

# INDUCED SEISMICITY HAZARD ASSESSMENT FOR THE ENERGY INDUSTRY

WEDNESDAY, JULY 9 | 11:00 AM - 1:00 PM PACIFIC | VIRTUAL

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The threat of earthquakes to infrastructure has led to the development of robust seismic hazard assessment frameworks in sectors such as nuclear energy and mining. Traditional probabilistic seismic hazard assessment commonly assumes a Poissonian process, where earthquake occurrences are independent and the event rate remains constant over time. This assumption is generally appropriate for long-term, naturally occurring seismicity, particularly for large-magnitude events. However, it does not adequately reflect the characteristics of induced seismicity, which tends to be transient, spatially clustered, and closely linked to industrial operations. As the energy sector expands its use of technologies such as hydraulic fracturing, wastewater injection, enhanced geothermal systems, and geological carbon storage, induced seismicity has emerged as a distinct source of seismic hazard. These operationally driven events present unique challenges for hazard and risk assessments of infrastructure situated in or near active industrial areas. This presentation examines the current practices in seismic hazard assessment and the regulatory frameworks aimed at mitigating induced seismicity risks. It also highlights the need for refined methodologies that better align with the nature of induced seismicity—supporting continued industrial development while ensuring the safety of surrounding communities and critical infrastructure.

*Ali is a seismologist with more than 20 years of experience in ground motion analysis, seismic hazard analysis, and induced seismicity. In 2014, he started Mahan Geophysical Consulting Inc. and, since then, has managed numerous induced seismicity projects in British Columbia, Alberta, and the central United States working with a diverse clientele including provincial and federal governments, academia, and private sector. Since August 2024, he has joined BGC Engineering Inc. where he works on international projects such as seismic hazard analysis for mining tailings storage facilities.*