Minutes of the XIIIth meeting of
National Committee on Seismic Design Parameter for River Valley Projects held on 18.12.2003 at Central Water Commission, New Delhi

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The XIIIth meeting of the National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects was held on 18.12.2003 in Central Water Commission office at Sewa Bhawan, New Delhi under the chairmanship of Shri S. K. Das, Member (D&R), CWC and Chairman, NCSDP. The list of NCSDP members, project representatives and invitees, who attended the meeting, is given in Annex-I.

Item No. 13.1 Welcome by Chairman, NCSDP

The Chairman, NCSDP welcomed all participants to the XIIIth meeting. At the outset, Chairman observed that the present meeting was being held after more than a year and NCSDP meeting should be held more frequently. A brief self introduction was given by the officials present. Thereafter, the agenda was taken up for discussion.

Item No. 13.2 Confirmation of the minutes of the last meeting

The minutes of the XIIth meeting of NCSDP held on 13.8.2002 at CWC, New Delhi were circulated to all concerned vide letter No. CWC/ FE&SA/2/2/2001/952-72 dt. Sept. 27, 2002. The observation of IIT Roorkee on the minutes was considered and agreed to. Accordingly, the minutes of the XIIth meeting was confirmed with following amendments;

(a) Para 12.7, 3rd line, i.e., "by the consultant from Department of Earthquake Engineering (DEQ) IIT Roorkee" stand deleted.
(b) Para 12.10.1, last line be amended as
"The committee recommended for reconsideration of the earthquake magnitude for arriving at seismic design parameters."
(c) Add Sl. No. 8A in the list of participants as
Dr. M.L. Sharma, Asstt. Professor, DEQ, IIT Roorkee – Spl. Invitee

Consequently, Sl. No. 25 in the list of participants stand deleted

Item No. 13.3 Follow up action of minutes of last meeting

The member-secretary briefed the committee members about the follow up action of minutes of last meeting. The seismic design parameters for the six projects, viz., Tungbhadra Dam, Brutang Irrigation Project, Myntdu Leshka HE Project, Subansiri Lower HE Project, Upper Beda Project and Lower Goi Project have been included as separate agenda items for the present meeting. The Jetpur Water Resources Project, Gujarat could not be included in the agenda item of the present meeting, since the project authorities have not

submitted the site specific study report, as recommended during last meeting. The matter regarding guidelines for site specific seismic study for river valley projects, to be prepared by NCSDP Sub-Committee, has also been included as separate agenda item for the present meeting.

Item No. 13.4 Guidelines for site specific seismic study for river valley projects prepared by NCSDP Sub-Committee.

The member-secretary briefed the committee members about the progress made by the Sub Committee on preparation of guidelines for site specific seismic study for river valley projects. As the guidelines evolved by the Sub Committee comprise of drafts, minutes, comments etc., it was decided that the Secretariat would compile and prepare the draft of guidelines, in a booklet form, on the basis of the findings of the sub-committee and circulate to all the committee members for their observations.

Item No. 13.5 Tungabhadra Dam, Karnataka Lat 76°20' 10" E N
Long 15°15' 19" E

The member-secretary submitted that the seismic design parameter for the safety review of Tungbhadra dam, Karnataka is being kept pending since IXth meeting till the finalisation of guidelines for site specific seismic studies, whereas seismic design parameters in respect of other projects are being decided by the committee. The committee, therefore, opined that the finalisation of seismic design parameters of this project should not be kept pending till the finalisation of guidelines for site specific seismic studies. Dr. I.D. Gupta, Jt. Director, CWPRS, Pune, who had carried out the site specific study for the project, presented the results on design response spectra and accelerograms for Maximum Credible Earthquake (MCE) and Design Basis Earthquake (DBE) condition for the focal depths of 10 km and 15 km respectively.

After detailed deliberations the committee decided that the site specific study carried out taking design basis earthquake of magnitude 6.3, epicentral distance of 15 km and focal depth of 15 km should only be considered. Accordingly, the committee recommended that a peak ground acceleration (PGA) of 0.27g for MCE condition and 0.14g for DBE condition along with the response spectra given in the site specific seismic report (technical report No. 3549, Oct. 1998, CWPRS, Pune) may be adopted for the safety review of the project.

Item No. 13.6 Brutang Irrigation Project, Orissa

A brief presentation about the project was made by project representative. The Committee noted that the project is a major project, and therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities, thereafter, should submit their revised proposal

to NCSDP along with site specific seismic study report, in twelve copies, for its consideration.

Item No. 13.7 Myntdu Leshka H.E. Project, Meghalaya 92°15'41"E (Long) 25°12'15"N (Lat)

As decided in the XII[th] meeting, the seismic design parameters for the project were to be modified by reducing the earthquake magnitude from 8.5 to 8.0 corresponding to Dauki fault. The revised site specific study report for the earthquake magnitude of 8.0 was presented and discussed. The committee recommended that a peak ground acceleration of 0.44g for MCE and 0.22g for DBE along with response spectra given in Fig. 4 and Table-IV of the revised site specific seismic report (Project No. P-2000-08 of August-2003 read with letter no. DEQ/Myntdu/975 dated August 8, 2003 of Department of Earthquake Engineering, IIT Roorkee) may be adopted for seismic design of the project.

Item No. 13.8 Subansiri Lower H.E. Project, Arunachal Pradesh

In the XII[th] meeting, the committee had recommended for reconsideration of the earthquake magnitude for arriving at seismic design parameters. After detailed discussion and deliberations, the committee suggested that in place of assigning the earthquake magnitude of 7.5 to MBT, the earthquake magnitude of 8.0 may be assigned to the detachment surface. The site specific seismic studies may be revised accordingly.

Item No. 13.9 Upper Beda Medium Project, Madhya Pradesh

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives. The project representatives wished to establish the proximity of the project with Indira Sagar Project and requested that similar seismic design parameters, as approved in respect of Indira Sagar Project, be accepted for this project also. The committee noted that the project is about 90 km away from the Indira Sagar Project, and as such, cannot be taken as close enough to accept same seismic design parameters. It was, therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities were advised to submit their revised proposal to NCSDP after carrying out the site specific seismic study, in twelve copies, for consideration.

Item No. 13.10 Lower Goi Project, Madhya Pradesh

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives. The project representatives wished to establish the proximity of the project with Indira Sagar Project and submitted that similar seismic design parameters, as approved in respect of Indira Sagar Project, be accepted for this project also. The committee noted that the project is about 150 km away from the Indira Sagar Project, and as such, cannot be taken as close enough to accept same seismic design parameters. It was, therefore, recommended for carrying out the

site specific seismic studies for the project. The project authorities were advised to submit their revised proposal to NCSDP alongwith the site specific seismic study report, in twelve copies, for consideration.

Item No. 13.11 **New Projects referred to NCSDP**

Item No. 13.11.01 **Kol Dam H.E. Project (Himachal Pradesh)**

The salient features along with the geological / geotectonic set up of the project was briefly presented by Officers of M/s NTPC. The committee noted large variation in seismic design parameters between those arrived at by IIT Roorkee and the ones by M/s EDF, France. On behalf of the project authorities, Sh. P.L. Narula, retd. DDG, GSI explained that such a large variation is due to difference in approach adopted by IIT Roorkee and EDF, France and submitted that the safety of the dam has to be checked for MCE condition, as stipulated in the EDF, France report. He also informed the Committee that the design of the dam has been checked for the seismic design parameters suggested by EDF, France taking PGA of 0.49g for MCE condition and Peak Ground Acceleration (PGA) of 0.209g for Operating Basis Earthquake (OBE) /DBE condition as well as for the parameters suggested by DEQ, IIT Roorkee for PGA of 0.31g and 0.155g for MCE and DBE conditions respectively and found to be safe.

The committee felt the need to reconcile the two approaches adopted by IIT Roorkee and EDF, France. This will also facilitate evolution of guidelines for site specific seismic study, which has been separately deliberated under item no. 13.4. The committee, therefore, suggested that the project authorities should forward site specific seismic study report of EDF, France to IIT Roorkee and submit views of IIT Roorkee to the NCSDP for finalisation of seismic design parameters. As the dam section has been reportedly found to be safe in both the cases, NTPC could go ahead with the designed section of the dam.

Lat 32°36'38" – 32°41'0" N

Item No. 13.11.02 **Sewa HE. Project Stage – II, Jammu & Kashmir**

Long 75°48'46", 75°55'38" E

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives from NHPC. The Committee recommended that a PGA of 0.44 g for MCE and 0.22g for DBE conditions along with the response spectra given in Fig.3 and Table-II of site specific seismic study report (Project No. P-2002-05 of March-2003 of DEQ, IIT Roorkee) may be adopted for the seismic design of the project.

Item No. 13.11.03 **Shahpurkandi Dam Project, Punjab**

A brief presentation about the salient features along with the geological / geotectonic set up of the project was made by project representative. The project representative wished to establish the proximity of the project with Ranjit Sagar Project and submitted that similar seismic design parameter, as approved in respect of Ranjit Sagar Project, should be accepted for this project

also. The member-secretary informed that the recommendation of the Standing Committee in their 19th meeting held on 31/08/1984 in respect of Ranjit Sagar Project was only for preliminary analysis. The project authorities were to report back to the Standing Committee about the dynamic analysis taking 3-D effect, which was not done. Hence, no final recommendation has ever been made in respect of Ranjit Sagar Project. The Committee noted that the project is a major project, and therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities should, thereafter, submit their revised proposal to NCSDP along with site specific seismic study report, in twelve copies, for consideration.

Item No. 13.11.04 Kutni Feeder Reservoir Project, Madhya Pradesh

A brief presentation about the project was made by project representative. The Committee noted that the project is a major project, and therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities should, thereafter, submit their revised proposal to NCSDP along with site specific seismic study report, in twelve copies, for consideration.

Item No. 13.11.05 IB Irrigation Project, Orissa

The project could not be discussed since no representative of the project was present in the meeting. However, the Committee noted the project is a major project, and therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities, thereafter, should submit their revised proposal to NCSDP along with site specific seismic study report, in twelve copies, for its consideration.

Long: 88°26'47"E

Item No. 13.11.06 Teesta Low Dam Project Stage – III, West Bengal

Lat. 27°00'7.5"N

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives from NHPC. The Committee recommended that a PGA of 0.33 g for MCE and 0.165g for DBE conditions along with the response spectra given in Fig.3 and Table-IV of site specific seismic study report (Project No. P-2001-16 of September-2002 of DEQ, IIT Roorkee) may be adopted for the seismic design of the project.

Item No. 13.11.07 Thotapalli Barrage Project, Andhra Pradesh

The project could not be discussed since no representative of the project was present in the meeting. However, the Committee noted that the project is a major project and, therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities should, thereafter, submit their revised proposal to NCSDP along with site specific seismic study report, in twelve copies, for consideration.

Item No. 13.11.08 **Mankulam H.E. Project, Kerala**

A brief presentation about the project was made by project representative. The Committee noted that the project is a major project and, therefore, recommended for carrying out the site specific seismic studies for the project. The project authorities, thereafter, should submit their revised proposal to NCSDP along with site specific seismic study report, in twelve copies, for consideration.

Long 90°31'0" E

Item No. 13.11.09 **Pagaladiya Dam Project Stage – III, Assam**

Lat 26°31'30" N

The salient features along with the geological / geotectonic set up of the project was briefly presented by the consultant, Dr. I.D. Gupta Joint Director, CWPRS, Pune. The Committee recommended that a PGA of 0.306 g for MCE and 0.18g for DBE conditions along with the design basis accelerogram and response spectra given in the site specific seismic study report (No. 3972 of March-2003 of CWPRS, Pune) may be adopted for the seismic design of the project.

Long - 77°15' - 77°45'

Item No. 13.11.10 **Parbati H.E. Project Stage – III, Himachal Pradesh**

Lat : 31°40' - 32°15'

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives from NHPC. The Committee recommended that a PGA of 0.36 g for MCE and 0.18g for DBE conditions along with the response spectra given in Fig.4 and Table-IV of site specific seismic study report (Project No. P-2001-03 of May-2001 of DEQ, IIT Roorkee) may be adopted for the seismic design of the project.

Lat ~~34°20'17"~~ to 34°39'00"

Item No. 13.11.11 **Kishanganga H.E. Project, Jammu & Kashmir**

Long : ~~74°38'20" to~~ 74°45'08"

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives from NHPC. The Committee recommended that a PGA of 0.34 g for MCE and 0.17g for DBE conditions along with the response spectra given in Fig.3 and Table-IV of site specific seismic study report (Project No. P-2003-01 of July-2003 of DEQ, IIT Roorkee) may be adopted for the seismic design of the project.

Lat 32-30' N

Item No. 13.11.12 **Chamera H.E. Project Stage – III, Himachal Pradesh**

Long 76° 12' E

The salient features along with the geological / geotectonic set up of the project was briefly presented by the project representatives from NHPC. The Committee recommended that a PGA of 0.31 g for MCE and 0.16g for DBE

conditions along with the response spectra given in Fig.4 and Table-IV of site specific seismic study report (Project No. P-2002-13 of August-2003 of DEQ, IIT Roorkee) may be adopted for the seismic design of the project.

Item No. 13.11.13 **Rihand Dam, Uttar Pradesh**

Lat : 24°12' 17.84" N
Long : 83° 0' 37.01" E

The salient features along with the geological / geotectonic set up of the project was briefly presented by the consultant, Dr. I.D. Gupta Joint Director, CWPRS, Pune. The Committee recommended that a PGA of 0.32 g for MCE and 0.171g for DBE conditions along with the design basis accelorogram and response spectra given in the site specific seismic study report (No. 3931 of October-2002 of CWPRS, Pune) may be adopted to review the seismic safety of the dam.

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