

Minutes of the eighteenth National Committee on Dam Safety meeting held on 28.11.97 at Central Water Commission, New Delhi.

The eighteenth meeting of National Committee on Dam Safety (NCDS) was held on 28th November 1997 in Central Water Commission (CWC) New Delhi under the Chairmanship of Shri Ramesh Chandra, Chairman, CWC as well as NCDS. The list of officers/representatives of various Organisations who attended the meeting is given as Annex.I

Before taking up the agenda items, Chairman welcomed the participants and emphasised the need for a IX Plan project to look after the Dam Safety aspects of the country. The proposal has already been submitted to Union Ministry of Water Resources (MoWR). The Chairman requested all the States to forward their detailed proposals and estimates. The proposal for the IX Plan supported by the estimates is to be submitted to the Government by March 1998.

The Chairman emphasised the need for computerisation of details for dams/projects and suggested that there ought to be a computer at each site. All relevant details such as those pertaining to inspection deficiencies, number of times the dam got filled, magnitude of floods, water availability, etc., need be computerised and stored so that it could be possible to retrieve the information at any time.

Referring to the four participating States of DSAR Project, Chairman informed that the World Bank has to be convinced first by demonstration of progress and performance. This will enable other willing States to join such a Project in future.

After a brief introduction of participants, Shri B.M.Upadhyay, Chief Engineer (DSO) referred to the letter No. 3/19/NCDS/DS/96/750, dated 17.4.97 addressed to all Chief Secretaries of States and Heads of Organisations by Chairman CWC and emphasised the need for implementation of Dam Safety programmes. Copies of this letter were again given to all participants. After this with the permission of the chair Chief Engineer (DSO) took up the agenda items for discussion.

18.1.0 Confirmation of the minutes of 17th meeting of NCDS.

The minutes of 17th meeting were circulated to all the members of NCDS and State Dam Safety Cells vide CWC letter No.3/19/NCDS/96/DSM/432-71 dated 12.3.97. Comments received from NHPC were included in the agenda note for the 18th meeting. As there were no more comments, the minutes as recorded were confirmed.

18.2.0 Status of implementation of Dam Safety Assurance and Rehabilitation Project (DSARP) for information.

18.2.1 The review mission of World Bank extended the project period by 2 more years beyond the scheduled project closing date of 30 September 1997. All four participating States had sent their willingness for the restructured proposal and each State submitted their restructured programme to the World Bank. Chairman advised the participating States to go ahead with basic task of achieving substantial progress and get prepared for showing good progress during the proposed visit of World Bank Supervisory Mission in January 1998.

It was emphasised that the States willing to join the project need fulfil the requirements of the World Bank. According to the requirements Pre-monsoon, Post-monsoon, Phase-I and Phase II inspections for all the dams under their respective jurisdictions are required to be completed and the dams requiring rehabilitation need to be identified. Certain other pre-requisites like formation of SDSC, DSRP, etc., are also to be fulfilled.

18.3.0 Review of National Scenario

18.3.1 The States were 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. All the States/dam-owning Organisations were asked to give a report if any such incident occurred and not already reported.

18.3.2 No State/Organisation reported such incidents. It was clarified in respect of queries of Andhra Pradesh, Karnataka and Bihar that the safety aspects of on-going dams have to be also reported.

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

18.4.1 The States have 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 difficult to implement.

18.4.2 The States of Rajasthan, Uttar Pradesh, Karnataka, Madhya Pradesh, Tamil Nadu, Gujarat, submitted their reports during the meeting. Maharashtra, BBMB, NHPC had submitted consolidated report during the previous meeting. Andhra Pradesh and

Karnataka have not given the present status of implementation. Bihar, Orissa have not submitted any status report. As DVC and KSEB have now become members of NCDS, they were also requested to submit the status report. Chairman, CWC has addressed a letter to all the Chief Secretaries of the States regarding implementation of the report on Dam Safety Procedures emphasising the need for quick action on each of the items vide No.3/19/NCDS/DS/96/750 dated 17.4.97. Copies of this letter were subsequently forwarded to all the State Secretaries of Water Resources and Engineers-in-Chief of States and other Organisations. Chief Engineer (DSO) read out the letter in the meeting before taking up the agenda items and copies of the letter were once again distributed among States/Organisations during the meeting.

- 18.4.3 All the States/Organisations were once again requested to send consolidated report, highlighting the achievements on the implementation of the recommendations of the "Report on Dam Safety Procedures" for information of the Committee.

18.5.0 Dam Safety Legislation

- 18.5.1 During the 17th meeting of the Committee, the Chairman had explained the importance and need to finalise the draft legislation. He desired that the draft legislation be finalised by incorporating the comment received from States/ Organisations.

The following States have already communicated their concurrence with comments.

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

Government of Madhya Pradesh is reported to have reconsidered its stand and decided to have Dam Safety legislation. Final decision of the Government, however, is awaited. West Bengal has reported that comments on the draft legislation will be sent shortly. Karnataka is not in favour of enacting legislation. It was clarified that the onus of deciding to enact Dam Safety

Legislation in their respective jurisdiction rests with the individual States. CWC shall only circulate the draft legislation after incorporating additional comments/suggestions received.

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

18.6.1 A decision for preparation of inundation maps and emergency action plans for d/s areas of dams of National Importance by all the States was taken during the earlier meetings. It was also decided that the four participating States of Dam Safety Assurance and Rehabilitation Project (DSARP) namely, Madhya Pradesh, Orissa, Rajasthan and Tamil Nadu under the World Bank assisted project may give priority for preparation of emergency action plans in respect of the 55 identified dams for rehabilitation in the first phase, followed by action plans for other remaining dams. The four participating States of DSARP were requested to inform about the total status on this activity during the meeting.

18.6.2 Emergency action plan has been completed for the following dams:

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|----|-------------------|-------------|
| 1. | Rana Pratap Sagar | |
| 2. | Jawahar Sagar | Rajasthan |
| 3. | Matrikundia | |
| 4. | Salal Dam | NHPC |
| 5. | Ozarkhed | |
| 6. | Girna | |
| 7. | Siddheshwar | Maharashtra |
| 8. | Yelderi | |
| 9. | Lower Terna | |

Punjab Irrigation Department has not made any progress in respect of the dams under the control of Bhakra Beas Management Board (BBMB) in Punjab State. NHPC reported that cross-sections of all dams have been completed but they could not make any progress further for want of Mike-II Software. The NHPC was asked to make a formal proposal for procurement of an extra dongle, the software key, so that the matter could be taken up with the Danish authorities. Tamil Nadu has entrusted the work to consultants for 10 dams, namely, Gomukhi, Ponnaniar, Uppar, Vidur, Gunderi Pallam, Amaravathy, Manimuthar, Pechiparai, Manimiktha Nadi, Perunchani. Gujarat has initiated the work for the three National Importance dams i.e. Karjan, Ukai and Kadana. Bihar has reported that the two

N.I. dams, i.e. Maithan and Panchat Hill in Bihar are under the control of DVC. Accordingly DVC was advised to take up the work. Karnataka reported that demarcation of flood zone is done for Linganamakki dam and for other dams also work has been initiated. Emergency action plan for Ghodahada and Hirakud in Orissa is under progress.

- 18.6.3 During the meeting Chairman emphasised the need to initiate and complete the work of preparation of emergency action plans and inundation maps. Progress in this regard need to be accelerated and reported upon.

18.7.0 Compilation of data book

- 18.7.1 As per decision taken by the NCDS, "Data Book" for dams of National Importance (NI Dams) was to be prepared by the respective States and sent to DSO/ CWC for record/reference. Critical geological features of the dam are only to be highlighted in this report instead of giving a detailed geological report.

- 18.7.2 Andhra Pradesh, Bihar, Gujarat, Karnataka, Rajasthan, Tamil Nadu and also BBMB and NHPC have submitted Data Books for dams of National Importance; Maharashtra has submitted Data Book only for Paithan Dam whereas 5 dams of National Importance are located in the State. Orissa has submitted Data Book for 72 dams, but only 2 out of 5 dams of National Importance under the State (Salandi, Rengali) have been covered in this. Data Book for 4 dams in Madhya Pradesh is under scrutiny in the State DSO.

- 18.7.3 Till date, data on 26 dams (out of 56 dams - 46 completed and 10 under construction) of National Importance have been received in CWC. Data are yet to be received for the remaining 29 dams. These are awaited from Kerala, Madhya Pradesh, Uttar Pradesh, Maharashtra, Orissa and West Bengal. All the States were requested to finalise and send the Data Books to DSO/CWC at the earliest.

18.8.0 Preparation of completion report of large dams

- 18.8.1 Completion report of all large dams (total 3596 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.

18.8.2 As per the information received from the States, the following States have prepared completion reports:

Karnataka	19 dams
Maharashtra	10 dams
Orissa	2 dams
Uttar Pradesh	Already exists for all large dams
Rajasthan	2 dams
Tamil Nadu	7 dams
BBMB	3 dams

The States of Rajasthan, Bihar, Madhya Pradesh, Gujarat and Orissa reported that they will engage consultants for the above work. As such the terms of reference for engaging consultants prepared by Tamil Nadu was circulated during the meeting. The State of Andhra Pradesh has informed the concerned field Chief Engineers will initiate and complete the work. Karnataka reported no further progress on this work. No report is received from Kerala. NHPC also did not report any progress in this regard. DVC was requested to initiate the work.

18.8.3 For completion reports of all the existing large dams, Chairman reiterated that the work may be got done by utilising the services of the retired officers or consultants. The amount of consultancy charges may be raised on realistic basis.

18.9.0 Preparation of Operation and Maintenance Manual

18.9.1 During the previous meetings Chairman has been emphasising that O&M Manual is an important document for operation and maintenance of dams and this manual should be available before commissioning of each project. As O&M manuals have not been prepared for several of the dams, this needs to be taken up without any further delay and completed expeditiously by the respective States/Organisations owning the dams. He also stressed to have standardised O&M manual for all the dams under each State/Organisation. This will help expedite the matter.

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

BBMB	-	All dams
Uttar Pradesh	-	All dams
Tamil Nadu	-	All dams
KSEB	-	All dams
NHPC	-	2 dams

Rajasthan	-	All dams with ungated spillways
Maharashtra	-	1 dam
Orissa	-	20 dams

Rajasthan has also submitted O&M manual for Jatpura dam which is a gated dam. Andhra Pradesh reported that Gate operation schedules for 3 N.I. dams have been prepared. Preparation of O&M Manual has been initiated for 9 dams in Gujarat and preparation of these manuals for 2 dams are under process in Karanataka. Madhya Pradesh has taken up preparation of O&M manuals for 24 gated dams on priority basis. NHPC reported that guidelines for operation of each dam under them have been prepared. It was emphasised that copies of the O&M manuals for various dams be sent to CWC.

- 18.9.3 All the States and DVC were requested to take up the work of preparing O&M manuals for the remaining large dams under their control and complete them expeditiously.

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

- 18.10.1 The States/Organisations 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. As was desired by the Chairman in an earlier meeting, a format has been circulated by DSO/CWC to all the States/Organisations and State DSOs to bring uniformity in reporting.

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

Rajasthan	-	upto May 1997
Maharashtra	-	upto June 1996
Andhra Pradesh	-	upto May 1997
Orissa	-	upto December 1995
Tamil Nadu	-	upto April 1997
Madhya Pradesh	-	upto April 1996
Gujarat	-	upto December 1996
NHPC	-	upto December 1996

DVC has submitted a brief report for the dam under them for 1997. Bihar has reported that the report will be sent by February 1998. All the States have been requested to submit consolidated reports on yearly basis for all the large dams under

them covering pre- and post-monsoon inspection and other details.

18.11.0 Safety review of large dams (once in ten years)

18.11.1 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 of 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.

18.11.2 Andhra Pradesh has constituted 2 Dam Safety Review Panels who have inspected 18 dams and a proposal has been sent to the Government to sanction one more panel so as to complete the remaining dams by 2000 AD. Constitution of Expert Committee is under finalisation in Bihar. Gujarat has completed inspection for 211 dams and the State will be able to complete inspection for the remaining dams by 1999. In Karnataka expert panel has been constituted for Narayanpur Dam and Krishna Rajasagar dam and a proposal for another panel has been sent to the Government for approval. An Expert Committee for 7 dams has been constituted in Madhya Pradesh. Sanction of the proposal for constituting expert committee sent to the Government is awaited in Rajasthan. Inspection of large dams is under progress in Tamil Nadu. In West Bengal only one dam is inspected (Kangsabati). Uttar Pradesh reported that an independent expert panel is still under consideration of the Government.

Orissa and Maharashtra have yet to intimate the latest position in this regard. Kerala has reported that expert committee is set up exclusively for safety aspects of distressed dams but the State is required to constitute expert committee for safety review of all large dams once in ten years. Although it is understood that some progress in safety review of dams has been achieved, all the States were reminded that the first 10 years period starting from 1987 is already over but the progress on this front has not been encouraging. All the States/Organisations were requested to complete the work at the earliest.

18.12.0 Safety status of dams of National Importance (NI)

18.12.1 The States have been requested to prepare safety status of 46 (completed) dams of National Importance in the prescribed proforma circulated by DSO/CWC, including Chamera under NHPC.

18.12.2 Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, BBMB and NHPC have submitted reports for the dams of National Importance totalling 40.

Kerala (Irrigation Department) and KSEB have not yet furnished any information for the 5 dams under them. NHPC is required to submit report for Chamera dam. All States/Organisations were requested to expedite and send all the necessary information to DSO/CWC.

18.12.3 All the States/Organisations were requested to send details on further dams whenever any addition is done in dams of National Importance.

18.13.0 Monitoring safety report of inter-State dams by sub-committees

18.13.1 Three sub-committees were set up during March 1990 to monitor the safety aspects of inter-State dams in (a) Parambikulam Aliyar Project (PAP), (b) Mahanadi River System and (c) Subernarekha River System.

18.13.2 Committee for Parambikulam Aliyar Project held 2 meetings in 1991 and 1992; Committee for Mahanadi River System held a meeting in 1992; and Committee for Subernarekha River System has held only one meeting in 1993. Subsequently no meetings have taken place.

18.13.3 Since no progress has been made for the last four years, Chairman suggested the concerned States to report to NCDS whether these inter-State Committees are to be wound up. Proper justification is required to be furnished in this regard.

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

18.14.1 Hydrology of all existing dams is required to be reviewed by setting up/ strengthening the existing Hydrology Units in the States. Some States/Organisations have already initiated

actions for strengthening/setting up of Hydrology Units and have also taken up review of hydrology of selected dams.

18.14.2 Progress made in setting up of Hydrology Units is given below:

Separate Hydrology Unit established

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

Hydrology review by existing units

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

Action for strengthening of existing units initiated

1. Andhra Pradesh
2. Karnataka
3. Tamil Nadu
4. West Bengal
5. Uttar Pradesh
6. No information from Kerala

No further progress is reported in this case.

18.14.3 All the concerned States were requested to take early action in setting up Hydrology Units for taking up hydrology review of all the existing dams. The States were also requested to avail of the services of CWC to get the hydrology review completed for their dams. The States/Organisations were requested to give a list of total dams under their jurisdiction and the number of dams for which hydrological review has been carried out and programme schedule for review of hydrology for all the remaining dams. The States of Rajasthan and Madhya Pradesh only have given detailed reports to CWC.

18.15.0 Instrumentation for dams

18.15.1 NCDS had decided that the States may take stock of the status of instrumentation in all large dams to know the performance of instruments, their mortality rate, periodicity for analysis of data,

carrying out the analysis and forwarding them to the designers for evaluation, status of structural behaviour reports and adequacy of the staff engaged on the job. So far information for the instrumented dams has been received from the following States/Organisations:

1. Andhra Pradesh
2. BBMB
3. Gujarat
4. Karnataka
5. Kerala
6. Madhya Pradesh
7. Maharashtra
8. Orissa
9. Tamil Nadu
10. N.H.P.C.

The following information on instrumentation need to be supplied to CWC by all the States:

1. Name of dam
2. Name of instruments
3. Date of instrumentation
4. Working condition of instruments
5. Position of data analysis
6. Results

18.15.2 The State of Tamil Nadu and Rajasthan have given a detailed report on instrumentation. Andhra Pradesh reported that instrumentation data are being collected twice in a month and compiled data are being sent to CWC for analysis. Bihar has reported that instrumentation on the existing dam is non-existence. Karnataka and Orissa have promised to submit the Status of remaining dams shortly. All States/ Organisations were requested to give more details about the status of instrumentation in their dams so that they could be incorporated for updating the CWC publication on instrumentation of dams.

18.16.0 Installation of standard meteorological instruments.

18.16.1 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.

- 18.16.2 The States/Organisations were asked about availability of standard meteorological instruments and not data. Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, BBMB and NHPC have supplied information in respect of a few dams. Orissa has informed that meteorological instruments have been installed at 15 dams covered under DSARP. West Bengal, Bihar, Uttar Pradesh and Kerala have been requested to expedite submission of information. All the States and DVC were requested to furnish individual dam-wise information on the above item.
- 18.16.3 During the previous meeting, Chairman had desired that all States/ Organisations may ensure that before the onset of monsoon season the meteorological instruments are in working order. The States were requested to prepare a performance report of the meteorological instruments for each project before the onset of monsoon and send them to CWC by the end of May every year. No such reports have been received. All the States were once again requested to send such a report.

18.17.0 Seismic studies of dams

- 18.17.1 DSO/CWC has made available copies of documents "Guidelines for inspection of dams following earthquake" to all the States/Organisations with a request to make use of these guidelines and report to the Committee about safety status of dams immediately after occurrence of earthquakes.

An earthquake of intensity reported as 6 on the Richter Scale, with its epicentre about 20 kms north-east of Jabalpur city in Madhya Pradesh occurred in the early morning of 22.5.97. The Superintending Engineer, Rani Avanti Bai Sagar Dam, Jabalpur and other officers inspected the dam immediately after the earthquake and found that there was no damage to the dam. Subsequently a joint inspection of Bargi dam was also made by officers of CWC and Narmada Valley Development Authority on 24.5.97. The dam authorities then inspected the dam as per ICOLD guidelines and submitted a report to CWC. Some minor damages were reported in about 43 other dams in Jabalpur and Mandla districts.

All States/Organisations were requested to confirm non-occurrence of such damages for dams under their control. No States/Organisations reported such incident during the meeting.

18.18.0 Need for Research and Development in Dam Safety

- 18.18.1 All the members of NCDS were requested to suggest areas requiring research and development of projects in the field of dam safety in particular and Water Resources Sector in general and send their suggestions to DSO/CWC. The Chairman during the last few meetings had desired that the States may examine the areas/fields to undertake research on a subject of their choice. They may also prepare report on the schemes for research and send the same to one of the 5 national Committees set up for taking up research schemes under Water Resources Sector. Out of 3 reports submitted by NHPC, 2 are under scrutiny in CWC. It was noted that no report has been received from any other States/Organisations so far. The Chairman suggested that States/Organisations requiring funds for research and development works, may send proposals through the respective National Committees for consideration. It was informed that adequate funds are available for the schemes that are purely research-oriented.

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

- 18.19.1 An estimate for rehabilitation of dams under distress in 12 States, viz. Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal has been sent to the Ministry of Water Resources, Government of India for inclusion in the IX Five Year Plan. Total amount provided in the tentative estimate has been revised to Rs.862.5 crores. The States have been requested to submit detailed proposals along with the estimates in respect of the distressed dams in their States that need rehabilitation. Provisions have been made in this scheme, as per the available information for the States in CWC. The States were requested to send details along with the estimates for examination by the Planning Commission and subsequent external funding, if possible. So far provision made by the States for IX Plan are:

Gujarat	-	Rs 20 crore
Bihar	-	Rs. 70 crore

The State of Karnataka wanted to know the criteria for declaring a dam as a distressed dam. It was clarified that after phase-I inspection, if it is found by the State Dam Safety Committee that the dam is hydrologically or structurally not fulfilling standards

set out in Phase I inspection guidelines, the dam has to undergo Phase II inspection. After phase-II inspection if a dam is unsafe, then the dam can be identified as a dam in distress. The Chairman requested the States to send the detailed estimate at the earliest so as to submit IX Plan estimate by March 1998.

18.20.0 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.

- 18.20.1 Copies of these guidelines have been sent to all NCDS members and Dam Safety Cells in the States and other organisations by CWC vide letter No.3/10-A/DSM/Guidelines/ 1590-1625 dated 30.12.96. These guidelines and standards existed in one form or the other, in the present form these will be more useful to various State Dam Safety Cells and other organisations in the country. Suggestions for improvement in the content, coverage and presentation are required to be sent to DSO/ CWC. The State of Gujarat has sent their comments. No other States/Organisations have sent their comments.

Regarding supply of CWC manuals/guidelines, it was informed that several of the published manuals/guidelines are under the process of updating/reprinting. These may be supplied after reprinting.

18.21.0 Membership formulation for non-member States/ Organisations for NCDS

- 18.21.1 Proposals for membership in NCDS received from KSEB and DVC have been accepted by MOWR. Communications regarding approval have already been sent to DVC/KSEB. All other States/Organisations who own large dams and are not regular members of NCDS were requested to make formal proposals to Chairman, NCDS for inclusion as member of the NCDS for more fruitful exchange of information. Andhra Pradesh Electricity Board has expressed willingness to become a member of NCDS. They are, therefore, requested to send the formal requisition for becoming a member of NCDS.

18.22.0 Risk Analysis in Dam Safety Engineering

There is a need to adopt and implement modern risk based approaches to Dam Safety Management in India. A proposal has

been formulated by CWC for training Indian engineers for this work. The training includes organising trainings/workshops on risk analysis in India and 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 prioritising 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 prepare draft guidelines for risk analysis in dam safety engineering.

This training in Risk Analysis is proposed to be funded under DSARP which is under implementation at the Centre and four States, viz. Madhya Pradesh, Orissa, Rajasthan and Tamil Nadu. After details are finalised, the participating States of DSARP will be informed.

18.23.0 Demonstration of Gate Operation Simulation Model (Version 2.0)

CWC has developed a software package, i.e. Gate Operation Simulation Model for training gate operators for emergency operation of gates during high flood and PMF conditions. This software model has been developed under the World Bank assisted DSAR Project. 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 respective States/Organisations for their review and comments, if any. This would facilitate improving the model for incorporating the suggestions as per experience of user agencies in actual operation of gates. The programme was widely appreciated by those who participated in the meeting.

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