Minutes of the XXI Meeting of National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects held on 08.09.2009 in CWC, New Delhi

General:

The XXI meeting of the National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects was held on 08th September 2009 at 1030 hours in the Conference Hall, Central Water Commission, New Delhi. **Sh. A.K. Ganju, Member (D&R), CWC and Chairman, NCSDP chaired the meeting**. The list of Members, project representatives and invitees who attended the meeting is given at **Annexure I**.

Meeting commenced with Sh. A.K. Ganju, Chairman, NCSDP welcoming the participants and invitees of the meeting. This was followed by a brief introduction of the participants. Thereafter, Dr.B.R.K. Pillai, Director (FE&SA), CWC and Member Secretary, NCSDP was requested to take up the agenda items for discussion.

Item No. 21.1 Confirmation of the minutes of the last meeting

Member Secretary informed that the Minutes of the XX meeting of NCSDP held on 23/09/08 were circulated to all Members; and no observation/ comment on the circulated Minutes have been received by the Secretariat. He also informed that relevant extracts from the Minutes of Meeting were also sent to the concerned project authorities. The Committee confirmed the minutes of the XX meeting as circulated.

Item No. 21.2 Agenda items carried over from previous meetings.

Item No. 21.2.1 Guidelines for Site Specific Seismic Studies for river Valley projects

The Member-Secretary apprised the Committee that as decided in the XX Meeting the Secretariat was approached various Institutes concerned with seismic design parameter studies with a request to submit the detailed study report highlighting the methodology, calculations, assumptions etc. adopted by their Institutes in the study. The response received from the Institutes were sent to experts for examination. For finalizing the guidelines for the specific seismic studies for river valley projects it is proposed to deliberate the above in a closed group meeting which was scheduled to be held on 7th September 2009 now postponed to 30th September 2009 due to the pre occupation of some of the Members.

Dr. Arya at this stage stressed the need for preparing the IS:1893-2002 Part V pertaining to dams and embankments to avoid confusion in the use of the site specific studies conducted by the various consulting agencies. He also requested that the Directorates of CWC dealing with dams should come forward and take up this problem with BIS and guide them in preparation/finalization of 1893-Part V. He also reminded that without the active participation of CWC this problem cannot be solved since it involves elaborated procedures for analysis of dams and embankments subject to seismic forces.

Item No. 21.2.2 Conditionally cleared projects of XIX meeting of NCSDP (clause 19.4.2.1)

In the XX meeting it was decided that all the 5.Nos conditionally cleared projects of XIX meeting of NCSDP shall be asked to submit the desired compliance at the earliest and failing which the conditional clearance will be reviewed.

The compliance received from Budhil H.E. Project, Himachal Pradesh and Teesta HE Project (Stage-III) Sikkim were sent to Director, CMDD (E&NE) for comments/observations. The same was deliberated during the meeting and after deliberation **Chairman NCSDP accorded formal clearance to Budhil H.E. Project, Himachal Pradesh and Teesta H.E. Project (St. III), Sikkim. Committee also decided that Singoli Bhatwari Hydro Electric Project, Uttarakhand, Vyasi H.E. Project, Uttarakhand and Lata Tapovan H.E. Project Uttarakhand shall be asked to submit the desired compliance.**

Discussion on Spillover Projects from previous NCSDP Meetings

Item No. 21.2.3 Dibang H.E. Project, Arunachal Pradesh

During the XX meeting the Committee decided to await the result of LET and MT studies before taking a final decision on site-specific seismic study report of IIT Roorkee. The Committee also requested project authorities to submit the site specific seismic study report conducted by CWPRS, and the design calculations done for the dam and its appurtenant structures using seismic parameters indicated in both the study report.

The project authorities submitted the study report and design calculations to the sect. and the same was forwarded to Director CMDD (E&NE) for examination.

The project authorities in the present meeting informed the Committee that all the details as desired by the Committee in the last meeting and the MT & L&T study reports received from IIG Bombay and GSI

Kolkata respectively are also forwarded to the Sectt. (submitted on 07.09.08 by NHPC) and requested for clearance. Project authorities also informed that MT Survey report send to GSI for correlation and validation.

During the meeting after the elaborated deliberation Sh. Sujit Das Gupta suggested to send the LET study report to IIG Mumbai also for compilation. The Committee also desired that IIT, Roorkee and CWPRS, Pune should revise their site specific study reports based on LET & MT study reports.

Member Secretary informed the Committee that the Sectt. has not yet received the LET & MT survey reports. The reports are to be circulated to the Members of the Committee for comments/observations. Decision on the clearance can then only be taken.

Item No. 21.2.4 Sapta Kosi high dam multipurpose project and Sun Kosi storage-cum-diversion scheme, Nepal.

In the XX meeting, the Members of the IIT Roorkee pointed out that the PGA values given in the study report are on higher side. The Committee desired that the project authorities should submit a revised study indicating expected (mean) value of PGA for the horizontal and vertical component of ground motion alongwith mean + sigma level response spectra for natural periods ranging from 0.04 seconds through 4.0 seconds with the PGA values rounded off to two decimal digits.

During the meeting the revised study report was presented by the project authorities alongwith the geology of the project area. The revised study estimated the mean values of PGA for horizontal and vertical components of ground motion alongwith mean + sigma level of response spectra for natural periods from 0.04 to 4.0 sec. and are given below.

Name of Site	Mean	
	PGA-H in g	PGA-V in g
Sapta Kosi dam	**0.43g**	**0.34g**
Sun Kosi dam	**0.41g**	**0.29g**
Chhatra barrage	**0.37g**	**0.27g**
Sun Kosi power house	**0.39g**	**0.26g**
Chisapani barrage & Kamala dam	**0.33g**	**0.23g**

The Committee after deliberation accepted and approved the mean values of horizontal and vertical PGA alongwith the mean+

sigma values according to the revised results on estimation of seismic parameters done by CWPRS, Pune.

Item No. 21.2.5 Bhairon Ghati H.E. Project (3x 127 MW), Uttarakhand

In the last meeting the Committee was requested project authorities to submit the full information as per the standard proforma of NCSDP to the Secretariat. The project authorities complied the decision of the committee given in the XX meeting.

In the present meeting the project authorities presented the seismic studies and geology of the project area. **After deliberation the Committee accorded approval to the estimated PGA value of 0.36g for MCE condition and 0.18g for DBE condition as given in the study report [(No. EQD-3005/2006-07 (May 2007) of IIT Roorkee)].**

Item No. 21.2.6 Teesta H.E. Project (Stage-VI), (4x125 MW), Sikkim

In the XX Meeting the Committee Members opined that the values appeared to be on the higher side apparently on account of their presentation in terms of Mean + Sigma level. After brief deliberation, the Committee decided that the project authority should submit a revised study indicating expected (mean) value of PGA for the horizontal and vertical component of ground motion along with mean + sigma level response spectra for natural periods ranging from 0.04 seconds through 4.0 seconds. The project authorities complied the decision taken by the Committee in the XX meting.

In the present meeting the project authorities presented the revised seismic studies conducted by CWPRS, Pune alongwith site geology of the project area. After the deliberation the **Committee approved the revised mean values of horizontal and vertical PGA as 0.383 g and 0.284 g respectively alongwith the MCE level of response spectrum compatible design accelerogram and the corresponding velocity and displacement records for the horizontal and vertical motion, the design response spectra for damping values of 1,3,5,7,10 and 15% of critical as computed from the revised design accelerograms, the amplitudes of the horizontal and vertical response spectra as given in the revised study. Committee also instructed the consultant of the project to round off the estimated seismic design parameters to two decimal digits.**

Item No. 21.2.7 Siang Lower H.E. Project, (8x300 MW), Arunachal Pradesh

In the XX meeting, the project authorities informed the committee that the magnitude of the earthquake occurred around the project was reduced to 8.0 from 8.7 in the site specific seismic study conducted by IIT Roorkee. The Committee decided that the project authority should submit a revised study without imposing any restriction on the magnitude of earthquake from various sources around the project. Accordingly, revised study has been conducted and the project authorities submitted the revised study report which shows the estimated PGA value as same as in the original study i.e. 0.36g from MCE condition and 0.18g for DBE condition.

During the meeting project authorities presented the seismic study and geology of the project area and requested for clearance.

Member Secretary informed the Committee that Sl. No. 3 of the proforma for submission of site specific seismic study of NCSDP Secretariat is not submitted by the project authorities which is mandatory.

The Committee after deliberation on the various aspects decided that the project authorities should submit the details mentioned in Sl. No. 3 of the proforma as per the required scale and the project will be considered in the next meeting for clearance.

Sh. Sujit Das Gupta, GSI suggested the need for the review of the "proforma for submission of the specific seismic study to NCSDP" Secretariat.

Member-Secy informed that the proforma presently used will be circulated to the Members of the Committee for their review.

Item No. 21.2.8 Dikrong/Pare H.E. Project,(2x55 MW), Arunachal Pradesh

In the XX meeting the Members of the Committee pointed out that the PGA values are on lower side and therefore, the study needs to be revised. Accordingly, revised study has been conducted and the revised study report submitted by the project authorities shows that the PGA value as 0.33g for MCE condition and 0.17g for DBE condition which is same as given in the original report.

During the meeting project authorities presented the seismic study and geology around the project area and requested for clearance.

After the deliberation the site specific study of the project was conditionally cleared by the committee with the decision that the

modified report to be submitted incorporating the revised table for peak ground horizontal acceleration from various sources around the project site.

Item No. 21.2.9 Rammam H.E. Project (Stage-III), (3x40 MW), West Bengal

The project authorities were not present in the XX meeting to present the case. The Committee, therefore, decided to consider the project in the next meeting.

During the meeting the project authorities presented the seismic study, salient features and geology of the project are and requested for clearance. **After a brief deliberation, the Committee accorded approval to the estimated PGA value of 0.38g for MCE condition and 0.19 g for DBE condition as given in the study report.**

Item No. 21.2.10 Halon Project, Madhya Pradesh

In the XX meeting the representatives of the project authorities were not prepared to present the case and the information to be submitted to the Secretariat as per the standard proforma for submission of projects to NCSDP also were not submitted.

During the meeting project authorities presented the seismsic studies and geology of the project area alongwith salient features of the project.

Member-Secretary informed that the **project authorities were not submitted the full information required to be submitted as per the standard proforma for submission of site specific seismic study to NCSDP. The project will be considered for clearance after the document as suggested is received.**

Item No. 21.3 New Cases for approval of site specific seismic study.

Item No. 21.3.1 Panan H.E. Project, Sikkim

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by Irrigation works circle, Uttarakhand**.** It was also informed that submission of mandatory information as per standard proforma has not been complied with the project authorities.

Discussion on the project was defered by the Committee till submission of full information by the project authorities as per standard proforma of NCSDP.

Item No. 21.3.2 Teesta H.E. Project (St. IV), Sikkim

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by National Hydro-Electric Power Corporation Ltd. (N.H.P.C.)

During the meeting project authorities presented the seismic study and geology of the project area alongwith salient features of the project.

Highlighting the recommendations of the site specific seismic study report the MCE magnitude for the project falling under seismic zone IV has been identified as 8.0 and the estimated PGA value is 0.36g. For evaluating the design acceleration spectra the normalized horizontal acceleration spectra has to be multiplied by 0.36g and 0.18g for MCE and DBE conditions respectively. Vertical acceleration spectral values has been recommended as 2/3 of the corresponding horizontal values. **After the deliberation, the Committee accorded approval to the above seismic parameters and the response spectra as furnished in IIT Roorkee's study report [Report No. EQD-3004/2006-2007 (February 2008)]**

Item No. 21.3.3 Jamrani Dam Multipurpose Project, Uttarakhand

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by Irrigation Works Circle, Uttarakhand.

During the meeting project authorities presented the seismic study and geology of the project area along with salient features of the project.

Highlighting the recommendations of the site specific seismic study report the MCE magnitude for the project falling under seismic zone IV has been identified as 7.5 and the estimated PGA value is 0.31g. For evaluating the design acceleration spectra the normalized horizontal acceleration spectra has to be multiplied by 0.31g and 0.16g for MCE and DBE conditions respectively vertical acceleration spectral values has been recommended as 2/3 of the corresponding horizontal values. **After the deliberation, the Committee accorded approval to the above seismic parameters and the response spectra as furnished in IIT Roorkee's study report [Report No. EQD-3006/2008-2009 (March 2008)]**

Item No. 21.3.4 Demwe H.E. Project, Arunachal Pradesh

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by ATHENA DEMWE POWER PVT. LTD.

During the meeting project authorities presented the seismic study and geology of the project area along with salient features of the project.

During the meeting **Sh. Sujit Das Gupta expressed his reservations in accepting the study carried out by IIT Roorkee for the project. He stated that it is a complex area an earthquake of magnitude 8.7 had occurred in that region and that should also be accounted for in the studies. The Committee also recommended for LET & MT studies to bring out the disposition of major regional structures around the project and to have some sub surface picture, to be conducted and input to be used for the studies related to site specific design earthquake parameters. The project authorities should submit the revised study report the project can then be considered for clearance.**

Item No. 21.3.5 Rampur H.E. Project, Himachal Pradesh

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by Satluj Jal Vidyut Nigam Ltd.

It was also informed that **the corrections to be incorporated in the original study report, data received in separate sheet, were received late and could not be circulated to the Members of the Committee for perusal. Therefore, discussions on the project was defered by the Committee.**

Item No. 21.3.6 Gundia H.E. Project, Karnataka

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by Karnataka Power Corporation Ltd.

During the meeting representative of the project authorities presented the seismic study and geology of the project area along with salient features of the project and requested by clearance.

After a brief deliberation **the Committee desired that revised report of seismic study to submitted by the project authorities incorporating the mean + value of horizontal and vertical PGA**

alongwith the meant sigma values. Also all the information as per the standard proforma for submission of seismic study report to NCSDP Sectt. to be submitted the project can then be considered for clearance.

Item No. 21.3.7 Ken Betwe Link H.E. Project (Makodia Dam), Madhya Pradesh

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by National Water Development Agency (NWDA).

During the meeting project authorities presented the seismic study and geology of the project area along with salient features of the project.

Highlighting the recommendations of the site specific seismic study report the MCE magnitude for the project falling under seismic zone II has been identified as 6.5 and the estimated PGA value is 0.08g for MCE condition and 0.04g for DBE Condition. The vertical acceleration spectral value has been recommended as 2/3 of the corresponding horizontal value. The design acceleration response spectra is obtained by multiplying the normalized horizontal acceleration spectra by corresponding PGA values **After the deliberation, the Committee accorded approval to the above seismic parameters and the response spectra as furnished in IIT Roorkee's study report [Report No. EQD-3017/2008-2009 (Nov. 2008)].**

Item No. 21.3.8 Ken Betwe Link H.E. Project (Daudhan Dam), Uttar Pradesh

Member-Secretary informed that the site specific seismic study was conducted by IIT Roorkee for the project owned by National Water Development Agency (NWDA).

During the meeting project authorities presented the seismic study and geology of the project area along with salient features of the project.

Highlighting the recommendations of the site specific seismic study report the MCE magnitude for the project falling under seismic zone II has been identified as 6.5 and the estimated PGA value is 0.11g for MCE condition and 0.06g for DBE Condition. The vertical acceleration spectral value has been recommended as 2/3 of the corresponding horizontal value. The design acceleration response spectra is obtained by multiplying the normalized horizontal acceleration spectra by

corresponding PGA values **After the deliberation, the Committee accorded approval to the above seismic parameters and the response spectra as furnished in IIT Roorkee's study report [Report No. EQD-3001/2008-2009 (Sept. 2008)]**

Item No. 21.3.9 Ramganga Barrage Irrigation Scheme, Uttar Pradesh

Member-Secretary informed the Committee that Ramganga Barrage is having a height of only 7.5m. As per the decision taken by the "Standing Committee", the Committee formed to suggest the design seismic coefficients formed by Govt. of India prior to the NCSDP constituted by MOWR. The barrages of lesser heights need not seek the approval of the NCSDP. The dam and the appurtenant structures can be designed as per the provisions given in the relevant IS Codes (latest).

Additional Agenda items with the permission to the chair.

The following four projects were included as an additional agenda item and could not be taken up due to the shortage of time.

1.0 Rupsiabagar-Khasiyabara HE Project, Uttarakhand
2.0 Mangdechhu HE Project, Bhutan
3.0 Kiru HE Project, J&K
4.0 Phata Byung Hydro Electric Project, Uttarakhand

The meeting ended with vote of thanks to the chair.

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Annexure -I

XXI Meeting of National Committee on Seismic Design Parameters (NCSDP) on River Valley Projects

Date : 08.09.2009

Attendance

Sl.No.	Name & Address	Designation	Deptt./ Org.	Status/ Representative
I. Committee Members				
1.	Sh .A. K. Ganju	Member (D&R)	CWC, New Delhi	Chairman, NCSDP
2.	Sh. G.S. Purba	Chief Engineer (DSO)	CWC, New Delhi	Member
3.	Sh. Sujit Das Gupta	Director	GSI, Kolkata	Member
4.	Dr. A.S. Arya	Prof. Emeritus	IIT Roorkee	Member
5.	Dr. Ashwani Kumar	Professor	DEQ, IIT Roorkee,	Member
6.	Sh. P.R. Baidya	Director	IMD Delhi	Member
7.	Sh. P.S. Verma	Suptd. Surveyor	Survey of India	Member
8.	Dr. I. D. Gupta	Director	CWPRS, Pune	Member
9.	Dr. B. R. K. Pillai	Director, FE&SA	CWC, New Delhi	Member-Secy. NCSDP
II. Special Invitees				
10.	Sh. S.K. Sibal	Director	CWC	
11.	Dr. M.L. Sharma	Assoc. Professor	DEQ, IIT Roorkee	
12.	Sh. Manish Shrikhande	Assoc. Professor	DEQ, IIT Roorkee	
13.	Sh. O.P. Gupta	Dy. Director	CWC	
14.	Sh. V.C. Gupta	Dy. Director	CWC	
15.	Mrs. J.M. Peter	A.D.-II	CWC	
III. Project Representatives and Consultants				
16.	Sh. Imran Sayeed	Chief Geologist	NHPC	Dibang H.E. Project
17.	Sh. Balraj Joshi	G.M. Designs	NHPC	Dibang H.E. Project
18.	Sh. S.K. Sahu	Project Manager	JPOSKSKI, Nepal	Sapta Kosi multipurpose project
19.	Sh. V. D. Ajmani	Executive Director	UJVN Ltd.	Bhairon Ghati HEP
20.	Sh. Bharat Bharadwaj	Executive Engineer	UJVN Ltd.	Bhairon Ghati HEP
21.	Sh. Amrut P. Niranjan	Sr. Manager	LANCO Energy Pvt. Ltd.	Teesta (St. VI), HEP
22.	Sh. Anupam Mishra	Sr. Engineer	LANCO Energy Pvt. Ltd.	Teesta (St. VI), HEP
23.	Sh. P. Kumar	DGM	LANCO Energy Pvt. Ltd.	Teesta (St. VI), HEP
24.	Sh. Harish Aggarwal	General Manager	Jaypee Ventures Pvt. Ltd.	Siang Lower HEP
25.	Sh. S.P. Jalote	Advisor	Jaypee Ventures Pvt. Ltd.	Siang Lower HEP

26.	Sh. Jitendra Thakur	Advisor	Jaypee Ventures Pvt. Ltd.	Siang Lower HEP
27.	Sh. H.H. Uzarika	G.M. (Design)	NEEPCO Ltd.	Dikrong/Pare HEP
28.	Sh. R. Sarma	Sr. Manager	NEEPCO Ltd.	Dikrong/Pare HEP
29.	Sh. S.S. Adhikari	Sr. Manager	NEEPCO Ltd.	Dikrong/Pare HEP
30.	Sh. A.K. Aggarwal	DGM	NTPC	Ramman (St. III) HEP
31.	Sh. N.K. Jain	DGM	NTPC	Ramman (St. III) HEP
32.	Sh. Arnab Das	Sr. Engineer	NTPC	Ramman (St. III) HEP
33.	Sh. O.P.S. Thakur	Ex. Engineer	N.V.D. Authority	Halon HEP
34.	Sh. S.S. Dahel	Asstt. Engineer	N.V.D. Authority	Halon HEP
35.	Sh. P.S. Mandal	GM	Himgiri Hydro Energy	Panan HEP
36.	Sh. R.C. sharma	Engineer	NHPC	Teesta (St. IV) HEP
37.	Sh. Pradeep	Engineer	NHPC	Teesta (St. IV) HEP
38.	Sh. Ajay Verma	Suptd. Engineer	Irrigation Works Circle, Uttarakhand	Jamrani Project
39.	Sh. V.K. Pandey	Asstt. Engineer	Irrigation Works Circle, Uttarakhand	Jamrani Project
40.	Sh. Javed Mohsin	Consultant	Athena Demwe Power Pvt. Ltd.	Demwe HEP
41.	Sh. S.S. Gohia	Consultant	Athena Demwe Power Pvt. Ltd.	Demwe HEP
42.	Sh. Pankaj Punetha	Consultant	Athena Demwe Power Pvt. Ltd.	Demwe HEP
43.	Sh. Navin Gupta	Consultant	Athena Demwe Power Pvt. Ltd.	Demwe HEP
44.	Sh. Gogan Aggarwal	Consultant	Athena Demwe Power Pvt. Ltd.	Demwe HEP
45.	Sh. Sanjeev Gupta	Sr. Manger, P.H.	SJVNL	Rampur HEP
46.	Sh. R.K. Chauhan	Sr. Manager, Geology	SJVNL	Rampur HEP
47.	Sh. R.S. Chauhan	Er. Designs, CD-II	SJVNL	Rampur HEP
48.	Sh. Anil K. Dutta	AGM	SJVNL	Rampur HEP
49.	Sh. O.P. Gupta	DGM	SJVNL	Rampur HEP
50.	Sh. Sannappa	Resident Engineer	KPCL	Gundia HEP
51.	Sh. O.P. Singh Kushwah	S.E.	NWDA	Ken Betwa Link Project (Makodia Dam)
52	Sh. O.P. Singh Kushwah	S.E.	NWDA	Ken Betwa Link Project (Daudhan Dam)