

Minutes of the sixteenth National Committee on Dam Safety meeting held on 27.8.96 at Central Water Commission, New Delhi.

The sixteenth meeting of the National Committee on Dam Safety (NCDS) was held on 27.8.1996 in CWC, New Delhi under the Chairmanship of Shri Ramesh Chandra, Chairman, CWC as well as NCDS. List of officers who attended the meeting is at Annex I.

At the outset, the Chairman welcomed all the participants. After a brief introduction of the participants, the Chairman requested the Chief Engineer (DSO) to take up items of the agenda for discussion.

16.1.0 Confirmation of the minutes of the fifteenth meeting of NCDS.

16.1.1 The minutes of 15th meeting were circulated vide CWC Letter No.3/19/NCDS/93-DS/249-82 dated 13.2.1996. As there were no comments from any of the States, the minutes as recorded were confirmed.

16.2.0 Status of implementation of "Dam Safety Assurance and Rehabilitation Project" for information of the Committee

16.2.0 For the effective implementation of the DSAR Project and to utilize the available funds, revised implementation schedules have been drawn and agreed by the participating States of Madhya Pradesh, Orissa, Rajasthan & Tamil Nadu. As per revised implementation schedule, it is proposed to utilize Rs.3076 million out of the estimated cost of the project of Rs.4591 million by the scheduled project closing date (September 1997). The financial progress as on March 1996 was as under:

Rs. in million

| Sl. No | State | Estimated cost on Dec.1995 upto 1999 | Exp. Upto March 1995 | Exp. During 1995-96 | | Programme of expenditure | |
|--------|--------------------------|--------------------------------------|----------------------|---------------------|--------|--------------------------|--------------|
| | | | | Target | Actual | 1996-97 | 4/97 to 9/97 |
| 1 | Central Water Commission | 364 | 23 | 15 | 6.7 | 114 | 54 |
| 2 | Madhya Pradesh | 1078 | 205 | 135 | 107 | 272 | 79 |
| 3 | Orissa | 1386 | 127 | 116 | 88 | 368 | 238 |
| 4 | Rajasthan | 977 | 160 | 134 | 64 | 314 | 198 |
| 5 | Tamil Nadu | 786 | 54 | 60 | 48 | 221 | 189 |
| | Total | 4591 | 569 | 460 | | 1289 | 758 |

- 16.2.1 A review meeting on progress of various activities of the Central component was held with the World Bank on 13.8.96. The World Bank again emphasized the need to speed up progress, particularly on remedial works component as the project is closing on September 1997. For this purpose it was desired that DSO, CWC may review and monitor the project of the States component on monthly basis. It was also indicated that the next review mission of the Bank was likely to visit by November 1996. The Chairman also stressed upon the four participating States to make sincere efforts to complete the works as per the target.

16.3.0 Review of National Scenario.

- 16.3.1 The States have been requested to intimate fresh cases of distress in dams, structural and operational deficiencies noted during the monsoon and failure cases, if any, since the last meeting.
- 16.3.2 No such report in this respect was reported by the States / Organizations during the meeting. It was informed that CWC officers inspected Bargi dam during 22-25 July 1996. Director (DS), BODHI, Madhya Pradesh informed that a report on Bargi dam would be submitted on receipt of CWC inspection report.

16.4.0 Progress of implementation of recommendations of the "Report on Dam Safety Procedures."

- 16.4.1 The States have been requested to implement the recommendations contained in the chapters of "Report on Dam Safety Procedures" circulated during 1987 and send a consolidated

report indicating achievements on various issues and to highlight those recommendations, if found difficult to implement.

16.4.2 It was informed that the States of Andhra Pradesh & Gujarat and BBMB have already sent their reports. NHPC had submitted a detailed report during August 1996. While agreeing on all the recommendations, the Organization reported that implementation of the recommendations are being done without any difficulty. The Organization has got all the infrastructure to carry out and implement the recommendations as reported by them. The State of Karnataka had submitted the progress on implementation during August 1996. It was pointed out that the States of Bihar, Kerala and West Bengal have not submitted any report so far.

16.4.3 It was reiterated that the key issues, namely, preparation of "Data Books" on large dams, Dam Safety Legislation, review of hydrology on existing dams, preparation of completion reports and Operation & Maintenance Manuals of large dams, etc., were taken up separately. All the States were requested to send a consolidated report highlighting the achievements on the implementation of the recommendations of the "Report on Dam Safety Procedures."

16.5.0 Dam Safety Legislation

16.5.1 The Chairman reiterated the importance and the need to give a fresh look for safety inspection, evaluation and maintenance of large dams in India which are mostly owned by Government agencies. He desired that the States which have not so far agreed for bringing out the legislation, may consider whether any guidelines could be formulated till the Dam Safety Legislation is enacted.

The following States had communicated their concurrence to draft act:

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

Comments offered by Gujarat, Maharashtra and Rajasthan would be considered at the time of finalizing the legislation.

16.5.2 BBMB had pointed out that since draft act does not cover joint venture of different States and statutory bodies, the BBMB for functioning under Central Government, draft act may require suitable amendments.

16.5.3 The States of Bihar, Karnataka, Kerala, Madhya Pradesh, Uttar Pradesh & West Bengal were again requested to inform the progress in this regard without any delay.

16.6.0 Preparation of Emergency Action Plans and inundation maps for d/s area.

16.6.1 A decision for preparation of Emergency Action Plan for downstream areas of dams of National Importance by all the States was taken during the preceding meetings. It was also decided that the four participating States – Madhya Pradesh, Orissa, Rajasthan & Tamil Nadu – under the World Bank assisted Dam Safety Assurance and Rehabilitation Project (DSARP) should give priority to the 54 identified dams posed for rehabilitation in the first phase followed by the remaining dams.

16.6.2 It was informed that the work of preparation of Emergency Action Plans for Karjan, Ukai, Machu-II (Gujarat), Linganamakhi (Karnataka), Ghodahada dam (Orissa), Kangsabati dam (West Bengal), Sathanur & Kodaganar (Tamil Nadu) has been initiated. Uttar Pradesh had identified 21 dams and concerned Chief Engineers have been requested to take up the work. Dam Break Studies of 9 dams in Maharashtra has also been initiated. The concerned States have been requested to intimate the latest progress in this regard.

NHPC had completed Emergency Action Plan for Salal dam. However, progress in respect of Chamera dam has not been submitted. Rajasthan had prepared Emergency Action Plan for Matrikundia dam.

16.6.3 States of Andhra Pradesh, Bihar, Madhya Pradesh, Orissa and West Bengal and Kerala (Irrigation Department) were asked to inform progress in this regard.

KSEB informed during the meeting that Dam Break Studies for Idukki dam were under progress and the report on the dam would be submitted soon. Punjab Irrigation Department agreed to take necessary action in respect of dams which are under the control of Bhakra Beas Management Board (BBMB) and downstream areas which lie in Punjab.

- 16.6.4 The Chairman reiterated his earlier suggestion that the basic input data, i.e. the work for taking downstream cross sections in the areas downstream of dams required for the Dam Break Studies may be started by all the States immediately.

16.7.0 Compilation of "Data Books."

- 16.7.1 As per the decision by the NCDS, "Data Books" for dams of National Importance are to be prepared by the States and sent to DSO, CWC for record / reference. Critical geological features of the dams are to be highlighted in this report instead of giving a detailed geological report.
- 16.7.2 It was informed that the States of Andhra Pradesh, Bihar, Gujarat, Karnataka and Tamil Nadu and also BBMB had submitted "Data Books" for dams of National Importance. NHPC had submitted "Data Book" for Salal HE project and Chamera project. Maharashtra has submitted "Data Book" only for Paithan dam out of 5 dams; Rajasthan submitted a fresh copy of "Data Book" (Part I & II) during the meeting. Uttar Pradesh was requested to submit "Data Book" of Ichari dam in the prescribed format. It was informed that "Data Books" Tawa, Minimata (Bango), Gandhi Sagar (Madhya Pradesh) and Idukki dam (KSEB) have not been received. Orissa agreed to submit the "Data Book" by October 1996.
- 16.7.3 It was also informed that "Data Books" were also awaited from Kerala (Irrigation Department) and West Bengal.

16.8.0 Preparation of completion report of large dams

- 16.8.1 Completion reports of all large dams are to be prepared by the respective States giving priority in the first phase to dams of National Importance. Original geological reports are also to form part of the completion reports.
- 16.8.2 It was informed that Maharashtra had completed reports of 10 dams and proposed to complete the remaining by engaging retired senior officers of Irrigation Department. Karnataka had prepared history reports of 19 dams. Though the work in this regard has been initiated by the States of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Tamil Nadu and West Bengal, status of progress has not been given by these States. Regarding report of Idukki dam, KSEB expressed difficulty in tracing out old records. During the meeting, it was reported by the States that the work had been completed for two dams in Orissa, six dams in Uttar Pradesh

and two dams in Rajasthan. Kerala (Irrigation Department) did not give any information.

- 16.8.3 As completion reports are to be prepared for all the existing large dams, Chairman reiterated that the work could be done by utilizing the services of the officers retired / serving who were actually associated with the project.

16.9.0 Preparation of Operation & Maintenance Manuals

- 16.9.1 During the meeting, Chairman emphasized that O&M Manual is an important document for operation & maintenance of dams and this manual should be available before commissioning of each project. As O&M Manuals have not been prepared for most of the dams, this needs to be taken up without any further delay and completed expeditiously.

- 16.9.2 It was informed that BBMB and Uttar Pradesh had completed O&M Manuals for the dams under their control. Orissa had completed for 17 dams. NHPC had submitted O&M Manual for Salal and Chamera dams. Rajasthan reported that the manual for ungated dams was under finalization. Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra, Rajasthan and West Bengal informed that the work had been initiated. Madhya Pradesh informed that the work of preparation of O&M Manuals for 24 gated dams had been taken up on priority. O&M Manual for Rani Avanti Baisagar has been prepared and approved by the State DSO whereas Manuals in respect of Barna and Ravisankar, were under finalization. Tamil Nadu reported that they had prepared compendium of rules and regulations for flood regulation for each large dam in the State. KSEB had prepared Manuals for all gated dams. No information had come from Irrigation Department, Kerala.

- 16.9.3 It was reiterated by the Chairman that the States may take up the work of O&M Manual and complete expeditiously for all large dams.

16.10.0 Periodical inspection of dams and the report on dam safety activities in the States.

- 16.10.1 The States / Organizations were requested to perform periodical inspection of dams in their States and send a consolidated yearly 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. As desired by the Chairman during the 15th meeting, a format has been circulated by DSO, CWC to all the States / Organizations for uniformity in reporting.

16.10.2 Maharashtra had submitted status report for 1994-95. Andhra Pradesh had submitted upto April 1996. Orissa submitted the report for the period ending 1995. NHPC had submitted four inspection reports for Bairasul, Salal, Chamera and Thanakpur H.E. projects but yearly consolidated report had not been submitted. Tamil Nadu had submitted report upto April 1995 and Gujarat upto December 1995. No consolidation reports were received from Bihar, Kerala, Rajasthan, Uttar Pradesh and West Bengal so far.

16.10.3 It was reiterated that all the States / Organizations should submit the yearly report in the prescribed format.

16.11.0 Safety review of large dams once in ten years.

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

16.11.2 In view of very large number of existing dams, progress in this regard was noted to be very slow in almost all the States. It was again emphasized that the States might increase the number of experts / panels to complete the inspection by 1997. the progress reported by the States / Organizations was as follows:

In the States of Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal, constitution of the experts' panel is stated to be under active consideration of their respective Governments. Bihar has also initiated action in this regard. Karnataka proposed take up constitution of panel under the World Bank assisted DSARP as and when it is agreed. Tamil Nadu proposes to complete inspection of all dams by 1997. Orissa has completed review of 119 out of 137 dams. Gujarat has completed inspection of 185 out of 373 dams upto December 1995. Andhra Pradesh has drawn a programme for the safety review of large dams in the State. Dam Safety Review Panel (DSRP) under MCIP (III) (R) in Maharashtra State has carried out review work of 9 dams. Review of 27 dams in the Latur and Osmanabad region is planned to be carried out by the expert committed headed by Shri V.R.Deuskar and a standing DSRP has also been proposed for the review of 753 identified large dams in the State. Information from Kerala State is awaited.

16.12.0 Safety status of dams of National Importance.

- 16.12.1 The States were requested to prepare safety status of 45 dams of National Importance in the prescribed proforma circulated by DSO, CWC.
- 16.12.2 Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh & West Bengal and BBMB & NHPC had submitted report for the National Importance dams. Kerala Irrigation Department and KSEB had not furnished any information.
- 16.12.3 All the States / Organizations were requested to send the details of dams and status report whenever any additions in the list of National Importance dams are updated.

16.13.0 Monitoring of safety report of inter-State dams by sub-committees.

- 16.13.1 Three sub-committees were set up during March 1990 to monitor the safety aspects of inter-State dams in the Parambikulam Aliyar System (PAP), Mahanadi River System and Subarnarekha River System.
- 16.13.2 Committee for Parambikulam Aliyar System (PAP) held two meetings in 1991 and 1992. Committee for Mahanadi River System held a meeting in 1992 and Committee for Subarnarekha River System has held only one meeting, i.e. during 1993. Subsequently no meetings took place.
- 16.13.3 The Chairman expressed his concern that not much progress has been achieved on this important item by the three sub-committees and urged all the participating States to intimate the progress and convene meetings of sub-committees regularly. He desired that safety status of inter-State dams and the follow up actions taken on the recommendations of the committees may also be intimated to DSO, CWC.

16.14.0 Setting up of hydrological unit in the States for review of hydrology of existing dams.

- 16.14.1 Hydrology of existing dams is required to be reviewed by setting up or strengthening existing hydrology units in the States. Some States / Organizations have already initiated actions for

strengthening / setting up of hydrology units and also taken up review of hydrology of selected dams.

16.14.2 On the basis of reports received, it was informed that the State of Gujarat had completed the hydrological review of 154 major and medium dams. Madhya Pradesh, Maharashtra, Orissa and Rajasthan have also taken up hydrology review of dams by their existing unit in the States. Orissa had completed review work of 19 dams and work of 17 dams was reported under progress. Madhya Pradesh had completed review work of 35 dams. BBMB and NHPC have established separate units in their organizations for this purpose. In Orissa two hydrology review divisions have been created and are functioning under DSO. Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Uttar Pradesh and West Bengal informed that action for strengthening of existing hydrology unit / establishing a separate unit have already been initiated and review of hydrology of some of the dams have also been taken up. Kerala, Irrigation Department, who was not present may send information in this regard. Representative from NHPC informed that hydrology unit in their organization has been strengthened and they are in a position to assist the States in taking up hydrologic review studies on consultancy basis if they so desire. Chairman requested the States to avail this opportunity.

16.14.3 The Chairman during the meeting desired that all the States / Organizations should identify / set up hydrological units for taking up hydrology review of existing dams.

16.15.0 Instrumentation for dams.

16.15.1 NCDS has decided that the States may take stock of the status of instrumentation installed on all large dams in order to see their performance, mortality, periodicity for analysis of data, referring the analysis to the designers for their suggestions, studies of structural behaviour report and the adequacy or otherwise of the staff engaged on the job. So far, information has been reported by the following States / Organizations for some of the instrumented dams:

Andhra Pradesh

Gujarat

Karnataka

Kerala

Madhya Pradesh

Maharashtra
Orissa
Tamil Nadu
BBMB

All the States / Organizations were requested to furnish details of instrumented dams to DSO, CWC.

Tamil Nadu has already instrumented six dams. Piezometers have been provided on 11 dams by the end of December 1995. Specification for the proposed seismometer for Sathanur dam, Manimuthar dam and Mettur dam has been got approved from IMD. In Uttar Pradesh, micro-earthquake instruments have been installed on Ramganga dam. No progress has been made by Madhya Pradesh in creating a Central Instrumentation Cell proposed by them.

16.15.2 All the remaining States / Organizations were requested to intimate the status to the Committee.

16.15.3 During the meeting, the Chairman stressed the need for analysis of instrumentation data to know the structural behaviour of dams and information in this regard maybe given to DSO, CWC. For this purpose, the States may constitute groups to analyze the data.

16.16.0 Standardized meteorological and other observations.

16.16.1 All the States have been requested to supply detailed information in a specified format on the type of meteorological instruments installed in the catchment areas and reservoirs of large dams for meteorological observations.

16.16.2 Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh & Maharashtra and BBMB have supplied information in respect of few dams. Orissa informed that 15 dams covered under DSARP have been selected for providing meteorological observation units at dam sites out of which weather stations have been installed on five dams. Meteorological instruments have been installed on 10 dams in Tamil Nadu under DSARP. Details of types of instruments installed were reported by the State in August 1996. Uttar Pradesh was requested to furnish details of meteorological instruments in the prescribed format. It was informed that the information submitted by Rajasthan during the 15th meeting was not in the specific format. NHPC submitted standardized meteorological

information for Bairasul, Salal, Chamera, Thanakpur and Loktak. West Bengal and Kerala were requested to expedite submission of information.

All the States were requested to furnish the dam-wise information on the above item.

- 16.6.3 The Committee decided that all the States / Organizations may carry out a drill before the monsoon season to see whether the instruments are in working order. It was also decided that the States may prepare a performance report for each project for the calendar year and submit to DSO, CWC for record.

16.17.0 Data on gated storages.

- 16.17.1 The Committee requested all the States / Organizations to furnish data on gated storages of large dams in a specified format. It was informed that the States of Andhra Pradesh, BBMB, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal have already submitted the information. NHPC has submitted for Salal and Chamera projects. Bihar has not sent any information so far.

16.18.0 Safety and inspection of barrages.

- 16.18.1 During the 7th NCDS meeting, it was decided to collect State-wise information in respect of all barrages in a prescribed format and send to DSO, CWC. The information has been received from most of the States except Bihar. Madhya Pradesh has submitted information for 6 barrages out of 7; and Uttar Pradesh has submitted data for barrages under them. Madhya Pradesh is requested to furnish information for the remaining one barrage. NHPC has submitted data for the barrages under their control. The State of Bihar was requested to submit data at the earliest.
- 16.18.2 Chairman desired that all the States may send aerial view photographs of barrages to DSO, CWC. BBMB has sent aerial photographs of Nangal dam and Pandoh dam. All other States and NHPC were requested to send the aerial photographs.

Chairman desired that the States / Organizations may give top priority to photographs as there is a necessity of projecting the development in the water resources sector through media for making mass awareness.

16.19.0 National Register of Large Dams

16.19.1 It was informed that the updated data for "National Register of Large Dams" received upto December 1994 from the States / Organizations had been entered in NIC Computer and the same can be retrieved by the States / Organizations on NICNET System even at the District level throughout the country. The revised / updated / corrected edition of NRLD has also been published and circulated / dispatched to all the State DSOs and organizations for their reference.

16.19.2 All the States / Organizations were requested to keep on informing the latest information on large dams so that stored data is updated from time to time for the benefit of users.

16.20.0 Seismic status of dams of National Importance.

16.20.1 DSO, CWC has made available copies of document "Guidelines for Inspection of Dams following Earthquake" to all States / Organizations with a request to make use of these guidelines and report to NCDS safety status of dams immediately on occurrence of earthquakes.

16.20.2 After the occurrence of Uttarkashi earthquake in October 1991, reports were received only from BBMB in respect of 3 dams; NHPC for Salal dam and Uttar Pradesh for Ram Ganga dam. After the occurrence Latur earthquake with epicenter near Killari on 30.9.93 in Maharashtra, post-earthquake inspection reports were submitted by Andhra Pradesh & Maharashtra and Karnataka. Copy of the report brought out on Uttarkashi earthquake has been received from GSI.

16.21.0 Problem bank on research & development.

16.21.1 All the members of NCDS were requested to suggest areas requiring research for development of projects and gadgets in the field of dam safety and send their suggestions to DSO, CWC. The Chairman, during the last few meetings had desired that the States should examine the areas / fields as indicated in the list given earlier and undertake research on a subject of their choice. They may also prepare a project report on the scheme for research and send the same to CWC. But no project report has been received from any States / Organizations so far.

16.21.2 The Chairman during the meeting desired that the States / Organizations consider this item actively and to come forward specifying the areas required for research and development of

projects and dam safety activities. Chairman also suggested that if any of the States / Organizations require funds for such research and development work, CWC can provide funds if useful schemes are submitted by States / Organizations.

The next meeting will be convened by February / March 1997.

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