OUR EXPERTISE

RIZZO Associates is a specialized consulting firm that has had a long term involvement in the nuclear industry. Specific to the NRC requirements to perform seismic analyses in response to the 50.54 letters, RIZZO offers the following demonstrated expertise:

- Licensing support, including Fragility Analysis, at Koeberg for Stress Test (post-Fukushima Dai-ichi)
- Westinghouse AP1000 Design, Analysis, and Licensing Support
- AREVA EPR Design, Analysis, and Licensing Support;
- MHI APWR Licensing Support
- Toshiba ABWR Licensing Support
- KEPCO APR1400 Licensing Support
- Support to Russian Nuclear Plants in Russia, Finland, Ukraine, and China
- Probabilistic Seismic Hazard Analyses (PSHA)— Cernavoda 1 & 2, Cernavoda 3 & 4, Bell Bend, Callaway 2, Braka and Alternate UAE sites, South Africa Fuel Plant, Koeberg PBMR Demo Project, Akkuyu, Borssele 2, and Krsko 2
- PSHA updates for CEUS - Bell Bend, Calvert Cliffs
- Probabilistic Fault Displacement - Krsko 2
- Seismic challenge and Equipment Fragility Analysis — Mochovce, Bohunice, Kozloduy, Gösgen, and Liebstadt
- Qualification of Equipment and Structures for various NPP’s in the U.S. and for U.S. DOE facilities

The RIZZO Team currently includes over 300 people, the majority of whom are engineering or science professionals, many with advanced degrees.

SEISMIC HAZARD EVALUATION

RIZZO provides seismic hazard assessments, including review of regional geology and tectonics, fault studies, preparation of earthquake catalogues, analysis of seismicity (including study of faults and active tectonic features, development of seismic source zones, and analysis of their seismicity), performing deterministic and probabilistic methodologies, and specialized studies such as assessment of the effects of nearfield earthquakes and micro-earthquake monitoring. RIZZO participated as an “Independent Reviewer” for the CEUS development.

RIZZO developed and maintains databases and software for full PSHAs based on the USGS codes and a library of ground motion models. We have implemented this methodology at commercial and defense-related nuclear sites in the U.S., Europe, Africa, Asia, and South America. Typically, this assessment provides exceedance probabilities and uncertainty bounds for peak ground acceleration and ground motion spectra.

Our focused expertise is in the areas of Seismic, Structural, and Geotechnical Engineering; Geologic Hazards; Hydrology; Flooding; and Environmental Assessments/Permitting.

OFFICE LOCATIONS WORLDWIDE

www.rizzoassoc.com
SEISMIC GROUND MOTION STUDIES, SITE RESPONSE, AND SOIL STABILITY ANALYSIS

Due to our involvement with a range of siting and site investigation projects, we offer unique experience and insights in assessing subsurface conditions, and design basis hazards, and designing remedial measures. We provide services related to the response of a site’s subsurface to seismic ground motion, including the interpretation of the inherent uncertainty in the field and laboratory determined soil data, residual strength, liquefaction potential, dynamic bearing capacity, seismic induced settlement, and amplification of ground motion.

RIZZO performs detailed analyses related to landslides and stability of natural earth and manmade slopes, including inspection; condition survey; and evaluation of stability under normal, unusual, and seismic loads. Our staff uses state-of-the-practice computer codes.

SEISMIC EVALUATION OF STRUCTURES AND COMPONENTS

RIZZO offers a full line of services for dynamic evaluation of Structures, Foundations, and Components. Our services include: design of facility upgrades and modifications; assessment of coupled building and foundation models; soil-structure interaction and soil-structure interaction with incoherent ground motion; machine induced vibrations; seismic qualification; development of floor response spectra; and interpretation of regulatory positions on safety issues relative to the plant design basis.

RIZZO has performed analysis and design of test facilities for the operational testing of the AP1000 Reactor Coolant Pump. Work included thermo-mechanical analyses and fatigue evaluation of the Pump casing, the thick-walled loop pipes, pipe supports, and associated bi-metallic weld details.

RIZZO provides expertise in soil-structure interaction, including interpretation of results from field and laboratory investigations of subsurface soils, vibratory ground motion, site seismic response, and state-of-the-art methods, which explicitly treat issues such as damping, frequency-dependent compliance functions, effects of embedment, effects of layered subsurface profiles, and other uncertainties.

SEISMIC QUALIFICATION OF EQUIPMENT AND PIPING, FRAGILITY ANALYSIS, AND WALKDOWNS

RIZZO provides a full range of services to qualify in-plant equipment, piping, and supports. Included are plant walk downs, experience-based qualification using in-house databases, and qualification by analysis. We maintain all necessary tools and industry-standard software.

Senior staff provides expert review in preparation of program plans, design criteria reviews, and linear and nonlinear analyses for a variety of static and dynamic loads including seismic, impact, pressure, and temperature transients. The results are used to identify design margins.

SEISMIC MARGINS AND SEISMIC RISK ASSESSMENTS

RIZZO supports PSHA, Probabilistic Fault Displacement Analysis, and Seismic Margin Evaluations for new or existing NPPs. RIZZO works closely with the client in selecting the methodology, accident scenarios, and Equipment Lists based on plant specific design. We provide expert interpretation of requirements and review plant design, seismic design basis, and soil/ foundation stability. We perform equipment walk downs, complete seismic hazard assessments, develop in-structure response spectra, and perform soil structure interaction.