


Curriculum Vitae

Application: Position of Vice President, Asian Region of IAEG Executive Committee 2023-26				
1.	Name: S. L. Kapil			
2.	Date of Birth : 10.01.1963			
3.	Nationality : Indian			
4.	Current Designation: Executive Director, HOD (R&D/Geotech Division), NHPC Ltd., Faridabad, Haryana, India.			
5.	Educational Qualification : M.Tech (Applied Geophysics)- IIT Roorkee, M.B.A. (Finance) – IMT (CDL), Ghaziabad			
6.	Membership of Professional Association : <ul style="list-style-type: none"> • President, Indian Society of Engineering Geology (ISEG) Term 2022-23, Past Secretary, ISEG Term 2020-21, Past Vice-President, ISEG Term 2019-20. • Vice President, ISRM (India) Term 2020-2023. • Member of Editorial Board of Journal of Engineering Geology • Indian Society of Rock Mechanics and Tunnelling Technology (ISRMTT), New Delhi, India -Life Member • Systems Society of India, Life Member. 			
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1. Brief description of the Achievement : <ul style="list-style-type: none"> • Presently working as Executive Director & HOD of R&D and Geotechnical Division of NHPC and Spearheading the complete survey and investigation works including geological, geophysical, geotechnical, rock mechanics, seismological, Remote Sensing and construction material survey works and works pertaining to DPR compilation and clearances from the nodal agencies. Also looking after geophysical and CMS related works in construction, commissioned and consultancy projects undertaken by the Corporation. • In the career spanning more than 37 years, contributed in the field of geological & geophysical technologies in investigation, construction, O&M and consultancy projects of NHPC, Introduced several advanced technologies in NHPC like tunnel seismic prediction, seismic tomography, MASW, resistivity imaging, vibration monitoring studies for optimum blast design and resistivity imaging for earth mat design for power plants etc. • Resolved several critical seismological aspects pertaining to hydroelectric projects and expedited the clearance procedure from NCSDP by close interaction and liaising with the executing and nodal agencies. Developed a Real Time Seismic 				

Data Center at NHPC, Faridabad for real-time recording of Accelerograph data from all NHPC power Stations. Conferred with exemplary commitment award in November 2017 by NHPC for this innovative work.

- Actively involved in seismological and National Green Tribunal clearances accorded for Dibang Multipurpose Project (2880MW), Subansiri Lower Project (2000MW) and Teesta-IV HE Projects of NHPC.
- Established Geotechnical Remote Sensing Lab at NHPC Corporate Office, Faridabad, Haryana.
- Authored more than 250 technical reports for DPR preparation and more than 25 technical papers in National/International Journals and conferences on investigation & construction related activities of the projects.

A. SOME TYPICAL APPLICATION OF GEOPHYSICAL STUDIES TO RESOLVE CRITICAL PROBLEMS:

1. Vibration Monitoring application: -

One of the oldest Monasteries, Alchi in Ladakh built 11th Century is situated at a distance of about 1.4 km in the downstream from the Nimoo Bazgo dam. This monastery is made up of mud & wood and famous worldwide for its golden and silver Kashmiri paintings. In view of the close proximity of the monastery from the proposed dam site, it was apprehended by Archeological Survey of India (ASI) and local people that the vibration generated by blasting at the time of excavation of various components of the project may cause damage to the Monastery.

Keeping in view the concerns of ASI local populace, Vibration Monitoring Studies at **Nimmo Bazgo (45 MW), Project Ladakh** had been undertaken for assessment of safe blasting pattern for the safety of Alchi Monastery towards clearance of the project from Archaeological Survey of India. The problem was resolved jointly with ASI by applying innovative vibration monitoring technique to design safe blasting pattern so that no harm to the structure was done.

2. Resistivity Imaging:

- a. Worked for various commissioning related activities including placement of earthmat for power house and switchyard of Kambang Small HEP, Arunachal Pradesh. Moreover, used Resistivity Imaging for cavity detection below the water channel.
- b. Successfully conducted resistivity imaging survey at Sengulam Augmentation Scheme, KSEB, Kerala for identification of extent and thickness of shear zones along the Diversion tunnel and Adit-II enroute ahead of collapsed face completed in record time of one month without drilling which was halted from October 2015. Based on resistivity values, geological sections were prepared for full length of 2.2km of Diversion Tunnel and 800m Adit tunnel. With application of this innovative technique, complete geometry of the shear zone was identified in a precise manner which helped in future planning and advancement of tunnel works.

3. Seismic Tomography:

- i. **Parbati-II H.E. Project (800MW):** At HRT (Face-IV of TBM) of Parbati-II Project (800MW) huge ingress of water mixed with Silt/Sand from Probe Hole led to filling of Sand/Silt & Water inside the Tunnel due to adverse geological conditions and presence of fault was apprehended ahead of TBM. Consolidation

grouting was undertaken to consolidate the sheared rockmass. In order to assess the extent of fault zone and efficacy of grouting, Seismic Tomography was proposed. Seismic Tomography successfully identified boundaries of apprehended fault ahead of TBM tunnel face of **Parbati Project (Stage-II)** 800 MW where the TBM was buried completely. This helped in resuming the TBM which was stalled for several years. Excavation of more than 2.5 km has been done so far after resume of tunnelling through TBM in 2014.

- ii. **Tamanthi H.E. Project (1200 MW), Myanmar:** It was apprehended that a fault is passing through the dam site of Tamanthi Project, 1200MW, Myanmar. The same was indicated by M/s Colenco, Switzerland in their reports. Accordingly, in order to detect the subsurface signatures of fault, seismic tomography was undertaken. The results confirmed the absence of fault at dam site. This had made the project viable.

B. SEISMIC MONITORING OF NHPC PROJECTS

- i. **Established Real Time Seismic Data Center** at Corporate Office, Faridabad for online seismic monitoring of power stations of NHPC located in Himalayan region. NHPC has become only power utility in country having this facility. During last five years, more than 600 earthquakes are recorded by data center in real time. This recorded data is an asset for seismological research & development in the country. Received exemplary commitment award from NHPC Limited for the above work.
- ii. **Seismological issues of Dibang Multipurpose Project (2880 MW), Arunachal Pradesh** - Supervised the work of MT studies at Dibang Project by IIG, Mumbai & Local Earthquake Tomography (GSI) through GSI, Kolkata for clearance of seismic design parameters of the project from National Committee on Seismic Design Parameters (NCSDP), attended and coordinated public hearing of Dibang Multipurpose project with State Pollution Control Board
- iii. **Seismological Issues of Subansiri Lower Project (2000MW), Arunachal Pradesh** –
 - a. Member of Core team for handling seismological aspects of Subansiri Lower Project and comments of Technical Expert Committee (TEC) appointed by Planning Commission and handing the issues raised by Expert Group appointed by Govt. of Assam. Attended several meetings with TEC and Expert Group and Environmental Appraisal Committee (EAC).
 - b. After persistent efforts of nearly five years including several meetings at different forums, finally the seismic design parameters of the project were reaffirmed by National Committee on seismic design parameters the nodal approving agency in the country. His consistent efforts can be credited for clearance of one of the biggest issue hampering the works and finally helped in restarting the works of prestigious Subansiri Lower Project, slated to be the biggest hydropower project of the country.

iv. RTS mitigation plan for Teesta IV HEP

Prepared a detailed Reservoir Triggerred Seismicity mitigation Plan for Teesta IV in compliance to NGT clearance of the project. The detailed plan in its general format is applicable to any hydro project in the Himalayas. This has been done for the first time for Himalayan hydro projects.

C. OTHER IMPORTANT INITIATIVES:

- Prepared documents for policy initiative for entering in renewable energy development for wind energy, solar energy, small hydro and geothermal energy.
- Prepared projects feasibility reports (PFR) for Geothermal Energy development for Tattapani and Puga Geothermal fields and ranking studies of all geothermal fields of India in association with Geothermax Inc., USA.
- Geotechnical exploration of all NHPC projects, 5 International projects of Bhutan & Myanmar & 20 consultancy projects for DPR preparation. Prepared 250 technical reports. Published 30 technical papers & delivered more than 100 lectures
- Established Geotechnical Remote Sensing Lab at NHPC Corporate Office. The lab is equipped with state-of-the-art Remote Sensing & GIS software & latest hardware. Remote Sensing is being utilized for geological and topographical assessment of project sites. High resolution satellite imageries and digital elevation models are being utilized for the purpose.
- Prepared Quality System Procedures for ISO 9001 for geophysical exploration & implemented
- For further enhancing the technical skills and to carry the technical way forward four R&D projects have been initiated by the applicant and are presently running successfully in the Geotech division of NHPC CO. This will deeply engrain the innovations in the present technical team of the division for further development of the corporation and the nation as a whole. The findings from these R&D projects will greatly help in optimization of project investigation costs and time overruns.
- As Secretary ISEG, in the past council 2020-21, made concentrated efforts to promote the vision of the society on an international platform. Recently conducted international conference EGCON-2021 successfully in Hybrid mode (Inauguration in physical mode and main conference in virtual mode) after covid pandemic for the past 2 years. EGCON-2021 showcased “Recent Advances in Geotechnics” to the international audience on a grand scale. The three days virtual conference had international keynote speakers from 14 different fields and had an overwhelming response with more than 124 technical papers in its kitty. During the conference delegates from more than 12 countries participated. Most of the large construction companies engaged in geotechnical works participated in the conference.

D. ORGANIZED WORKSHOPS/CONFERENCES

- Conducted International Conference “EGCON-2021” with the theme Recent Advances in Geotechnics from 9-11 December 2021 (Hybrid Mode)
- Conducted Geoscience Meet on “Role of Geotechnics in Investigation and Construction of River Valley Projects” from 20-21 September 2018 at NHPC.
- Conducted Workshop on “Accelerograph Data Processing, Application of Attenuation Laws, Generation & Interpretation of Response Spectra” from 18-22 September 2017 at NHPC.
- Conducted workshop on “Seismological Considerations in Hydropower Design & Accelerograph Data Processing” from 25-27 February 2016.
- Training cum awareness program on “Laboratory Rock Mechanic Testing, Remote Sensing, Geophysical Techniques & Seismicity Aspects of Hydroelectric Projects” on 17th February 2021 at NHPC, Faridabad.

2.List of Ongoing R&D Projects

No.	Names of project	Project source	Project Leader	Starting and ending time	Funds (10k€)
1	Analysis of Strong Motion Accelerograph data recorded at NHPC Power Station for Development of Site Specific Peak Ground Acceleration Attenuation Relationship for Himalayan region.	R&D Project NHPC in association with DEQ, IIT Roorkee	S.L.Kapil	Feb2020- Jan2023	Approx. 112K€
2	Targeted Solution through Emerging Geophysical Technology in Resistivity Imaging & Ground Penetrating Radar for optimizations of Geological Uncertainties in Hydropower Project	R&D Project NHPC	S.L.Kapil	July2018- March 2022	Approx. 130K€
3	Targeted Solution through Emerging Geophysical Technology in Seismic Tomography for optimizations of Geological Uncertainties in Hydropower Project	R&D Project NHPC	S.L.Kapil	July2018 – August2022	Approx. 96K€
4	Optimization of Earthmat Design by Resistivity Imaging Technology	R&D Project NHPC	S.L.Kapil	Oct2020- Sept.2022	Approx. 30K€

3. Key Papers and Works

No.	Paper: All authors, title, journal, year of publication, issue No., page - page Work: All authors, book name, press, publish place, year of publication, total pages
1	Gahalaut V.K., Kapil S.L. et.al, Seismological, Geodetic, macroseismic and historical context of the 2016 Mw 6.7 Tamenglong (Manipur) India Earthquake, <i>Tectonophysics</i> , 2016, 688 (2016), 36–48., 12.
2	Kapil S.L. (2017) “Dams-not a threat but a necessity for modern India” Published in <i>The Clarion</i> ; Vol. 6 Number 1 (2017) PP 119-120.
3	Kapil, S.L.(2013) “Geophysical Surveys”, Published in <i>Best Practices in Underground Construction Works</i> by Central Board of Irrigation & Power, Publication No. 315, Feb. 2013.
4	Kapil S. L. and Jyotirmoy(2014) Utility of Seismic Tomography in Site Characterization , <i>Journal of Water & Energy International</i> , December 2014 issue
5	Kapil S. L. and Jyotirmoy(2016), An innovative Approach for Optimization of Earth Mat Design Utilizing Geophysical Resistivity Imaging: A Case Study, <i>Water & Energy International</i> , October 2016 issue.
6	Kapil. S. L., Nagar Vipul & Shweta (2020), “Technological Advancements in Topographical Survey- Utility Of Digital Elevation Models And GIS”, <i>Journal of Engineering Geology</i> , Vol - Volume XLIV, Nos. 1 & 2, Pp 55-61.

4. Specifications and Standards

No.	Name of Specifications and Standards	Participants in order
1	WRD05 – Geological Investigations and Sub-Surface Explorations Sectional Committee	Member (Representing NHPC)
2	WRD03 – Groundwater and Related Investigations Sectional Committee	Member (Representing NHPC)

5. International and National Awards

No.	Award Name	Award Organization	Class of Award	Award Date	Names in order
1	Exemplary Commitment Award	NHPC	Annual award of NHPC for exemplary performance in any field	Nov. 2017	S.L.Kapil

6. Papers in International Conference

No.	Conference Name	Topic of Lecture	Speaker	Date	Place	Plenary/Invited/Oral Lecture
1.	International R&D Conclave	Emerging opportunities & challenges of R&D in Indian Power Sector	<i>S.L. Kapil</i>	20 th -21 st Feb, 2018		Oral Lecture
2.	87 th ICOLD-AGM & Symposium	Comparative analysis of observed and estimated PGA for Himalayan earthquakes	-	9 th to 14 th June 2019	Canada	Conference proceedings
3.	International Dam Safety Conference	A comparative Study of PGA Data from Seismic Network of Himalayan Dams and Attenuation Laws of Site Specific Studies	-	Feb. 2019	Bhubaneswar	Conference proceedings
4.	International Conference on "Engineering Geology in New Millenium"	Systematic approach to seismicity studies for hydroelectric projects with special reference to NE India	S.L. Kapil	27th-29th Oct. 2015	IIT-Delhi	Oral Lecture
5.	21st Annual Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP)	Assessment of Geological Conditions of Barrage Seat Area through Seismic Tomography: A Case Study.	S.L. Kapil	April 6-10, 2008	Philadelphia, USA.	Oral Lecture
6.	6 th International R&D Conference organized by CBIP	Resistivity Imaging, a Fast Emerging Economic and Reliable Tool for Geotechnical Exploration	-	13-16 th Feb. 2007	Lucknow	Conference proceedings
7.	International conference on "Hydropower development- A major source of Renewable Energy	Assessment of Blast vibration effect on sensitive structures – A case study of Alchi Monastery, Leh, Ladakh	S. L. Kapil	25th – 27th May, 2005	Kathmandu, Nepal.	Oral Lecture

No.	Conference Name	Topic of Lecture	Speaker	Date	Place	Plenary/Invited/Oral Lecture
8.	International Conference "Tunneling Asia - 2004, Need for Accelerated Underground Construction – Issues & Challenges	Application of Seismic Tomography in the investigation of Hydroelectric Projects	S. L. Kapil	14 th -17 th Dec 2004	New Delhi	Oral Lecture
9.	International Conference on Hydropower Development in Himalayas	A Simpler Polarized Shear Wave Approach Towards In-situ Dynamic Elastic Parameter Estimation"	S. L. Kapil	20-22 April, 1998	Shimla.	Oral Lecture
10.	International Association of Seismology and Physics of Earth's Interior	BAR-ARMA Modelling of earthquake sequences as a means of earthquake prediction	S. L. Kapil	31 st Oct -7 th Nov., 1984.	Hyderabad	Oral Lecture
11.	EGCON-2021 International Conference on "Recent Advances in Geotechnics"	Minimizing Geological Uncertainties by utilizing Geophysical Techniques	S. L. Kapil	9 th – 11 th Dec 2021	Virtual Mode	Keynote lecture
12.	EGCON-2021 International Conference on "Recent Advances in Geotechnics"	Integrated Geophysical Approach for Resolving Critical Problem faced during Tunnel Construction of Parbati-II Hydroelectric Project, Himachal Pradesh, India	S. L. Kapil, M. P Singh, Vipul Nagar & Naveen Pandey	9 th – 11 th Dec 2021	Virtual Mode	Oral (Recipient of best paper award)

No.	Conference Name	Topic of Lecture	Speaker	Date	Place	Plenary/Invited/Oral Lecture
13.	Diamond Jubilee National Conference on “Emerging Trends in Geophysical Research for Make in India” at IIT(ISM) Dhanbad	Rokmass Characterization through High Resolution Seismic Tomography and Resistivity Imaging in Hydroelectric Projects	S. L. Kapil	1 th – 11 th March 2018	Dhanbad	Keynote Lecture
14.	32 ND National System Conference NSC-2008 at Electrical Engineering Department, IIT Roorkee	Optimization of Earthmat Ground Resistance of a switchyard through Resistivity Imaging.	S. L. Kapil	17 th – 19 th December 2008	IIT Roorkee	Oral Lecture
15.	4 th National Geo-Research Scholar Meet (NGRSM) at	Why Geotechnical Investigations are Important for Successful Construction of Hydro Power Project??"	S. L. Kapil	2020	Wadia Institute of Himalayan Geology (WIHG), Dehradun, India	Oral Presentation

7. Some of the Important Projects Handled

No.	Project	Main Contributions	Time	Contributors	Evidence Provider
1.	Tamanthi HEP, Myanmar (1200MW)	Colenco, Switzerland in PFR of Tamanthi HEP, inferred a fault near dam. Seismic tomography & other geophysical explorations were taken-up by NHPC & this confirmed the absence of fault making project viable	2010	S.L.Kapil & team	Department of Hydro Power Implementation (DHPI), Ministry of Electric Power, Union of Myanmar
2.	Shweazye HEP, Myanmar (600MW)	Study & appraise DPR for techno economical feasibility	2012	S.L.Kapil & team	Department of Hydro Power Implementation (DHPI), Ministry of Electric Power, Union of Myanmar

7. Some of the Important Projects Handled					
No.	Project	Main Contributions	Time	Contributors	Evidence Provider
3.	Vishnugad Pipalkoti HE Project (444MW), Uttarakhand	As a team leader supervised and completed the geophysical resistivity imaging survey work at HRT Adit area of the project.	2019	S.L.Kapil & team	THDC Limited
4.	Sengulam Augmentation Scheme, KSEB, Kerala	Successfully conducted resistivity imaging survey for identification of extent and thickness of shear zones along the Diversion tunnel and Adit-II enroute ahead of collapsed faces.	2017	S.L.Kapil & team	KSEB Limited
5.	Kuri Gongri HEP, Bhutan,	Worked as Project Head for completion of investigation works for preparation of PFR assigned by Ministry of External Affairs.	2013-14	S.L.Kapil & team	Govt. of Bhutan

Statement of Authenticity of the Achievements

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any willful misstatement described herein may lead to my disqualification, or dismissal, if engaged.

Date: 15/06/2022

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