Major population centers may be at risk; building codes must reflect new seismic data

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Earthquakes in stable continental regions lack sufficient understanding to prepare local populations for future seismic activity, according to a paper published in the February issue of the *Bulletin of the Seismological Society of America*. Scientists provide a new hazard assessment for Peninsular India to highlight the urgent need to update design standards there in order to construct adequate and safe industrial facilities, dams, and community buildings.

"The results of this paper imply that the level of seismic safety of structures designed based on current standards is lower than its desired level," states co-author Ravi Sinhaa, Ph.D., professor of civil engineering at Indian Institute of Technology (ITT) in Mumbai, India. Sinha and Kishor Jaiswal, also at ITT, focused their research on Peninsular India, which is an old and stable continental plate and home to more than 400 million people.

Stable continental regions are areas away from the boundaries between tectonic plates but still are threatened by infrequent earthquakes that can create strong shaking. Because the large earthquakes are infrequent, they are difficult to study. The Central and Eastern United States is also considered a stable continental plate and has experienced strong earthquakes. The 1811-1812 New Madrid, Missouri earthquakes, for example, were of a magnitude greater than 7.

To estimate the devastating consequences of potential earthquakes, scientists continually re-evaluate hazard assessments for an area. Based

on these assessments, governments modify codes for construction of structures, such as dams, industrial buildings, and homes. Design codes based on out-dated assessments could increase the risk of heavy damage by seismic activity.

Sinha and Jaiswal conducted a hazard assessment for the region that looks at a variety of information regarding seismic activity in the region, using a probabilistic framework. The assessment results show that the seismic hazard associated with some major urban areas, such as Mumbai, is higher than the standard design specification now used to build earthquake-resistant structures there.

The authors noted an apparent increase in seismic activity due to better seismological instrumentation to record earthquakes. The increase in seismic activity requires a closer consideration of construction standards. Sinha and Jaiswal explain that their work is "useful in specifying design level for upgrading and retrofitting major structures such as dams and industrial facilities to the desired level of seismic safety."

Source: Seismological Society of America