

## Enhancing Risk Mitigation Strategies: Beyond the Seismic Catalog

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### Summary

Seismic monitoring during operations records a catalog of event locations, magnitudes as well as ground motion measurements from seismic stations. Often, operators will limit the scope of seismic monitoring to this, as regulatory requirements are satisfied. Operators with a focus on risk management and responsible practices will go beyond the seismic catalog, and perform additional studies to understand the impact of critical earthquake scenarios and develop internal traffic light protocols (TLP) to mitigate the risk of such an event from occurring. A key first study is to develop or adopt a local or regional ground motion model that characterizes the source, path and site effects of induced seismicity in the region. These models can be used to estimate the ground motion experienced at the surface throughout the area (ie. a shakemap) for historical events, as well as scenario events, and give an understanding of the potential impact of earthquakes in the region. Next, by quantifying the variability in ground motions that can result from induced events, ground motion models can help an operator be confident that an earthquake with magnitude  $M$  is unlikely to generate ground motions that exceed regulator thresholds, felt levels or damage thresholds. Critical earthquake scenarios that may exceed a ground motion threshold of interest can then be determined and incorporated in the development of internal TLPs. These shakemaps, critical magnitude scenarios and internally developed TLPs are powerful tools for communication with internal, and external stakeholders / regulatory agencies for proactive risk management.