

**Minutes of the twentieth meeting of National Committee  
on Dam Safety (NCDS) held at CWC, New Delhi on 25.1.1999**

The twentieth meeting of National Committee on Dam Safety (NCDS) was held on 25 January 1999 in Central Water Commission (CWC) under the Chairmanship of Shri A.D.Mohile, Chairman, CWC and Chairman, NCDS.

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

The Chairman welcomed the members and representatives of various dam owning agencies participating in the meeting and expressed his concern about the lukewarm attention on Dam Safety activities in the country by various dam owning agencies in general and the States having significant number of large dams in particular.

After a brief introduction of the representatives, the Chairman asked the Chief Engineer (DSO), CWC, who is Member-Secretary of the Committee to take up the agenda items for deliberations

**20.1.0 Confirmation of the minutes of 19<sup>th</sup> meeting of NCDS**

21.1.1 Minutes of 19<sup>th</sup> meeting were circulated to all the members of NCDS and State Dam Safety Cells vide CWC letter No.3/19/NCDS/97/DSM/ 1993-2030 dated 12.8.98. The comments of the member States/Organizations on the MOM were of minor nature and had been taken care of in the agenda note for the 20<sup>th</sup> meeting. The minutes of 19<sup>th</sup> meeting were, therefore, confirmed by the committee.

**20.2.0 Status of implementation of Dam Safety Assurance and Rehabilitation Project (DSARP) and position of proposed DSARP-Phase-II**

20.2.1 Chief Engineer (DSO), CWC gave a brief account of the on-going DSAR Project.

He informed that the first year extension of the project period ended on 30.9.98. The performance of Tamil Nadu during the first year was not upto the desired level as stipulated by the World Bank. Tamil Nadu, therefore, was not considered for the second year extension upto 30.9.99. The World Bank Supervisory mission is scheduled to review the progress of the project from 26.1.99 to 11.2.99. After visiting the States of Madhya Pradesh, Orissa and Rajasthan, there will be wrap-up meetings with respective State Secretaries (WR). The mission's

visit is scheduled to conclude after a wrap-up meeting with the Secretary (Water Resources), Government of India on 11.2.99.

20.2.2 Director (DSM), CWC gave details of the ongoing DSARP and also informed about the action taken so far about the proposed DSARP Phase-II.

20.2.3 The members expressed their willingness to share the experiences gained by the 4 participating States under DSARP for detailed knowledge on various aspects of dam safety activities. On the suggestion of the Chairman, Chief Engineer, Rajasthan agreed to organize a workshop on Dam Safety in collaboration with CWC and other DSARP participating States at Kota, Rajasthan. It was decided that the workshop may be of three to four days duration in which senior and middle level officers of all the member States/Organizations of NCDS may participate. One of the objectives of the workshop would be to share information about action taken by DSARP states with the non DSARP states so that they can also take some advantage of the experience. Further necessary action in this regard may be taken by the State of Rajasthan in consultation with CWC.

### **20.3.0 Review of National Scenario**

20.3.1 The States and representatives of dam-owning agencies were requested to intimate fresh cases of distress in dams, structural and operational deficiencies noted and failure cases, if any, since the last meeting.

20.3.2 The Deputy Chief Engineer, DVC reported that some under sluice repair works in respect of Tillaya dam has been undertaken. He also informed that EOT Crane of Maithon dam was not functioning. However, the repair work could not be taken up due to lack of funds.

20.3.3 The committee expressed its concern and requested DVC to take necessary action. Discussions were held with regard to flooding of power house at Srisaillam dam on Krishna River in Andhra Pradesh. The Chief Engineer, Andhra Pradesh stated that the magnitude of flood was within the design limit. Chairman desired that a copy of the report of the committee set up for looking into the causes of flooding may be made available.

20.3.4 No other State/Organization reported fresh Dam Safety problems.

20.3.5 It was suggested by the Chairman that field units of CWC may also consider possibility of reporting cases regarding dams in distress in their region of jurisdiction.

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

20.4.1 The States had been requested to implement the recommendations contained in the "Report on Dam Safety Procedures" circulated in 1987 and send a consolidated report indicating achievements on various issues and highlight the issues which are difficult to implement. A report on this need to be presented to the Committee giving the latest position.

20.4.2 The States of West Bengal, Uttar Pradesh and Kerala have not submitted any report on Dam Safety procedures so far. Chairman desired that Member (D&R), CWC may pursue this at his level.

20.4.3 The States of Bihar, Gujarat, Madhya Pradesh and Maharashtra have submitted reports bringing out latest development in their respective States.

20.4.4 All other States/Organizations were requested to send consolidated report highlighting the achievements on the implementation of the recommendations of the "Report on Dam Safety Procedures" before the next meeting of NCDS.

**20.5.0 Dam Safety Legislation**

20.5.1 During the 19<sup>th</sup> meeting of the Committee, the Chairman had underlined the importance and need to finalize the draft legislation. He desired that the draft legislation be finalized by incorporating the comments received from States/Organizations.

20.5.2 The following State Governments have communicated their concurrence with minor comments.

1. Andhra Pradesh
2. Gujarat
3. Maharashtra
4. Orissa
5. Rajasthan
6. Tamil Nadu
7. Kerala
8. Bihar

- 9. Uttar Pradesh
- 10. Karnataka

- 20.5.3 Information has been received from the States of Madhya Pradesh and West Bengal also. However, formal letters from these State Governments are yet to be received.
- 20.5.4 Chief Engineer (DSO) informed about procedure of legislation. Water being in the State list such a legislation may be brought about by consent of interested States. In this connection Article 252 of the Constitution of India was quoted. The Article 252 gives "Power of Parliament to legislate for two or more States by consent and adoption of such legislation by any other State."
- 20.5.5 It was desired by the Chairman that draft legislation incorporating the comments of various States may be forwarded to Ministry of Water Resources for further necessary action.

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

- 20.6.1 Decision for preparation of inundation maps and emergency action plans (EAP) for d/s areas of dams of National Importance by all the States has already been taken during earlier meetings.
- 20.6.2 It was decided that the four participating States of the ongoing Dam Safety Assurance and Rehabilitation Project (DSARP) namely, Madhya Pradesh, Orissa, Rajasthan and Tamil Nadu may give priority for preparation of emergency action plans in respect of the identified dams under rehabilitation. The four participating States of DSARP were also requested to inform about the status on this activity for all other dams in their States.
- 20.6.3 As regards to action taken by various States/Organizations, the Superintending Engineer, Maharashtra reported compilation of EAP for 2 National Importance dams, i.e. Koyna and Paithon. BBMB has pursued the matter regarding EAP of the BBMB dams with Principal Secretary to Government of Punjab (Irrigation & Power), Chandigarh in April 1998. The position of completion of EAP of NI dams is as given below:

- 1. Maharashtra - 2 dams [Koyna, Paithon]
- 2. NHPC - 1 dam [Salal]

The following States/Organizations have initiated work for taking up emergency action plan for the following NI dams :

Maharashtra	-	1 dam [Isapur]
Gujarat	-	2 dams [ Ukai, Kadana]
Rajasthan	-	1 dam [Rana Pratap Sagar]
Madhya Pradesh	-	2 dams [Gandhi Sagar, Tawa]
Orissa	-	1 dam [Hirakud]

- 20.6.4 It was opined by members that Dam Break Studies need not be done as a routine. Dams having safety problems have to be identified. Priority for carrying out dam break analysis and preparation of EAP for these dams should be accorded. As the States reported fund problems, Chairman desired that Plan allocations must be sought for this purpose as Dam break analysis and preparation of EAP is very important for dams having safety problem. Demand for Plan allocation for preparation of EAPs must be brought out as an agenda item during State Irrigation Ministers Conference or such other national forums.

## **20.7.0 Compilation of data book**

- 20.7.1 As per decision taken by the NCDS, "Data Books" for dams of National Importance (NI Dams) were to be prepared by the respective States and submitted to DSO/CWC for record/reference.

- 20.7.2 The position of States who have prepared data books of NI dams as on 25.1.99 is given below:

1. Kerala	5 dams
2. Maharashtra	1 dam
3. Orissa	1 dam
4. Uttar Pradesh	4 dams
5. West Bengal	<u>1 dam</u>
Total	<u>12 dams</u>

- 20.7.3 10 dams of National Importance are under construction. Data books in respect of these dams may also to be prepared.

## **20.8.0 Preparation of completion report of large dams**

- 20.8.1 Completion report of existing 3596 large dams are to be prepared by the respective States and dam owning agencies giving priority in the first phase to dams of National Importance.

- 20.8.2 As per the information received from the States, the following

States have prepared completion reports for the following number of dams.

Karnataka	19
Maharashtra	127
Orissa	2
Rajasthan	2
Tamil Nadu	7
Uttar Pradesh	123
BBMB	<u>3</u>
Total	<u>283</u>

20.8.3 Rajasthan has initiated preparation of completion report for 20 more dams. Terms of Reference for engaging retired officers as consultants is under preparation in Madhya Pradesh. In Gujarat, the report for one dam (Dantiwada) has been prepared and is under scrutiny. Preparation of the completion report for NI dams in Gujarat is being taken up on priority basis, as reported by Government of Gujarat.

20.8.4 Chief Engineer, NHPC pointed out that no authentic completion drawings of the dams are available with State authorities which are a major problem for preparation of the Report. Chairman advised to accept the available modified drawings duly certified by the present officers. Chairman desired that one copy of the completion report must also be available with State DSO.

## **20.9.0 Preparation of Operation and Maintenance Manual**

20.9.1 During the previous meetings it had been emphasized that O&M Manual is an important document for operation and maintenance of dams and this manual should be available before commissioning of the project. As O&M manuals have not been prepared for several dams, this work needs to be taken up without any further delay and completed expeditiously by the respective States/Organizations owning the dams. Emphasis was also laid on the need for standardization of O&M manuals. This will help expedite the matter.

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

BBMB	-	All dams
Tamil Nadu	-	All dams
Uttar Pradesh	-	All dams
KSEB	-	All dams
NHPC	-	Guidelines for operation of each dam

		under the Organization has been prepared.
Rajasthan	-	All dams with ungated spillways and 3 gated dams.
Maharashtra	-	101 dams
Orissa	-	20 dams
Madhya Pradesh	-	10 dams
Andhra Pradesh	-	3 dams

- 20.9.3 A format for O&M manual prepared by BBMB has already been circulated among all member States/Organizations as a guidance for preparation of O&M manual. Chairman advised the members that certain aspects such as safety of the dam, safety of d/s structures, pre-depletion condition rule curves, etc., must be incorporated in the O&M manual. All the States/Organizations must critically study the O&M manuals on these points. Chairman suggested to select 2 nos. for standard O&M manuals received from the States/Organizations and to circulate along with bibliography as a guidance.

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

- 20.10.1 The States/Organizations were requested to carry out periodical inspection of dams and send a consolidated annual report on the status of dams and dam safety activities under the title "Health Status of Dams and Dam Safety Activities in the States" to DSO/CWC in the format circulated by DSO/CWC.

- 20.10.2 The reports received by DSO/CWC are given below:

Andhra Pradesh	-	upto May 1998
Bihar	-	upto December 1997
Gujarat	-	upto December 1996
Madhya Pradesh	-	upto March 1998
Maharashtra	-	upto June 1997
Orissa	-	upto March 1998
Rajasthan	-	upto July 1998
Tamil Nadu	-	upto June 1998
BBMB	-	for 1997-98
NHPC	-	upto February 1998

- 20.10.3 The following States were requested to intimate action taken for the dam's deficiency reported by them during the inspection of dams.

Sl. No.	Name of State	No.of dams inspected	Major deficiency	Minor deficiency
1	Andhra Pradesh	38	--	38
2	Madhya Pradesh	217	--	31
3	Maharashtra	99	55	39
4	Orissa	140	74	55
5	Rajasthan	125	23	73

20.10.4 The State of Bihar has informed about inspection of 51 dams and the report is under preparation. The latest report is also under preparation in the State of Maharashtra. The State of Karnataka has also not submitted the latest report.

20.10.5 The States of Uttar Pradesh, Kerala and West Bengal have not submitted any report so far, Chairman desired to address letters to these States at the level of Member (D&R), CWC.

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

20.11.1 In accordance with the recommendations contained in the "Report on Dam Safety Procedures (1987)," safety review of large dams which are more than 15m in height or which store 60 million cu.m or more water are to be carried out by an independent panel of experts once in ten years. For this purpose, experts committees comprising of only those officers from the States who were not connected at any stage either with construction or maintenance of the structures are to be constituted.

20.11.2 After discussions it was opined that though the Dam Safety Review Panels need to be constituted by an independent panel of experts not connected with the construction works of the dam directly or indirectly in a State, many States/Organizations were found reviewing safety of their dams by their own field engineers or the officers of State DSO. This should not be encouraged. Most of the States expressed difficulty to get sanction from their respective Governments for such independent panel of experts. All the States/Organizations were requested to give information of such independent panel of experts already constituted by their Governments which are directly or indirectly connected with the safety review of the



dams.

- 20.11.3 It was noted with concern that no significant progress has been made on this important issue, even after completion of the stipulated period of ten years in 1997. It was, therefore, felt necessary to bring out such issues to the notice of higher bodies such as State Chief Ministers'/Irrigation Ministers' Conference, National Water Board and such other National/State forums.

#### **20.12.0 Safety status of dams of National Importance (NI)**

- 20.12.1 The States/Organizations have been requested to prepare safety status of 46 completed dams of National Importance in the prescribed proforma circulated by DSO/CWC.
- 20.12.2 Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, BBMB and NHPC have submitted reports for 41 dams of National Importance.
- 20.12.3 As the State of Kerala has not submitted reports for 5 dams of National Importance under them, Chairman desired that necessary letter to Government of Kerala may be addressed.
- 20.12.4 Action taken for comprehensive Dam Safety Review of Dams of National Importance as decided in the 19<sup>th</sup> meeting may be reported by respective States.

#### **20.13.0 Monitoring safety report of inter-State dams by sub-committees**

- 20.13.1 Three sub-committees were set up in March 1990 to monitor the safety aspects of inter-State dams in (a) Parambikulam Aliyar Project (PAP), (b) Mahanadi River System and (c) Subarnarekha River System.
- 20.13.2 The progress made by the Committees so far is given below:
- |                             |   |  |
|-----------------------------|---|--|
| Parambikulam Aliyar Project | - | 2 meetings held in 1991 and 1992 respectively. |
| Mahanadi River System       | - | One meeting held in 1992.                      |
| Subarnarekha River System   | - | 3 meetings held so far. (last one on 24.7.98)  |

20.13.3 Members from the States of Bihar, Tamil Nadu, Madhya Pradesh who participated in the meeting expressed lack of coordination among the member States of the sub-committees. The Chairman desired that the matter may be taken up at the higher level of the States for early convening of the meetings of the first two committees.

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

20.14.1 Hydrology of all existing dams is required to be reviewed by setting up/strengthening the existing hydrology units in the States/Organizations. Some States/ Organizations have already initiated actions for strengthening/setting up of hydrology units and review of hydrology of selected dams has been taken up.

20.14.2 Status of completion of hydrology review upto 19<sup>th</sup> NCDS meeting as reported by the representatives is as follows:

- |                   |   |  |
|-------------------|---|--|
| 1. Gujarat        | - | 156 dams   |
| 2. Madhya Pradesh | - | 51 dams  |
| 3. Orissa         | - | 46 dams  |
| 4. Rajasthan      | - | All large dams<br>(except some new large dams<br>- 31 identified recently)<br>- This needs verification. |
| 5. Tamil Nadu     | - | 17 dams  |

20.14.3 All States are requested to intimate the latest position with regard to hydrology review of large dams.

20.14.3 Progress in setting up of hydrology units upto 19<sup>th</sup> meeting

a) Separate hydrology unit established

1. BBMB
2. NHPC
3. Maharashtra
4. Orissa

b) Strengthening of existing units for carrying out hydrology review

1. Bihar
2. Gujarat
3. Madhya Pradesh

#### 4. Rajasthan

c) Action initiated for strengthening of existing hydrology units

- 1) Andhra Pradesh
- 2) Karnataka
- 3) Tamil Nadu
- 4) West Bengal
- 5) Uttar Pradesh

20.14.4 The State of Orissa had reported that hydrology review of 51 dams is being completed shortly. In the State of Bihar, data for hydrology review are being collected for review work in the existing hydrology unit of the State. 13 more dams have been identified for hydrology review by the State of Madhya Pradesh.

20.14.5 The State of Kerala may be addressed separately in the matter since no report has been sent by the State of Kerala.

DVC was also requested to carry out Hydrology review of dam under their control either by themselves or by engaging consultants for this job.

#### **20.15.0 Instrumentation for dams**

20.15.1 NCDS had decided that the States may take stock of the status of instrumentation in all existing large dams to know the performance of instruments, their mortality rate, periodicity for analysis of data and forwarding the analysis of data to the designers for evaluation, status of structural behaviour reports and adequacy of the staff engaged for this job, etc.

20.15.2 BBMB submitted the status of instruments under them. It was reported that the result of analyzed data is in order and within the permissible limits.

The representative from the State of Gujarat reported that 25 existing dams were instrumented and the analysis of data is being done in the Instrumentation Cell of Gujarat Engineering Research Institute, Vadodara regularly.

In Madhya Pradesh, there are 25 instrumented dams. 9 more dams were instrumented under DSAR Project out of 39 dams proposed under the project.

The Superintending Engineer, Bihar reported that no instruments of the dams installed in the State were in working condition and the status of some of the instruments on Chandil dam is being reviewed.

Representatives from Uttar Pradesh and DVC agreed to send the status report. Other States/Organizations who have not supplied any information on instrumentation were requested to send the information immediately to CWC.

20.15.3 Status of instrumentation of existing dams as available in DSO/CWC is given below.

1. Andhra Pradesh	-	3 dams
2. Gujarat	-	10 dams
3. Karnataka	-	14 dams
4. Kerala	-	2 dams
5. Madhya Pradesh	-	19 dams
6. Maharashtra	-	41 dams
7. Orissa	-	17 dams
8. Rajasthan	-	2 dams
9. Tamil Nadu	-	6 dams
10. BBMB	-	3 dams
11. NHPC	-	2 dams

The State of Uttar Pradesh, Bihar, West Bengal and DVC were requested to send data immediately on the status of instrumentation of dams in their States to CWC.

20.15.4 All the States/Organizations were requested to forward the results of analysis of data to the Instrumentation Directorate of CWC for assessing the behaviour of dams/hydraulic structures and finalizing the reports.

20.15.5 Keeping in view the importance and to get acquainted with the state-of-the-art, CWC and CSMRS have jointly proposed to organize a three day training course on Instrumentation at CSMRS building at New Delhi from 22-24 February 1999. The Information bulletin was circulated among the members during the meeting and the representatives of the States/Organizations were requested to depute 2 to 3 officers to participate in the course. It was informed that there is no registration fee for this course.

## **20.16.0 Installation of standard meteorological instruments**

- 20.16.1 All the States were requested to supply detailed information as per specified list of items already circulated by CWC on the type of meteorological instruments installed in the catchment areas and reservoirs of large dams for meteorological observations.
- 20.16.2 No information has been received from Kerala, Orissa, West Bengal, Uttar Pradesh and DVC. Representatives from Bihar reported that only rain gauges are available at the dam sites in Bihar except Chandil dam where standard meteorological instruments are also available. All the States/ Organizations have agreed to submit the performance report of the meteorological instruments without further delay.
- 20.16.3 Chairman desired to issue a circular to all States/Organizations for providing standard meteorological instruments at all new dams.

#### **20.17.0 Seismic studies of dams**

- 20.17.1 DSO/CWC has made available copies of document titled "Guidelines for inspection of dams following earthquake" to all the States/ Organizations with a request to make use of the guidelines and report to the Committee about safety status of dams immediately after occurrence of earthquake in the region.
- 20.17.2 No reports of such incident of earthquake were received from any of the States/Organizations since last meeting. All States/Organizations were requested to follow the guidelines and to act according to the guidelines on occurrence of any such incident.
- 20.17.3 Chairman desired that CWC should keep contact with IMD to collect information on earthquake from time to time. From this instruction, large dams near the epicenters of earthquakes above a threshold may be listed & inspection reports of these may be invited.

#### **20.18.0 Need for Research and Development in Dam Safety**

- 20.18.1 The representatives were requested to suggest areas requiring research and development in the field of dam safety in particular, and Water Resources Sector in general and send their suggestions to DSO/CWC. Any scheme identified for research need to be prepared and sent to one of the 5 National Committees set up for taking up research schemes under Water Resources Sector. In this connection, as already informed, R&D

Directorate, CWC may be approached for detailed information.

**20.19.0 Proposal for rehabilitation of distressed dams in India during the IX Five Year Plan**

20.19.1 An estimate for rehabilitation of dams under distress in 12 States, viz. Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal has been forwarded to the Ministry of Water Resources, Government of India for inclusion in the IX Five Year Plan. Total amount provided in the tentative estimate is Rs.862.5 crores. The estimate prepared earlier by various States need to be revised keeping in view the proposed next phase of DSARP.

**20.20.0 (i) Guidelines and standards on assumptions to be made for potential gate malfunction, pre-flood reservoir level, free board and other relationship for routing the flood through reservoir for the process of computing the inflow, outflow and storage.**

**(ii) Hazard classification of dams**

20.20.1 Copies of these guidelines were sent to all NCDS members and Dam Safety Cells in the States and other Organizations by CWC vide letter No.3/10-A/DSM/Guidelines/1590-1625 dated 30.12.96 and No.16/1/95-DSRD dated 23.10.96 respectively. Suggestions for improvement in the content, coverage and presentation have been received from the States of Gujarat, Tamil Nadu, Karnataka and Maharashtra and incorporated in the guidelines.

20.20.2 Need was felt by the Committee to finalize the guidelines at the earliest based on the comments received from the member States / Organizations.

**20.21.0 Risk Analysis in Dam Safety Engineering**

20.21.1 The Committee was informed about the progress of proposed package on Risk Analysis and Training. It was informed by the Chief Engineer (DSO), CWC that a proposal has been formulated under the ongoing DSARP for training Indian engineers for this work. The training includes organizing trainings/workshops on risk analysis in India as well as abroad. The main objectives of this training are :

- a) to create awareness of the potential benefits and limitations of risk based approaches to dam safety management at all levels;
- b) to identify opportunities for beneficial adaptation and use of risk based approaches to dam safety management in India;
- c) to recommend approaches for prioritizing or classifying dams for detailed safety investigation and allocation of funds for remedial actions;
- d) to sharpen the focus of further activities for Indian engineers in India and to prepare guidelines for risk analysis and reformulation of guidelines on dam safety.

This training in "Risk Analysis" is proposed to be funded under the on-going World Bank assisted DSARP which is under implementation at the Centre (CWC) and four States, viz. Madhya Pradesh, Orissa, Rajasthan and Tamil Nadu. The entire programme on risk analysis is to be completed before the end of extended project period, i.e. 30 September 1999.

- 20.21.2 Chairman desired that draft guidelines may be circulated to all members of the Committee to get their views before they are finalized.

## **20.22.0 Gate Operation Simulation Model (Version 2.0)**

- 20.22.1 CWC has developed a software package, i.e. Gate Operation Simulation Model for training gate operators for emergency operation of gates during high floods and PMF conditions. This software model has been developed under the World Bank assisted DSAR Project. During 18<sup>th</sup> meeting, a demonstration of this model was made by Director, Software Management Directorate, CWC and a floppy containing the software model was given to all the States/Organizations for their review and comments, if any. So far some comments have been received from Gujarat only. Comments from all other States/Organizations are awaited.
- 20.22.2 It was desired by the Chairman that during one of the sessions in the proposed workshop on dam safety at Kota, Rajasthan, presentation of the software may be made and views of the participants about the utility of the package may be shared.

## **20.23.0 National Register of Large Dams**

20.23.1 Chairman, during the 19<sup>th</sup> meeting, desired to update the National Register of Large Dams published by DSO/CWC in December 1994. A circular to this effect, along with the proforma, was issued during the 19<sup>th</sup> meeting of NCDS with a request to send the updated data. So far information has been received from Andhra Pradesh, Bihar, Gujarat, Orissa, Rajasthan & West Bengal and BBMB, NHPC & DVC. The remaining States/Organizations were requested to give information at the earliest so that the register could be revised/updated.

Concluding the meeting, Chairman expressed his hope for desired progress in various dam safety related activities. As significant progress is not achieved in various dam safety activities, he suggested that various issues requiring immediate attention such as dam safety legislation, preparation of emergency action plans, safety review of large dams by independent panels of experts may be addressed at higher levels such as National Water Board, State Irrigation Ministers' Conference, etc.

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