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

MINUTES OF 32nd MEETING (12th July, 2017)

Secretariat

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

MINUTES OF THE 32ND MEETING OF
NATIONAL COMMITTEE ON SEISMIC DESIGN PARAMETERS FOR RIVER VALLEY PROJECTS
HELD ON 12TH JULY, 2017 AT CWC, NEW DELHI

GENERAL

The 32nd meeting of the National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects was held on 12th July 2017, at Central Water Commission, New Delhi under the chairmanship of Sh. N.K. Mathur, 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. N.K. Mathur, Chairman, NCSDP welcoming the participants and invitees of the meeting. Highlighting the importance of the NCSDP, Chairman stressed the need for holding NCSDP meetings more regularly. This was followed by a brief introduction of the participants. Thereafter, Member Secretary, NCSDP was requested to take up the agenda items for discussion.

Item 32.1 CONFIRMATION OF THE MINUTES OF THE 31ST MEETING

Member Secretary informed the Committee that the Minutes of the 31st Meeting of NCSDP held on 23rd June, 2016 were circulated to the Members of the Committee. He also informed that relevant extracts from the Minutes of Meeting were sent to the concerned project authority for information. He further informed no comments have been received from any of the member.

The Committee noted above and confirmed the Minutes of the 31st Meeting as circulated.

Item 32.2 AGENDA ITEMS CARRIED OVER FROM PREVIOUS MEETINGS

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

Member Secretary apprised the Committee that the site specific seismic study report of 9 projects was cleared in the previous meetings subject to submission of report on MEQ studies. Accordingly, reminders were issued to the concerned project authorities for submission of the desired compliance. In response, project authorities of 8 projects have requested for extension of time and one project i.e. Lakhawar Multipurpose Project, Uttarakhand has submitted the MEQ study on 04.07.2017. The report has been circulated to members of the Committee vide Secretariat letter dated 05.07.2017.

The issue was discussed in detail and keeping the status of project/study in view, following has been decided by the Committee:

- Extension of time for submission of final MEQ study report in respect of three (3) projects namely ***Etalin H.E. Project, Arunachal Pradesh; Sawalkote H.E. Project, J&K and Punatsangchhu-I H.E. Project, Bhutan*** may be given to the concerned project authorities considering their request. The Committee was of the opinion that the time line given to the project authorities for submission of the requisite study report shall be adhered to.

- The project authorities of five (5) projects namely ***Ratle H.E. Project, J&K; Thana Plaun H.E. Project, Himachal Pradesh; Seli H.E. Project, Himachal Pradesh; Pauk H.E. Project, Himachal Pradesh*** *and* ***Wangchu H E Project, Bhutan*** may be asked to submit the status of the MEQ Studies within three months and the decision on extension of time for submission of the final study report of MEQ will be taken accordingly by the Committee in the next meeting.

- The MEQ study report of ***Lakhawar Multipurpose Project, Uttarakhand*** will be considered for discussion in the next meeting after receipt of the observations from all the members. As the MEQ study report the said project has been submitted recently (i.e. on 04.07.2017) and most of the Member could not gone through the report due to paucity of time. Dr. Srinagesh, NGRI has forwarded their observations through email dated 12.07.2017 as he could not attend the meeting due to his prior commitments. In his mail, Dr Srinagesh mentioned that there are only 4-5 earthquakes within the seismological network whilst the rest are all to the north of the network. Hence, the hypocentral parameters of this earthquakes debatable. Further, the agency which has executed this project should have had the network more spread in the dimensions rather than a close spacing network. He has also informed that CSIR-NGRI is going to operate more than 75 broad band seismological stations in Uttarakhand and about 25 accelerometers in the coming few months. In future, if any project is coming up in this region, seismological data agency may approach CSIR-NGRI, which will provide appropriate information at a cost. He also mentioned that this will cut down the delay in installation, monitoring and preparation of reports and will provide the response spectra at different locations in the Uttarakhand. The observations from other Members are awaited. Chairman

requested all the Members to forward their observations (if any) on the study report on priority so that the report may be considered for discussion in the next meeting accordingly.

32.2.2 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 until last meeting there were total seven projects for which site specific seismic study report required to be submitted by the concerned project authorities as compliance to conditional clearance of the DPR. He also informed that out of these seven projects, the project authorities of three projects namely *Tamanthi H E Project, Myanmar; Nafra H E Project, Arunachal Pradesh and Chhatru H E Project, Himachal Pradesh* have submitted the study report and the same have been included in the Agenda of the 32nd meeting under Item nos. 32.3.1, 32.3.6 and 32.3.8 respectively for consideration of the Committee. Now remaining 4 projects are required to submit the desired study report. Out of the these 4 projects, two projects namely *Dibbin H E Project, Arunachal Pradesh* and *Talong Londa H E Project, Arunachal* Pradesh have requested for extension of time. The response for other two projects namely *Amochu H E Project, Bhutan and Kolodyne H E Project, Mizoram* is yet to be submitted by the concerned project authorities.

The issue was discussed and keeping the status of project/study in view, following has been decided by the Committee:

- *Extension of time for submission of desired compliance i.e. site specific seismic study report in respect of* ***Dibbin H E Project, Arunachal Pradesh*** *and* ***Talong Londa H E Project, Arunachal Pradesh*** *may be given to the concerned project authorities considering their request.*

- *The project authorities of* ***Amochu H E Project, Bhutan and Kolodyne H E project, Mizoram*** *who have not responded, may be asked to submit their compliance by* ***December, 2017*** *and the decision will be taken accordingly in the next meeting.*

Item 32.3 PROJECTS CONSIDERED FOR APPROVAL OF THE COMMITTEE

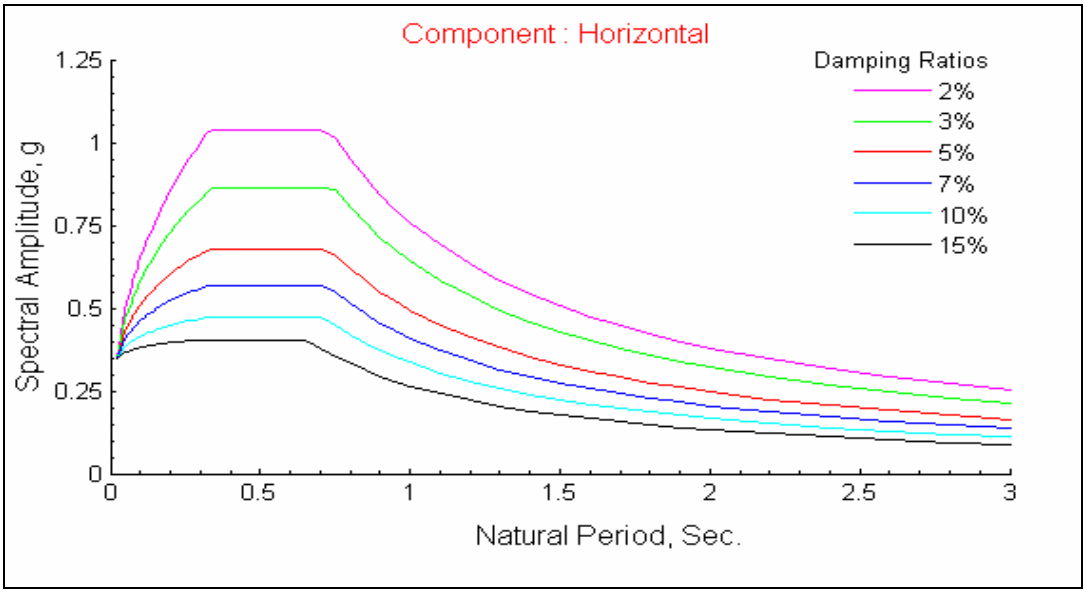
Before start of the presentation by the project authorities, the issue of the acceptance of studies carried out by the individual expert(s) for consideration of the Committee was raised. In response, Member Secretary informed the Committee that in the 31st meeting held on 23rd June, 2016, the matter was discussed in detail and it was agreed to decide these matters on case to case basis. Further, the Committee was also of the opinion that the selection of the consultant is the domain of Project authorities and we should accept or reject the study based on its merit. The deficiencies in such report(s) should be indicated and project authorities may be asked for its re-submission after incorporating the requisite compliance. Accordingly, the study report of the Nafra Hydro Electric Project carried out by Dr I D Gupta (Ex. Director, CWPRS) in individual capacity which was placed at Agenda of this meeting under item no 32.3.6 has been accepted for consideration of the Committee.

32.3.1 Tamanthi Hydro Electric Project, Myanmar

A presentation on the study report was made by the project authorities. During discussion, Dr Yogendra Singh, IIT Roorkee suggested that the shape of design response spectra needs to be smoothened in the study reports of CWPRS, Pune. He further clarified that the studies carried out by CWPRS are as per NCSDP guidelines, however, keeping in view of engineering perspective, the design response spectra may be modified with flattened peak. In view of this, the Committee decided that design response spectra should be modified accordingly. The representatives of CWPRS agreed to modify the design response spectra and ***submitted the modified the design response spectra along with updated study report vide their letter no.324/41/2017-ES/644 dated 17.08.2017 (Annexure-II).*** Further, The Committee also suggested that the seismic zone of the project shall be considered as Zone-V and the seismic co-efficient (α_h & α_v) shall be taken as 0.24 and 0.16 respectively.

After brief deliberation, the Committee accorded approval to the study report of Tamanthi Hydro Electric Project, Myanmar incorporating the modified design response spectra. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra (DBE-H)



(b) Other seismic parameters

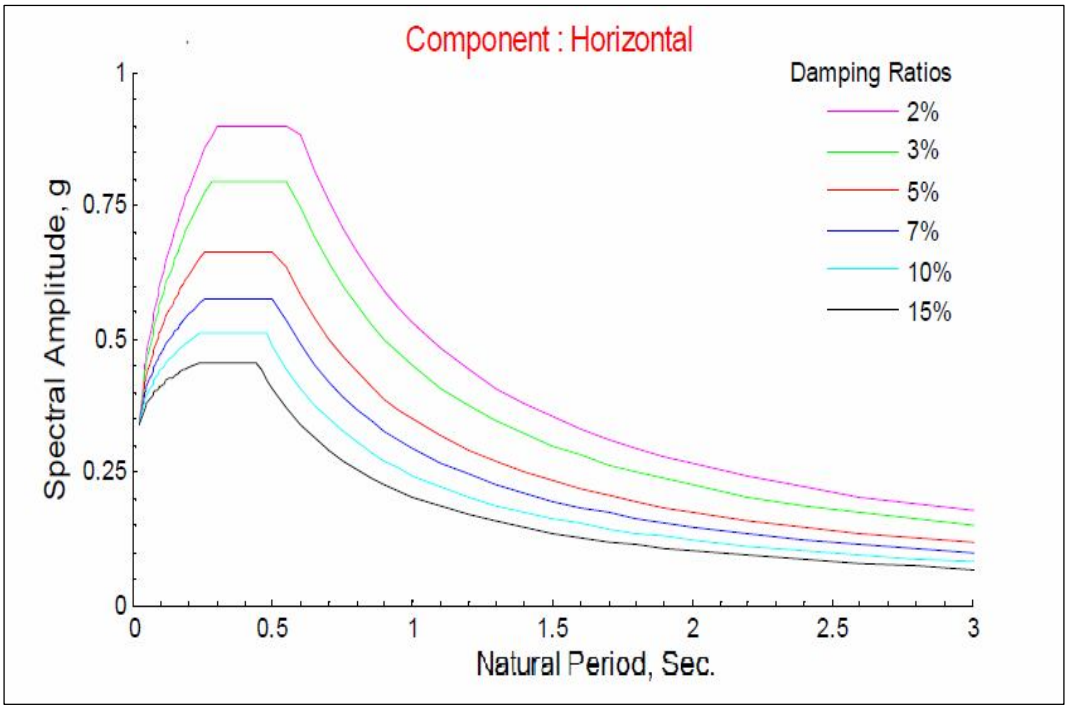
Max. Credible Earthquake	7.5	Closest distance from fault rupture plane (R_{rup}) (km)		91	
Horizontal seismic co-efficient (α_h)		0.24	Vertical seismic co-efficient (α_v)		0.16
Strong motion duration (second)		15	Total duration (second)		57
Report reference		CWPRS, Pune Technical Report number 4869 (Modified), August 2011			

32.3.2 Goriganga-IIIA Hydro Electric Project, Uttarakhand

A presentation on the study report was made by the project authorities. During the discussion, it was mentioned that the design response spectra should be modified as discussed under item 32.3.1 above. Accordingly, CWPRS, Pune has supplied the modified design response spectra alongwith modified report vide their letter dated 17.08.2017 ***(Annexure-II).***

After brief deliberation, the Committee accorded approval to the study report of Goriganga-IIIA Hydro Electric Project, Uttarakhand incorporating the modified design response spectra. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra (DBE-H for River Bed)



(b) Other seismic parameters

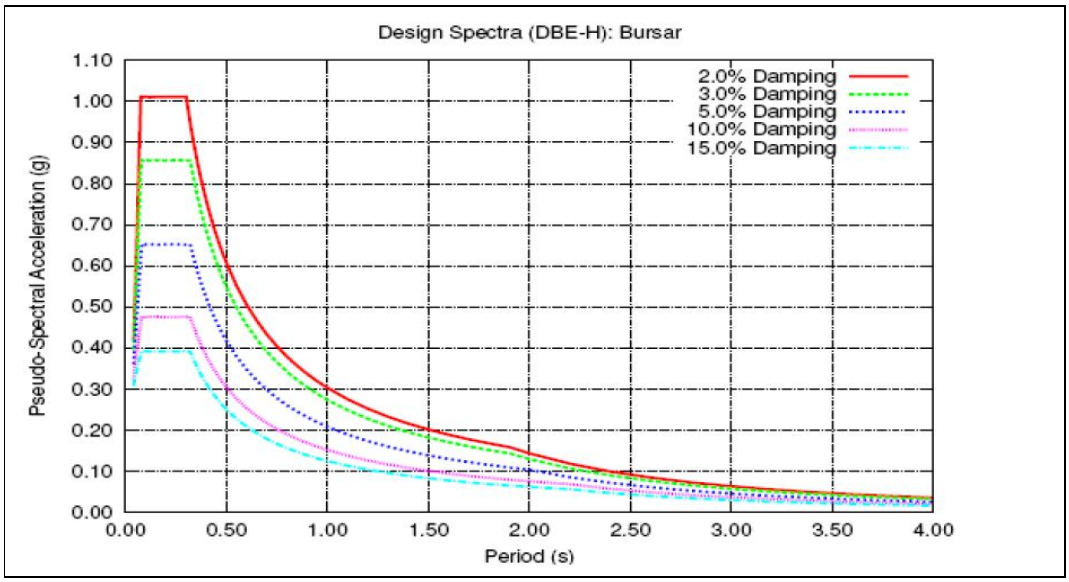
Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)		5	
Horizontal seismic co-efficient (α_h)		0.24	Vertical seismic co-efficient (α_v)		0.16
Strong motion duration (second)	6(at bed rock level) 9(at river bed level)		Total duration (second)	42(at bed rock level) 48(at river bed level)	
Report reference	CWPRS, Pune Technical Report number 5254 (Modified), February 2015				

32.3.3 Bursar Project, Jammu & Kashmir

A presentation on the study report was made by the project authorities. The project authorities have also presented the MEQ studies and informed that LET studies are under progress and the same will be submitted after its completion.

After brief deliberation, the Committee accorded approval to the study report of Bursar Project, Jammu & Kashmir subject to submission of the final report of MEQ/LET studies by July, 2018. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

Max. Credible Earthquake	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)	8	Total duration (second)	42		
Report reference	IIT Roorkee Report [EQ 2016-14 (M); Project no. 6015/14-15; March,2016 (Modified)]				

32.3.4 Kirthai-II Hydro Electric Project, Jammu & Kashmir

The study has been carried out by CWPRS, Pune. A presentation on the study report was made by the project authorities.

During discussion, the representatives of IIT Roorkee mentioned that PGA values obtained for Kirthai-II HE Project are on higher side as compared to Kirthai-I HE Project as both the sites are situated only 13 km away. The PGA values obtained for Kirtahi-II HE Project are 0.56g for horizontal and 0.41g for vertical component for MCE condition whereas the PGA values obtained for Kirtai-I HE Project are 0.48g for horizontal and 0.32g for vertical component for MCE condition. The study report of the Kirthai-I H E project had already been approved in the last meeting of NCSDP. In response, representatives of CWPRS, Pune clarified that these studies are site-specific and depends on several other parameters such as Vs30, type of geology, Hanging wall/foot wall etc. The study was deliberated and it was suggested by the Committee to have a look on other projects carried out in the same region on either side of MCT in vicinity of these two projects and review the study of Kirthai-II HE Project accordingly. Further, it was requested from IIT Roorkee to provide the requisite details of other approved

projects in the vicinity of the project carried out by them and IIT Roorkee agreed for the same. Accordingly, it was decided that CWPRS will review the study report and apprise the Committee in the next meeting for consideration. Further, the project authorities were also suggested to carry out MEQ studies as the dam height is 121 m.

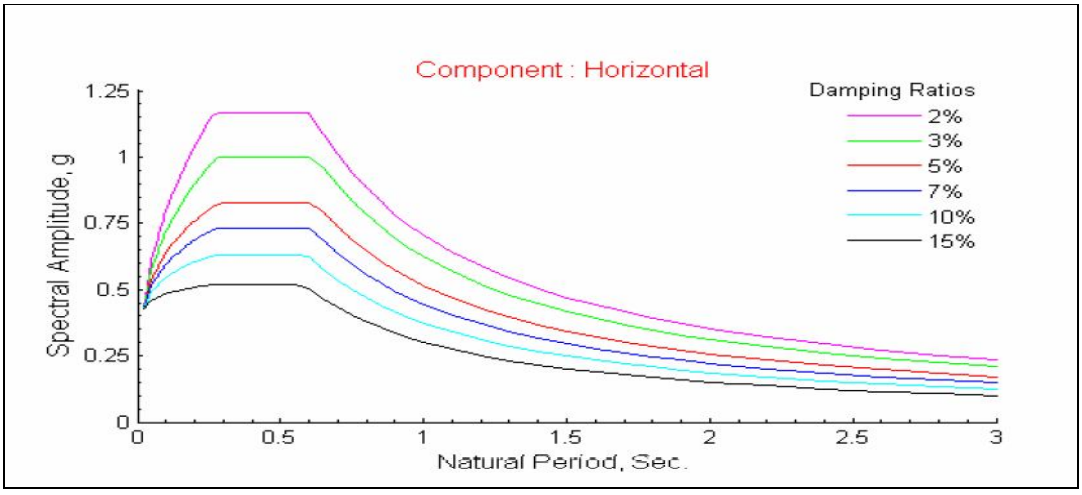
After brief deliberation, the Committee decided that CWPRS, Pune will review the study report of Kirthai-II HEP vis-à-vis Kirthai-I HEP and other projects in the vicinity. The project will be considered in the next meeting accordingly.

32.3.5 Naitwar Mori Hydro Electric Project, Uttarakhand

A presentation on the study report was made by the project authorities. During the discussion, it was mentioned that the design response spectra should be modified as discussed under item 32.3.1 above. Accordingly, CWPRS, Pune has supplied the modified design response spectra alongwith modified report vide their letter dated 17.08.2017 ***(Annexure-II).***

After brief deliberation, the Committee accorded approval to the study report of Naitwar Mori Hydro Electric Project, Uttarakhand incorporating the modified design response spectra. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra (DBE-H for River Bed)



(b) Other seismic parameters

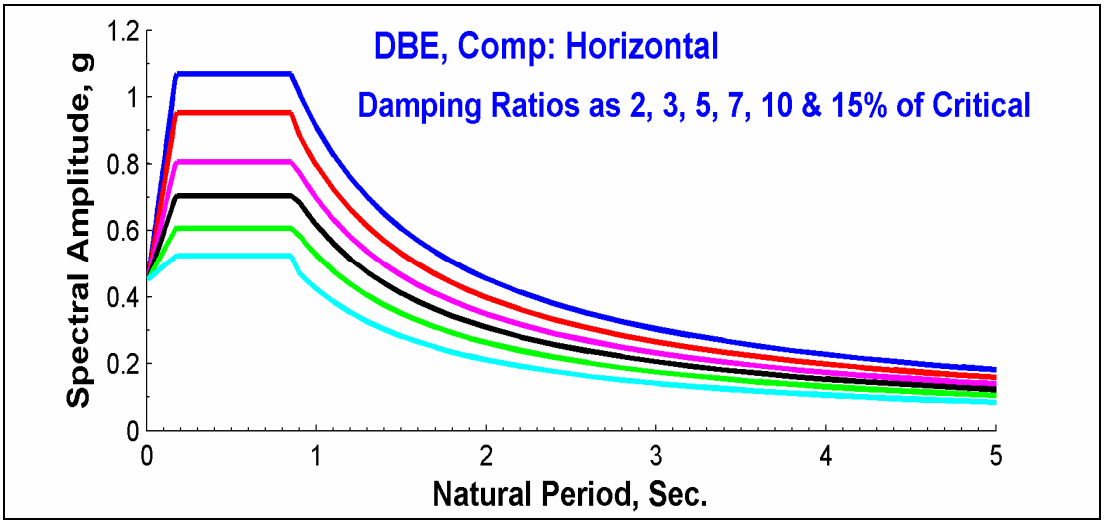
Max. Credible Earthquake	8.0	Closest distance to fault rupture plane (R_{jb}) (km)		5	
Horizontal seismic co-efficient (α_h)	0.22	Vertical seismic co-efficient (α_v)	0.15		
Strong motion duration (second)	6(at bed rock level) 9(at river bed level)	Total duration (second)	41(at bed rock level) 47(at river bed level)		
Report reference	CWPRS, Pune Technical Report number 5442 (Modified), November 2016				

32.3.6 Nafra Hydro Electric Project, Arunachal Pradesh

A presentation on the study report was made by the project authorities. The issue of carrying out the studies of the Project by the Individuals was discussed in detail before start of the meeting and decision taken is explained under item no.32.3 above. Further, the design response spectra also need to be modified as discussed under item no 32.3.1 above. Accordingly, the project authorities vide their letter no. SEL/NHEP/T/2017/372 dated 17.07.2017 (***Annexure-III)*** have submitted the modified design response spectra and a copy of the updated report have also been supplied.

After brief deliberation, the Committee accorded approval to the study report of Nafra Hydro Electric Project, Arunachal Pradesh incorporating the modified design response spectra. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

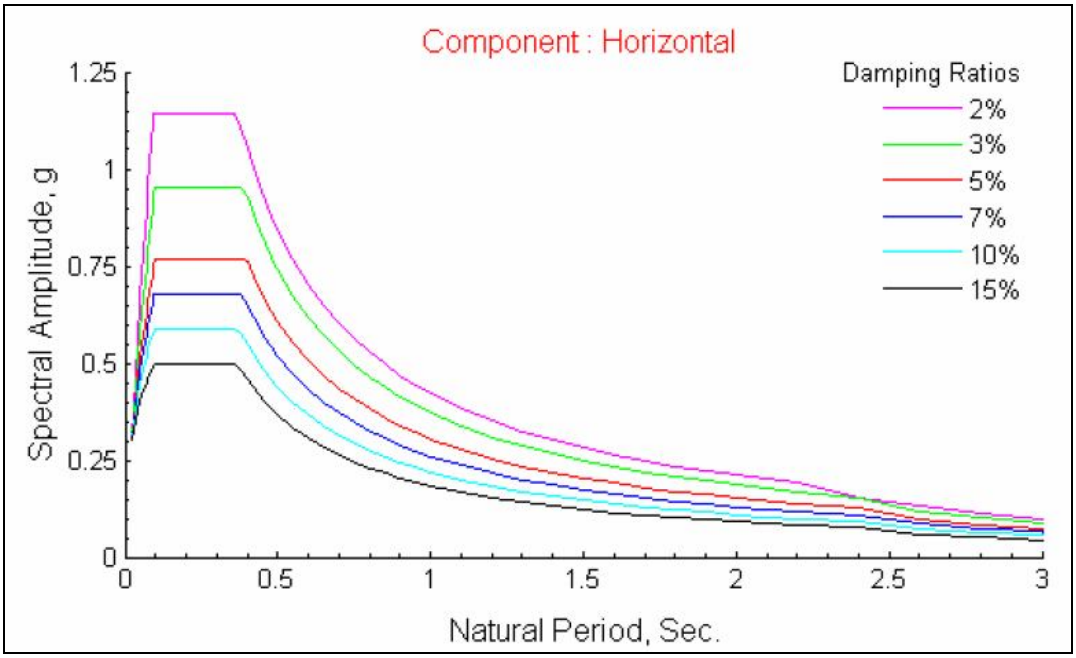
Max. Credible Earthquake	8.0		Closest distance from fault rupture plane (km)	15.7	
Horizontal seismic co-efficient (α_h)	0.24		Vertical seismic co-efficient (α_v)	0.16	
Strong motion duration (second)	13		Total duration (second)	75	
Report reference	Dr. I.D. Gupta Ex Director, CWPRS, Pune Technical Report number Nil (June 2016)				

32.3.7 Kulsi Multipurpose Project, Assam

A presentation on the study report was made by the project authorities. During the discussion, it was mentioned that the design response spectra should be modified as discussed under item 32.3.1 above. Accordingly, CWPRS, Pune has supplied the modified design response spectra alongwith modified report vide their letter dated 17.08.2017 ***(Annexure-II).***

After brief deliberation, the Committee accorded approval to the study report of Kulsi Multipurpose Project, Assam incorporating the modified design response spectra. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra (DBE-H)



(b) Other seismic parameters

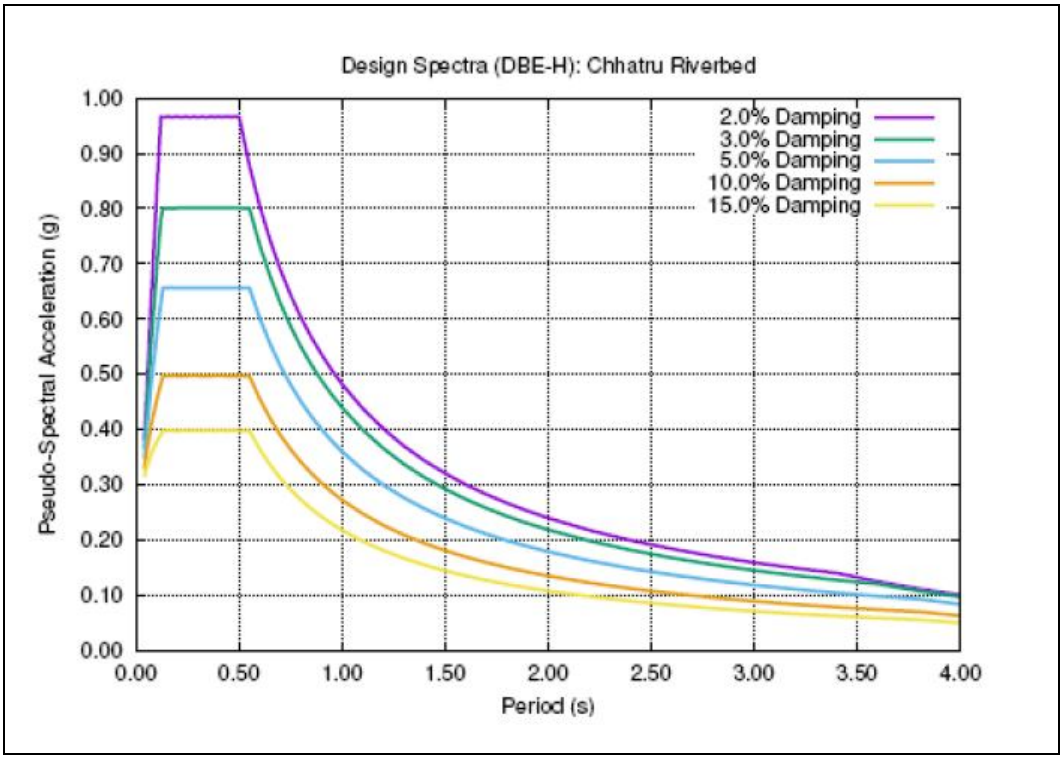
Max. Credible Earthquake	8.2	Closest distance from fault rupture plane (km)		22
Horizontal seismic co-efficient (α_h)		0.24	Vertical seismic co-efficient (α_v)	0.16
Strong motion duration (second)		7	Total duration (second)	43
Report reference	CWPRS, Pune Technical Report number 5113 (Modified), November 2013			

32.3.8 Chhatru Hydro Electric 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 Chhatru Hydro Electric Project, Himachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

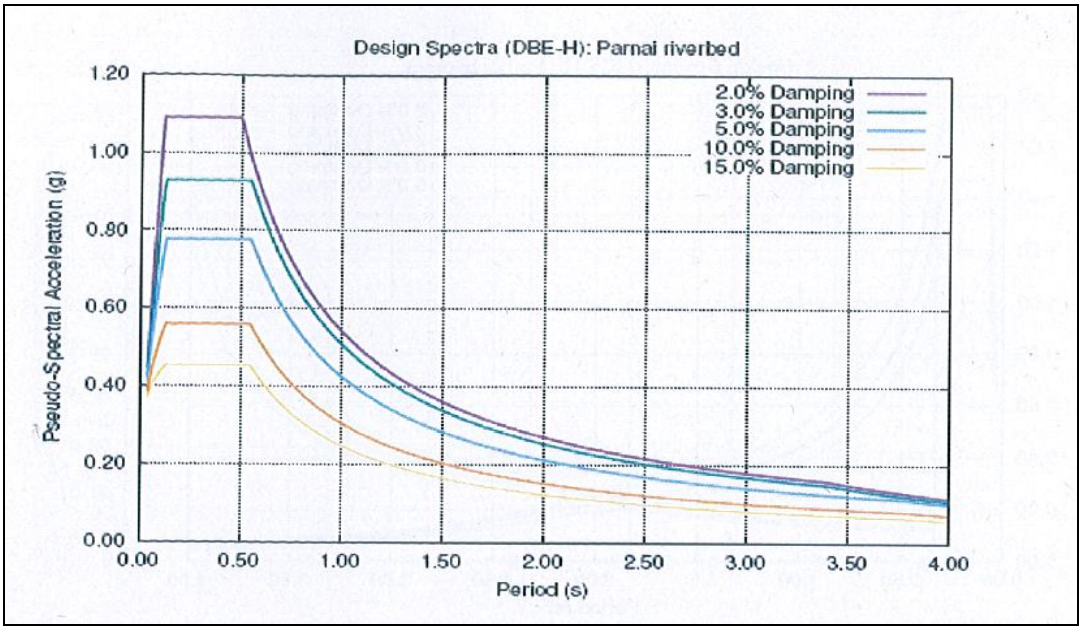
Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)	5	Focal Depth (km)	15
Horizontal seismic co-efficient (α_h)		0.18	Vertical seismic co-efficient (α_v)		0.12
Strong motion duration (second)	11(at bed rock level) 16 (at river bed level)	Total duration (second)	55 (at bed rock level) 80 (at river bed level)		
Report reference	IIT Roorkee Report [EQ 2017-01; Project no. 6010/16-17, January-2017]				

32.3.9 Parnai Hydro Electric Project, Jammu & Kashmir

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

After brief deliberation, the Committee accorded approval to the study report of Parnai Hydro Electric Project, Jammu & Kashmir. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)	5	Focal Depth (km)	15
Horizontal seismic co-efficient (α_h)	0.21		Vertical seismic co-efficient (α_v)		0.14
Strong motion duration (second)	8(at bed rock level) 13 (at river bed level)	Total duration (second)	42(at bed rock level) 66(at river bed level)		
Report reference	IIT Roorkee Report [EQ 2016-06 (M); Project no. 6035/14-15; March-2016 (Modified)]				

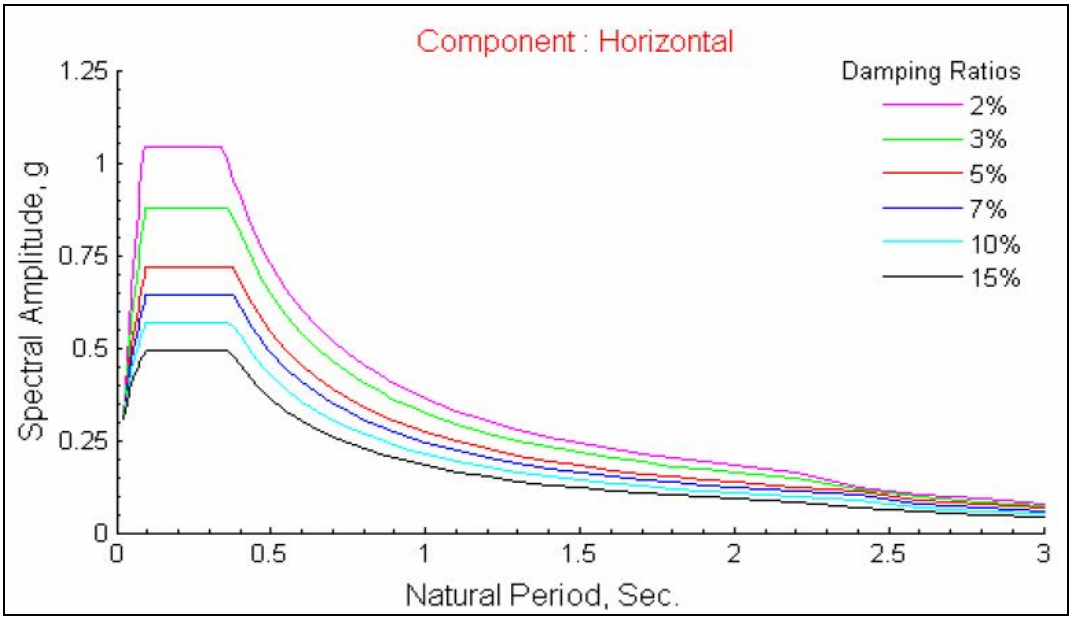
32.3.10 Rupaligad Re-regulating Dam, India-Nepal

A presentation on the study report was made by the project authorities. During the discussion, Dr Yogendra Singh, IIT Roorkee stated that Target Response Spectra for both Pancheshwar and Rupaligad sites are different. In response, Dr G D Naidu, CWPRS Pune clarified that the seismo-tectonic sources governing the Deterministic Target Response Spectra for both Pancheshwar and Rupaligad sites are different. The major contribution to the deterministic spectral amplitudes for both sites is from decollement surface. Considering the dip of decollement surface and the site location of Rupaligad project

(lies south of Pancheshwar), the rupture distance considered for Rupaligad site is slightly lesser than Pancheshwar. Hence the deterministic target response spectra shows slightly higher spectral amplitudes for Rupaligad project. The probabilistic target response spectrum also shows marginally higher spectral amplitudes for the Rupaligad site. Hence the spectral amplitudes of 5% damped target response spectra for Rupaligad sites are at the higher side. The estimated seismic design parameters for both the projects are very much close to each other. Further, it was also mentioned that the design response spectra should be modified as discussed under item 32.3.1 above. Accordingly, CWPRS, Pune has supplied the modified design response spectra alongwith modified report vide their letter dated 17.08.2017 ***(Annexure-II).***

After brief deliberation, the Committee accorded approval to the study report of Rupaligad Re-regulating Dam, India-Nepal incorporating the modified design response spectra. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra (DBE-H)



(b) Other seismic parameters

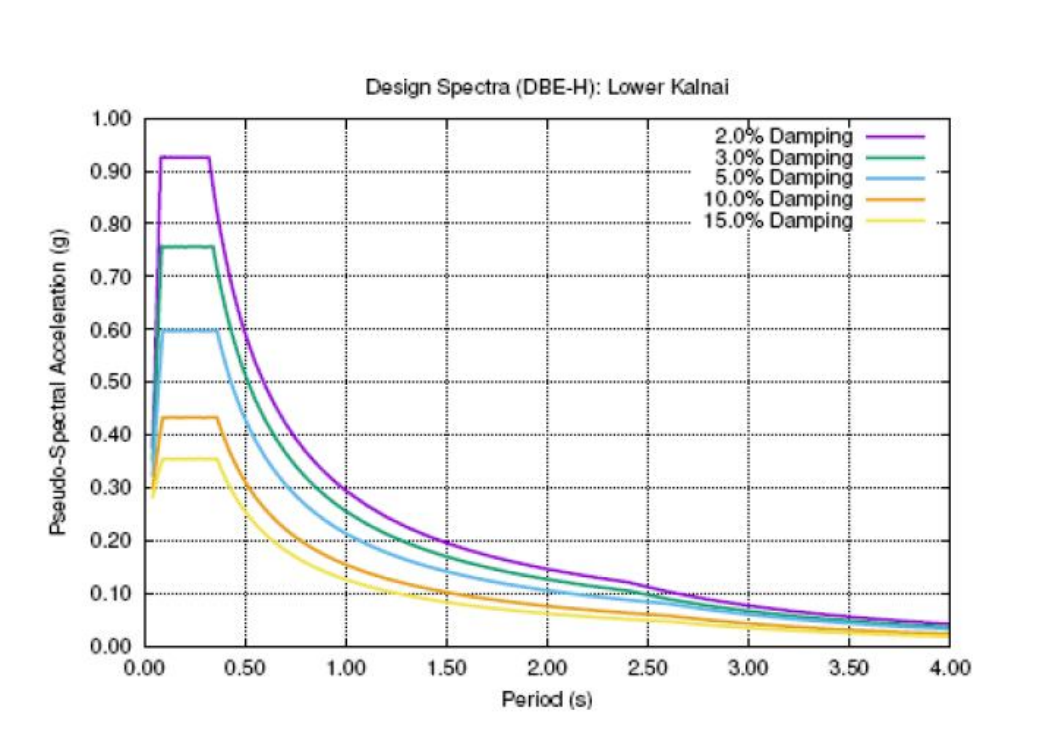
Max. Credible Earthquake	8.0	Closest distance from fault rupture plane (R_{rup}) (km)	17.2	
Horizontal seismic co-efficient (α_h)		0.24	Vertical seismic co-efficient (α_v)	0.16
Strong motion duration (second)		6	Total duration (second)	42
Report reference	CWPRS, Pune Technical Report number 5488 (Modified), April 2017			

32.3.11 Lower Kalnai Hydro Electric Project, Jammu & Kashmir

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

After brief deliberation, the Committee accorded approval to the study report of Lower Kalnai Hydro Electric Project, Jammu & Kashmir. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

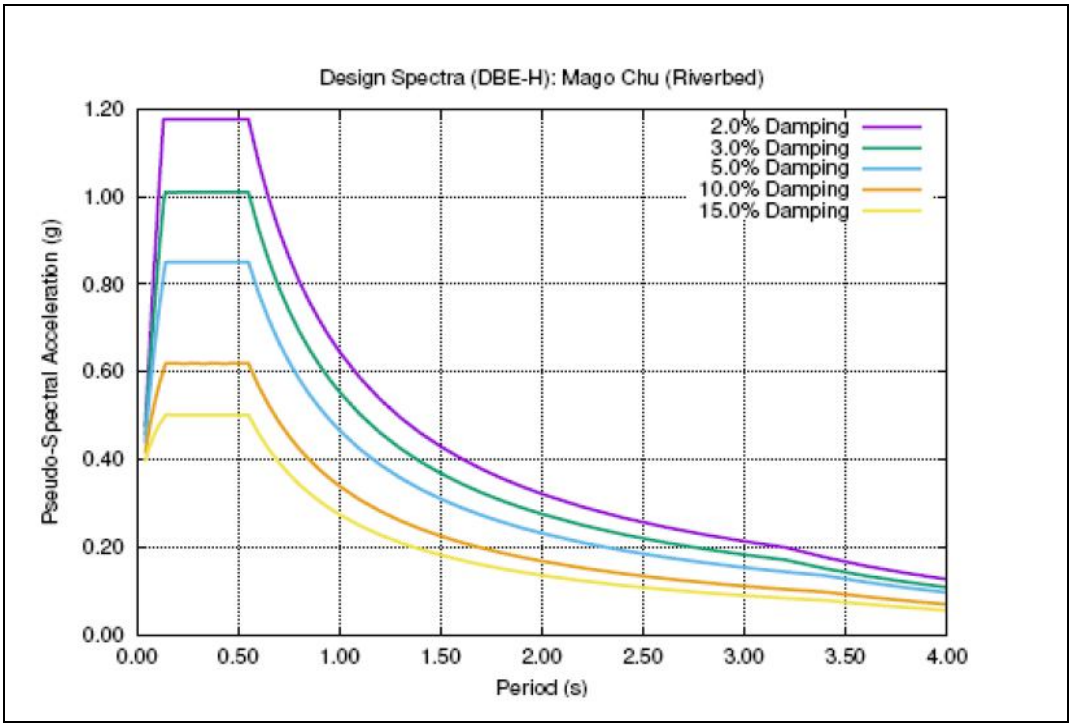
Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)	5	Focal Depth (km)	15
Horizontal seismic co-efficient (α_h)		0.16	Vertical seismic co-efficient (α_v)		0.11
Strong motion duration (second)		11	Total duration (second)		55
Report reference	IIT Roorkee Report [EQ 2016-22; Project no. 6001/15-16 (December, 2016)]				

32.3.12 Mago Chu Hydro Electric 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 Mago Chu Hydro Electric Project, Arunachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

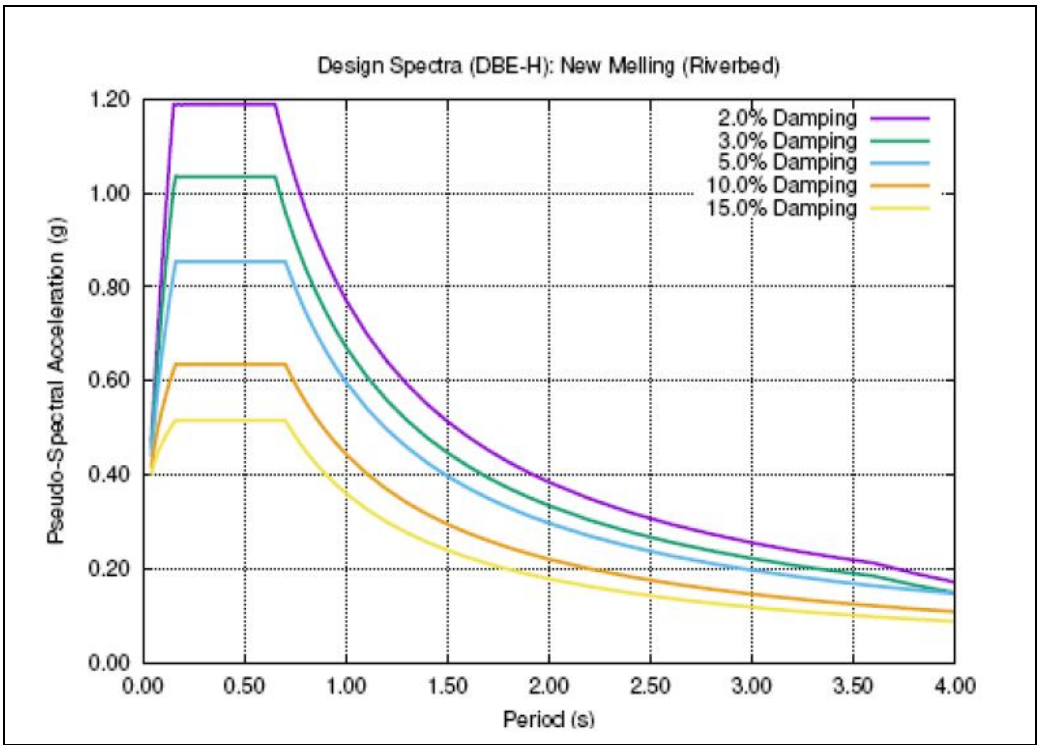
Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)	5	Focal Depth (km)	15
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)	0.16		
Strong motion duration (second)	11(at bed rock level) 16 (at river bed level)	Total duration (second)	55(at bed rock level) 80(at river bed level)		
Report reference	IIT Roorkee Report [EQ 2011-30 (R); Project no. EQD-3002/10-11 & 3007/11-12; April-2017 (Modified)]				

32.3.13 New Melling Hydro Electric Project, Arunachal Pradesh

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

After detailed deliberation, the Committee accorded approval to the study report of New Melling Hydro Electric Project, Arunachal Pradesh. The summarized seismic design parameters of the approved report are as under:

(a) Response Spectra



(b) Other seismic parameters

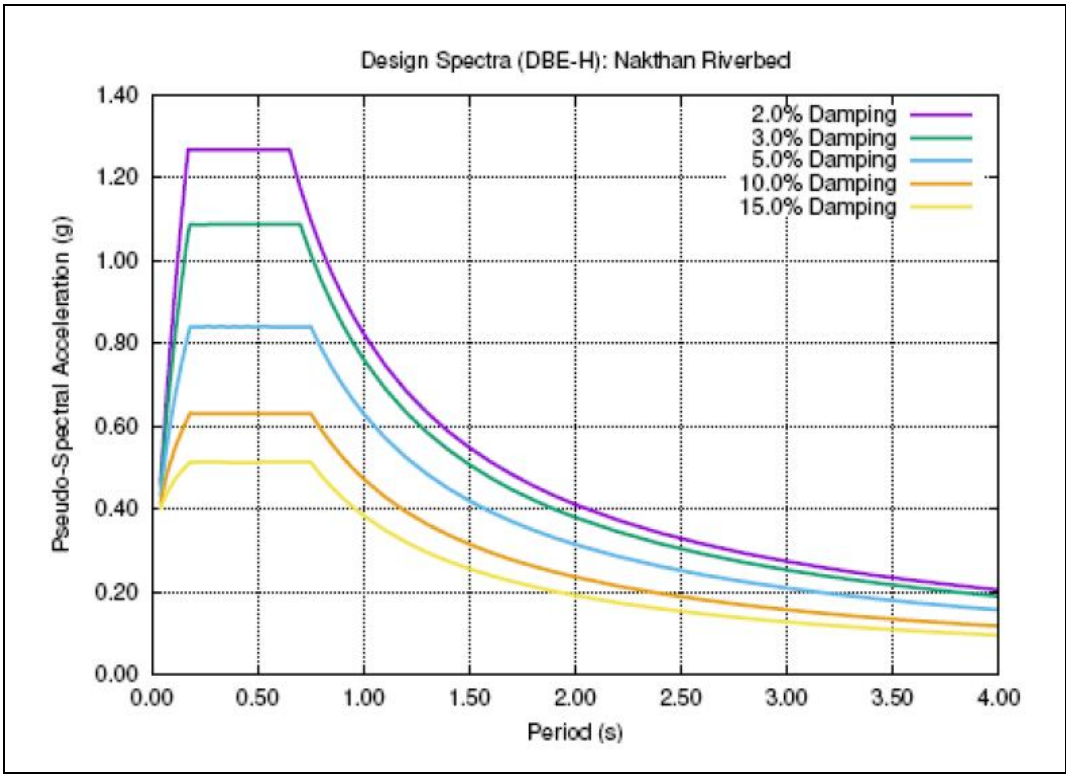
Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)	5	Focal Depth (km)	15
Horizontal seismic co-efficient (α_h)	0.24	Vertical seismic co-efficient (α_v)	0.16		
Strong motion duration (second)	11(at bed rock level) 16 (at river bed level)	Total duration (second)	55(at bed rock level) 80(at river bed level)		
Report reference	IIT Roorkee Report [EQ 2011-27(R); Project no. EQD-3002/10-11 & 3007/11-12 (April-2017)]				

32.3.14 Nakthan Hydro Electric Project, Himachal Pradesh

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

After detailed deliberation, the Committee accorded approval to the study report of Nakthan Hydro Electric 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	8.0	Horizontal distance to surface projection of fault (R_{jb}) (km)	5	Focal Depth (km)	15
Horizontal seismic co-efficient (α_h)	0.23	Vertical seismic co-efficient (α_v)	0.15		
Strong motion duration (second)	11(at bed rock level) 16 (at river bed level)	Total duration (second)	55(at bed rock level) 80(at river bed level)		
Report reference	IIT Roorkee Report [EQ 2014-05 (R3)); Project no. EQD-6021/12-13, March, 2017 (Modified)]				

32.4 Review of NCSDP Guidelines

The Member Secretary informed the Committee that as per decision taken in the last NCSDP meeting, a Sub-Committee has been constituted with the approval of Chairman, NCSDP for review of NCSDP guideline document so as to incorporate new insight/development in the subject matter. It was also informed by the Member Secretary that the first meeting of the Sub-Committee will be held shortly in consultation with the members of the Sub-committee.

The Committee noted above.

32.5 Seismic Hazard Assessment Studies for Dam Rehabilitation Improvement Project (DRIP) dams

The Member Secretary informed the Committee that the work of "Seismic Hazard Assessment for South India region" was awarded to IIT Roorkee by Central Water Commission in March, 2016. Accordingly, IIT Roorkee has taken up the study and submitted an Interim Report to CWC. He also informed the Committee that the Interim Report was presented by the representatives of IIT Roorkee before an Expert Group on 1st May, 2017 and discussions were held in detail for further improvement. He further mentioned that as suggested in the last meeting of NCSDP, a proposal from CWPRS, Pune on "Seismic Hazard Assessment for North and North East India" was received in CWC and the said proposal was also presented by the representatives of CWPRS, Pune in the Expert Group meeting and the same was discussed. In the group meeting various observations/suggestions were made by the members for consideration in finalization of the Seismic Hazard Mapping Studies being carried out by IIT Roorkee and firming up of the proposal of CWPRS, Pune.

The representatives of IIT Roorkee informed the Committee that the observations/suggestions made by the Expert Group members are being considered and the study is under progress and will be completed in time. The representatives from CWPRS also informed the Committee that the proposal on "Seismic Hazard Assessment for North and North East India" is being firmed up as per suggestions of the Expert Group and will be submitted shortly.

The Committee noted above.

****

The meeting ended with vote of thanks to the chair.

****

Central Dam Safety Organisation

National Committee on Seismic Design Parameters (NCSDP)

32nd t Meeting

Summary of the Decisions taken at the Meeting

Date of Meeting:	12.07.2017	Time:	11:00 h to 18:00 h	Venue:	Conference Room, CWC Library Building, R K Puram, New Delhi-66
Present					
Chairperson:	Sh. N.K. Mathur, 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***					

Item no.	Agenda Points / Decision	Responsibility	Achievement/ Progress	Remarks
32.1	Confirmation of the Minutes of the 31st meeting	-	Confirmed	-
32.2	Agenda items carried over from the previous meetings			
32.2.1	Conditionally cleared Projects - Submission of Micro Earthquake (MEQ) study	Concerned project authorities	Discussed and decided	-
32.2.2	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	-
32.3	Projects considered for approval of the Committee			
32.3.1	Tamanthi Hydro Electric Project, Myanmar	-	cleared	-
32.3.2	Goriganga-III A Hydro electric Project, Uttarakhand	-	Cleared	-
32.3.3	Bursar Project, Jammu & Kashmir	Concerned project authorities	Conditional clearance	Final MEQ/LET studies to be submitted by July 2018
32.3.4	Kirthai-II Hydro Electric Project, Jammu & Kashmir	Concerned project authorities/ consultant	To be considered in next meeting	Studies to be reviewed
32.3.5	Naitwar Mori Hydro Electric Project, Uttarakhand	-	cleared	-

Item no.	Agenda Points / Decision	Responsibility	Achievement/ Progress	Remarks
32.3.6	Nafra Hydro Electric Project, Arunachal Pradesh	-	cleared	-
32.3.7	Kulsi Multipurpose Project, Assam	-	Cleared	-
32.3.8	Chhatru Hydro Electric Project, Himachal Pradesh	-	Cleared	-
32.3.9	Parnai Hydro Electric Project, Jammu & Kashmir	-	Cleared	-
32.3.10	Rupaligad Re-regulating dam, India-Nepal	-	Cleared	-
32.3.11	Lower Kalnai Hydro Electric Project, Jammu & Kashmir	-	Cleared	-
32.3.12	Mago Chu Hydro Electric Project, Arunachal Pradesh	-	Cleared	-
32.3.13	New Mailing Hydro Electric Project, Arunachal Pradesh	-	Cleared	-
32.3.14	Nakthan Hydro Electric Project, Himachal Pradesh	-	Cleared	-
30.4	Review of NCSDP Guidelines	Informative	-	-
30.5	Site specific seismic parameters for Dam Rehabilitation Improvement Project (DRIP) dams	Informative	-	-

Annexure -I

32nd Meeting of National Committee on Seismic Design Parameters (NCSDP) on River Valley Projects

List of Participants on 12.07.2017

Sl. No.	Name & Address	Designation	Deptt./Org.	Status/ Representative
I. Committee Members				
1.	Sh. N.K. Mathur	Member (D&R)	CWC, New Delhi	Chairman, NCSDP
2.	Sh. T. K. Sivarajan	Chief Engineer (DSO)	CWC, New Delhi	Member
3.	Dr. Yogendra Singh	Professor & Head, Deptt. of Earthquake Engg.	DEQ, IIT Roorkee,	Member
4.	Dr. G. Suresh	Scientist 'F'	National Centre for Seismology, IMD, New Delhi	Member
5.	Dr. Saibal Ghosh	Director, EPE Division, GSI	GSI, New Delhi	Representative of GSI
6.	Dr. G. D. Naidu	Scientist 'B'	CWPRS, Pune	Representative of CWPRS
7.	Sh. O.P. Gupta	Director, FE&SA	CWC, New Delhi	Member-Secretary NCSDP
II. Special Invitees and other officials				
8.	Dr. M.L. Sharma	Professor	DEQ, IIT Roorkee	IIT Roorkee
9.	Sh. A.S.P. Sinha	Chief Engineer Designs (NW&S)	CWC	CWC
10.	Sh. Saibal Ghosh	Director, CMDD (N&W)	CWC	CWC
11.	Sh. M. Ramesh Kumar	Director, Embankment (N&W)	CWC	CWC
12.	Sh. S. Selvan	Scientist 'B'	CWPRS	CWPRS
13.	Sh. Kuldeep Kumar Singh	Deputy Director, DSM Dte.	CWC	CWC
14.	Sh. A.P. Kandiyal	Dy. Director , FE&SA Directorate	CWC	NCSDP Secretariat
15.	Sh. Satyam Aggarwal	Asst. Director, FE&SA Directorate	CWC	"

III.	**Project Representatives and Consultants**			
16.	Sh. S.L. Kapil	NHPC	NHPC,	Tamanthi Hydro Electric Project, Myanmar
17.	Ms. Pallavi Khanna	-do-	-do-	-do-
18.	Sh. Rajeev Saxena	-do-	-do-	-do-
19.	Dr. Surjeet Singh	Geologist	JKSPDC, J&K	Kirthai-II, HEP, J&K
20.	Sh. Rakesh Sehgal	Additional GM	SJVNL	Naitwar Mori HEP, Uttarakhand
21.	Sh. Om Prakash Thakur	Chief Manager	-do-	-do-
22.	Sh. Narendra Kumar Bhaskar	Deputy Manager	-do-	-do-
23.	Sh. Brijesh Badoni	Deputy Manager	-do-	-do-
24.	Sh. S.L. Kapil	NHPC	NHPC,	Goriganga IIIA Hydro Electric Project, Uttarakhand
25.	Ms. Pallavi Khanna	-do-	-do-	-do-
26.	Sh. Arindam Chakraborty	-do-	-do-	-do-
27.	Sh. Rohit Khanna	-do-	-do-	-do-
28.	Sh. S. B. V. Somoyajulu	SEW	SEW	Nafra HEP, Arunachal Pradesh
29.	Sh. V. R. Sharma	-do-	-do-	-do-
30.	Sh. Amit Srivastava	SMEC	SMEC	-do-
31.	Ms. Nita Arora	-do-	-do-	-do-
32.	Sh. D.J. Bogohain	SE (P)	Brahmaputra Board	Kulsi MPP, Assam
33.	Sh. R. Deka	AEE	-do-	-do-
34..	Sh. S.L. Kapil	NHPC	NHPC,	Bursar Project, J&K
35.	Ms. Pallavi Khanna	-do-	-do-	-do-
36.	Sh. Ajay Mittal	-do-	-do-	-do-
37.	Sh. Shirish Dubey	-do-	-do-	-do-
38.	Sh. Ajay Singh	-do-	-do-	-do-
39.	Sh. P. Mahesh	-do-	-do-	-do-
40.	Sh. Manoj Kumar	DCM, Shriram Infrastructures Limited	DCM, Shriram Infrastructures Limited	Chhatru HEP, Himachal Pradesh
41.	Sh. K.S. Raghav	-do-	-do-	-do-
42.	Sh. Y.P. Sharda	-do-	-do-	-do-
43.	Sh. N.L.N. Murthy	-do-	-do-	-do-
44.	Sh. Alok Kumar Pathak	Consultant	JKSPDC	Parnai HEP, J&K
45.	Dr. Surjeet Singh	Geologist	JKSPDC, J&K	-do-
46.	Sh. Mahakjeet Singh Deol	WAPCOS Ltd.	WAPCOS Ltd.	Rupaligad Re-regulating Dam, India Nepal
47.	Sh. Ashfaque Ahmad Khan	-do-	-do-	-do-
48.	Sh. Chandar Mohan Prasad	-do-	-do-	-do-
49.	Sh. O.P. Chibbar	-do-	-do-	-do-
50.	Sh. S. B. V. Somoyajulu	SEW	SEW	Mago Chu HEP, Arunachal Pradesh
51.	Sh. V. R. Sharma	-do-	-do-	-do-
52.	Sh. Amit Srivastava	SMEC	SMEC	-do-
53.	Ms. Nita Arora	-do-	-do-	-do-
54.	Sh. Alok Kumar Pathak	Consultant	JKSPDC	Lower Kalnai HEP, J&K

55.	Dr. Surjeet Singh	Geologist	JKSPDC, J&K	-do-
56.	Dr. Naksh Raja	JKSPDC	JKSPDC	-do-
57.	Sh. Dhayan Singh Verma	HPPCL	HPPCL	Nakthan HEP, Himachal Pradesh
58.	Sh. Suresh Sharma	-do-	-do-	-do-
59.	Sh. Sharad Bhandral	-do-	-do-	-do-
60.	Sh. Rajesh Guleria	-do-	-do-	-do-
61.	Sh. Mukesh Kumar	-do-	-do-	-do-
62.	Sh. S. B. V. Somoyajulu	SEW	SEW	New Mailing HEP, Arunachal Pradesh
63.	Sh. V. R. Sharma	-do-	-do-	-do-
64.	Sh. Amit Srivastava	SMEC	SMEC	-do-
65.	Ms. Nita Arora	-do-	-do-	-do-

Annexure-II

Government of India
भारत सरकार
Ministry of Water Resources,
River Development & Ganga Rejuvenation
जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय
Central Water and Power Research Station
केन्द्रीय जल और विद्युत अनुसंधान शाला
Khadakwasla, Pune 411 024
खड़कवासला, पुणे - 411 024

Phone : 020-24103425, 24103356
Fax : 020-24381004
e-mail : ghosh_ak@cwprs.gov.in
Web Site: www.cwprs.gov.in
www.mowr.gov.in

No. 324/41/2017-ES/ 674 Date : 17.8.2017

To

Shri. O.P. Gupta
Director, FE&SA Dte, CWC &
Member Secretary NCSDP
Sewa Bhawan, R.K. Puram
New Delhi – 110 066

Sub: Submission of Site-specific Seismic Design Parameters study reports modified with flat Design Response Spectra

Ref: NCSDP letter No.2/2/2017(Vol-I)/FE&SA/204-213 dated 1.06.2017

Sir,

As per the decision taken in the 32nd NCSDP meeting held on 12th July, 2017 to provide flat Design Response Spectra in the Site-specific Seismic Design Parameters study reports, the following technical reports are modified by including flat Design Response Spectra and the soft copies of the same are submitted herewith.

1. Kulsi Multipurpose Project, Assam
2. Naitwar Mori Hydro Electric Project, Uttarakhand
3. Goriganga IIIA Hydroelectric Project Site, Uttarakhand
4. Tamanthi Hydro Electric Project, Myanmar
5. Rupaligarh Re-regulating dam, Nepal/India

Thanking you.

Yours faithfully,

17/08/2017

(A.K.Ghosh)
Scientist 'D'

CC : Soft copy of the Technical Report to respective project authorities

Figures of flat design response spectrum

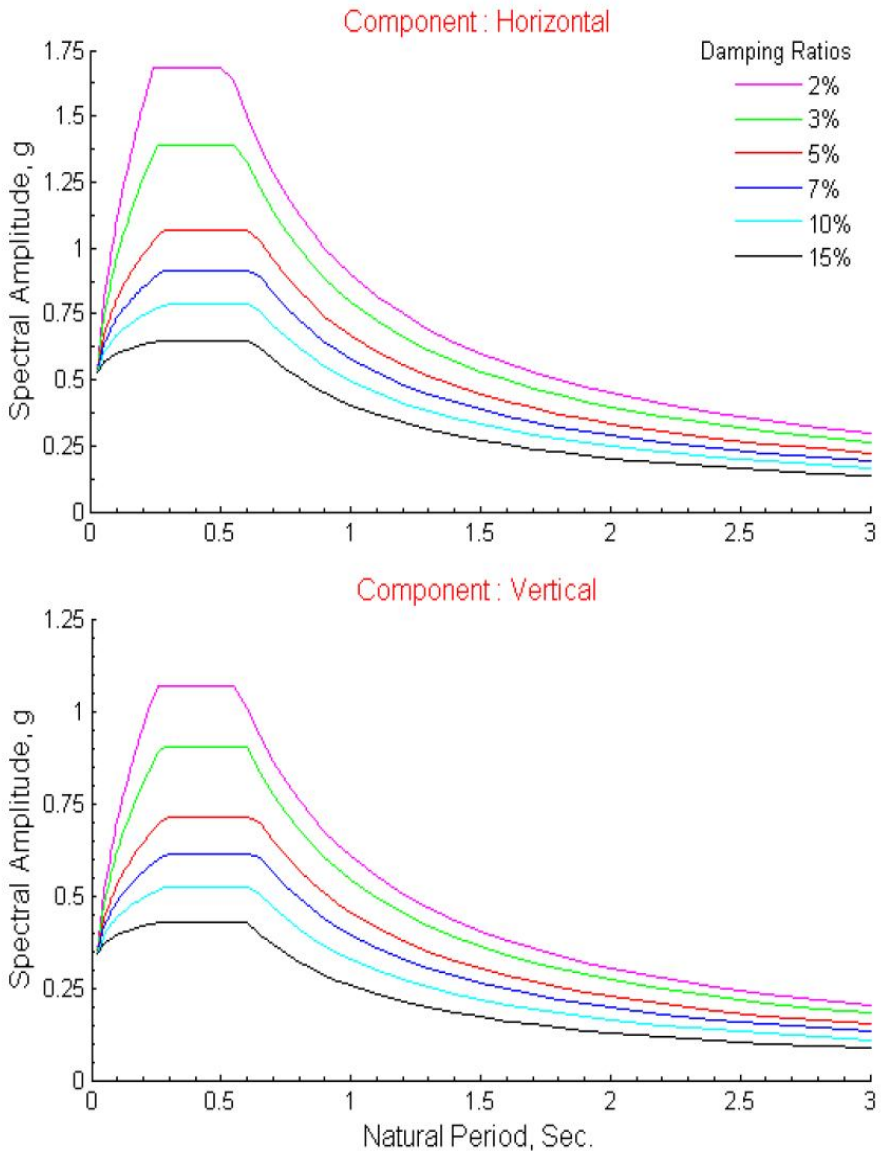


Fig. 12: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion*

1

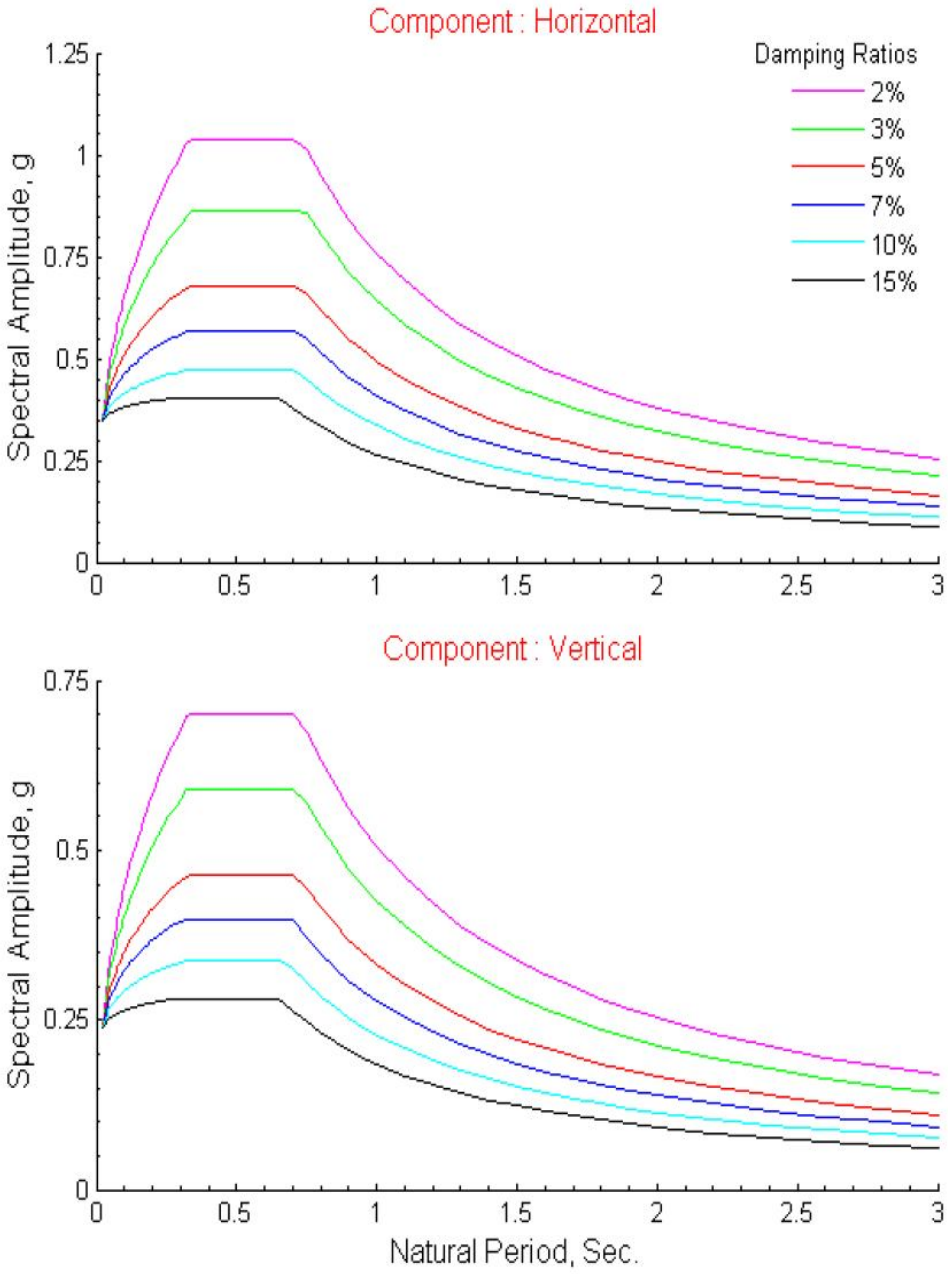


Fig. 15: *DBE level of response spectra with damping ratios 2%, 3%, 5%, 7%, 10% and 15% for horizontal and vertical components of motion.*

2

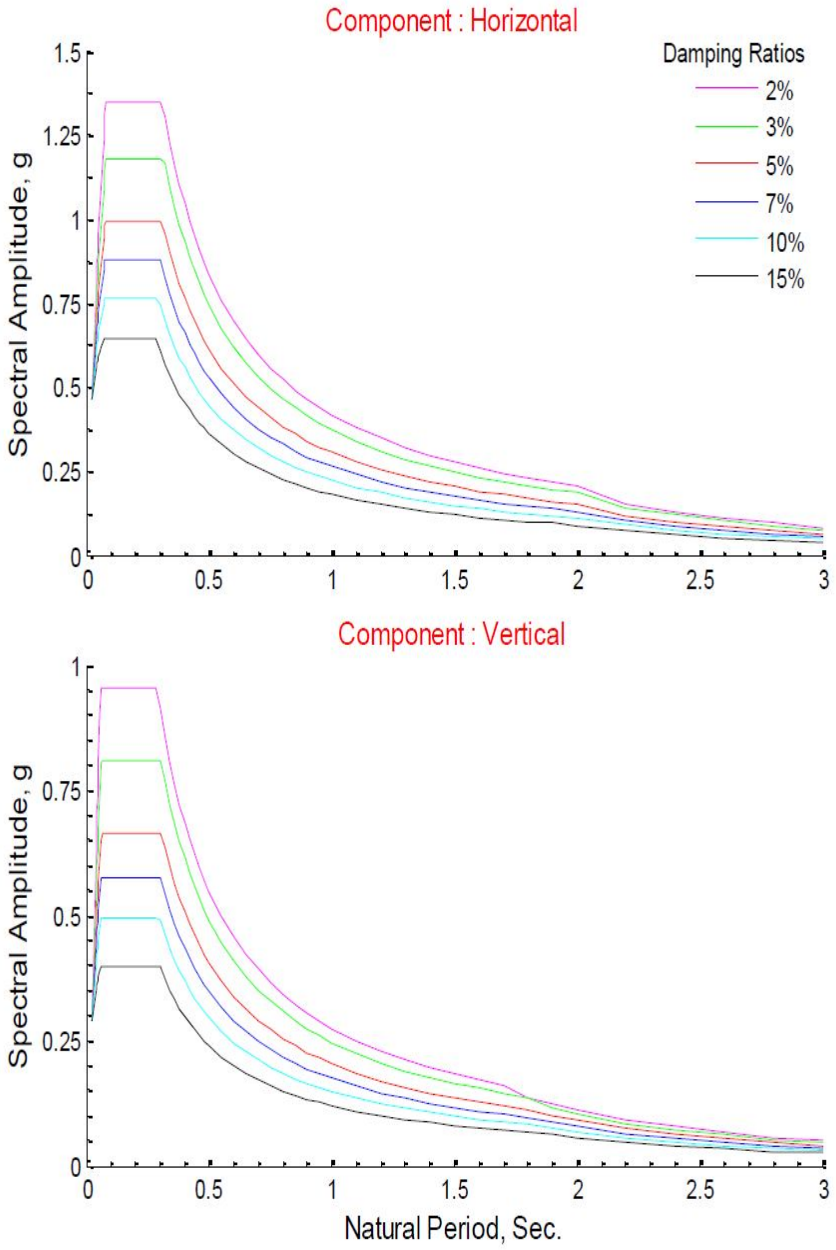


Fig.14. *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion for rock outcrop.*

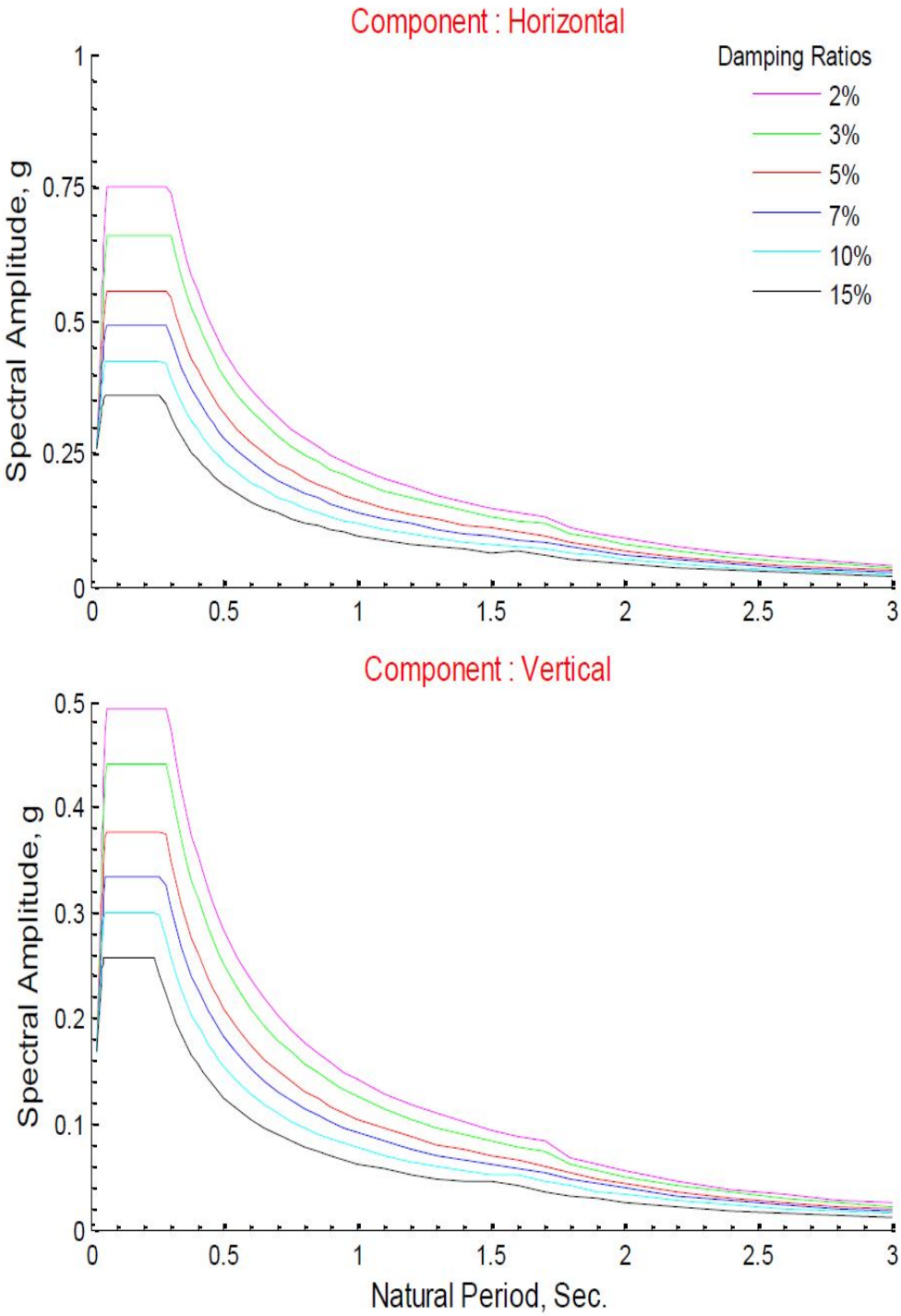


Fig.16. *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the DBE level of accelerograms for horizontal and vertical components of ground motion for rock outcrop.*

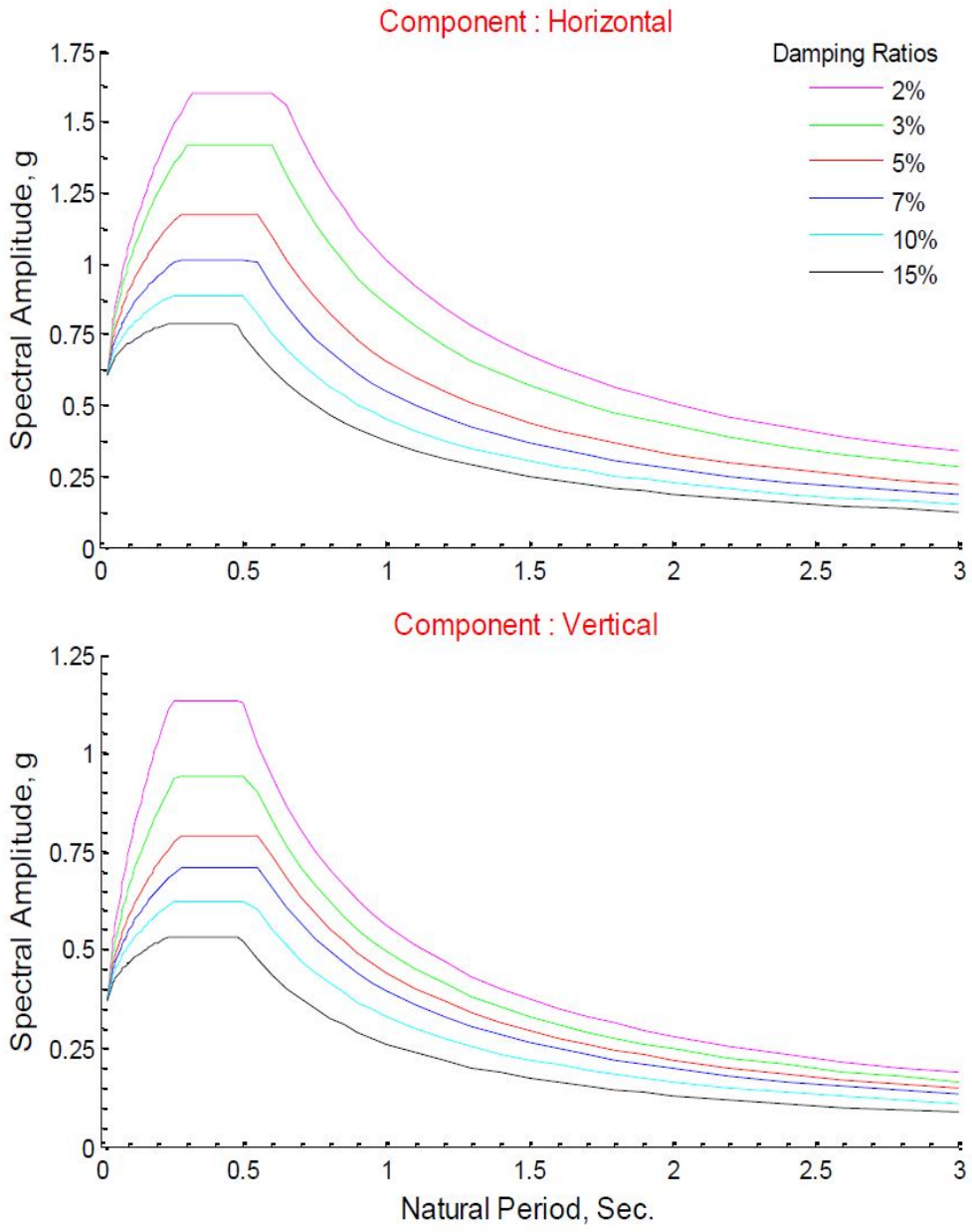


Fig.18. *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion for Riverbed.*

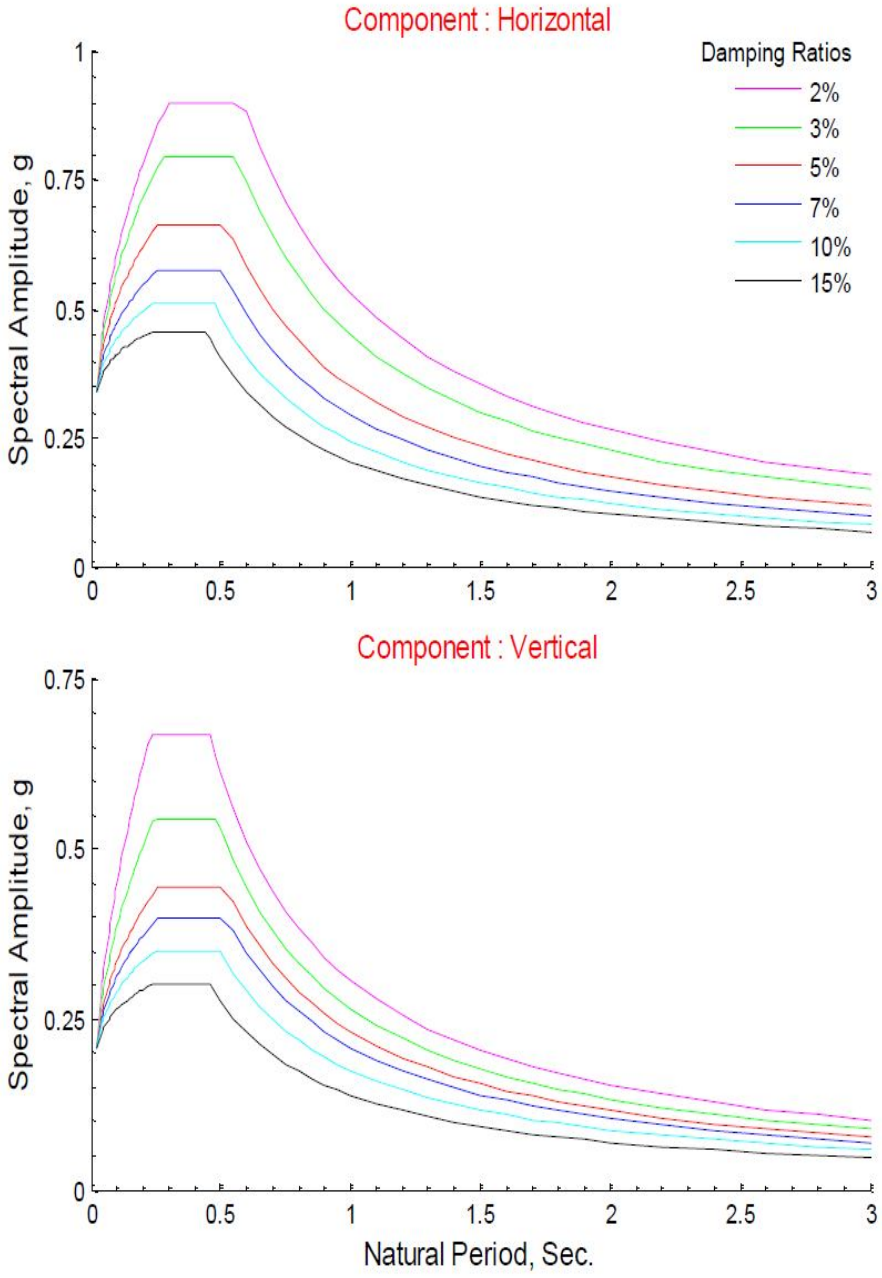


Fig.20. *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the DBE level of accelerograms for horizontal and vertical components of ground motion for Riverbed.*

6

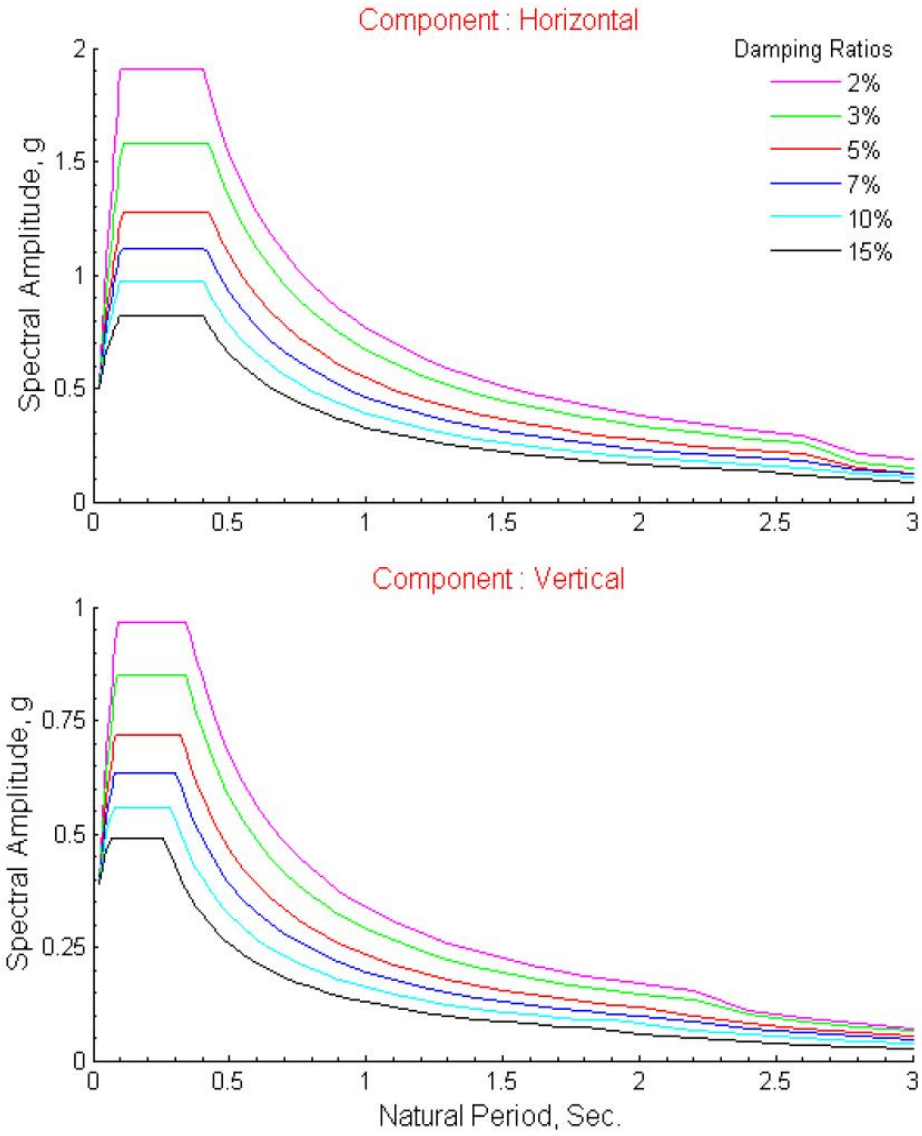


Fig. 12: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion*

7

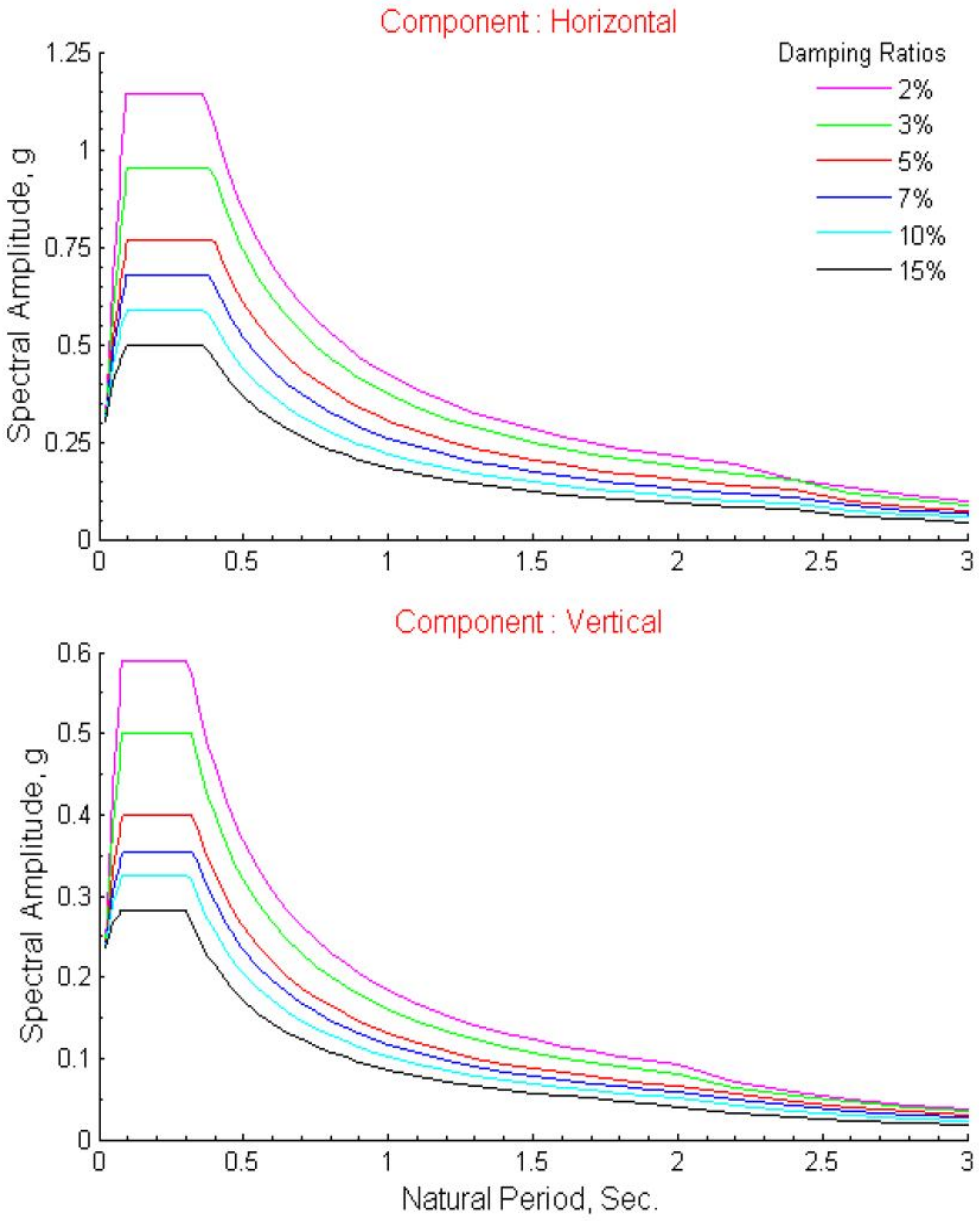


Fig. 15: *DBE level of response spectra with damping ratios 2%, 3%, 5%, 7%, 10% and 15% for horizontal and vertical components of motion.*

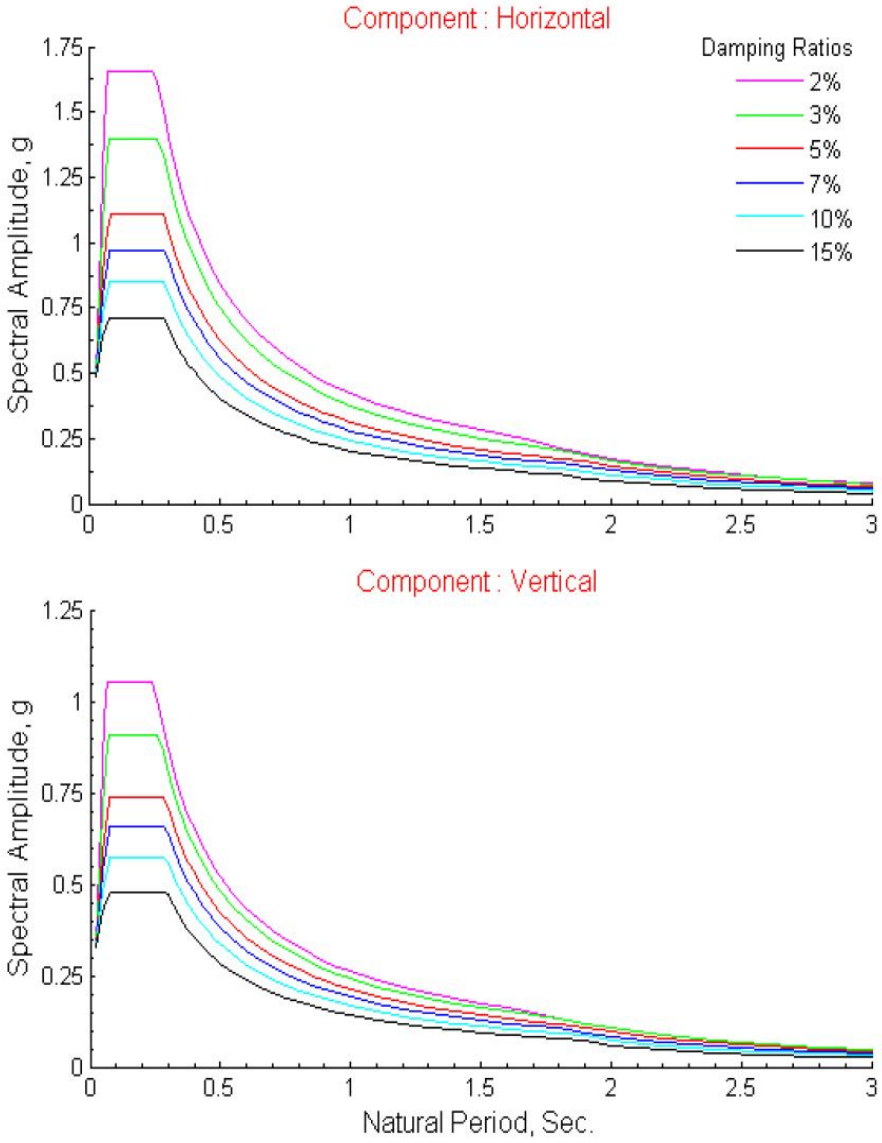


Fig. 13: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion for rock outcrop.*

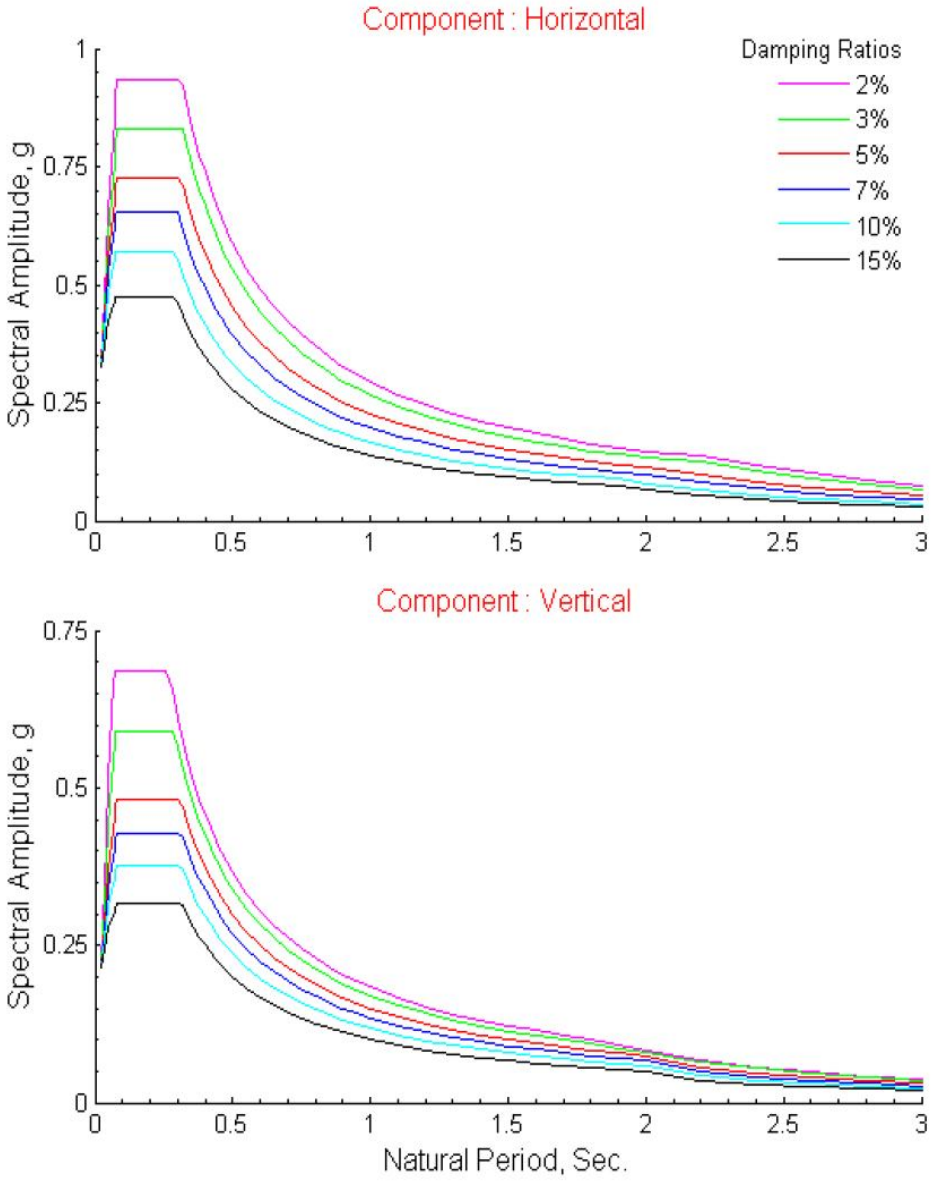


Fig. 15: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15 % critical as computed from the DBE level of accelerograms for horizontal and vertical components of ground motion for rock outcrop level.*

10

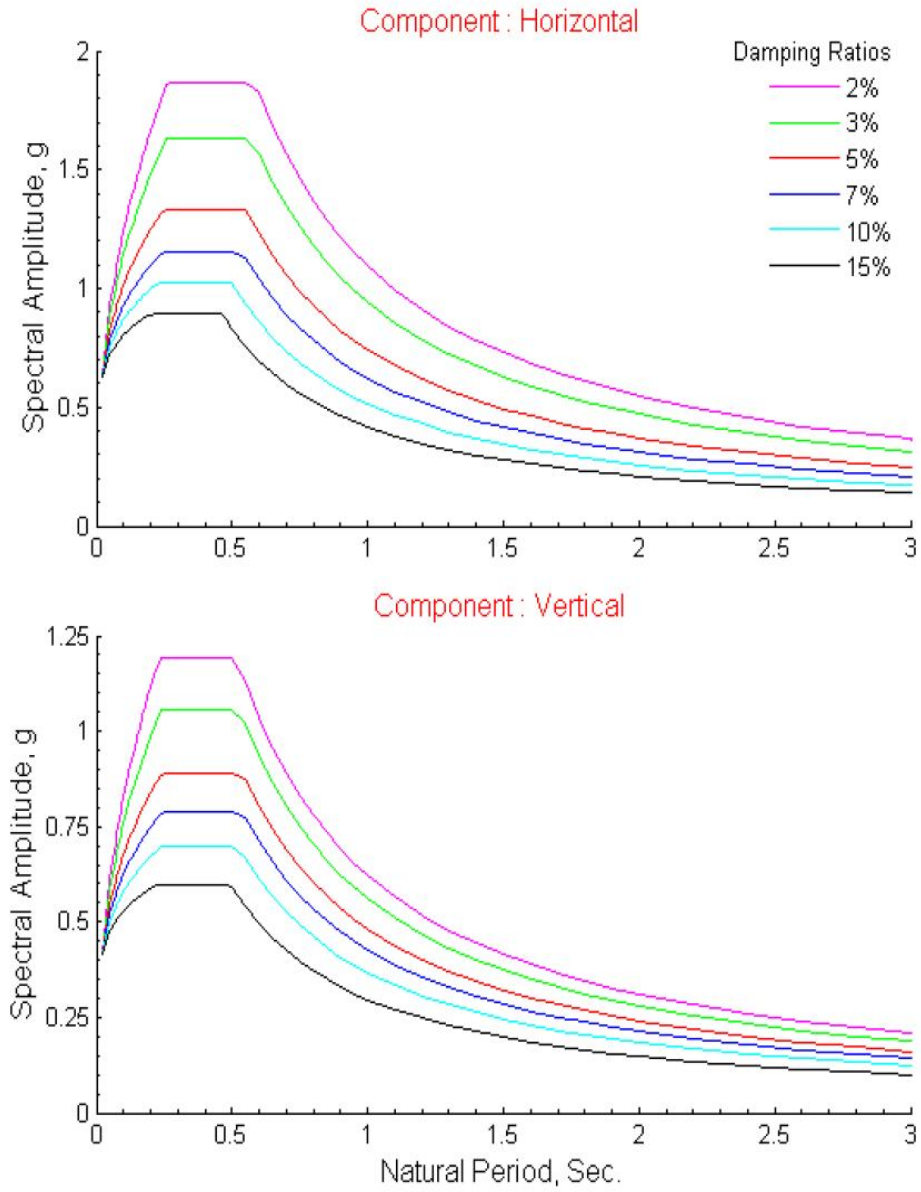


Fig. 18: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion for riverbed level.*

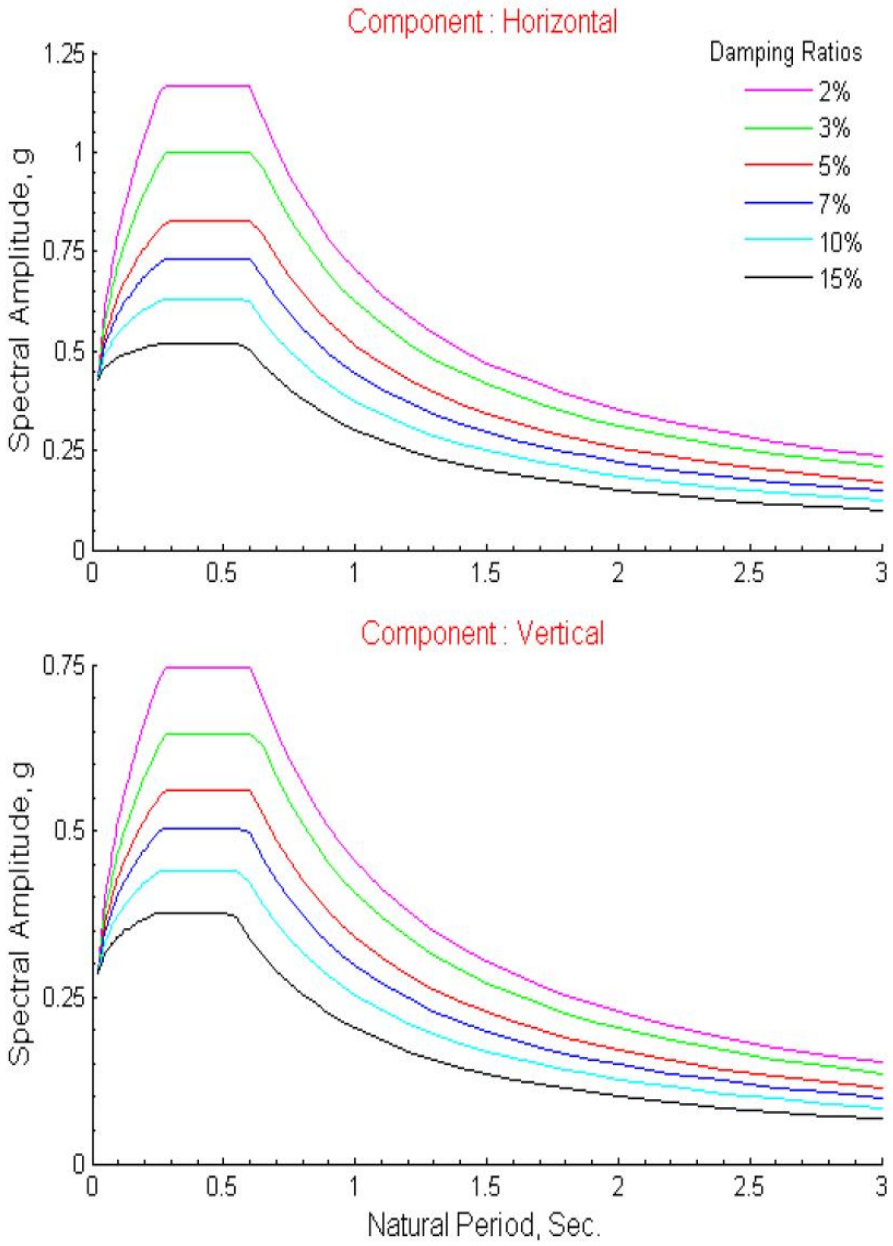


Fig. 19: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the DBE level of accelerograms for horizontal and vertical components of ground motion for river bed level.*

12

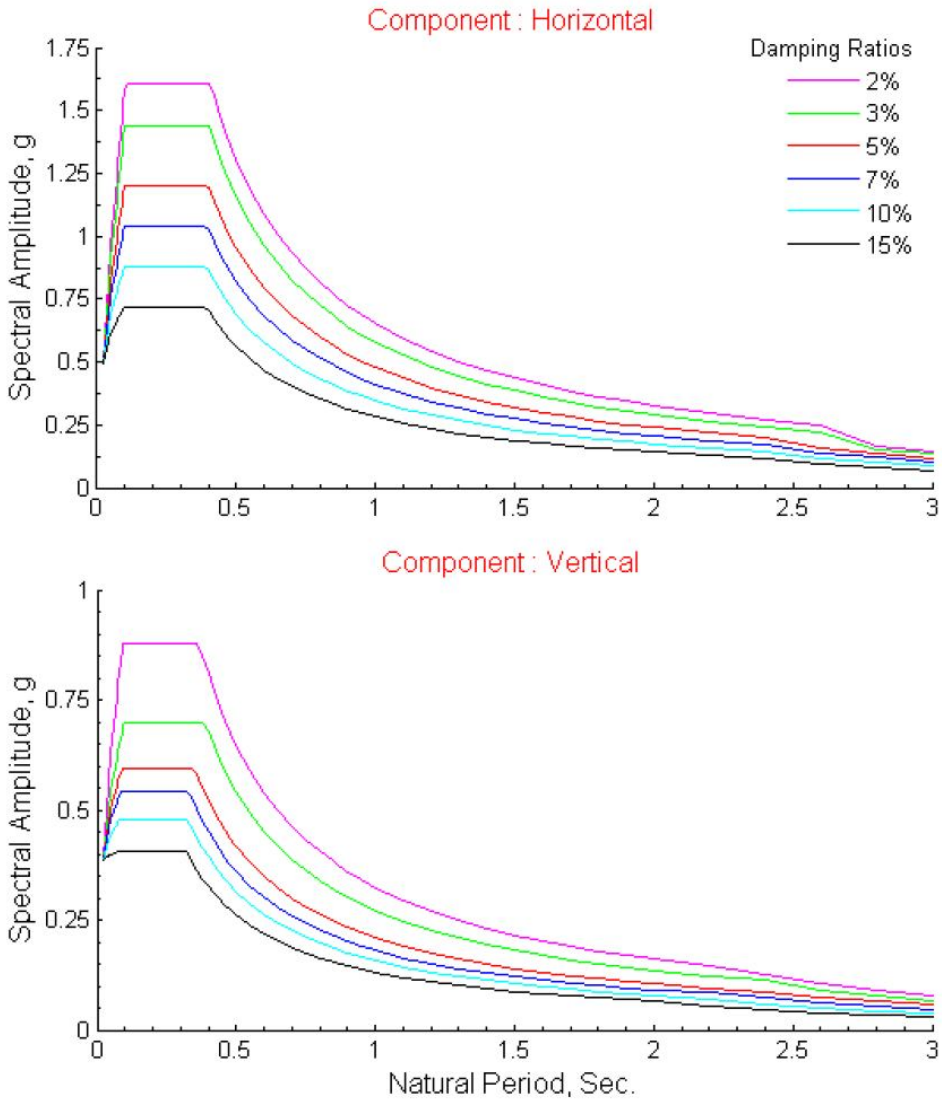


Fig. 12: *The design response spectra with damping ratios of 2%, 3%, 5%, 7%, 10% and 15% critical as computed from the MCE level of accelerograms for horizontal and vertical components of ground motion*

13

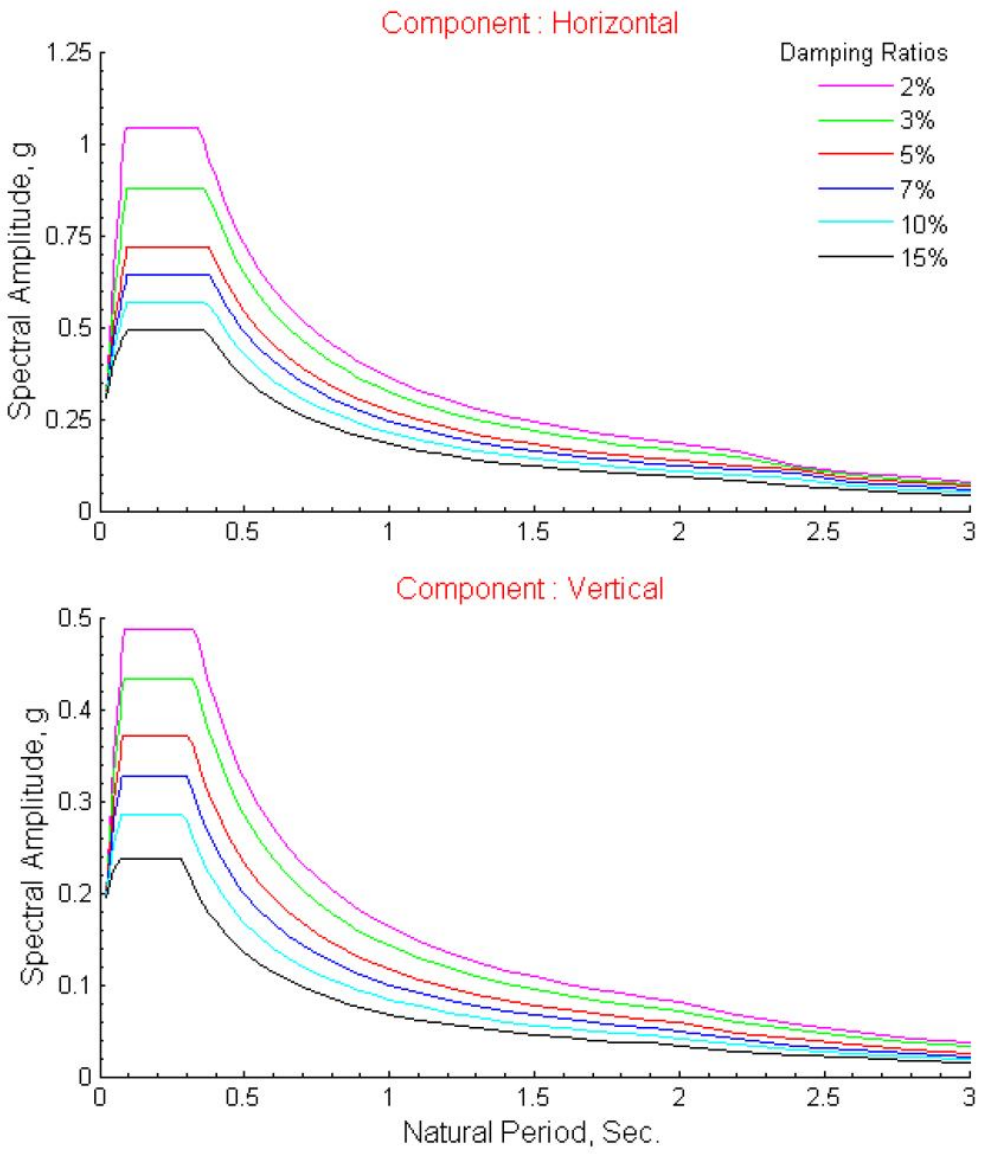


Fig. 15: *DBE level of response spectra with damping ratios 2%, 3%, 5%, 7%, 10% and 15% for horizontal and vertical components of motion.*

14

SEW NAFRA POWER CORPORATION LIMITED

(WOS (s) SPV OF SEW GREEN ENERGY LIMITED) PAN No: AALCS8827R
PROJECT OFFICE: Nafra- 790 001, Dist: West Kamang, Arunachal Pradesh, *INDIA*

L No: SEL/NHEP/T/2017/372 Date: 17.07.2017

To
Shri O.P. Gupta
Director FE&SA and Member Secretary NCSDP,
Central Water Commission,
8th Floor (North), Sewa Bhawan,
R.K.Puram, **NEW DELHI – 110 066**

Sub: - Nafra HEP (2*60 MW), Arunachal Pradesh- submission of site specific seismic studies to NCSDP - reg.
Ref:- Our letter No. SEL/NHEP/T/2016/351 dated 19.12.2016

Sir,

Kind reference is invited to our letter dated 19.12.2016 submitting site specific seismic studies to NCSDP in respect of Nafra HEP (2*60 MW), Arunachal Pradesh.

It is to submit that the Design Response Spectra (Fig.12 at Page 38 of the Site Specific Seismic Study Report) and the Table 6 and 7 (at Page 49-50 and 51-52 of the Report) have been revised in view of the discussions in the recent NCSDP Meeting on 12.7.2017 and submitted herewith for consideration and further needful action please.

BBSSA
.....अनु./Sec./निदे./Dte.
डा. सं./Dy. No. 129
दिनांक/Date 17/08/2017

Thanking you sir

Yours faithfully,

For SEW Nafra Power Corporation Ltd.,

(Y.GANGADHARA RAO)

DIRECTOR

Encl: As above.

16/8

Ll. Kept in 32nd meeting file 17/8/17

R.O.6-3-871, 'SNEHALATHA', Greenlands Road, Begumpet, Hyderabad-500 016, TG, INDIA.
Tel: 91-40-66300000, Fax:91-40-66300001
Email:sewenergy@sewinfrastructure.com,url:www.sewinfrastructure.com

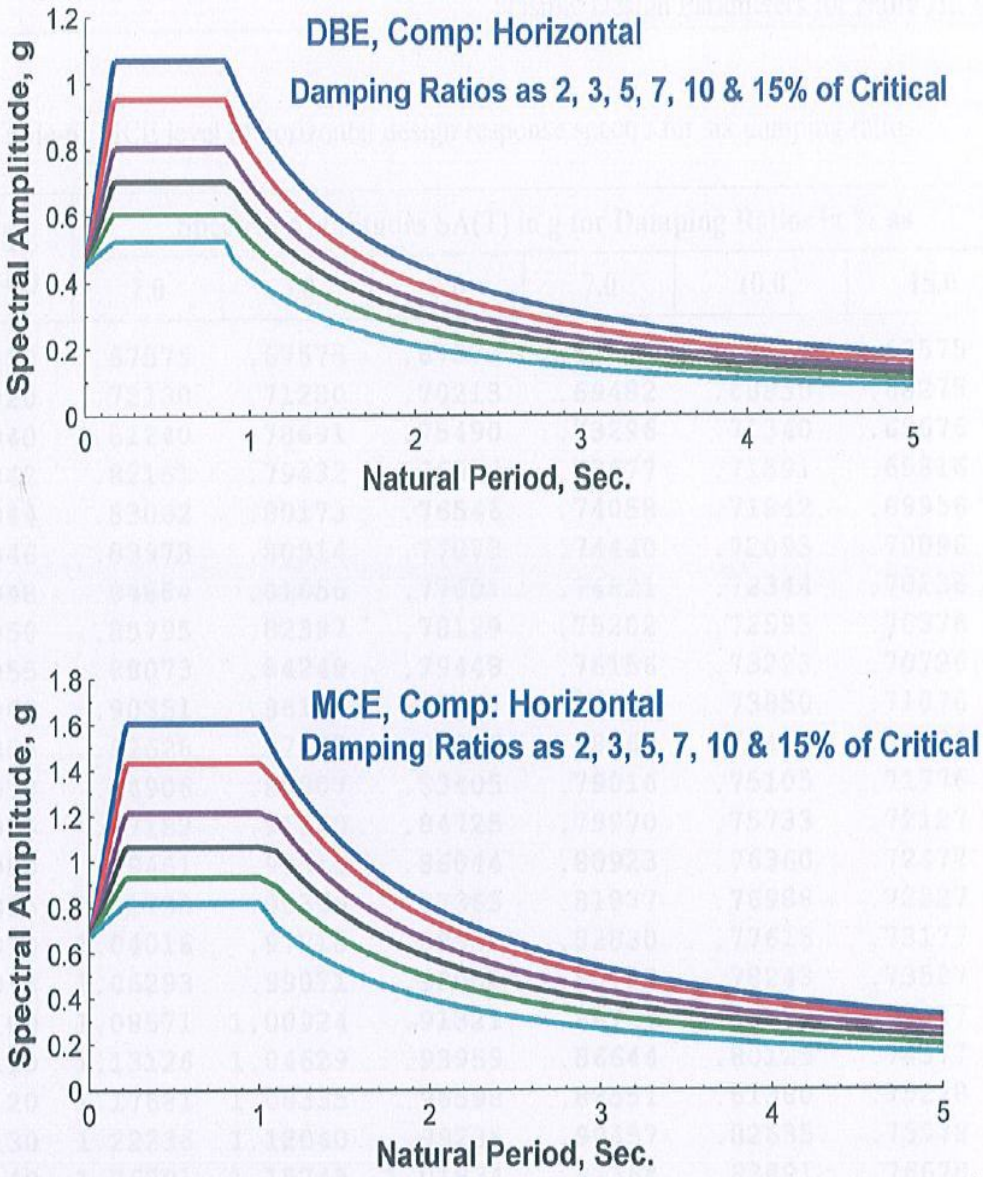


Figure 12: DBE (upper panel) and MCE (lower panel) levels of horizontal design response spectra with damping ratios of 2, 3, 5, 7, 10 & 15 % of critical damping.