Seismicity of East Malaysia

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A detailed study of the historical and instrumental seismicity record (up to 1994) of the general area located between latitudes 0.0°N and 8.5°N, and longitudes 109.5°E and 120.0°E, shows that the distribution of most earthquake epicenters is consistent with the present-day plate tectonic setting. In Sabah, the majority of epicentres are located in, or off-shore, the Dent and Semporna Peninsulas, where they demarcate a broad zone between the Sulu Trench and the Sulu Volcanic Arc. Earthquake foci in this area are mostly of shallow depths (< 33 km) and appear to be closely related to major northeast and northwest trending faults (Lim, 1986). Seismicity in this area is thus considered to result from reactivated fault movements associated with a present-day tensional crustal setting. Epicentres in central and north Sabah demarcate an approximately north-northeast trending belt and are centered around Ranau where they appear to be related to northeast trending fractures (Lim, 1985, Lim and Godwin, 1992). Earthquake foci here are mainly of shallow depths (< 33 km) and are considered to result from reactivated fault movements associated with continued uplift of the area in a tensional crustal setting. Epicentres in the Labuk Bay area appear to be related to major north to northeast trending faults (Lim, 1985) and are considered to result from reactivated fault movements associated with a tensional crustal setting. Epicentres to the southeast of Sabah and off-shore East Kalimantan mostly show foci of shallow to moderate depths (15 to 69

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km) and are considered to result from fault movements associated with spreading centres and strike-slip faults in an essentially compressional tectonic setting. Epicentres in the South China Sea, to the west of Sabah and Sarawak, appear to parallel the trend of the Northwest Borneo Trench and may represent renewed fault movements in this area. Other epicentres in the general area, particularly those in Sarawak, show no clear relationship with the present-day tectonic setting, though a reevaluation of available instrumental records shows that they mark real events and can therefore be considered to represent renewed fault movements in probably a tensional crustal setting. It is concluded that the design of large engineering structures in East Malaysia should take into consideration the likelihood of earthquake induced processes in view of the seismicity of both the general area, and of Sabah and Sarawak themselves.

References

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