems are very much related to safety of dam. The instruments are embedded in the dam. Some technology must be evolved in consultation with the manufacturers of the instruments who are well conversant with the technology of the same to replace the old instruments by new ones or making the instrument functional. Leakage in dams and choking of drainage pipes due to leaching are common problems faced by many project authorities. All the project authorities must have the modern technology, which may be helpful in sorting out such problems.

Chairman suggested that one day conference on leakage and other related problems of dams may be convened by Government of Maharashtra where different case studies would to be presented and discussed at length and suitable recommendations could be finalized. BBMB had conducted earlier a workshop on leaching during 1998. Regarding fixation of PMF for design of spillway, Chairman desired that one should be very careful because it directly affects the cost of the dam/project.

The meeting ended with a vote of thanks to the Chair.