A Probabilistic Seismic Hazard Assessment (PSHA) was required for Cernavodă Units 1, 2, 3 & 4. The study was awarded to RIZZO Associates and a comprehensive report was issued in August 2004. The methodology was consistent with accepted practice in accordance with the International Atomic Energy Agency (IAEA). Based on the technical information reviewed by RIZZO, the seismotectonic model was established for the region to explain recorded earthquakes and to define the potential source for future seismic activity. Based on the seismotectonic understanding, RIZZO’s staff further defined the seismic sources and the source characteristic in terms of recurrence parameters and the uncertainties in these parameters. Historic seismicity, as well as structural geology, was examined to identify the sources. Recorded accelogram records generated from recent earthquakes were evaluated and analyzed to develop attenuation relationships utilizing multiple regressions of the Peak Ground Acceleration (PGA), as well as spectral accelerations. These attenuation relationships were compared to available models from other parts of the world subjected to similar tectonic conditions. Based on the analysis, RIZZO defined the attenuation models and the associated uncertainties for use in the PSHA.

The Deliverables were the site seismic hazard in terms of annual exceedance probabilities for various measures of ground motion and spectral accelerations, and presented the methodology and how it integrated the site area seismic sources, the seismic potential of these sources, and the ground motion models to estimate the annual exceedance probabilities.

At the request of Comisia Nationala de Control a Activitatilor Nucleare (Romanian National Commission for Nuclear Activities Control [CNCAN]), an IAEA team performed a review of the PSHA. As a result of the review, comments and recommendations were issued. Stevenson and Associates, Romania (with the help of University of Bucharest and Technical University of Civil Engineering Bucharest) addressed the IAEA review comments and recommendations and revised the PSHA accordingly. At the request of CNCAN, an IAEA team performed a follow-up of the review of the PSHA to access the degree of resolution.

EnergoNuclear more recently awarded RIZZO a contract to develop a Ground Motion Response Spectrum (GMRS) based on the “Revised Probabilistic Seismic Hazard Calculations for the Cernavodă Site” and Time Histories, and to perform an in-depth review and assessment of the revised PSHA including the supporting documentation, addressing the resolved and partially resolved IAEA issues, and developing an Assessment Report identifying elements of conservatism in the current PSHA. This body of work will be used to support licensing of the next CANDU Units – Cernavodă 3 & 4.