National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects

MINUTES OF 30th MEETING (15th September, 2015)

Secretariat

Foundation Engineering & Special Analysis (FE&SA) Directorate
Central Water Commission
New Delhi

MINUTES OF THE 30TH MEETING OF
NATIONAL COMMITTEE ON SEISMIC DESIGN PARAMETERS FOR RIVER VALLEY PROJECTS
HELD ON 15TH SEPTEMBER, 2015 IN CWC, NEW DELHI

GENERAL

The 30th meeting of the National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects was held on 15th September, 2015, at Central Water Commission, New Delhi under the chairmanship of Sh. C. K. Agrawal, Member (D&R), CWC. The list of Members, invitees and project representatives who attended the meeting is given at ***Annexure I***.

Meeting commenced with Sh. C. K. Agrawal, Chairman, NCSDP welcoming the participants of the meeting followed by a brief introduction of the participants.

Before taking up the Agenda items for discussion, Member Secretary informed the Committee that some clarification on issues discussed in 28th meeting of NCSDP have been forwarded by CWPRS, Pune. Dr. M L Sharma, IITR responded to the clarification/observations of CWPRS and after brief discussion, it was agreed by the Committee Members that these issues will be discussed in a separate meeting involving IIT Roorkee, CWPRS and CWC to be coordinated by Member Secretary. Thereafter, Member Secretary, NCSDP was requested to take up the agenda items for discussion.

Item 28.1 CONFIRMATION OF THE MINUTES OF THE 28TH AND 29TH MEETING

Member Secretary informed the Committee that the Minutes of the 28th Meeting of NCSDP held on 9th January, 2015 were circulated to the Members of the Committee; and no observation/comment on the circulated Minutes has been received by the Secretariat. He also informed that relevant extracts from the Minutes of Meeting were sent to the concerned project authority for information.

The Committee noted above and confirmed the Minutes of the 28th Meeting as circulated.

The minutes of the 29th meeting (Extraordinary) of NCSDP held on 19th May, 2015 were circulated to all the Members of the Committee vide letter No. 2/2/2014 (Vol-

II)/FE&SA/314-330 dated 12.06.2015. The observation/comment from IMD on the recommendation para at page 7 for point 29.2.3 of the minutes was received vide their email dated 24.06.2015 as indicated in the Agenda of the meeting. The matter was discussed in the meeting and it was decided that IMD will provide to CWC software script as well as expected intensity map of important events.

The Committee noted above and confirmed the Minutes of the 29th Meeting as above.

Item 30.2 AGENDA ITEMS CARRIED OVER FROM PREVIOUS MEETINGS

30.2.1 Conditionally cleared Projects - Submission of Micro Earthquake (MEQ) study

1. Dikhu HE Project, Nagaland

The Member Secretary apprised the Committee that the site specific seismic study report of the aforesaid project was approved by the Committee in its 25th meeting held on 28th June and 8th July, 2013 with the condition to submit the final report of MEQ studies. As a follow up, the project authorities had submitted the report on Site Specific Micro Earthquake (MEQ) Survey around Dikhu HE Project, Nagaland. Subsequently, the report was discussed in the 27th meeting held on 23rd June, 2014 and observations were made by the Committee. The project authorities have submitted the revised report incorporating the clarifications to the observations of the Committee and the same was discussed in 28th meeting of NCSDP held on 9th January, 2015. After brief deliberation, the Committee considering the views of IITR accorded the conditional clearance to the MEQ studies. The project authorities have requested for unconditional clearance of the MEQ study repot. Accordingly, the matter was discussed in the meeting and Dr M L Sharma mentioned that they have examined the study and may be cleared. ***After brief deliberation the Committee cleared the MEQ study of Dikhu HEP, Nagaland.***

Further, Member secretary apprised the Committee that the site specific seismic study report of the aforesaid project was approved by the Committee in its 25th meeting with the following parameters (seismic co-efficient):

Horizontal seismic co-efficient (α_h)	Dam (Rock-filled)	0.13	Vertical seismic co-efficient (α_v)	Dam (Rock-filled)	0.09
	Conc. Spillway	0.17		Conc. Spillway	0.12

Member Secretary also informed the Committee that as per decision taken in 26th meeting of NCSDP**,** *the horizontal and vertical seismic co-efficient of aforesaid project stands revised as 0.24 and 0.16 respectively for preliminary designs or firming up the dam dimensions only. The actual dam stability shall be worked out using response spectrum/Time history approved by NCSDP. The updated parameters were also confirmed in the 27th meeting held on 23rd June, 2014.*

Member Secretary mentioned that IIT Roorkee vide their email dated 30.04.2015 and project authority have requested that the issue related to earth and rock fill dam may be deliberated and suitable clarifications/amendments may be issued for recommended guidelines for site specific design parameters. The copy of the IIT Roorkee's email has already been placed in the Agenda of the meeting.

Dr. Manish Shrikhande, IITR mentioned that the seismic co-efficient for rock-fill dam should be reviewed in light of the clarification submitted vide their email dated 30.04.2015. In response, Sh. S K Sibal, Chief Engineer, UGBO, Lucknow, CWC clarified that the seismic coefficients approved/revised by the Committee in 26th Meeting are for preliminary design only. He stated that the seismic design parameters (SDP) approved are site specific and they are independent of the type of dam. He added that the Committee while approving the site specific seismic study report of the aforesaid project including time history have not been modified/changed SDP which remains same as approved in the 25th meeting. For detailed design, the dynamic analysis using time history shall be carried out. Hence, review of the co-efficient for preliminary design is not required and the same was agreed by the Committee.

After detailed discussion, the Committee decided that review of the co-efficients to be used for preliminary design is not required. The project authority shall carry out the dynamic analysis for detailed designs of the structure.

2 Thana Plaun HE Project, Himachal Pradesh

Member Secretary apprised the Committee that the site specific seismic study report of the aforesaid project was approved by the Committee in its 25th meeting with the condition to submit the final report of MEQ studies by July, 2014 which was extended till July, 2015 on the request of the project authorities in the 28th meeting held on 9th

January, 2015. Now, Project authorities have again requested to extend the date for submission of MEQ study report till July 2016 as the final layout of the project is under review.

After brief deliberation, the Committee accepted the request of the project authorities for extension till July 2016 for submission of the final report of MEQ. The Committee was also of the opinion that the time line given to the project authorities for submission of the requisite study report shall be adhered to.

3 Dugar HE Project, Himachal Pradesh

Member Secretary apprised the Committee that the site specific seismic study report of the aforesaid project was approved by the Committee in its 27th meeting held on 23rd June, 2014 with the condition to submit the final report of MEQ studies by June, 2015. In response, project authorities vide their letter no. Dugar/CWC/Consultation meeting/20150528-01 dated 28th May, 2015 have informed that DHPL requested to accord the permission/ approval for construction of pits for installation of seismic instruments from DFO Chamba and the same is still awaited. Further, they have also indicated that there is limited accessibility to Dugar site from June to November in a year. They have informed that the MEQ study will be taken up immediately after forest land is diverted to Dugar project and report will be submitted by **end of year 2017**.

After brief deliberation, the Committee accepted the request of the project authorities for extension till December 2017 for submission of the final report of MEQ. The Committee was also of the opinion that the time line given to the project authorities for submission of the requisite study report shall be adhered to.

30.2.2 Non-submission of site specific seismic study reports for NCSDP approval in respect of projects whose DPRs were conditionally cleared:

The Member Secretary apprised the Committee that till the 28th meeting the compliance in respect of submission of site specific seismic studies from 13 projects was required to be submitted. Accordingly, reminders were issued to the concerned project authorities for desired compliance. In response, the site specific seismic study report of three projects namely Kholongchhu HEP, Bhutan; Chango Yangthang HEP, Himachal Pradesh and Punatsangchhu -II HEP, Bhutan have been submitted and the same have

been included in the Agenda items of this meeting under Item nos. 30.3.7, 30.3.9 and 30.3.11 respectively. The project authorities of remaining 10 projects, 6 projects authorities have requested for extension of time and the response from 4 projects is still awaited.

The issue was discussed and keeping the status of project/study in view, ***it was decided by the Committee that the extension of time for submission of the desired compliance may be given to the project authorities considering their request. The Committee also decided that the project authorities who have not responded, shall submit their compliance by June, 2016.***

30.2.3 Needs of modification in prevalent design practices (and also recommendation procedures) with regards to safety of ancillary structures and components – especially at the top and other overhanging portions of the dam – that are prone to significant damages by catastrophic earthquakes.

30.2.4 Ways of defining acceptable damages in dams caused by major earthquake and after-shocks, with linkage to necessities of emergent lowering of reservoir levels.

30.2.5 Possibility of preparing Guidelines for mandatory retrofitting of dams subjected to nominal damages caused by major earthquake.

The Member Secretary appraised the Committee that the Agenda item under 30.2.3, 30.2.4 and 30.2.5 above were discussed in 29th meeting (extraordinary) and it was opined by the Committee Members that Central Water Commission may consider recommending the formation of separate Committee(s) involving its design experts and also pertinent experts from other Organizations. It was decided to take up further discussion in the next meeting based on the information furnished by the states on dams. He further informed that as per information received, no damages to Indian dams from Nepal earthquake have been reported so far.

In response to item under 30.2.3, 30.2.4 and 30.2.5 above, Sh Y K Handa, Chief Engineer Designs (N&W), CWC informed the Committee that presently all the design of the ancillary structures and components including at the top and other overhanging portions are designed taking into account the seismic parameters recommended for the

project. In the current design practices seismic forces are being considered adequately. He also mentioned that as regards the acceptable damages due to earthquake, all the dams are designed for DBE and checked for MCE condition. The MCE is the largest earthquake magnitude that can occur. Further, as per the present state of art, it is expected that the dams checked for MCE condition will perform without catastrophic failure, such as uncontrolled release of reservoir water. However significant damages to the structure can occur which can be restored. Further, he stated that preparation of the guidelines for Retrofitting of dams subjected to acceptable damages caused by major earthquake may not be possible at this stage because the repair to the damages caused by earthquake is decided after studying and investigating on case to case basis.

Dr M L Sharma, IIT Roorkee mentioned that the subject matter does not fall under the purview of the Committee and the matter may be dealt by the concerned designers accordingly. The same was agreed by the other Members of the Committee.

After brief deliberation, it was decided by the Committee that subject matter is judgemental and appropriate action wherever required shall be taken by the concerned designers.

Item 30.3 PROJECTS CONSIDERED FOR APPROVAL OF THE COMMITTEE

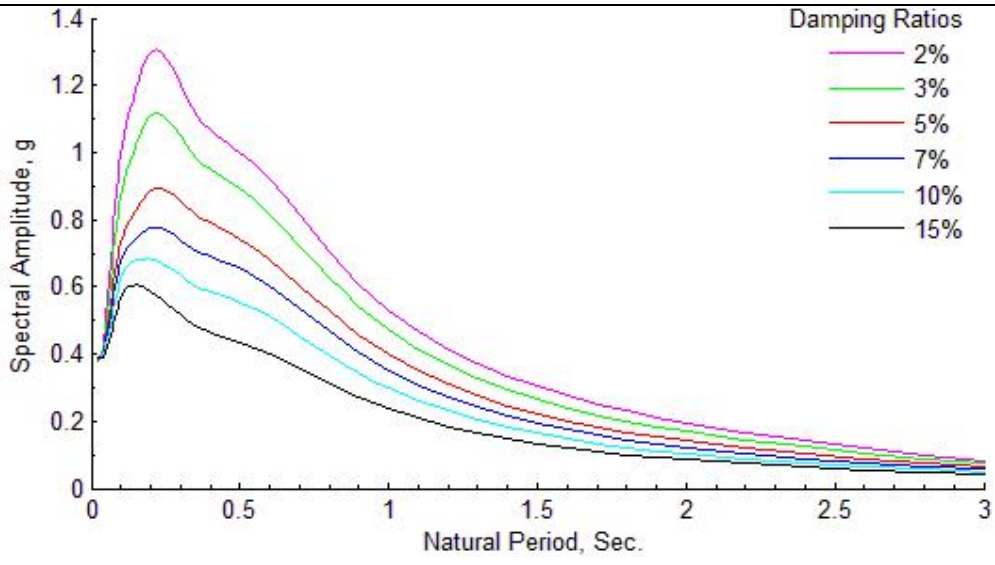
30.3.2 Tawang (Stage-I) HE Project, Arunachal Pradesh

Member Secretary informed the Committee that the site specific seismic study report of the aforesaid project was earlier discussed in the 27th meeting of NCSDP held on 23rd June, 2014. After detailed deliberation, the Committee decided that the study needs to be revised considering the seismic potential for MCT as magnitude 8 event. Further, the time histories and response spectra shall be given both at foundation (river bed) level as well as at the rock outcrop level. Accordingly, the project authorities have submitted the revised study report of the aforesaid project for consideration of the Committee

A presentation on the study report was made by the project authorities. During discussion Member Secretary pointed out that the PGA values should be rounded off to two decimal places and the period of strong motion/total duration should be rounded off to an integer value. The representative of CWPRS has agreed and mentioned that the same will be complied in their reports in future.

After brief deliberation, the Committee accorded approval to the study report of Tawang (Stage-I) HE Project, Arunachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



DBE level of horizontal response spectra at river bed level

(b) Other seismic parameters

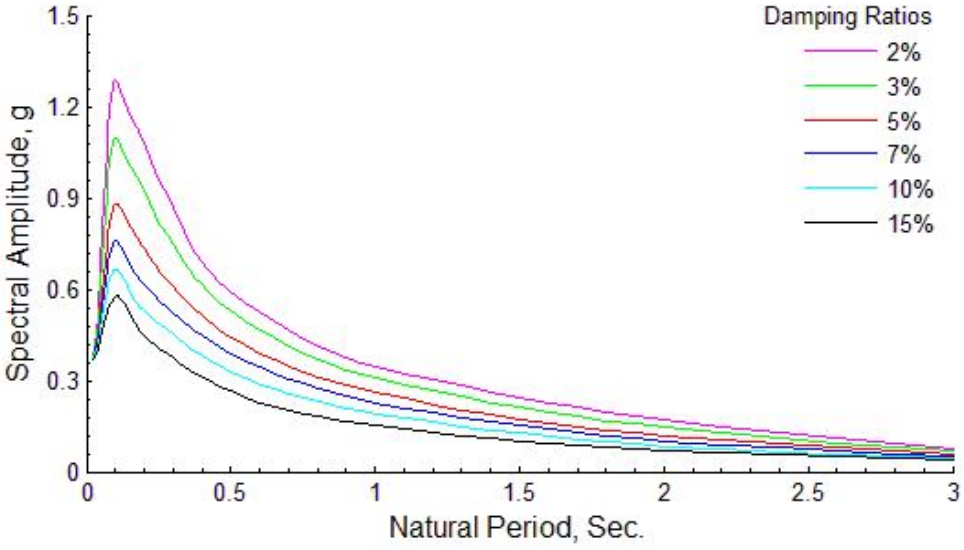
Max. Credible Earthquake Magnitude	8.0	Horizontal distance to surface projection of fault (R_{JB}) (km)	30	Focal depth (km)	30
Horizontal seismic co-efficient (α_h)		0.24		Vertical seismic co-efficient (α_v)	0.16
Strong motion duration (second)		7.6 (at rock out crop) 10.5 (at river bed level)		Total duration (second) for both cases (At rock outcrop/river bed level)	50
Report reference	CWPRS Report (Technical Report No. 4668 A (January-2010)-revised as NCSDP Guidelines in May, 2015)]				

30.3.2 Tawang (Stage-II) HE Project, Arunachal Pradesh

Member Secretary informed the Committee that the site specific seismic study report of the aforesaid project was earlier discussed in the 27th meeting of NCSDP held on 23rd June, 2014. After detailed deliberation, the Committee decided that the study needs to be revised considering the seismic potential for MCT as magnitude 8 event. Further, the time histories and response spectra shall be given both at foundation (river bed) level as well as at the rock outcrop level. Accordingly, the project authorities have submitted the revised study report of the aforesaid project for consideration of the Committee. A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Tawang (Stage-I) HE Project, Arunachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



DBE level of horizontal response spectra at river bed level

(b) Other seismic parameters

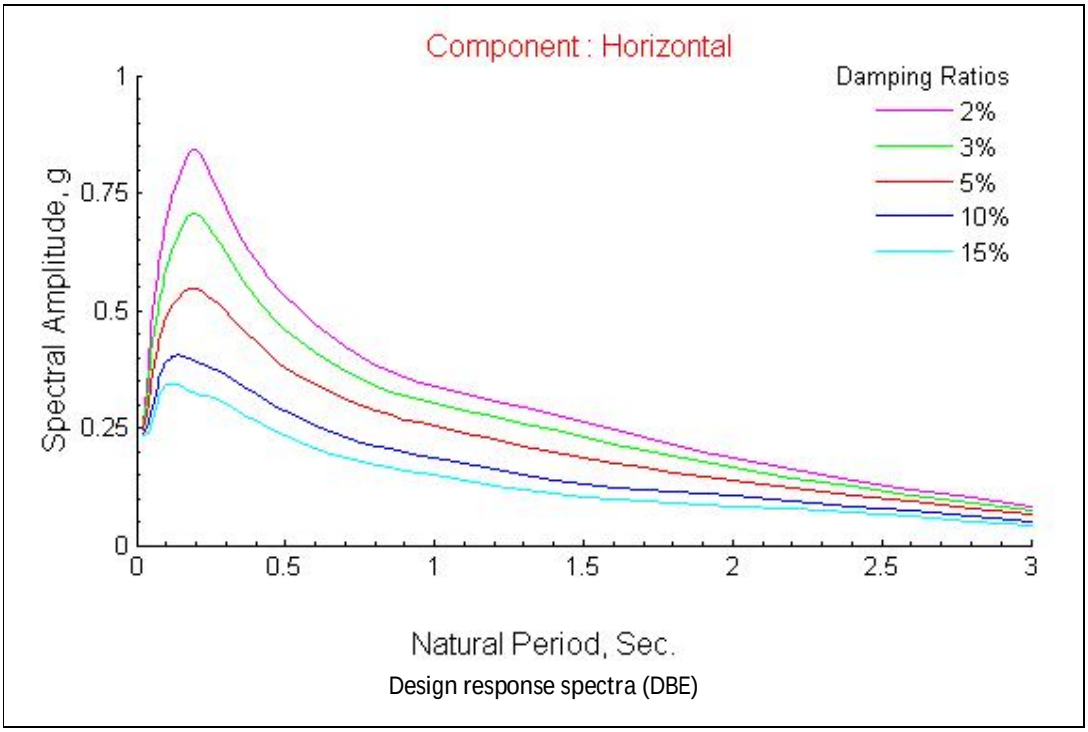
Max. Credible Earthquake Magnitude	8.0	Horizontal distance to surface projection of fault (R_{JB}) (km)	30	Focal depth (km)	30
Horizontal seismic co-efficient (α_h)		0.24		Vertical seismic co-efficient (α_v)	0.16
Strong motion duration (second)		7.6 (at rock out crop) 10.5 (at river bed level)	Total duration (second) for both cases (At rock outcrop/river bed level)		50
Report reference	CWPRS Report (Technical Report No. 4686 B (January-2010) - revised as NCSDP Guidelines in May, 2015)				

30.3.3 Loktak Down Stream HE Project, Manipur

A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Loktak Down Stream HE Project, Manipur. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



Design response spectra (DBE)

(b) Other seismic parameters

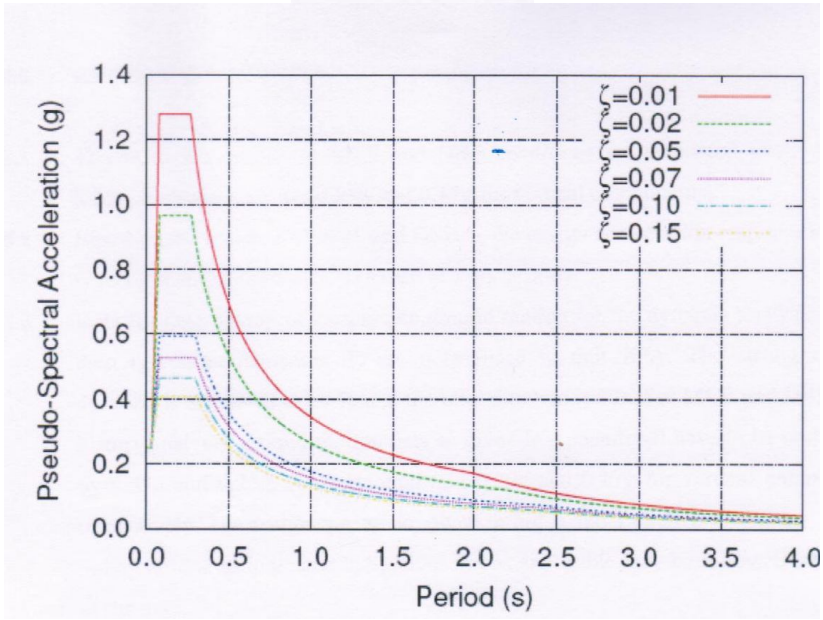
Max. Credible Earthquake Magnitude	7.5	Closest distance from fault rupture plane (km)	119.6	Focal depth (km)	100
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)	0.16		
Strong motion duration (second)	16	Total duration (second)	59		
Report Reference	CWPRS Report (Technical Report No. 5208 (September-2014)]				

30.3.4 Sawalkot HE Project, Jammu & Kashmir

The Member Secretary informed the Committee that the project authorities have submitted the updated copy of the study report (IIT Roorkee Report (EQ: 2014-31; Project No. 6042/12-13 (August-2015)] incorporating the spectra for 15% damping and safety criterion. A presentation on the study report was made by the project authorities. The project authorities have informed that MEQ studies for 193.0 m concrete dam will be taken up shortly and final study report will be submitted by September, 2016.

After brief deliberation, the Committee accorded approval to the study report of Sawalkot HE Project, Jammu & Kashmir. The Committee also noted that its approval is conditional subject to the submission of MEQ studies by the project authorities by September, 2016. The summarized seismic design parameters of the approved report are given below:

(a) Response Spectra



(b) Other seismic parameters

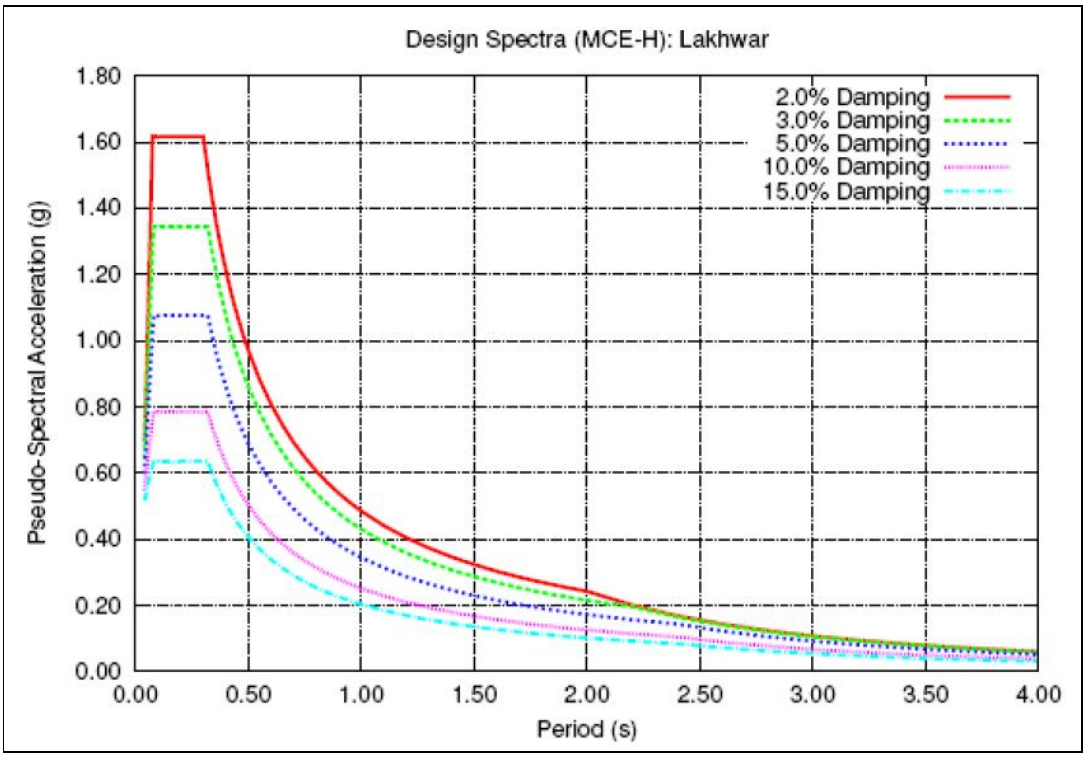
Max. Credible Earthquake Magnitude	7.0	Horizontal distance to surface projection of fault (R_{JB}) (km)	5	Focal depth (km)	15
Horizontal seismic co-efficient (α_h)	0.16	Vertical seismic co-efficient (α_v)	0.11		
Strong motion duration (second)	7	Total duration (second)	37		
Report Reference	IIT Roorkee Report (EQ: 2014-31; Project No. 6042/12-13 (August-2015)]				

30.3.5 Lakhwar Multi-Purpose Project, Uttarakhand

A presentation on the study report was made by the project authorities. The project authorities have informed that MEQ studies for 204 m concrete dam will be taken up shortly and final study report will be submitted by September, 2016.

After brief deliberation, the Committee accorded approval to the study report of Lakhwar Multi-Purpose Project, Uttarakhand. The Committee also noted that its approval is conditional subject to the submission of MEQ studies by the project authorities by September, 2016. The summarized seismic design parameters of the approved report are given below:

(a) Response Spectra



(b) Other seismic parameters

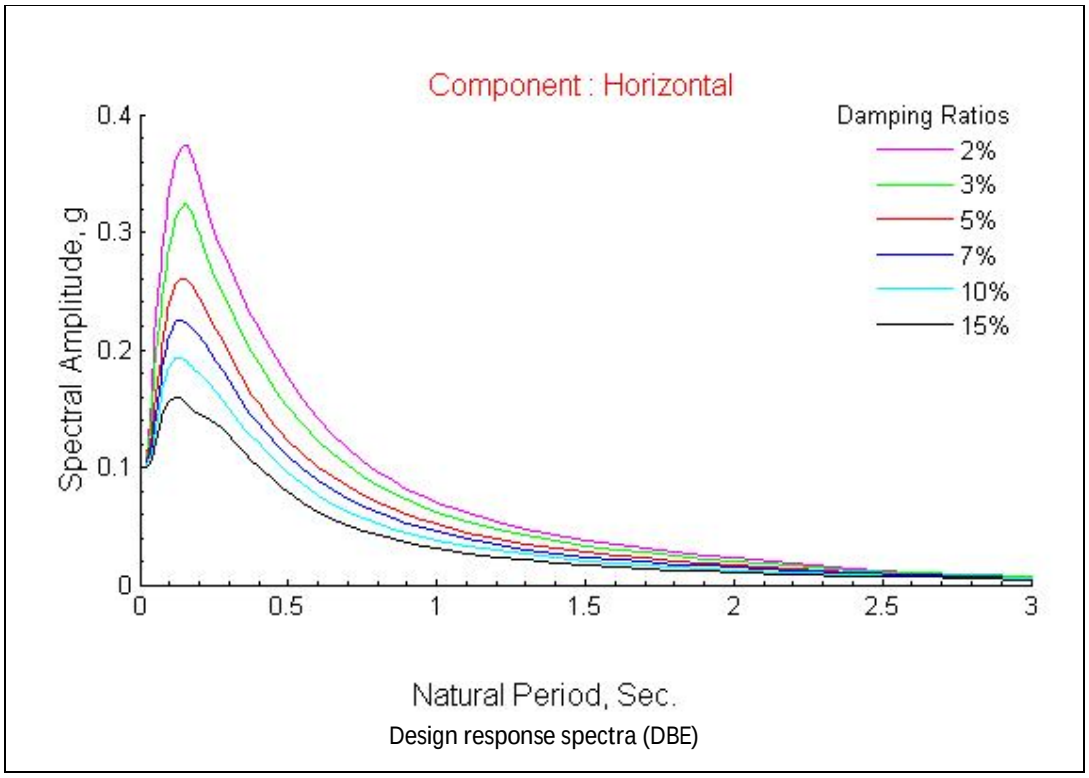
Max. Credible Earthquake Magnitude	7.5	Horizontal distance to surface projection of fault (R_{JB}) (km)	5.0	Focal depth (km)	15
Horizontal seismic co-efficient (α_h)	0.16	Vertical seismic co-efficient (α_v)			0.11
Strong motion duration (second)	8	Total duration (second)			42
Report Reference	IIT Roorkee Report (EQ: 2015-03; Project No. 6017/2014-15 (February-2015)				

30.3.6 Turga Pumped Storage Project, West Bengal

A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Turga Pumped Storage Project, West Bengal. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



Design response spectra (DBE)

(b) Other seismic parameters

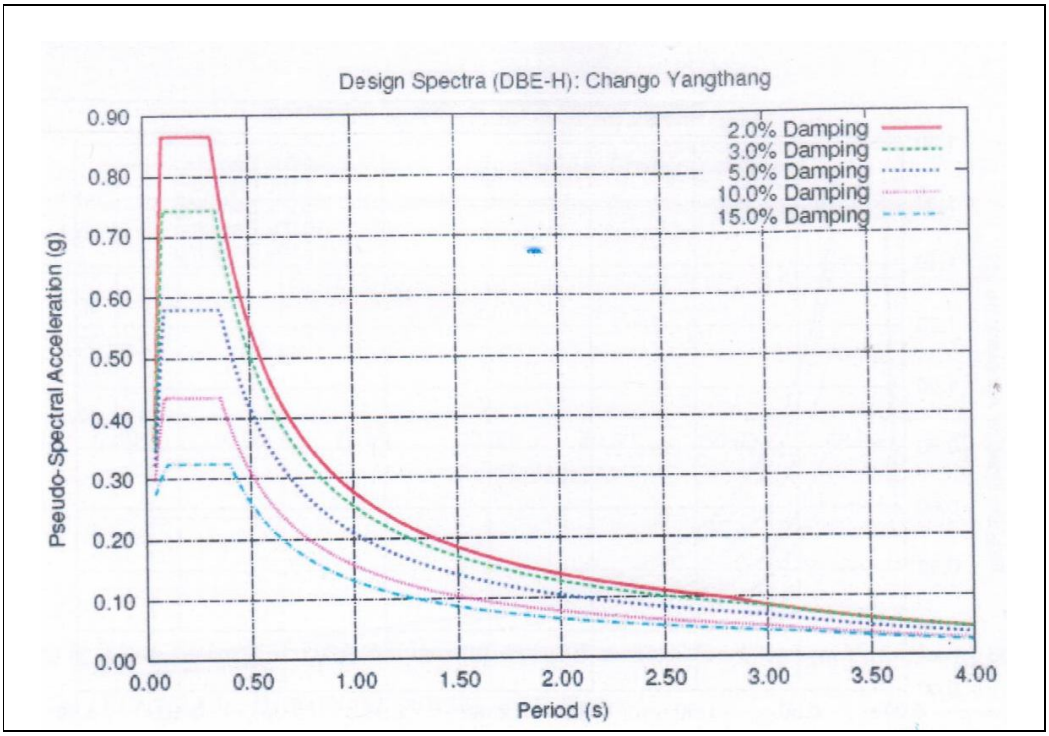
Max. Credible Earthquake Magnitude	6.2	Epicentral distance (km)	9.4	Focal depth (km)	20
Horizontal seismic co-efficient (α_h)		0.12	Vertical seismic co-efficient (α_v)		0.08
Strong motion duration (second)		9	Total duration (second)		50
Report Reference	CWPRS Report [(Technical Report No. 5220 (October-2014)]				

30.3.7 Chango Yangthang HE Project, Himachal Pradesh

A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Chango Yangthang HE Project, Himachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

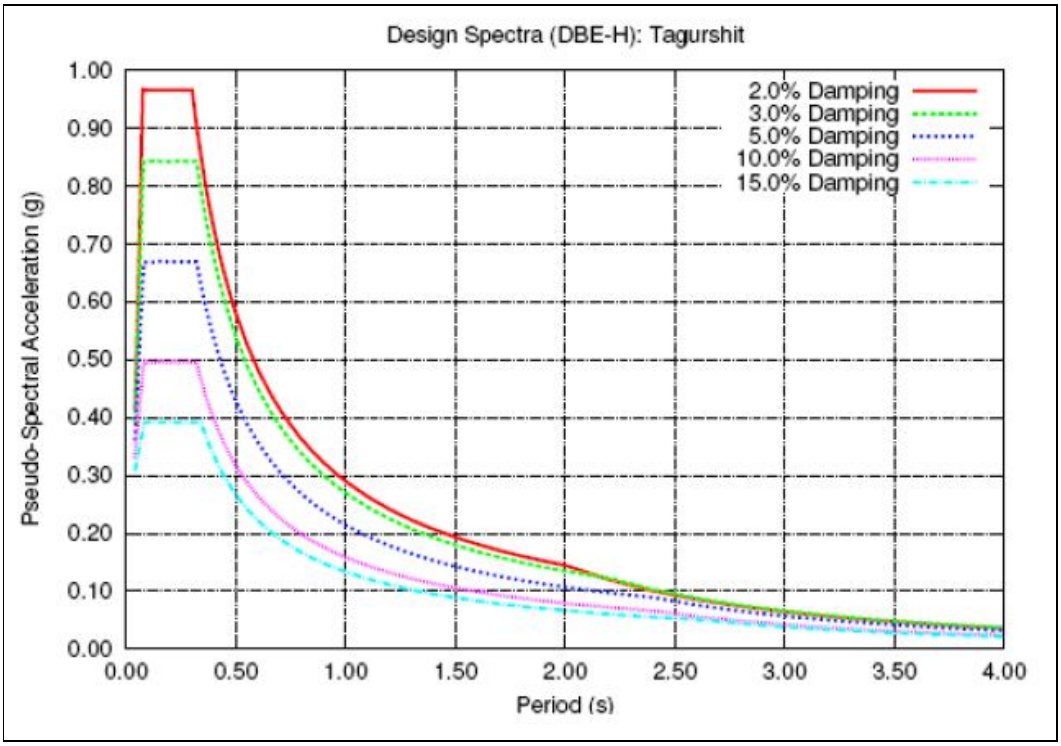
Max. Credible Earthquake Magnitude	8.0	Horizontal distance to surface projection of fault (R_{JB}) (km)	5	Focal depth (km)	15
Horizontal seismic co-efficient (α_h)	0.16	Vertical seismic co-efficient (α_v)	0.11		
Strong motion duration (second)	9	Total duration (second)	48		
Report Reference	IIT Roorkee Report (EQ: 2013-17(M); Project No. EQD-6011/12-13 (June-2015)				

30.3.8 Tagurshit HE Project, Arunachal Pradesh

A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Tagurshit HE Project, Arunachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

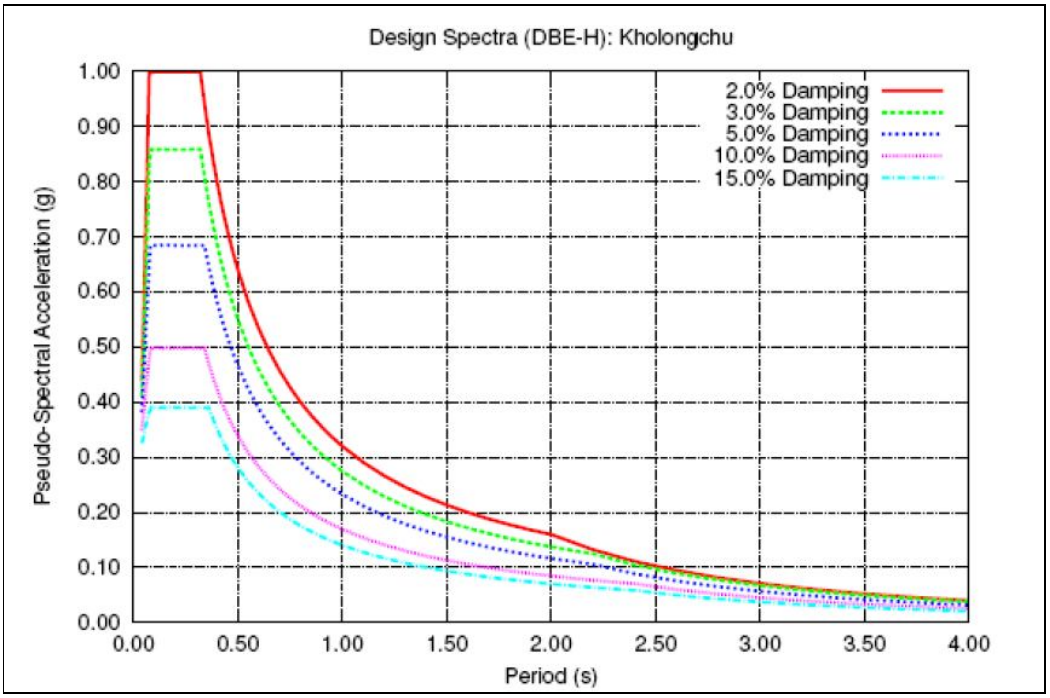
Max. Credible Earthquake Magnitude	7.5	Horizontal distance to surface projection of fault (R_{JB}) (km)	5	Focal depth (km)	15
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)			0.16
Strong motion duration (second)	8	Total duration (second)			42
Report Reference	IIT Roorkee Report (EQ: 2015-09; Project No. EQD-6034/14-15 (June-2015)				

30.3.9 Kholongchhu HE Project, Bhutan

A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Kholongchhu HE Project, Bhutan. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

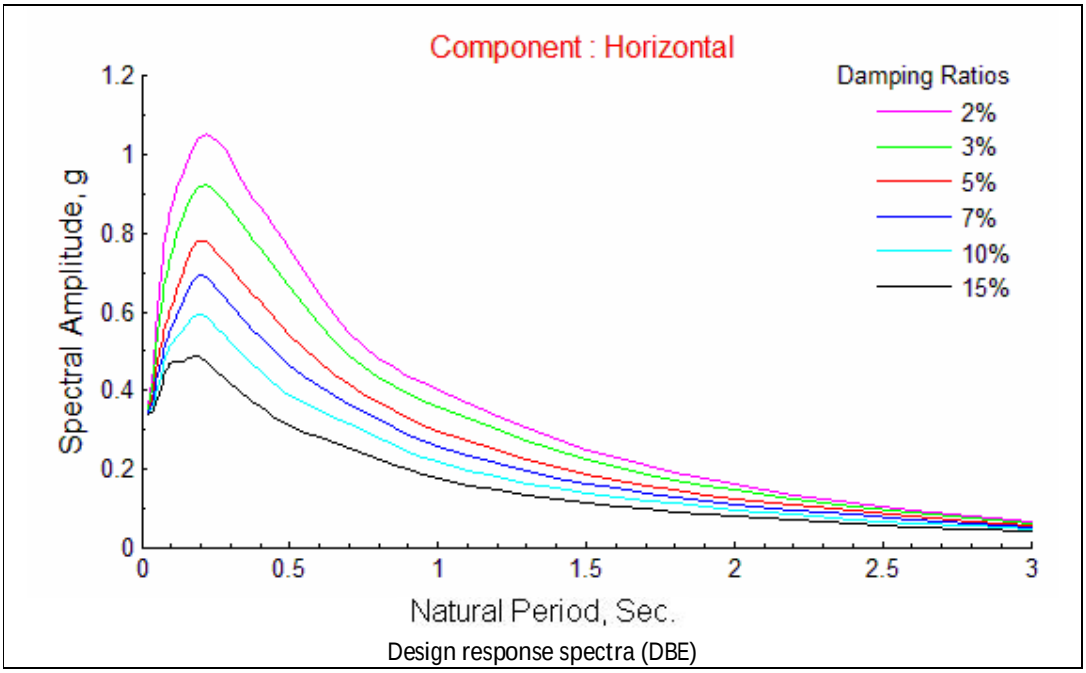
Max. Credible Earthquake Magnitude	8.0	Horizontal distance to surface projection of fault (R_{JB}) (km)	5	Focal depth (km)	15
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)			0.16
Strong motion duration (second)	9	Total duration (second)			48
Report Reference	IIT Roorkee Report (EQ: 2015-06; Project No. EQD-6033/2014-15 (March-2015)				

30.3.10 Punatsangchhu-I HE Project, Bhutan

A presentation on the study report was made by the project authorities. The project authorities have informed that MEQ studies for 130 m concrete dam will be taken up shortly and final study report will be submitted by September, 2016.

After brief deliberation, the Committee accorded approval to the study report of Punatsangchhu-I HE Project, Bhutan. The Committee also noted that its approval is conditional subject to the submission of MEQ studies by the project authorities by September, 2016. The summarized seismic design parameters of the approved report are given below:

(a) Response Spectra



Design response spectra (DBE)

(b) Other seismic parameters

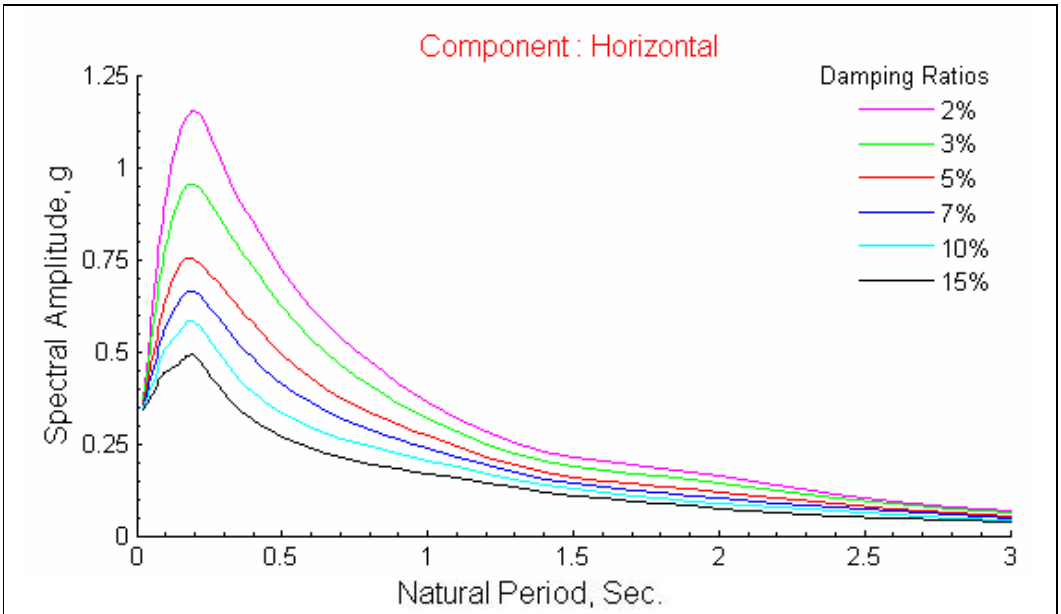
Max. Credible Earthquake Magnitude	7.5	Closest distance from the fault rupture plane (km)	20.5
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)	0.16
Strong motion duration (second)	6	Total duration (second)	43
Report Reference	CWPRS Report (Technical Report No. 5275 (March-15)]		

30.3.11 Punatsangchhu-II HE Project, Bhutan

A presentation on the study report was made by the project authorities.

After brief deliberation, the Committee accorded approval to the study report of Punatsangchhu-II HE Project, Bhutan. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



Design response spectra (DBE)

(b) Other seismic parameters

Max. Credible Earthquake Magnitude	7.5	Closest distance from the fault rupture plane (km)	19.3
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)	0.16
Strong motion duration (second)	6	Total duration (second)	42
Report Reference	CWPRS Report (Technical Report No. 5274 (March-15)]		

30.4 Additional Item with the permission of the Chair:

30.4.1 Site specific seismic parameters for Dam Rehabilitation Improvement Project (DRIP) dams

Member Secretary requested Director DSR, CWC and Project Director (DRIP) to brief the Committee about the status of the site specific seismic parameters for DRIP Dams. Dr. B.R.K. Pillai, Director DSR, CWC and Project Director (DRIP) stated that it was desired by the Committee in its 27th meeting to explore the possibility for a regional level study to cover all the DRIP dams. Accordingly, as a follow up, the matter was discussed with IIT Roorkee for carrying out a region specific seismic study (South Indian region) so as to cover all DRIP dams. Subsequently, a proposal costing Rs. 80.90 lakh (Rupees eighty lakh ninety thousand only) for the said study has been received from IIT Roorkee, and the same was discussed in the 9th meeting of Technical Committee of DRIP held during 07-08 August, 2014. The Technical Committee of DRIP agreed with the proposal submitted by IIT Roorkee and also for booking the cost under central component of DRIP. No objection from World Bank in this regard has also been received. The Proposal was then sent to MoWR for approval of the competent authority. The Ministry has now sent some observations on the proposed case, and the same is requested to be clarified in consultation with IIT Roorkee. Dr. M L Sharma, IITR agreed to share their response on the Ministry's observations at an early date.

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The meeting ended with vote of thanks to the chair.

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Central Dam Safety Organisation

National Committee on Seismic Design Parameters (NCSDP)

30th Meeting

Summary of the Decisions Taken at the Meeting

Date of Meeting:	15.09.2015	Time: 11:00 h to 17:00 h	Venue:	Conference Room, 525(N), Sewa Bhawan, R K Puram, New Delhi-66
Present Chairperson:	Sh. C K Agrawal, Member (D&R), CWC		Member Secretary:	Sh O P Gupta Director (FE&SA), CWC
Other Members and special Invitees, (Name, Designation, Organization): A List of participants is placed at ***Annexure-I***				

Sl.N.	Agenda Points / Decision	Responsibility	Achievement/ Progress	Remarks
30.1	Confirmation of the Minutes of the 28th and 29th meetings	-	Confirmed	-
30.2	Agenda items carried over from the previous meetings			
30.2.1	Conditionally cleared Projects - Submission of Micro Earthquake (MEQ) study	Concerned project authorities	Discussed and decided	-
30.2.2	Non-Submission of site specific seismic study reports for NCSDP approval in respect of projects whose DPRs were conditionally cleared	Concerned project authorities	Discussed and decided	-
30.2.3	Needs of modification in prevalent design practices (and also recommendation procedures) with regards to safety of ancillary structures and components – especially at the top and other overhanging portions of the dam – that are prone to significant damages by catastrophic earthquakes.	-	Discussed and decided	-
30.2.4	Ways of defining acceptable damages in dams caused by major earthquake and after-shocks, with linkage to necessities of emergent lowering of reservoir levels.			
30.2.5	Possibility of preparing Guidelines for mandatory retrofitting of dams subjected to nominal damages caused by major earthquake.			

S.N.	Agenda Point / Decision	Responsibility	Achievement/ Progress	Remarks
30.3	Projects to be considered for approval of the Committee			
30.3.1	Tawang-Stage-I HE Project, Arunachal Pradesh	-	cleared	-
30.3.2	Tawang-Stage-II HE Project, Arunachal Pradesh	-	Cleared	-
30.3.3	Loktak Down Stream HE Project, Manipur	-	Cleared	-
30.3.4	Sawalkot HEP, Jammu & Kashmir	-	Conditional clearance	MEQ studies to be submitted by September, 2016
30.3.5	Lakhwar Multi- Purpose Project, Uttarakhand	Concerned Project Authorities	Conditional clearance	MEQ studies to be submitted by September, 2016
30.3.6	Turga Pumped Storage Project, West Bengal	-	Cleared	-
30.3.7	Chango Yangthang HE Project, Himachal Pradesh	-	Cleared	-
30.3.8	Tagurshit HE Project, Arunachal Pradesh	-	Cleared	-
30.3.9	Kholongchhu HE Project, Bhutan	-	Cleared	-
30.3.10	Punatsangchhu-I HE Project, Bhutan	Concerned Project Authorities	Conditional clearance	MEQ studies to be submitted by September, 2016
30.3.11	Punatsangchhu-II HE Project, Bhutan	-	cleared	-
30.4	Additional Item with the permission of the Chair			
30.4.1	Site specific seismic parameters for Dam Rehabilitation Improvement Project (DRIP) dams	Informative	-	-

Annexure –I

30th Meeting of National Committee on Seismic Design Parameters (NCSDP) on River Valley Projects

List of Participants on 15.09.2015

Sl. No.	Name & Address	Designation	Deptt./ Org.	Status/ Representative
I. Committee Members				
1.	Sh. C.K. Agrawal	Member (D&R)	CWC, New Delhi	Chairman, NCSDP
2.	Sh. L.A.V. Nathan	Chief Engineer (DSO)	CWC, New Delhi	Member
3.	Dr. M.L. Sharma	Professor & Head Deptt. of Earthquake Engg.	DEQ, IIT Roorkee,	Member
4.	Dr. P.K. Champati Ray	Group Head, Geo Science and Disaster management studies	Indian remote sensing (IIRS), Dehradun	Member
5.	Dr. L.R. Pattanur	Scientist 'D'	CWPRS, Pune	Representative of CWPRS
6.	Sh. P R Baidya	Scientist 'E' (EMS)	National Seismological Centre, IMD, New Delhi	Representative of IMD
7	Dr. D. Srinagesh	Chief Scientist, CSIR	NGRI, Hyderabad	Representative of NGRI
8.	Sh. O.P. Gupta	Director, FE&SA	CWC, New Delhi	Member-Secy. NCSDP
II. Special Invitees and other officials				
9.	Sh. Y K Handa	Chief Engineer Designs (N&W)	CWC	CWC
10.	Sh. S.K. Sibal	Chief Engineer UGBO, Lucknow	CWC	CWC
11.	Dr. B. R. K. Pillai	Director (DSR)	CWC	CWC
12.	Dr. Manish Shrikhande	Professor	DEQ, IIT Roorkee	IIT Roorkee
13.	Dr Jasodhir Das	Associate Professor	DEQ, IIT Roorkee	IIT Roorkee
14.	Sh. L K Taneja	Director (DSM)	CWC	CWC
15.	Sh. Saibal Ghosh	Director, CMDD (N&W)	CWC	CWC
16.	Sh. Vevek Tripathi	Director, CMDD(E&NE)	CWC	CWC
17.	Sh. S Selvam	Scientist 'B'	CWPRS	CWPRS
18.	Sh. Upananda Rath	Asst. Director (DSM)	CWC	CWC
19.	Sh. Satyam Agrawal	Asst. Director	CWC	NCSDP Secretariat
20.	Sh. G. Sanjeeva Reddy	Asst. Director II	CWC	"
21.	Sh. C.L. Premi	Head Draftsman	CWC	"
22.	Ms. Vinod Sharma	Sr. Draftsman	CWC	"

III. Project Representatives and Consultants				
23.	Dr. G A Mukhtar	Chief Geologist, JKSDPC	JKSDPC, Srinagar	Sawalkot HEP. J&K
24.	Sh, Vijay Nagri	JKSDPC	JKSDPC, Jammu	-do-
24.	Meenakshi raina	JKSDPC	JKSDPC, New Delhi	-do-
25.	Sh. S C Mittal	JKSDPC	JKSDPC, New Delhi	-do-
26.	Sh. Jai Kumar	JKSDPC	JKSDPC, New Delhi	-do-
27.	Sh. S L Kapil	Chief (Geophysics)	NHPC, Faridabad	Tawang Stage-I HEP, Arunachal Pradesh
28.	Sh. Sankhadip Chowdhary	Sr Manager (C)	NHPC, Faridabad	-do-
29.	Sh. Rajeev Saxena	Manager (Geo)	-do-	-do-
30.	Ms Pallavi Khanna	Dy. Manager (Geophysics)	-do-	-do-
31.	Sh. Rajeev Kumar Agarwal	General Manager (Civil)	UJVNL	Lakhawar Multi-purpose Project, Uttarakhand
32.	Sh. Dinesh Shukla	General Manager (CD&H)	-do-	-do-
33.	Sh. Anil kumar Badani	DGM (CD-I)	-do-	-do-
34.	Harish Bahuguna	Env & Geology Cell	-do-	-do-
35.	Sh. Satish Kumar Singh	Executive Engineer	-do-	-do-
36.	Sh. Amresh Kumar Sharma	Executive Engineer	-do-	-do-
37.	Sh. Lalit Kumar	Executive Engineer	-do-	-do-
38.	Sh. S L Kapil	Chief (Geophysics)	NHPC, Faridabad	Loktak Downstream HEP, Manipur
39.	Sh. R S Virmani	Chief (Geology)	-do-	-do-
40.	Sh. Sankhadip Chowdhary	Sr Manager (C)	-do-	-do-
41.	Ms Pallavi Khanna	Dy. Manager (Geophysics)	-do-	-do-
42.	Sh. G Narendra	Dy. Manager (C)	LDHCC	-do-
43.	Sh. Amitabh Tripathi	Chief Engineer	WAPCOS Ltd.	Turga Pumped Storage Project, West Bengal
44.	Mehakjeet Deol	Sr. Engineer	-do-	-do-
45.	Sh. S P Bansal	AVP	Chango Yangthang HP Ltd.	Chango Yangthang HEP, Himachal Pradesh
46.	Sh Y. Deva	Head Geology	-do-	-do-
47.	Sh. S. Srinivas	Chief Principal Engineer	-do-	-do-
48.	Sh. Santanu Kundu	Principal Engineer	-do-	-do-
49.	Sh. Puneet Malhi	Dy. Manager	-do-	-do-
50.	Sh. B Bhattachargee	Head - Technical	L&T Power Development Ltd.	Tagurshit HEP, Arunachal Pradesh
51.	Sh. Dweependra N Kalita	Sr. DGM	-do-	-do-
52.	Sh. P Kathiravan	DGM	-do-	-do-
53.	Sh. Ashish Kr Roshan	Assistant Manager	-do-	-do-
54.	Ms. P Sumana	Chief Engineer	WAPCOS Ltd.	Punatsangchu –I HEP, Bhutan
55.	A. Tripathi	Chief Engineer	-do-	-do-

56.	Sh. S L Kapil	Chief (Geophysics)	NHPC, Faridabad	Tawang Stage-II HEP, Arunachal Pradesh
57.	Sh. Sankhadip Chowdhary	Sr Manager (C)	NHPC, Faridabad	-do-
58.	Sh. Rajeev Saxena	Manager (Geo)	-do-	-do-
59.	Ms Pallavi Khanna	Dy. Manager (Geophysics)	-do-	-do-
60.	Sh. S K Chadha	GM (Geo)	SJVNL, Shimla	Kholongchu HEP, Bhutan
61.	Sh. L M Verma	AGM (Design)	-do-	-do-
62.	Sh. M S Thakur	Sr Manager (Design)	-do-	-do-
63.	Sh. Kuldip Kumar Garg	Sr Engineer (Design)	-do-	-do-
64	Sh. Mohit Shukla	Engineer (Design)	-do-	-do-
65.	Ms. P Sumana	Chief Engineer	WAPCOS Ltd.	Punatsangchu –II HEP, Bhutan
64.	A. Tripathi	Chief Engineer	-do-	-do-
65.	Sh. Rakesh Mathur	Naga Manu Power Pvt. Ltd.	Naga Manu Power Pvt. Ltd	Dikhu HEP, Nagaland
66.	Sh. Sunil Garg	Consultant	ICCS, Noida	-do-