



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

**MINUTES  
OF  
33<sup>rd</sup> MEETING  
(25<sup>th</sup> April, 2018)**



**Secretariat**

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

**MINUTES OF THE 33<sup>RD</sup> MEETING OF  
NATIONAL COMMITTEE ON SEISMIC DESIGN PARAMETERS FOR RIVER VALLEY PROJECTS  
HELD ON 25<sup>TH</sup> APRIL, 2018 AT CWC, NEW DELHI**

**GENERAL**

The 33<sup>rd</sup> meeting of the National Committee on Seismic Design Parameters (NCSDP) for River Valley Projects was held on 25<sup>th</sup> April, 2018, at Central Water Commission, New Delhi under the chairmanship of Sh. N.K. Mathur, Member (D&R), CWC. Due to urgent meeting in the Ministry, Sh N K Mathur could not chair the meeting at beginning and joined later on. In his absence, Sh. Gulshan Raj, Chief Engineer (DSO), CWC chaired the meeting. The list of Members, invitees and project representatives who attended the meeting is given at ***Annexure I.***

At the outset, Sh. Gulshan Raj, Chief Engineer (DSO), CWC welcomed the participants and invitees to the meeting. Highlighting the importance of the NCSDP, he briefly summarized the various Agenda items to be considered by the Committee. This was followed by a brief introduction of the participants. Thereafter, Sh O P Gupta, Director (FE&SA), CWC and Member Secretary, NCSDP took up the agenda items for discussion.

**Item 33.1      CONFIRMATION OF THE MINUTES OF THE 32<sup>ND</sup> MEETING**

Member Secretary informed the Committee that the Minutes of the 32<sup>nd</sup> Meeting of NCSDP held on 12<sup>th</sup> July, 2017 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 and as such called for confirmation of the minutes.

**The Committee noted above and confirmed the Minutes of the 32<sup>nd</sup> Meeting as circulated.**

**Item 33.2      AGENDA ITEMS CARRIED OVER FROM PREVIOUS MEETINGS**

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

**33.2.1.1** The Committee was informed that the site specific seismic study report of 15 projects was cleared in the previous meetings subject to submission of report on MEQ studies. In response, the MEQ study report of following four projects have been received from the concerned project authorities:

1. Lakhawar Multipurpose Project, Uttarakhand:
  2. Kwar H E Project, J&K
  3. Bursar Project, J&K
  4. Etalin H E Project, Arunachal Pradesh
- The MEQ Study reports of the three projects namely ***Lakhawar Multipurpose Project, Uttarakhand; Bursar Project, J&K and Etalin H E Project, Arunachal Pradesh*** have been examined and deliberated by the Committee in detail and found to be generally in order. Accordingly, ***it was decided to accept the reports in compliance to the conditional clearance of the site specific seismic study of the respective projects.***
  - The MEQ study report of the **Kwar H E Project, J&K** was also taken up for discussion. Sh Sachin Khupat, CWPRS, Pune made the following observations:
    - (i) Formulae used in for computation of magnitude may be provided along with constants.
    - (ii) As per text and Annexure-II, within 50 km radius of the project site, 83 earthquakes were recorded but fig 30 on page 33 of the report shows 91 recorded events. This may be verified and confirmed.
    - (iii) Further, In Annexure-II, Column 3 (S Phase- P phase) and column 9 (Distance from Kwar station) are not matching. The same may be clarified.

***The Committee after discussion decided that the project authorities shall incorporate all the observations of the Committee and re-submit the updated study report for consideration of the Committee in the next meeting.***

**33.2.1.2** Member Secretary informed the Committee that the site specific seismic study reports of balance 11 projects which were cleared in the previous meetings subject to submission of report on MEQ studies are required to submit the same. Out of these, three (3) project authorities namely of *Thana Plaun HE Project, Himachal Pradesh; Kamala HE Project Arunachal Pradesh and Sankosh H E Project, Bhutan* had requested for extension of time. Three (3) project authorities namely of *Ratle HE Project, J&K; Pauk HE Project, Arunachal Pradesh and Wangchu HE Project, Bhutan* had stated that there were some issues to be resolved before taking up the desired studies. The response from remaining five (5) project authorities namely of *Seli HE Project, Himachal Pradesh; Kirthai-I HE Project, J&K; Bunakha HE Project,*

*Bhutan; Dugar HE Project, Himachal Pradesh and Umngot HE Project, Meghalaya* was yet to be received.

The issue was discussed and keeping the status of project/study in view, ***it was decided that the extension of time for submission of the desired compliance may be given to the 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 Committee also decided that the project authorities who have cited that certain issues to be resolved before taking up the studies and those who have not responded, shall submit their compliance by June, 2019. The Committee members were of the opinion that the concerned project authorities shall resolve their issues as early as possible and complete the desired MEQ studies and submit the same within the stipulated time as above.***

#### **33.2.2 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 in total four projects for which site specific seismic study report was required to be submitted by the concerned project authorities as compliance to the conditional clearance of the DPR. However, only ***Talong Londa H E Project, Arunachal Pradesh*** had submitted the study report and the same had been included in the Agenda of the 33<sup>rd</sup> meeting under Item nos. 33.3.1 for consideration of the Committee. Reports of remaining 3 projects namely *Dibbin H E Project, Arunachal Pradesh, Amochu H E Project, Bhutan and Kolodyne H E Project, Mizoram* were awaited. Out of which *Dibbin H E Project, Arunachal Pradesh* had requested for time extension till ***December, 2018***. The response for other two projects namely *Amochu H E Project, Bhutan and Kolodyne H E Project, Mizoram* was awaited from the concerned project authorities.

The issue was discussed and keeping the status of project/study in view, ***it was decided that extension of time for submission of site specific seismic study report in respect of Dibbin H E Project, Arunachal Pradesh may be given. The Committee was of the view that the project authorities who have not responded, shall submit their compliance by June, 2019.***

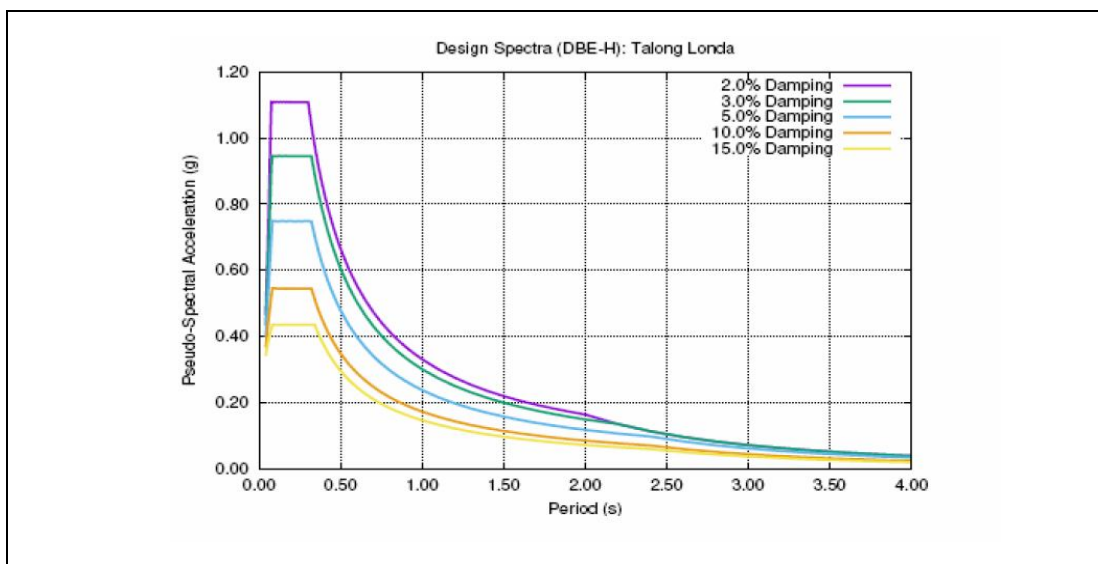
### Item 33.3 PROJECTS CONSIDERED FOR APPROVAL OF THE COMMITTEE

#### 33.3.1 Talong Londa Hydro Electric Project, Arunachal Pradesh

The Member Secretary informed the Committee that the project authorities have submitted the updated copy of the study report incorporating the seismic co-efficient ( $\alpha_h$  &  $\alpha_v$ ) as 0.24 and 0.16 respectively. Accordingly, a presentation on the study report was made by the project authorities. During discussion, Dr Sandip Kumar Som, GSI was of the opinion that Active Fault Mapping should be carried out by the project authorities. The project authorities have agreed that Active fault mapping and MEQ studies for 108.5 m high concrete dam will be taken up shortly and final study report will be submitted by April, 2019. Dr D Srinagesh, NGRI opined that the fault plane being quite close to the dam site, the effect of displacement of fault on dam might also be studied during MEQ study phase. After deliberation, it was decided that in future this aspect should also be flagged in the report so that designer could make suitable changes in the dam design after accounting for the fact. IIT Roorkee clarified that this aspect had already been accounted for in this study.

***After detailed deliberation, the Committee accorded approval to the study report of Talong Londa Hydro Electric Project, Arunachal Pradesh. The Committee also noted that its approval is conditional subject to the submission of MEQ studies and Active Fault Mapping by the project authorities by April, 2019. The summarized seismic design parameters of the approved report are given below:***

##### (a) Response Spectra (DBE-H)



(b) Other seismic parameters

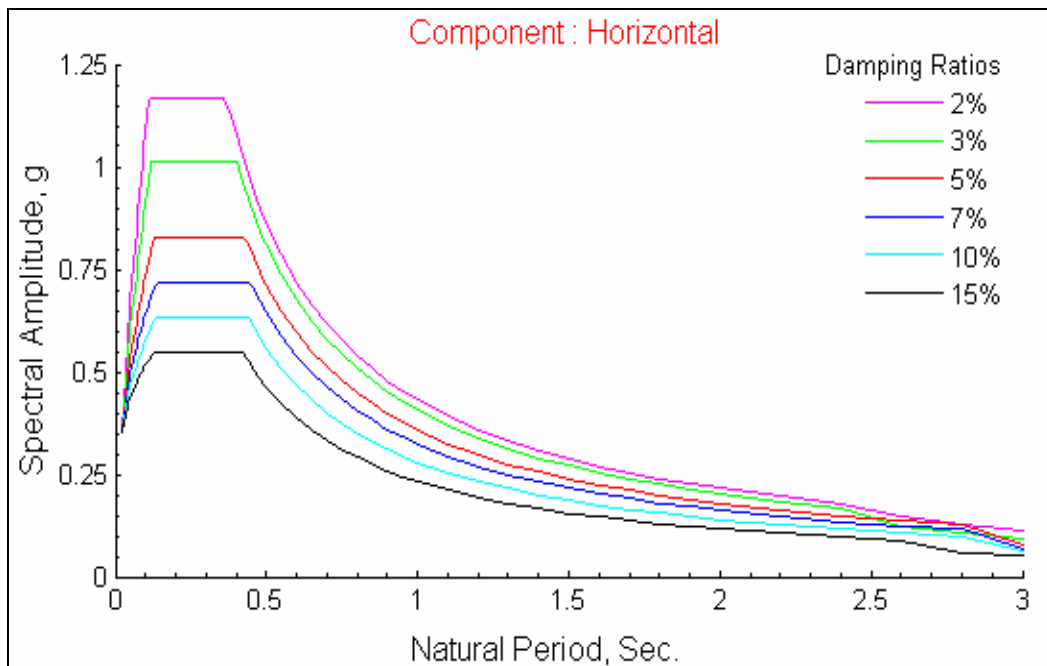
Max. Credible Earthquake	8.0	Horizontal distance to surface projection of fault ( $R_{JB}$ ) (km)	5
Horizontal seismic co-efficient ( $\alpha_h$ )	0.24	Vertical seismic co-efficient ( $\alpha_v$ )	0.16
Strong motion duration (second)	11	Total duration (second)	55
Report reference	IIT Roorkee Report (EQ: 2017-22; Project No. EQD-6019/16-17, November, 2017)		

### 33.3.2 Noa-Dihing Multipurpose 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 Noa-Dihing Multipurpose Project, Arunachal Pradesh. The summarized seismic design parameters of the approved report are as under:***

a. Response Spectra (DBE-H)



(b) Other seismic parameters

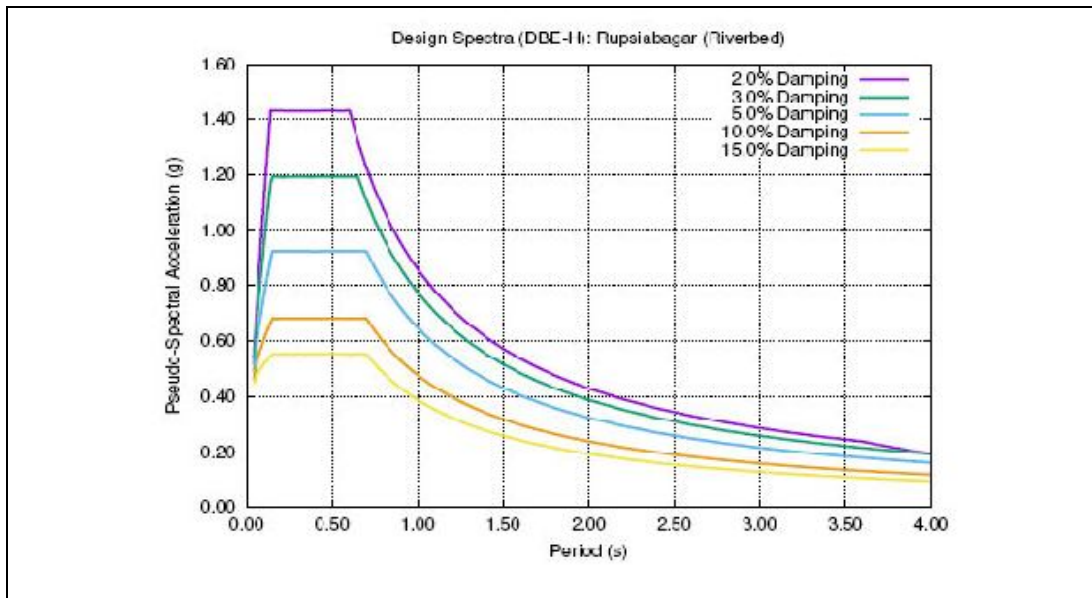
Max. Credible Earthquake Magnitude	8.0	Closest distance from fault rupture plane (km)	21.1
Horizontal seismic co-efficient ( $\alpha_h$ )	0.24	Vertical seismic co-efficient ( $\alpha_v$ )	0.16
Strong motion duration (second)	7	Total duration (second)	43
Report reference	CWPRS, Pune Technical Report number 5114 (November-2013)		

### 33.3.3 Sirkari Bhyol Rupsiabagar Hydro Electric Project, Uttarakhand

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

***After brief deliberation, the Committee accorded approval to the study report of Sirkari Bhyol Rupsiabagar Hydro Electric Project, Uttarakhand. 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 ( $\alpha_h$ )			0.24	Vertical seismic co-efficient ( $\alpha_v$ )		0.16
Strong motion duration (second)		16 (at river bed level)		Total duration		80 (at river bed level)
		11 (at bed rock level)		(second)		55 (at bed rock level)
Report reference	IIT Roorkee Report [EQ: 2017-13; Project No. EQD-6017/16-17; (June-2017)]					

#### **33.3.4 Rho Hydro Electric Project, Arunachal Pradesh**

The site specific seismic study for the project has been carried out by IIT Roorkee. A presentation on the study report was made by the project authorities. During discussion, Dr Sandip Kumar Som, GSI mentioned that the Geological map of the project site appended with the report is not complete. Further, he also mentioned that the Geological map of Arunachal Pradesh also needs to be reviewed as it appears that the map is prepared by any other Agency and not by GSI. He also informed the Committee that Geological maps required for such type of reports are readily available with GSI with out any cost and project authorities should utilized these maps prepared by GSI.

***After brief deliberation, the Committee decided that project authorities should revisit the geological maps appended with the report and updated map shall be made available to IIT Roorkee (consultant) to review the study and suggest the modification, if any. The project authorities shall submit the study report along with updated geological map to the secretariat for consideration of the Committee in its next meeting accordingly.***

#### **33.4 Review of NCSDP Guidelines**

The Member Secretary informed the Committee that a Sub-Committee was constituted with the approval of Chairman, NCSDP for review of NCSDP guidelines so as to incorporate new insight/developments in the subject domain. Accordingly, first meeting of the Sub -Committee was held on 16.03.2018 under the chairmanship of Chief Engineer (DSO), CWC at New Delhi. The minutes of the meeting are placed at ***Annex-C*** of the Agenda papers of this meeting. Member Secretary also requested Members of the Committee to forward their inputs/suggestions at the earliest so that these may be deliberated and finalized in the next Sub-Committee meeting before putting them before the NCSDP Committee in its next meeting.

***The Committee noted the above.***



### **33.5 Seismic Hazard Assessment Studies for Dam Rehabilitation Improvement Project (DRIP) dams**

Members Secretary apprised 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. He informed that IIT Roorkee had submitted an Interim Report to CWC. The Seismic Hazard Assessment Information System (SHAISYS) software being developed as a part of works was demonstrated by IIT Roorkee before an Expert Group on 1<sup>st</sup> May, 2017 and discussions were held in detail for further improvement.

As a follow up of the Expert Group meeting held on 1<sup>st</sup> May, 2017 at CWC, New Delhi, a meeting was held on 16<sup>th</sup> March 2018, at Central Water Commission, New Delhi under the Chairmanship of Sh. N. K. Mathur, Member (D&R), CWC to discuss and review the further progress of development of Seismic Hazard Assessment of South India by IIT Roorkee and another study being done by CWPRS Pune for North and North East India. The minutes of the meeting are placed at **Annex-D** of the Agenda papers of this meeting. Dr M L Sharma, IIT Roorkee briefly stated that progress since the last meeting of 16<sup>th</sup> March, 2018. He stated that most of the observations of CWC have been taken care in the study, which is now on verge of completion. Member Secretary also requested Dr Sharma to submit the completed study including SHAISYS within a week and the same was agreed.

***The Committee noted above.***

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The meeting ended with vote of thanks to the chair.

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# National Committee on Seismic Design Parameters (NCSDP)

## 33<sup>rd</sup> Meeting

### *Summary of the Decisions taken at the Meeting*

Date of Meeting:	25.04.2018	Time: 11:00 h to 16:00 h	Venue: Committee Room, CWC 3 <sup>rd</sup> Floor, Sewa Bhawan, R K Puram, New Delhi-66	
<u>Present</u>				
Chairperson: Sh. N.K. Mathur, Member (D&R), CWC		Member Secretary: Sh. O. P. Gupta Director (FE&SA), CWC		
<u>Other Members and special Invitees, (Name, Designation, Organization):</u>				
A List of participants is placed at <b><i>Annexure-I</i></b>				
Item no.	Agenda Points / Decision	Responsibility	Achievement/ Progress	Remarks
33.1	Confirmation of the Minutes of the 32 <sup>nd</sup> meeting	-	Confirmed	-
33.2	Agenda items carried over from the previous meetings			
33.2.1	Conditionally cleared Projects - Submission of Micro Earthquake (MEQ) study	Concerned project authorities	Discussed and decided	-
33.2.2	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	-
33.3	Projects considered for approval of the Committee			
33.3.1	Talong Londa Hydro Electric Project, Arunachal Pradesh	Concerned project authorities	Conditional clearance	Final MEQ studies and Active Fault Mapping to be submitted by April, 2019
33.3.2	Noa-Dihing Multipurpose Project , Arunachal Pradesh	-	Cleared	-
33.3.3	Sirkari Bhyol Rupsiabagar Hydro Electric Project, Uttarakhand	-	Cleared	-
33.3.4	Rho Hydro Electric Project, Arunachal Pradesh	Concerned project authorities/ consultant	To be considered in next meeting	Geological maps to be reviewed
33.4	Review of NCSDP Guidelines	Informative	-	-
33.5	Seismic Hazard Assessment studies for Dam Rehabilitation Improvement Project (DRIP) dams	Informative	-	-

**33<sup>rd</sup> Meeting of National Committee on Seismic Design Parameters (NCSDP)  
on River Valley Projects**

**List of Participants on 25.04.2018**

Sl. No.	Name & Address	Designation	Deptt./Org.	Status/ Representative
<b>I. Committee Members</b>				
1.	Sh. N.K. Mathur	Member (D&R)	CWC, New Delhi	Chairman, NCSDP
2.	Sh. Gulsan raj	Chief Engineer (DSO)	CWC, New Delhi	Member
3.	Dr D Srinagesh	Head, Seismology Observatory, Chief Scientist	NGRI, Hyderabad	Member
4.	Dr. Yogendra Singh	Professor & Head, Deptt. of Earthquake Engg.	DEQ, IIT Roorkee,	Member
5.	Dr. Sandip Kumar Som	Director, Geodynamics, GSI	GSI, New Delhi	Representative of GSI
6.	Sh K V Prasad	Director, PMKSY	CWC, New Delhi	Representing Commissioner (SPR), MoWR, RD & GR
7.	Sh. Neeraj Gurjar	Superintending Surveyor	Survey of India	Representing Survey of India
8.	Dr. Suman Sinha	Scientist 'B'	CWPRS, Pune	Representative of CWPRS
9.	Sh. O.P. Gupta	Director, FE&SA	CWC, New Delhi	Member- Secretary NCSDP
<b>II. Special Invitees and other officials</b>				
10.	Sh. A.S.P. Sinha	Chief Engineer Designs (NW&S)	CWC, New Delhi	CWC
11.	Sh SK Sibal	Chief Engineer Designs (N& W)	CWC, New Delhi	CWC
12.	Sh. T. K. Sivarajan	Chief Engineer Designs (E&NE)	CWC, New Delhi	
13.	Dr. M.L. Sharma	Professor	DEQ, IIT Roorkee	IIT Roorkee
14.	Dr Josodhir Das	Professor	DEQ, IIT Roorkee	IIT Roorkee
15.	Sh. Vivek Tripathi	Director, CMDD (E&NE)	CWC, New Delhi	CWC
16.	Sh. Samir Kumar Shukla	Director, DSM	CWC, New Delhi	CWC
17.	Sh. Sachin Khupat	Scientist 'B'	CWPRS	CWPRS
18.	Sh. A.P. Kandiyal	Dy. Director , FE&SA Directorate	CWC, New Delhi	NCSDP Secretariat
19.	Sh. Satyam Aggarwal	Asst. Director, FE&SA Directorate	CWC, New Delhi	"

III. Project Representatives and Consultants				
20.	Sh. G.S. Sharma	GMR	GMR	Talong Londa Hydro Electric Project, Arunachal Pradesh
21.	Sh. Sitaram Agrawal	-do-	-do-	-do-
22.	Sh. Milan Bandopadhyaya	-do-	-do-	-do-
23.	Dr. Rishi Sharma	-do-	-do-	-do-
24.	Sh. G.M. Gupta	-do-	-do-	-do-
25.	Sh. Shyamal Kumar Deka	Brahmputra Board	Brahmputra Board	Noa-Dihing Multipurpose Project, Arunachal Pradesh
26.	Sh. Satyavan Dhanda	-do-	-do-	-do-
27.	Sh. S.C. Baluni	UJVNL	UJVNL	Sirkari Bhyol Rupsiabagar HEP, Uttarakhand
28.	Dr. Harish Bahuguna	-do-	-do-	-do-
29.	Sh. Dharmendra Singh	-do-	-do-	-do-
30.	Sh. Dheeraj Chaudhary	-do-	-do-	-do-
31.	Sh. Rohit Khanna	SEW	SEW	Rho Hydro Electric Project, Arunachal Pradesh
32.	Sh. V.R. Sharma	-do-	-do-	-do-