



SPECIALTY STRUCTURAL ANALYSIS & DESIGN

OUR STRUCTURAL EXPERTISE

RIZZO International, Inc. performs a wide range of consulting and engineering activities related to civil structures, mechanical equipment and piping systems for a multitude of industry sectors including nuclear, chemical, mining, steel and power industries. Structural engineering expertise includes:

- Conceptual and detailed structural and mechanical design
- Support of Seismic Probabilistic Risk Assessments (SPRAs) and Seismic Margin Assessments (SMAs) for new or existing nuclear power plants
- Third party peer review of completed SPRAs
- Seismic capability, tornado and high wind walkdowns of nuclear facilities
- Fragility evaluation of structures, mechanical and electrical components and distribution systems
- Seismic qualification analysis
- Environmental qualification analysis
- Structural qualification analysis
- Dynamic vibration analysis
- Soil-structure interaction analysis
- Structural and foundation analysis and design for extreme load combinations with seismic, wind, flooding, hydrodynamic, impact and blast loads

The majority of the RIZZO Team includes engineering or science professionals, many with advanced degrees and professional licenses. Our Team is led by international experts with specializations in seismic engineering and advanced structural analysis and design. We provide engineering

services for a broad range of clients including utilities, nuclear energy facilities, regulatory bodies, architect-engineers and component suppliers.

RIZZO's Quality Assurance (QA) Program has been audited by NUPIC and it meets the requirements of Title 10 CFR 50 Appendix B and ASME NQA-1-1994 and NQA-1-2008 (and the NQA-1a-2009 Addenda). We are certified under ISO 9001:2008 for provision of professional engineering and consulting services.

RIZZO maintains in-depth and current knowledge of prevalent codes and standards developed by AISC, ACI, NWS, ANSI, NRC, ANS, EPRI, IEEE, IBC, IEC, IAEA, ASI NTD, ASCE, ASME, and ASTM.

KEY STRUCTURAL SERVICES

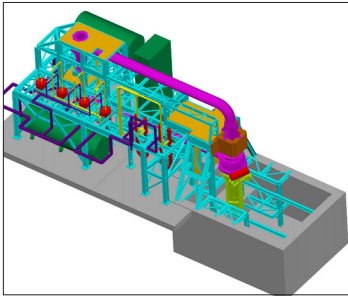
For the analysis and design process, our engineering team specializes in a variety of major structural and mechanical software packages, including ANSYS, GTStrudl, SAP2000, STAAD.Pro and RISA-3D. Additionally, we maintain several special in-house programs to supplement these general-purpose codes. We also utilize static and dynamic non-linear analysis software such as ABAQUS, ADINA, SOLVIA, SCIA Engineer, LS-DYNA, SASSI, NASTRAN, CAESAR, AUTOPIPE, dPIPE, Pipestress and ALGOR.

RIZZO's structural services expertise can be summarized as:

- Advanced structural and mechanical analysis
- Design and detailing of complex systems
- Seismic qualifications of buildings, equipment and distribution systems

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ADVANCED STRUCTURAL AND MECHANICAL ANALYSIS



RIZZO provides a wide range of analytical services for civil structures and mechanical systems. The analyses comprise several loading scenarios of complex structural systems, including nuclear seismic category I and II buildings, dams, stadiums, historical structures, underground

facilities, industrial facilities, wind and gas turbines, offshore oil and gas platforms, utility distribution systems, fixed equipment, machinery and isolation systems.

The types of advanced analysis performed include:

- Dynamic analysis including seismic, harmonic vibration and impact response
- Evaluation of other static and dynamic structural loads including wind and support settlement
- Material and geometrical non-linear structural analysis
- Soil-structure and fluid-structure interaction analysis
- Heat transfer analysis and thermal strain analysis
- Piping analysis for water and steam hammer and other valve operating loads
- High Energy Line Break analysis considering impingement and piping whip effects
- Fatigue evaluation and life extension

DESIGN & DETAILING OF COMPLEX SYSTEMS

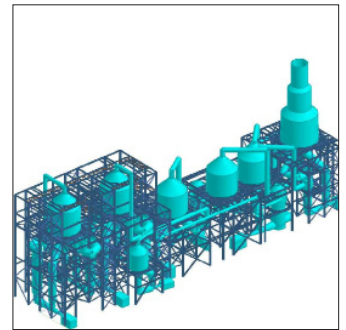
In addition to analysis, RIZZO develops the design of new structural and mechanical systems with appropriate considerations of load and performance issues that arise from normal and extraordinary operation. RIZZO performs conceptual and detailed structural and mechanical design, including:

- Design and detailing of metal and concrete building systems, foundations and mechanical components

- Design of seismic isolation systems with optimization of acceleration, velocity and displacement responses
- Design of mechanical equipment for operating conditions and loads, fatigue limits, and vibration control
- Anchorage design of structures, mechanical equipment and distribution systems
- Facilities planning and plant layout design

STRUCTURAL QUALIFICATIONS

In recent years, our projects have included design, retrofit and construction of seismic upgrades and re-evaluation of a wide range of structural systems. For a confidential client, RIZZO performed seismic qualification of containment internal structures based on compliance with ACI 349, ANSI/AISC N690, and the ASME B&PV Code. For this project, RIZZO evaluated dead and live loads, internal pressures, steady state thermal and flooding analyses, and response spectrum analyses.



For several other confidential clients, RIZZO has participated in the preparation of equipment qualification specifications, preparation of qualification calculation reports and evaluations of seismic shake table testing for approval by nuclear regulatory bodies. RIZZO is the leading consulting company to introduce equipment qualification programs for the Czech and Slovak NPPs and develop a seismic equipment qualification program for Ukrainian NPPs. RIZZO's structural qualification services include:

- Review and development of standards and guidelines
- Retrofit and construction of seismic upgrades and reevaluation of various structural systems
- Forensic engineering, such as post-earthquake evaluations