

## CONSIDERATIONS ON THE DIFFUSE SEISMICITY ASSUMPTION IN STABLE CONTINENTAL REGIONS (SCR)

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**Abstract.** It is well known that seismic activity is much higher along inter-plate boundaries, decreasing perceptibly in intra-plate regions. Although a few locations in so-called Stable Continental Regions (SCRs) around the globe, like the New Madrid area in the USA, have been subjected to earthquakes with magnitudes above  $M_w = 8$ , the largest events in most SCRs do not exceed about 7, and their prediction for engineering purposes presents great difficulties on account of the scarce available evidence on seismic activity in intra-plate regions. The situation led in the last two decades to the extensive studies promoted by EPRI. In view of the difficulty to identify seismogenic sources in most SCR areas, the assumption of diffuse seismicity is often accepted in Seismic Risk Analysis of Nuclear Power Plants (NPP) in SCRs, like the South American Plate, used in this paper as an illustrative example. There are few objective criteria known to the authors to accept or reject the hypothesis that the currently used uniform seismicity model is acceptable in any given location, which led to the generalized adoption of the view that an active fault does not exist until its existence can be confirmed by other means. In the paper the authors examine available seismic data for two 500km radius circular areas in the South American SCR, subjecting the hypothesis of a uniform (diffuse) seismicity to a critical assessment. In addition to an evaluation of parameters applicable to both areas and to preliminary estimates of the differences, a proposal is advanced to define, on the statistical evidence provided by recorded seismic events, specific seismogenic sources. The possible influence of the approach on the final outcome of risk assessments is finally discussed.