

**Minutes of the second meeting of
National Committee on Dam Safety held on 28.7.1988**

- 1.0 The second meeting of the National Committee on Dam Safety was held on 28 July 1988 in Sewa Bhavan, New Delhi under the Chairmanship of Shri M.A.Chitale, Chairman, Central Water Commission.
- 1.1 List of officers who attended the meeting is given in Annex I.
- 1.2 Chairman welcomed the members of NCDS and other participants. Since the Dam Safety Organizations have been functioning for quite some time in many of the States, Chairman requested the representatives of the States to give a brief account of the progress made by their respective Dam Safety Organizations. Members from Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra and Orissa briefly described the progress made by the Dam Safety Organizations in their States. It transpired during discussion that Bihar and Rajasthan States do not have identified organizations for dam safety activities. It was desired that they do so immediately.

(Action : Bihar & Rajasthan States)

2.0 Register of Large Dams – compilation of.

- 2.1 Chairman and Chief Engineer (Dam Safety Organization), CWC wanted to know the difficulties in compilation of information on large dams by the States since many of the States have yet to send or update this information. During discussion, it was observed that dams apart from being owned by the Irrigation Departments, are also owned by the Electricity Boards, Municipal Corporations, Public Health Departments and others. It is necessary to compile information on all the dams in the State. Representative of Gujarat intimated that they have been conducting inspection of all dams in the State.

Representatives from Andhra Pradesh and Karnataka informed that in their inspection programme, dams belonging to both the Irrigation and Power Departments have been included. Representative from Tamil Nadu intimated that only Irrigation Projects are being covered. Representative from Bihar intimated that they are concerned only with Irrigation Projects.

- 2.2 Chairman desired to know from the members of the Committee as to what should be the best mechanism for compilation of information of all the large dams in the States. Representative from Uttar Pradesh

informed the lack of response from the field officers in this work and suggested that the Engineer-in-Chief of the State should write to the Chief Engineers of the projects. Representative from Maharashtra intimated that there are a large number of percolation tank dams in his State without any ownership and they come under the category of large dams. It would, therefore, be difficult for the Dam Safety Organization of the State to compile information on such dams.

- 2.3 It was decided that members should send details of all large dams in the State, including dams owned by all agencies in the State, in the format enclosed (Annex II). If all details given in the format are not available for dams owned by other agencies, names and details readily available may be compiled and sent to the Chief Engineer (Dam Safety Organization), CWC by October 1988.
- 2.4 For compilation of the National Register of Large Dams, it was decided that the ICOLD definition of large dams, as given below should be adopted.

Large Dam – For the purpose of inclusion in the World Register of Dams, a large dam is defined as any dam above 15 m in height (measured from the lowest point of foundation to the top of dam) or a dam between 10 m and 15 m in height which meets at least one of the following conditions :

- a) the length of crest of the dam to be not less than 500 metres (length of top of dam including spillway may be adopted).
- b) the capacity of the reservoir formed by the dam to be not less than one million cubic metres.
- c) the maximum flood discharge dealt with by the dam to be not less than 2000 cubic metres per second.
- d) the dam has specially difficult foundation problems
- e) the dam is of unusual design.

(Action : all members)

3.0 Review of action taken on the minutes of the first meeting.

- 3.1 Action taken on the minutes of the first meeting of NCDS was reviewed by the Committee and it was found that action has already been taken on many of the issues involved.

- 3.2 One of the major issues concerned holding of a seminar on hydrologic safety of dams at Nagpur in October 1988 being organized jointly by CBIP and the State of Maharashtra. Member Secretary from CBIP explained the themes of the seminar to members of the Committee and intimated that the response to call for papers has been poor. Chairman informed the members of the Committee that this seminar is of vital importance in projecting the capability of Indian engineers concerned with dam safety for tackling problems related to the hydrologic safety of dams, particularly to the World Bank who had expressed some reservations in respect of the capability of Indian engineers. He explained the necessity of contributing papers of International Standard by engineers of the State Governments to dispel the view held by the World Bank that we are not capable of tackling our own dam safety problems. We should prove that we have indigenous expertise to advice on dam safety activities, including projects aided by the World Bank. The six themes contemplated for the seminar were discussed with the members of the NCDS and it was decided that papers would be contributed by the States of Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa & Rajasthan and also by Central agencies like CWC, IMD, NIH, etc. Chairman also suggested that educational institutions connected with the hydrologic safety of dams should also be asked to attend the seminar. In fact, it would worthwhile to ask the representative of the World Bank to attend the seminar to recognize the capability of Indian engineers, so far as the safety of dams is concerned.

(Action : CBIP & States)

4.0 Formats for compilation of data and periodical inspection of dams.

- 4.1 In order to evolve a uniform procedure for compilation of basic data on dams and for periodical inspection of dams, the following formats were circulated to all members in March 1988 for their comments:

1. Data Book Format
2. Sample Checklist
3. Proforma for periodical inspection of dams.

Comments have been received from Andhra Pradesh, Gujarat and Madhya Pradesh. These documents have been modified based on their comments. The revised formats will be circulated shortly.

- 4.2 For the physical inspection of dams, either of the two formats, i.e. sample checklist and proforma for periodical inspection of dams, could

be adopted. The Committee felt that it would be desirable to adopt the format "proforma for periodical inspection of dams" in the initial stages, till the inspection teams are trained in dam safety inspection. Choice of the format to be adopted was left to the State.

(Action : States & CWC)

5.0 Setting up of a hydrological unit and geological unit in the States.

5.1 Replies have been received on this issue from Andhra Pradesh, Bihar, Karnataka, Kerala & Maharashtra and Karnataka Power Corporation only. Discussing on these issues it transpired that very few States have a hydrological unit for review of inflow design flood of existing dams and also for fixation of inflow design flood for on-going projects. Chairman intimated that for projects in the pipeline unless the State has a hydrological unit of its own in the Irrigation Department, CWC will not technically clear the projects. He emphasized that the hydrological units of the States have a very important role to play in ensuring the safety of the dams from the hydrologic point of view and it is imperative that all States should have a hydrological unit of their own. Dependence on recognized institutions and national institute for ensuring the hydrological safety of dams will not suffice. Members felt that this is an important issue and, if necessary, Chairman, CWC may be required to pursue this matter with the Secretaries of the States for establishment of a hydrological unit in the Irrigation Departments of the States.

5.2 Chairman desired that members from the States where a separate hydrological unit has not been established, should immediately take up the case with the State Governments for creation of such units.

(Action : all members)

5.3 As regards setting up of a geological unit in the States, there was no unanimous opinion amongst the members. States like Gujarat and Maharashtra which have a large number of dams felt that the Geological Survey of India may not be able to cater to the needs of the States by way of personnel and each State should have a geological unit attached to the Irrigation Department. It was agreed that some arrangement has to be there with the Irrigation Department of the state to take care of the geological aspects of both the existing and on-going projects though for very large projects, GSI has been assisting the States. It was agreed by the members that the matter concerning strengthening of the engineering geological base of each State should be discussed in detail as a separate item. The States

have been requested to give their views on this issue. The representative of the GSI was also asked to send a note stating the views of his Organization for discussion in the next meeting.

(Action : States & GSI)

6.0 Dam Safety Legislation

- 6.1 The matter concerning legislation for inspection of dams was discussed in detail. Chairman expressed the view that there is a need for a mandatory procedure or stringent measures to ensure accountability. The premise that the dams are owned by Government does not absolve the owner of the responsibility of their operation in a safe manner. There are many issues like the appointment of hydrologists, preparation of completion reports, operation & maintenance manuals where action needs to be taken, irrespective of legislation. Safety of dams is basin oriented and there has to be a mechanism so that the basin as a whole is operated in a safe manner.
- 6.2 A note from ICOLD giving the list of countries having some sort of legislation, along with brief details was circulated.
- 6.3 It was decided that the states should think about the issue, the advantages & disadvantages of legislation and how to have a basin-wise operation mechanism.
- 6.4 It was decided that even without legislation, the contents of the legislation as given in the "Report on Dam Safety Procedures" is accepted and the members / states would give a feedback how administratively they will be operated. We need not wait for legislation.
- 6.5 It was also decided that there has to be an operation & maintenance manual for each project.

(Action: all States / Members)

- 7.0 **To identify inter-State dams of which safety aspects will be monitored by sub-Committee.**

and

Formation of sub-Committee to monitor the safety aspects of inter-State dams (Agenda No.6)

- 7.1 This item was discussed in detail amongst members and it was felt that a definition has to be evolved for preparation of a list of inter-State dams. Gujarat has sent a note on Mahi case and the representative of Rajasthan was requested to give the views of his State on Mahi. It was decided that this matter would be discussed in the next meeting.

(Action : all States / Members)

8.0 Report on dam safety activities in the States – Status Reports from States showing health of dams. (Agenda No.7)

- 8.1 Status reports have been received from Andhra Pradesh, Karnataka, Kerala, Gujarat, Madhya Pradesh, Maharashtra and Orissa only. The reports sent by most of the States were organizational and contained very little information on the health status of the dams in their States. Of the status reports received, the one from Orissa indicated the deficiencies existing in four large dams and the State of Maharashtra had indicated deficiencies noticed in 74 large dams in the State revealed by inspections. The reports sent by Gujarat contained in detail the health status of 6 large dams. As regards compilation of the health status based on deficiencies noticed in the dams, the Committee was of the view that there should be uniformity in the categorization of deficiency and the categorization should be standardized. The term sick dam should also be clearly defined. The State of Maharashtra had adopted their own criteria in the categorization of deficiencies in dams and it was decided that this note would be circulated amongst the members of the Committee and their comments obtained.
- 8.2 Chairman expressed that it would be very helpful to prepare the status reports of dams basin-wise accompanied by maps showing the distribution of dams in each State basin-wise. Representatives from Gujarat and Maharashtra explained that the information collected by them is district-wise. They said that basin-wise preparation of information on dams would involve administrative difficulties. Chairman, however, requested all the States to make an attempt to present the status reports showing the health of dams basin-wise and intimate the Committee the difficulties faced, if any, in their attempt. However, the National Committee report would be published on the basis of data in hand.

(Action : all States / Members and CWC)

9.0 Action Points on the recommendations of the "Report on Dam Safety Procedures" (Agenda No.8).

- 9.1 It was decided in the first meeting that the action points would be discussed during the second meeting of the NCDS. The Action Points were, therefore, discussed in detail, including the comments received from various States on some of the Action Points.
- 9.2 Discussing on the Action Point 10.1, the members desired to know the implications of the state-of-art of dam engineering. It was decided that an agenda would be circulated on this issue.
- 9.3 Regarding responsibility of safety review of dams owned by other agencies in a State apart from the Irrigation Department, it was considered necessary to take up this matter with the Chief secretaries of the State, for such States where the safety review of dams owned by other departments are not being conducted by the Dam Safety Cell of the State.
- 9.4 Action Point 10.4 suggested that for writing the completion report of major projects under construction, it is essential to keep some of the knowledgeable officers in the same project till the final chapters are written. Members felt that this may involve administrative and financial difficulties. Chairman suggested that an attempt may be made to follow this procedure and the difficulties faced brought to the notice of the Committee.
- 9.5 While discussing on the strengthening of the Dam Safety Organization in the Centre, members of the Committee intimated that they have certain expectations from the Dam Safety Organization at the Centre, particularly in regard to dissemination of dam safety literature and assistance in the form of providing information for issues concerning dam safety. Chief Engineer (Dam Safety Organization) of CWC explained that this facility is already available and the Dam Safety Organization in the Centre has been discharging such duties for quite some time.
- 9.6 As regards an enhancement of budget provision for maintenance and hydraulic structures on realistic basis as enumerated in Action Point 10.13, Chairman explained that the maintenance grant is based on per acre basis and has no bearing on the size of the structure or on the safety status. This matter will have to be pursued by the members of the Committee with their respective State Governments. Representative from Maharashtra explained that lots of difficulties have been faced on the maintenance of concrete and masonry dams in his State, particularly in respect of cleaning of the porous drains that were checked. Director (Dam Safety) explained that this matter has been receiving our attention for quite some time.

- 9.7 There are some equipments available in the country for cleaning of boiler tubes. These should be tried in cases where the porous formed drains are open at the top of the dam. The difficulty arises in cleaning of porous drains which cannot be located from the top of the dam. At present there is no equipment available which cleans such porous drains. There is also no equipment available which can clean such drains from the drainage gallery. Effort needs to be made to develop the equipment. Similarly, the technology for carrying out under-water repairs of the dam is also at a nascent stage and the members will have to develop an appropriate technology for this purpose. It was decided that a Central facility also needs to be established where all pertinent information on such operation would be available. To start with, the listing of available equipment and agencies for repairs of dams would be taken up by the Dam Safety Organization of the CWC. Chairman desired that CBIP should hold a seminar on maintenance of dams.
- 9.8 The note received from Maharashtra on the Action Points of the "Report on Dam Safety Procedures" was discussed. One of the main issues concerned, fixation of criteria for a large dam. As per ICOLD criteria, there are 1200 large dams in the State of Maharashtra. Representative from Maharashtra explained the difficulty for including all these dams in the inspection programme of Dam Safety Organization and for conducting safety review of these dams once in 10 years as laid down in the Action Points of the "Report on Dam Safety Procedures." The Committee members agreed that whereas ICOLD definition of a large dam may be adopted for compiling the NRLD, for the purpose of inspection and review, the NCDS is free to adopt its own criteria.
- 9.9 In view of the large number of such dams in some States, the Committee felt that priority could be assigned for safety reviews of dams of height more than 60 metres or having a reservoir capacity of 1 km cube and those having specific identified problems. The safety reviews should include hydrological reviews, structural reviews, etc., in accordance with the "Guidelines for Safety Inspection of Dams" and the "Report on Dam Safety Procedures."
- 9.10 Discussing on the issue of dam associated seismicity, the Committee felt that a separate National Committee will be needed to look into this subject in detail.
- 9.11 Members should formally take up processing of the implementation of the recommendations of the "Report on Dam Safety Procedures" with

the State Governments within about six months. It would be then possible to implement various dam safety measures effectively.

(Action : States, CWC & CBIP)

10.0 Action Point 10.20 of the "Report on Dam Safety Procedures" – Note from Karnataka. (Agenda item No.9)

10.1 During the first meeting, it was decided that the member from Karnataka would prepare a brief note on Action Point 10.20 of the "Report on Dam Safety Procedures", viz. "Investigation, design and construction shall be done by recognized institutes manned by qualified engineers with expertise in dam technology." The note received from Karnataka was discussed in the meeting and it was agreed that organizations exclusively for investigation, design and construction, including quality control should be created within the Irrigation Department and have them suitably manned by qualified engineers with expertise in respective fields. In specific cases, however, private consultants could be co-opted.

11.0 The role of individual consultants / consulting organizations and sharing of work with them for safety inspection of dams (Agenda No.10).

11.1 This point was discussed in detail amongst the Committee members and it was agreed that the Dam Safety Cells of the States should develop their own manpower and reasonable expertise for undertaking inspection and review of dams. However, consultants could be engaged for special problems only.

12.0 Members agreed to meet again in December 1988.

13.0 List of papers circulated to the members in the meeting is given in Annex III.

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