



Dam in the Waitaki Valley, New Zealand

GNS Science has been commissioned by three power generation companies to carry out seismic evaluations on their dam structures along the Waikato River, in the Waitaki Valley and on the Clutha River. These dams are used to generate at least 70% of New Zealand hydroelectric energy, hence the importance to assess their safety in the event of an earthquake. Evaluations are performed in line with modern practice including a review by an international board to obtain quality input data for the assessment of dam performance standards.

The projects involve: (i) evaluation of the geological and tectonic setting by mapping and assessing the dam foundation conditions; (ii) excavation of paleoseismology trenches to evaluate active fault displacement history; (iii) sample dating from trenches to determine recurrence interval of fault ruptures; (iv) establishing contemporary tectonic strain rates from historic earthquake records and GPS deformation measurements; (v) estimation of seismic return periods; (vi) determination of earthquake attenuation characteristics from accelerograph records; (vii) evaluation of shaking loads for large earthquakes and fault displacement loads on dams by deterministic and probabilistic approaches.

Project Description

Project: Seismic Evaluation of Existing Dam Structures

Location: New Zealand

Client: Major Power Generation Companies in New Zealand

Total Project Value: Confidential

Start Date: August 1999

End Date: Ongoing

Lead Company: GNS Science

Associated Consultants: URS Corporation

Key Features:

- Geological, geophysical and soil surveys
- Soil mechanics and foundation engineering
- Earthquake engineering
- Disaster/Emergency planning
- Risk management advice