

Influence of Seismic Hazard Model Components on typical risk metrics: Examples from South-East Asian Countries

Jochen Woessner (1), Emel Seyhan (2), and Marleen Nyst (2)

(1) Risk Management Solution Inc., Zurich, Switzerland (jochen.woessner@rms.com), (2) Risk Management Solutions Inc., Newark, CA, USA

The last decade has tragically shown the social and economic vulnerability of countries in South-East Asia to earthquake hazard and risk. The 2004 M9.2 Sumatra earthquake and the associated tsunami caused significant casualties and economic losses generating major attention internationally due to the scale of its impact across the urban areas of South-East Asia and Indian Ocean (Indonesia, Thailand, Sri Lanka, and India). While many disaster mitigation programs to improve societal earthquake resilience are under way focusing on saving lives and livelihoods, the risk management sector is challenged to model economic consequences. We present the hazard component suitable for a South-East Asia earthquake risk model covering Indonesia, Malaysia, the Philippines and Indochine countries. The consistent regional model builds upon refined modelling approaches for 1) background seismicity, i.e. earthquakes not occurring on mapped fault structures, 2) seismic activity from geologic and geodetic data on crustal faults and 3) along the interface of subduction zones. We combine this with an up-to-date ground motion model that is suitable for this tectonically complex area. We assign more weights to globally developed ground motion prediction equations (GMPEs) due the scarcity of strong ground motion data in Southeast Asia. Finally, we analyze the influence of several hazard model components on typical risk metrics (return period losses, average annual loss) and consider the impact of the hazard model on various lines of business and different types of buildings from a regional perspective.