

**PROBABILISTIC SEISMIC HAZARD ASSESSMENT OF 548 MW KAIGAH
HYDROPOWER PROJECT, DISTRICT KOHISTAN, KPK, PAKISTAN**

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Abstract

The Kaigah Hydropower Project is proposed on River Kandiah, near Village Karrang in Kohistan district of Khyber Pakhtunkhwa province, Pakistan. Physiographical province of the project area is the Kohistan Island Arc, a tectonically active region which is sandwiched between the converging Indian and Eurasian tectonic plates. The project region has been subjected to many damaging earthquakes in the past. It is therefore imperative that a study of tectonic and earthquake history of the region be conducted to determine the seismic hazard to which the proposed project may be exposed. So the realistic seismic design parameters for the safe design of the Dam and its appurtenant structures are evaluated. Based on current knowledge of the region, the project is located in the collision zone of the Indian and Eurasian plates; therefore the Kaigah Hydropower Project is faced by a severe earthquake hazard potential. Within the scenario of many destructive events in the region, it becomes important to be very cautious regarding the seismic hazard assessment for such a major public project. In this study the probabilistic seismic hazard assessment (PSHA) for Kaigah Hydropower project is done by means of available geological data, tectonic data and historical as well as Instrumental seismological data of the region. The aim of this dissertation is to assess the seismic design parameters in accordance with the ICOLD guidelines (Revised 2010). Hence, the Peak Ground Acceleration (PGA) for OBE (Operating Based Earthquake), DBE (Design Based Earthquake), SEE (Safety Evaluation Earthquake) and MCE (Maximum Credible Earthquake) are determined to be used for the seismic resistant design.