No.CWC/FED/2/2/94/
Government of India
Central Water Commission
Foundation Engineering Directorate
.....

712, Sewa Bhawan,
R.K.Puram,
New Delhi-110066.

Dated: Nov.1995.

To

Sub: Amended Minutes of the Fifth Meeting of the National Committee on Seismic Design Parameters (NCSDP) held on 20.5.94 in New Delhi - regarding.

Sir,

Please find enclosed herewith the Amended Minutes of the Fifth Meeting of the National Committee on Seismic Design Parameters of Hydraulic Structures in River Valley Project held on 20.5.94 at Sewa Bhawan in New Delhi. The amendments carried out are based on the approval of NCSDP during its 6th meeting held on 20.9.95.

The revised minutes is sent for record purposes.

Yours faithfully,

Encl: as cited above.

(V.N.Vakpanjar)
Dy.Director (FE&SA)
for Member Secy, NCSDP

MINUTES OF THE FIFTH MEETING OF THE NATIONAL COMMITTEE ON SEISMIC DESIGN PARAMETERS (NCSDP) OF HYDRAULIC STRUCTURES IN RIVER VALLEY PROJECTS.

OPENING REMARKS:

The 5th Meeting of the National Committee on Seismic Design Parameters (NCSDP) of Hydraulic Structures in River Valley Projects was held in Room No.307, Sewa Bhawan, CWC, New Delhi on 20th May, 1994 under the Chairmanship of Shri A.B.Joshi, Member (D&R), CWC. Shri Joshi welcomed the Committee Members, Project officials and other participants of the meeting and took up the agenda items for discussion and suggestion. (List of participants is at Annex-I).

ITEM NO.1

Confirmation of Minutes of 4th Meeting held on 3.5.1993

Minutes of the 4th Meeting which were circulated vide letter No. CWC/FED/2/2/93/Vol.II/307-314 dated 5.7.1993 to the members of the NCSDP Meeting were confirmed with amendment to Item No.3 regarding Nathpa Jhakri Hydro-electric Project (H.P.), vide letter No. FED/2/2/94/428-449 dated 21st September, 1993.

ITEM NO.2

2.0 Dhauli Ganga HE Project (STAGE-I) U.P.

2.1 The Project Authorities of Dhauli Ganga Project described the salient features to the Committee members. The Project lies in Zone V of Seismic zoning map of India. The representative from project Authorities presented the DEQUOR Report and requested the Committee Members to suggest suitable design seismic parameters for the Dhauliganga H.E.Project.

2.2 It was felt by the Committee members that the checking the designs of the dam and its appurtenant structures by dynamic analysis with site response spectra as well as considering the geo-tectonic features and the magnitude of Uttarkashi Earthquake which occured on 20th Oct., 1991, it is desirable to know the response of the structure as well as safety of the project.

2.3 It was also considered that in view of the proposed revision to the IS Code (IS-1893-84) in persuance to the Uttarkashi Earthquake, it may be desirable to treat this location to be in higher zone for the above computation.

ITEM NO. 3

3.0 Sindh Project (Phase-II), Madikheda Dam Distt. Shivpuri (M.P.).

3.1 The representative from the project narrated the salient features of Sindh Project which is a straight gravity masonry cum rockfill earth dam with central spillway and 5 Nos. saddles in the right periphery of the dam with outlet works in Ukaila Saddle No.2. The dam is 160 metre long and 61.9 metre high. The deepest foundation level of straight gravity masonry dam is RL: 288 metres. The project is located in Zone I of Seismic Zoning Map of India (IS : 1893-1984).

3.2 The Committee after going through the modified proforma and GSI reports submitted by the Project authorities, recommended that the project to be designed for Zone-II instead of Zone-I, as per Seismic Zoning Map of India (IS : 1893-1984).

ITEM NO.1

1.0 Srisailam H.E.Project (Andhra Pradesh)

1.1 This Project was discussed in the 2nd Meeting of the Standing Committee of CWC on 6.1.1970 and values of horizontal and vertical design seismic co-efficients were recommended as zero in the year 1970. The Dam Safety Panel then constituted by Dr.Y.K.Murthy (the then Chairman of Dam Safety Panel) had suggested for reviewing the recommended seismic coefficient value for the Project.

1.2 The entire project lies within Zone-I of seismic Zoning Map of India (IS : 1893-1984). The Committee members considered the report on "Seismicity around Nagarjuna Sagar and Srisailam Reservoir - July, 1993" prepared by National Geo-physical Research Institute, Hyderabad.

1.3 Committee members opined that the seismic co-efficients taken earlier appears to be alright. However, the Committee members expressed that the safety of dam to be checked for the observed magnitude around the lake as reported by NGRI in their report of July, 1992 around Nagarjuna Sagar & Srisailam Reservoirs, considering the response spectra by dynamic analysis and the results of the analysis to be submitted to the committee in the next meeting to enable the members to suggest the modified design seismic coefficient for the project.

ITEM NO.5

5.0 Nagarjuna Sagar Dam (A.P.)

5.1 The project Authorities from Nagarjuna Sagar Dam described its salient features. The dam is located in seismic Zone-I of Seismic Zoning Map of India (IS : 1893-1984). The project authorities submitted the NGRI report on "Seismicity around Nagarjuna Sagar Reservoir, A.P. - July, 1993", which was circulated to the Committee Members during the meeting. The representatives from the project Authority requested for suggesting horizontal seismic coefficient applicable to Nagarjuna Sagar Dam.

5.2 NGRI had, at the instance of Project Authorities provided a report on the seismicity around Nagarjuna Sagar Dam in July, 1993. Earlier the DEQUOR as consultants for A.P. Irrigation Department had concluded their studies and provided the following reports.

(i) EQ 84-14 "Two Dimensional Static and Dynamic Analysis of NOF Section of Nagarjunasagar Dam.

and

(ii) EQ 85-15 "Two-Dimensional Static and Dynamic Analysis of NOF Section of Nagarjunasagar Dam Section."

The Seismic scenario earlier considered in the analysis as per DEQUOR's report and the proposed evaluation of

NGRI need to be compared to facilitate proper consideration of the issue, NCSDP desired that a some further work needs to be undertaken by Project Authorities and their Design Consultants. Any other reports of relevance including response to nearby events of recent nature (such as Latur/Osmanabad) are also to be considered.

ITEM NO.6

6.0 Doyang H.E.Project (Nagaland)

6.1 The Project Authorities narrated the Salient features of Doyang Project and requested the Committee members to suggest the Seismic Coefficient for the Project.

6.2 The Committee after going through the DEQUOR Report prepared 10 years ago and submitted by the Project Authorities, expressed the necessity of analytical report of the dam and its component structures. The Project Authorities were requested to carry out the dynamic analysis. The Committee agreed to adopt the response spectra suggested by the University of Roorkee in their report.

6.3 The Committee also expressed to remove the overburden material susceptible to liquefaction from the downstream portion of the Copper dam and also to study liquefaction effects, considering the response spectra suggested by University of Roorkee in their report.

ITEM NO.7

7.0 Latur and Osmanabad Earthquake

7.1 The National Committee on Seismic Design Parameters discussed the catestrophical earthquake of Sept.'93 experienced in the Latur and Osmanabad of Marathwada region of Maharashtra.

7.2 Sh.R.K.Kalsi, Director (Dam Safety), CWC informed the Committee members that an Expert Committee was constituted by Government of India under the Chairmanship of C.E.(DSO), CWC. The Committee examined the structural status and safety of large dams and important irrigation structures in Latur and Osmanabad districts. The recommendations of the report submitted by the committee were presented by Sh.Kalsi to the members of NCSDP. Sh.Kalsi requested that the committee may consider in wake of earthquake of magniude 6.3 on the Ritcher Scale, in this region, whether the seismic parameters as given in BIS Code 1893-1984 require any upgradation from Zone-I. The members of the Committee, however, felt that without their going through the full report & seeing the recommendations therein, they are not in a position to appreciate this point and enable to take a decision.

7.3 Dr.Jaikrishna opined that all engineered structures are to be checked up for their safety in view of this catastrophic earthquake.

Although Koyna earthquake did spur us to reconsider Zoning of the Deccan Plateau, but the upgrading of zoning of certain regions was not due to this earthquake alone. The whole region was reconsidered on the basis of new data that became available after the previous exercise. The Committee members unanimously opined that upgradation of this region at this stage is not warranted. However, the Committee members opined that before reaching a conclusion report of GSI must be obtained for Latur and Osmanabad area.

ITEM NO.8

8.0 Deformation of earth's Lithosphere due to reservoir surface loading.

8.1 The proposal regarding deformation of earth's Lithosphere due to reservoir surface loading has been received from the Govt. of Andhra Pradesh. The State Government has selected Nagarjuna Sagar Project for the studies.

8.2 The Committee members after going through the proposal opined for submitting details of the proposal to the Committee. After going through these proposals, the Committee may suggest the suitability of carrying out such studies.

List of Participants of the fifth meeting of NCSDP held on 20-5-94

Sl No. (1)	Name & Designation (2)	Complete Postal Address (3)	Tel.No. (4)	Fax/ Telex (5)	Remarks (6)
	Name of the members of NCSDP				
1.	Shri A.B. Joshi, Chairman of the Committee	Member (D&R), Central Water Commission Sewa Bhavan, R.K. Puram New Delhi - 110066.	608150		
	Members of the Committee				
2.	Dr. Jai Krishna, Non official member	Ex. Vice Chancellor, Roorkee University, 61 Civil Lines, Roorkee-247667.	72338	01332/ 73560	
3.	Shri S.K. Thakkar	Head, Deptt. of Earthquake Engg., University of Roorkee, Roorkee - 247667	72349 Ext.228	01332	
4.	Shri S.C. Bhatia	Scientist, E-II National Geophysical Research Institute, Uppal Road, Hyderabad - 500007.	8501419 (Office) 851576(R)	040/ 851564 0425/ 7018 NGRI-IN	
5.	Shri B.C. Roy	Director, Geodatic & Research Branch, Survey of India, 17 E.C. Road, Dehradun.	24528	0135/ 27623	
6.	Shri T.D. Sundar Babu	Chief Engineer(DSO), Central Water Commission, R.No. 901(N), Sewa Bhavan, R.K. Puram, New Delhi-110066.	606247(O)		
7.	Shri Ravinder Singh, Member Secretary	Director(FED), Central Water Commission, R.No.712(S), Sewa Bhavan, R.K. Puram, New Delhi-110066	601017(O)		

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(1)	(2)	(3)	(4)	(5)	(6)
	Other than member				
8.	Shri A.R. Chandrasekaran	Department of Earthquake Engg., University of Roorkee, Roorkee - 247667.	72349 Ext.228	01332	
	Name of the CWC officers				
9.	Shri M. Gopal Krishnan	Superintending Engineer(NER), Central Water Commission, Jamir Mansion, Nong Shilleng, Shillong, Meghalaya.			
10.	Shri R.K. Kalsi	Director, Dam Safety, Central Water Commission, Room No.715, Sewa Bhavan, R.K. Puram, New Delhi-110066.			
11.	Shri A.C. Gupta	Director, CMDD II Central Water Commission			
	Name of the project authorities				
	Dhauliganga H.E. Project (U.P)				
12.	Shri V.K. Gupta	Manager(Design), National Hydro-electric Power Corporation, Design Division, R.No. 308, Eros Apartment, 56 Nehru Place, New Delhi-110019.	6432901		
13.	Shri G.S. Sharma	Manager (Design), N.H.P.C. Design Division, R.No.308, Eros Apartment, 56 Nehru Place, New Delhi -110019.			
14.	Shri Gopal Dhawan	Manager, Geology, N.H.P.C. Design Division, R.No.308, Eros Apartment, 56, Nehru Place, NewDelhi-110019.			
15.	Shri G.S. Sharma	Manager (C), N.H.P.C.			

(1)	(2)	(3)	(4)	(5)	(6)
	Sindh Project, Phase-II (M.P)				
16.	Shri V.K. Agarwal	Chief Engineer, Yamuna Basin, Water Resources Department, Gwalior, M.P.	340492 (O) 341221 (R)		
17.	Shri Rao Balraj Singh	Superintending Engineer, Sindh Project, H.W. Circle, Shivpuri (M.P).	2240 (O) 2844 (R)		
	Srisailam H.E. Project (A.P)				
18.	Shri C. Gopinath	Superintending Engineer, Design Organisation, Srisailam Project.	556417		
19.	Shri Char	Office of the Chief Engineer (Projects), Srisailam Project, 6th Floor, Hyderabad - 500001.			
	Nagarjuna Sagar Project (A.P)				
20.	Shri R. Janardan	Chief Engineer, Nagarjuna Sagar Project, Vijpuri North, Nalgonda - 508202.			
	Doyang H.E. Project (Nagaland)				
21.	Shri U. Bora	Superintending Engineer, North Eastern Electric Power Corporation, 209, Palika Bhawan, R.K. Puram Sector-XIII, New Delhi-110066.			
22.	Shri V.C. Bhowmik	N.E.E.P.C.O.(address as above).			
	Maharashtra				
23.	Shri V.C. Shabane	Superintending Engineer, C.D.O., Irrigation Deptt., Nasik, Maharashtra.			