

**Minutes of the fifth meeting of
National Committee on Dam Safety held on 30.11.1989**

1.0 The fifth meeting of National Committee on Dam Safety was held on 30 November 1989 in Sewa Bhavan, New Delhi under the Chairmanship of Shri R.B.Shah, Chairman, Central Water Commission.

1.1 The list of officers who attended the meeting is given in Annex I.

1.2 Chairman welcomed the members of NCDS and other participants.

2.0 Confirmation of the minutes of the 4th meeting.

2.1 The minutes of fourth meeting of NCDS held on 25.5.1989 at Nasik, Maharashtra were confirmed.

3.0 Dam Safety Assurance Project

3.1 Chairman desired to take up the agenda on Dam Safety Assurance and Rehabilitation Project under the World Bank aid at the commencement of discussions, as it was considered a very urgent issue and the States were required to send proposals, if any, within a short period. Chairman intimated that the working group for VIIIth Plan on Major & Medium Irrigation Projects has made separate provision in respect of dam safety activities for each State, tentatively. Chairman also explained that the World Bank is keen on financing this project and the MoWR has also evinced interest. The States should, therefore, make all efforts to project their requirements for finalization of the programme for this project. The World Bank team is scheduled to come for discussion in the middle of January 1990 and proposals should be ready by end of December 1989 for appraisal of the World Bank.

3.2 Chairman desired to know the status of preparation of Identification Report for Dam Safety Assurance Project from each of the States and the representatives of the States explained the position as detailed below:

(a) **Andhra Pradesh :** Information received from the State is incomplete. Chairman requested the representative from the State to identify dams in the State that needs strengthening and to send proposal seeking assistance from World Bank for their rehabilitation. The proposal should indicate approximate cost estimates. Representative from the State agreed to send the proposals by the third week of December 1989.

(Action : Andhra Pradesh)

- (b) **Bihar** : No reply has been received from the State and there was no representative attending the meeting.

(Action : Bihar)

- (c) **Gujarat** : In reply to the questionnaire, the State had mentioned two dams – Dantiwada and Dharoi – in distress. It was also mentioned that funds are not available for special repairs. The State has not indicated the need for World Bank assistance. Representative from Gujarat mentioned that rough cost of strengthening 15 other dams would be about Rs.24.80 lakh. The State representative was asked to send proposals along with technical details of distress and remedial measures and rough cost estimate for assistance from World Bank under the present proposal. The proposal in complete shape should reach DSO, CWC by middle of December 1989.

(Action : Gujarat)

- (d) **Karnataka** : The State has identified only one dam, viz. Talakalale as under distress. Chief Engineer (DSO) suggested that since no safety inspection has been carried out for other large dams in the State, their safety status is not known. It would, therefore, be appropriate if the State would ask assistance if necessary from World Bank for undertaking phase I investigations of all major dams in the State to enable them to determine the safety status of all large dams in Karnataka. Representative from Karnataka agreed to send a proposal to this effect by middle of December 1989.

(Action : Karnataka)

- (e) **Kerala** : There are 42 large dams in the State of which 20 are under the Electricity Board, which do not come under the purview of State Dam Safety Cell. The State has identified three dams under distress and lack of finance has been mentioned as a constraint for carrying out remedial measures. Chairman, CWC would addressing the Chief Secretary of the State for bringing the dams of Electricity Board under the purview of Dam Safety Cell of the Irrigation Department for the purpose of safety inspection of dams. Member from Kerala did not attend the meeting.

(Action : CWC / Kerala)

- (f) **Madhya Pradesh** : Information has been supplied by the Irrigation Department of the State and detailed discussions have been held by

Chief Engineer (BODHI), Madhya Pradesh with Chief Engineer (DSO), CWC for finalization of proposal. Chief Engineer (BODHI), Madhya Pradesh would send revised complete proposals after ascertaining the views of the State, by middle of December 1989.

(Action : Madhya Pradesh)

- (g) **Orissa** : Information received from the State is incomplete and inadequate. Representative from the State did not attend meeting.

(Action : Orissa)

- (h) **Rajasthan** : No reply has been received from the State and there was no representative attending the meeting.

(Action : Rajasthan)

- (i) **Tamil Nadu** : There are 87 completed large dams in the State and only 51 dams are under the purview of the State Dam Safety Cell. The remaining dams are under the State Electricity Board. To bring these dams under the purview of Dam Safety Cell of the Irrigation Department, the State representative requested Chairman, CWC to write to the Chief Secretary of the State. Since no dam safety programme has been established in the State, Chairman advised the State representative to send a proposal for establishing a regular Dam Safety Cell tailored to the needs of the State, for seeking assistance from the World Bank by middle of December 1989.

(Action : Tamil Nadu)

- (j) **Uttar Pradesh** : Information received from the State is incomplete and the assistance required has not been indicated. Representative from the State was requested to send complete information for seeking World Bank assistance. Chairman mentioned that if necessary, he would write to the concerned Engineer-in-Chief of the State.

(Action : Uttar Pradesh)

4.0 Review of National Scenario.

- 4.1 The national scenario, particularly with reference to the operation of dams during floods and deficiencies, if any, in the structural and operational features revealed during operation and post-monsoon inspection is to be reviewed in the Committee meeting as a normal feature.

4.2 Members attending the meeting reported the following:

- (a) **Andhra Pradesh** : Post-monsoon inspection reports are yet to be received in the Dam Safety Cell of the State.
- (b) **Bhakra Beas Management Board (BBMB)** : Representative from BBMB intimated that the seals of radial gates of Bhakra dam were replaced before last monsoon. Rainfall in the catchment area for dams of BBMB was about 64% of the normal rainfall this monsoon. Damp patches were seen on the power dam blocks of Pong dam.
- (c) **Gujarat** : During the last monsoon, leakage was observed in Karjan dam. The Kaila dam failed by piping. Chairman requested the representative of the State to send in details of the dam that failed to the DSO of CWC.
- (d) **Karnataka** : Pre-monsoon inspection reports indicated no major incidences. Post-monsoon inspection reports are yet to arrive at the Dam Safety Cell. Health status report of large dams of the State is under preparation. The State representative intimated that this year all the reservoirs have filled and the dams did not experience operational problems during the monsoon.
- (e) **Madhya Pradesh** : Representative from the State intimated that rainfall was low in almost all regions of the State and that none of the reservoirs got completely filled. Post-monsoon inspection reports have not been received from the field offices.
- (f) **Maharashtra** : Representative from the State intimated that rainfall in Maharashtra was good and most of the reservoirs got filled. There are no specific cases to report on the operation of spillway gates and outlets. During monsoon, a 22 metre high monozone embankment dam (Nher dam) in Satara District developed distress. The embankment was gradually slipping, which was noticed and the reservoir depleted to undertake remedial measures. There were isolated cloud bursts in July 1989 in Konkan and Aurangabad regions. These, however, did not affect dams in these regions.
- (g) **Tamil Nadu** : Representative from the State intimated that the monsoon was poor and only a few reservoirs got filled. A system of inspection for pre- and post-monsoon (for both monsoon rain periods) is prevalent. About ten dams experienced floods in excess of the design flood volume.

- (h) **Uttar Pradesh** : No information has been received in the Dam Safety Cell of the State.

- 4.3 Chairman requested members from Andhra Pradesh and Maharashtra to send technical report on the recent failure of dams in their State, viz. Kaletivagu in Andhra Pradesh and Nher in Maharashtra.

(Action : Andhra Pradesh / Maharashtra)

- 4.4 Member (WP) requested all the members to send in a short two-page report at every meeting indicating the scenario of each State during monsoon with specific reference to distressed dams.

(Action : Members / States)

- 4.5 Representative from IMD intimated to all members of the Committee on the new computer installed this year at IMD for comprehensive weather forecast and that the forecast has been very accurate. A power regression model has been used for forecasting atmospheric phenomenon. IMD has divided the entire country into 35 meteorological sub-divisions and rainfall has been good in 29 sub-divisions. Except for the State of Madhya Pradesh, rainfall has been well distributed over time and space this monsoon.

5.0 Implementation of the recommendations of "Report on Dam Safety Procedures."

- 5.1 Director, DSO, CWC, intimated that some States have replied detailing the progress made in their States on the implementation of the recommendations. Since States have been taking action from time to time on this issue, the information needs updating. Chairman, therefore, requested all members to send in a brief note annually, preferably in November every year containing the latest position on this subject to the DSO of CWC for putting up to the NCDS once a year. The position as on 30.11.1989 may be intimated immediately.

(Action : Members / States)

6.0 Creation and strengthening of DSOs / Dam Safety Cells in States.

- 6.1 All States having significant number of dams have created DSO/Cells. However, in most of the States, except Maharashtra, Gujarat and BBMB, the organization created is inadequate and needs strengthening for effective implementation of the dam safety programme.

- 6.2 This matter stands already discussed under item 3.0 (Dam Safety Assurance Project) of the minutes of this meeting and the existing position of the States have been elaborated therein.
- 6.3 Chairman opined that advantage should be taken of the Dam Safety Assurance Project aided by the World Bank and the States should send proposals for strengthening of their organization for effective implementation of their dam safety programme.

7.0 Dams under purview of State DSOs / Cells.

- 7.1 Presently, all dams do not come under the purview of the State DSO / Cell. Information received from the States and compiled by the DSO was put up to the Committee during this meeting. The information is incomplete and the Chairman requested all the States to update this information.
- 7.2 Where dams under other agencies did not come under the purview of the State DSO, details of the dam owning organizations may be intimated to the DSO, CWC. On receipt of this information, the Chairman, NCDS would write to the Secretaries of the States concerned, to bring all dams in the States under the purview of the State DSO / Cell of the Irrigation / Water Resources Department.

(Action : States / Members / CWC)

8.0 Setting up of hydrological unit in the State for review of hydrology of existing dams.

- 8.1 The position regarding setting up of a hydrology cell in the States was put up before the Committee. It was seen that in most of the States, the hydrology unit is engaged with on-going projects and very few States have taken up the work of review of hydrology of existing projects. States like Gujarat, Madhya Pradesh and Maharashtra are the only ones who have undertaken review of hydrology of existing dams. Representative from Maharashtra informed that shortage of staff is the greatest handicap in undertaking this work.
- 8.2 Chairman requested representative from other States to pursue with their Governments in establishing hydrology units preferably in the Dam Safety Cell of the State, for undertaking review of hydrology of existing dams. Chairman also observed that the Irrigation Departments of the States have been training their officers on hydrology at the University of Roorkee for quite some time and by now there would be a sizeable number of such engineers in each State.

These engineers could be utilized by the States for forming a unit to review the hydrology of existing dams. Chairman, NCDS and Member (WP), CWC were of the opinion that, should there be any difficulty, the States can send such officers to CWC with appropriate data who can conduct the review of hydrology of existing dams in their States under the guidance of the hydrology unit of CWC.

(Action : Members / States)

9.0 Safety review of dams.

- 9.1 Commenting on the safety review of dams, Chairman observed that the Phase I review envisaged is very involved and need to be subdivided into at least two stages. The first stage would be a physical inspection and also with comments indicating the necessity or otherwise of conducting structural and hydrological review. The second stage would involve actually carrying out such reviews and reporting of the findings of the review. The need for existence of a hydrology unit was once again stressed for review of hydrology of existing dams. Whether this unit would be a part of the State Dam Safety Cell or of the State Design Unit need to be examined and may vary from State to State.
- 9.2 It came to light during discussions that the States of Gujarat and Maharashtra have conducted safety review only of dams in distress and BBMB has undertaken physical inspection of dams under their charge. The findings of the review should be sent to DSO, CWC.
- 9.3 Representative from BBMB during the meeting handed over a document titled "Dam Safety Committee Report in respect of Nangal Dam, Nangal Hydel Channel and Canal Power Houses" prepared by BBMB in August 1989. Chairman desired that the Dam Safety Directorate of CWC should examine this report and comment on how far this document fulfils the requirement envisaged under Phase I investigation.

(Action : Gujarat / Maharashtra / BBMB / CWC)

10.0 Safety status of dams of National Importance.

- 10.1 During the fourth meeting it was decided that the States would send safety status report of dams of National Importance (height more than 100 m or storage more than one km cube) to the DSO of CWC for compilation. The States of Gujarat Maharashtra, Tamil Nadu and BBMB have supplied information in the proforma supplied by CWC. Information supplied by Karnataka is incomplete and those supplied by Andhra Pradesh and Madhya Pradesh are neither in accordance with

the specific format nor are they complete. Chairman requested all the members to expedite information in respect of completed dams in the specified format to CWC immediately, as this information is to be incorporated in the report on dam safety activities being prepared in DSO, CWC.

(Action : Members / States)

- 10.2 Information on salient features of dams of National Importance compiled by the Dam Safety Directorate of CWC was shown during the meeting. Chairman desired that the list be circulated among all members for updating. He also desired inclusion of only completed dams in the list.

(Action : CWC)

11.0 Preparation of Operation & Maintenance Manual.

- 11.1 After examining the few O&M manuals received from the States, it was felt that O&M provisions of Bhakra dam and Bhakra reservoir could be taken as a good model. A copy of the extracts of these two documents was circulated amongst members during the meeting for use as reference material.
- 11.2 Representative from BBMB intimated that the O&M manual for Beas dam would be appropriate for embankment dams and its contents would be circulated amongst the members on receipt of a copy from BBMB.

(Action : BBMB)

- 11.3 Representative from Gujarat intimated that O&M manuals have been prepared for Karjan and Damanganga projects and submitted to the World Bank for approval. Chairman desired that after the same are approved by the World Bank, the contents should be circulated to all members / States.

(Action : Gujarat)

- 11.4 Chairman requested all members / States, who have not yet sent a copy of O&M manual for any major project of the State, to send the same to the DSO of CWC early.

(Action : members / States)

12.0 Preparation of completion reports of large dams.

- 12.1 During the fourth meeting it was decided that members would consult their States regarding administrative proposals for getting completion reports prepared and report further developments to DSO of CWC for placing before the Committee in its next meeting. It was also decided that as a first step, a target would be set up for preparation of completion reports for dams of National Importance.
- 12.2 Chairman observed that this job cannot be done on a routine basis and some persons have to be specifically appointed for this job. He also wanted CBIP representative who was present in the meeting (as a special invitee) to check up whether specific grants are available with the CBIP for this job. Chairman desired to know from the members the progress achieved on the preparation of completion reports in the States.

(Action : Members / States / CBIP)

- 12.3 Replies of members State-wise are as follows:

Andhra Pradesh : The representative had no specific information but intimated that the work has commenced.

Gujarat : Work has been taken up for preparing the completion reports of eight projects aided by World Bank. Concerned field officers will be writing the reports under the guidance of State CDO.

Karnataka : Representative from the state intimated that work has been taken up for dams of National Importance. Experts have been identified and for some dams draft reports have been finalized.

Madhya Pradesh : Representative from the state intimated that report on Gandhisagar is being compiled.

Maharashtra : Representative from the State intimated that a draft report has been prepared for Koyna project. Completion drawings have been compiled for many major projects.

Tamil Nadu : Representative from the State intimated that compilation has been taken up for Sathanur dam and half of the data has been collected for other large dams.

- 12.4 Chairman observed that in the compilation of completion reports of major projects, assistance from GSI may be necessary. Representative from GSI intimated that he hardly has any State or project approaching them for past geological reports or problems in

existing dams. They would render assistance as required. The Chairman observed that GSI should also be associated with field inspection of dams.

(Action : all States)

13.0 Compilation of "Data Books."

13.1 Director (Dam Safety), CWC intimated the Committee, names of dams of National Importance for which data books have been received. He informed that the States have been sending copies of 'Data Books' of large dams other than those classified as dams of National Importance to CWC. He informed the Committee that it was decided in the 4th meeting that 'Data Books' of dams of National Importance may be sent to DSO, CWC for record. The 'Data Books' of other large dams should be prepared and kept in the State DSOs.

13.2 Chairman requested the members to compile Data Books of remaining dams of National Importance and send them to DSO of CWC expeditiously.

(Action : Members / States)

14.0 Standardized meteorological and other observations.

14.1 During the fourth meeting it was agreed that certain minimum hydrometeorological observations should be done at all large dams. The observations should include rainfall (with self-recording gauges), atmospheric pressure (with barometers), maximum / minimum temperature, humidity, wind speed, wind direction, height of waves, temperature on downstream face of a gravity dam, etc. A start could be made by establishing such observatory at all dams of National Importance. Wherever meteorological observations are being carried out, the scope could be enhanced to include all parameters indicated above. Members / States were to intimate DSO, CWC the names of all large dams with the types of observations being made at such dams.

(Action : Members / States)

14.2 Chairman desired to know the progress made in this aspect and the members presented the following:

Andhra Pradesh : Representative from the State intimated that no such observations have yet started on an organized scale.

Gujarat : Representative from the State intimated that meteorological data is being observed in 48 large dams.

Karnataka : Action has been taken to install systems for standardized meteorological observations.

Maharashtra : Representative from the State intimated that certain meteorological observations are being carried out for large dams and details will be sent.

Tamil Nadu : Representative from the State intimated that so far only rain gauge recordings have been carried out. Action has now been taken to have comprehensive meteorological observations.

BBMB : They have been carrying out standard meteorological observations and have intimated the same to the DSO, CWC.

14.3 Representative from IMD stressed on the need for meteorological observations at dam site and insisted that this should be done for all large dams in the country.

14.4 Chairman desired to know the types of gadgets used for recording wave height in reservoirs and directed the DSO, CWC to get in touch with CWPRS, Pune for the same.

(Action : CWC)

15.0 Dam safety Legislation.

15.1 The present position regarding views of those States who have replied on this issue was made known to the members of the Committee.

15.2 Amongst the States who have yet to reply, the position was explained by Members. Representatives from Andhra Pradesh and Karnataka intimated that the case is lying with their respective Governments. Representative from Tamil Nadu intimated that the case is being sent to their Government. Representative from Maharashtra intimated that the case is lying with the State Government and that Tata and Municipal Corporation in Maharashtra have agreed for inspection of their dams by the Irrigation Department.

15.3 Chairman suggested that members from States who had not yet replied may pursue with their State Governments for expediting the replies.

(Action : Members / States)

16.0 Report on Dam Safety Activities in the State including Status Report on the health of dams.

16.1 The second report on dam safety activities in India is to be published by February March 1990 and it was decided in the fourth meeting that report on dam safety activities in the States, including the health status report should be sent to the DSO, CWC by 31.10.1989 to enable compilation of the draft report by 31.12.1989. Information has been received so far only from Gujarat and BBMB.

16.2 Chairman desired that those Members / States who have not yet replied, should send all the information by the end of December 1989.

(Action : Members / States)

17.0 Formation of sub-committees to monitor safety aspects of inter-State dams.

17.1 During the fourth meeting, it was decided to set up three sub-committees consisting of members of NCDS to monitor safety aspects of selected inter-State dams. Chief Engineer (DSO), CWC as the Member – Secretary of NCDS, has requested the concurrence of States of Kerala, Madhya Pradesh, Orissa and Tamil Nadu towards formation of sub-committee and for nominating respective representative of the State in the NCDS to the sub-committees. West Bengal which does not have a representative in the NCDS was also addressed for the purpose mentioned above. Replies have been received from Madhya Pradesh and Tamil Nadu.

17.2 Chairman requested that members from Kerala and Orissa may pursue with their Governments for expediting this issue.

(Action : Kerala / Orissa)

18.0 Dam Safety Assurance Project – considerations of criteria for candidate projects.

18.1 Chairman, CWC stated that presently Dam Review Panels have been established only for all World Bank assisted projects as a requirement of the World Bank. The DRPs have been found to be quite useful and such DRPs should also be established for all major irrigation projects. This is also one of the recommendations of the "Report on Dam Safety Procedures" and the States should take action on this.

- 18.2 Names of projects other than World Bank assisted projects for which a
DRP was / has been established may be intimated to DSO, CWC.

(Action : Members / States)

19.0 Safety and inspection of barrages

- 19.1 A note on the subject along with a format for data on barrages was
circulated during the meeting.
- 19.2 Question regarding safety inspection of barrages by the Dam Safety
Cells of the States is a moot point in which the States expressed
divergent views. To have an overview of this aspect, Chairman
suggested that we may take stock of the situation and prepare a list of
large barrages, criteria being the extent of area served by the
barrages. Members agreed to the suggestion of preparing a list of
barrages in their States in the format circulated, copy of which is given
at Annex II. Once the list is available, the Committee can then take a
view on this issue.

(Action : Members / States)

- 20.0 The meeting concluded with a vote of thanks to the Chair.