and to independently check results. This practice is not always found in conventional engineering firms.

In particular, the nuclear industry and specialty purpose facilities require more scrutiny to be placed on the functionality and safety of these facilities. These clients have heightened requirements, and knowledge of specific niche software programs is a must in order to perform the work. Our team’s ability to work on a wide variety of analysis platforms enables us to perform work on a unique variety of structures and situations. Many of our clients return because of our ability to utilize the specific software tools their project requires.

The company also maintains a stringent Quality Control policy for all work. Configuration control is required for each software package used in nuclear safety-related applications through Computer Software Validation and Verification. Within our firm, an individual is assigned as responsible for Configuration Control for each software package that is utilized for performance of nuclear safety-related work.

A recent global event has called attention to the importance of protecting against tsunami challenges.

### SOFTWARE & TECHNOLOGY IN THE 21st CENTURY

At RIZZO, our engineers and scientists service a wide range of markets, most notably the nuclear power, dams and water resources, transportation, mining, and tunneling industries. A unique identifier is our ability to perform almost any given analysis for niche services within these broad industries. A backbone of our efforts in these fields is our use of over 200 types of software, enabling us to maintain a state-of-practice approach to our work. In particular, we have long been at the forefront in seismic and specialty structural engineering and earthquake and tsunami modeling.

RIZZO engineers possess the technical expertise to perform complex analyses beyond the capabilities of many engineering firms. Our experiences range from performing routine static analyses to complex dynamic analyses such as Harmonic Response Analysis, Time History Analysis, Heat Transfer Analysis, and Non-Linear Plastic Analysis. To successfully perform these analyses a certain background and education is required. Evaluation of the results is more multi-faceted than what is required for simple analysis. A working knowledge of the programs used to model and perform the analysis is not enough – there is also a need to review the results and determine if they make sense and are accurate, and to independently check results. This practice is not always found in conventional engineering firms.

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A recent global event has called attention to the importance of protecting against tsunami challenges.
for major structures, and particularly for nuclear facilities that potentially can be impacted. With growing global energy needs there continues to be an increase in demand for new nuclear power plants, and now more than ever before a strong emphasis is being placed on performing a thorough site investigation to support plant design, part of which includes coastal and tsunami modeling. We have a unique combination of expertise to perform all aspects of these investigations. Our portfolio of services is steadily growing and adapting to include siting in a variety of conditions. Using programs such as DELFT3D, RIZZO engineers are able to simulate two-dimensional and three-dimensional flow, sediment transport and morphology, waves, water quality and ecology and analyze the interactions between these processes.

Additionally, RIZZO utilizes Geographical Information Systems (GIS), which integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. The GIS software is also the platform for HEC-geoRAS, HEC-geoHMS, and Arc-Hydro, which are geospatial hydrology tools used by our engineers and hydrologists. To a great extent, GIS is used in support of nuclear siting studies. A comprehensive GIS Model is developed, allowing for detailed analysis of plant siting inputs and accurate determination of specific areas best suited for nuclear power plant siting.

Our software capabilities also enhance the services we provide for the dams, transportation, mining, and tunneling industries. Our expertise in earthquake engineering, e.g. ground motion studies, site response analysis, and soil-structure interaction analysis, sets us apart from the competition. Our staff possesses the knowledge and experience-driven skill set to perform a diverse range of analysis and design services enhanced by state-of-the-art engineering software. The majority of our structural engineering projects have utilized SHAKE, GT-STRUDL, RISA, STAAD Pro, and SAP2000 software for analysis and code checks. Our seismic and structural engineering work utilizes SASSI and ANSYS software for analysis. RIZZO engineers are proficient with the versatile PLAXIS and FLAC software that can be used to simulate and analyze even the most complicated geotechnical problems.

Additionally, we maintain several special purpose programs to supplement these general-purpose codes. We also have the option and ability to increase our capabilities in static and dynamic non-linear analysis using software such as ADINA and LS_DYNA.

RIZZO maintains in-depth knowledge of prevalent codes and standards, such as AISC, ACI, and NWDS, for construction in steel, concrete, and wood. Our engineers are familiar with computer-aided analysis and design and are encouraged to develop productivity software for in-house use. Senior-level staff members participate in code committees for organizations such as ASTM, ASCE, and ACI.

Our firm also sustains an understanding of the evolution of the various programs we use by attending seminars on the latest improvements in software capability and by utilizing software evaluation as new versions become available. In a few instances, our team has caught flaws in software programs and worked with the responsible company to improve the program. Additionally, RIZZO employees have created programs to serve a specific industry need. Among others, Dr. Jose Blanco wrote the programs ProHazard, ProHazard Beta, and Rizzo-Hazard that perform Probabilistic Seismic Hazard Analysis, and Dr. Evren Ulku is working with Bentley Software Corporation on the program SSDD.

The use of these software programs allows our engineers to provide improved solution and modeling capabilities. It is hard to pinpoint where the programs will be in 5, 10 or even 20 years as the development is so dynamic, but it is very reasonable to say that we have not yet reached the full capacity of these programs. Regardless of how the software evolves, RIZZO engineers and scientists are committed to remaining at the forefront of these efforts.

For more information on RIZZO’s Seismic and Structural capabilities, please contact Jim Hayes at james.hays@rizzoassoc.com.
SUMMER NEWS
FROM THE RIZZO COMMUNITY

CONGRATULATIONS TO RIZZO’S DAMS & WATER RESOURCES TEAM!
The Wyaralong Dam Project in Queensland, Australia was the recipient of the IQPC’s 11th Annual Collaborative Contracting Excellence Award. RIZZO is a member company of the Wyaralong Dam Alliance, the team responsible for the design and construction of the Wyaralong RCC Water Supply Dam (pictured below), which began storing water in December 2010 and was turned over to the Owner in June 2011.

At RIZZO, our employees are our greatest asset. An atmosphere of continued learning is encouraged, from partnering interns and junior engineers with senior-level employees to encouraging our engineers to research and publish industry articles. This ideal is further fostered through the company’s Tuition Reimbursement Program. Employees can pursue higher degrees while maintaining their work schedule at RIZZO, giving them real-world, hands-on experience they can apply to their studies.

Congratulations to the latest graduates of the Tuition Reimbursement Program, Jessica Raithel and Enrique Bazan!

CONGRATULATIONS TO ENRIQUE BAZAN ARIAS for earning an Executive MBA (EMBA) degree from the University of Pittsburgh Katz Graduate School of Business! Enrique graduated July 2011 after management development coursework, teamwork, and hard work - all the while working full-time at RIZZO.

More than 50 students graduated with Enrique and will join the more than 1,100 Katz EMBA alumni who are forging successful careers worldwide.

It’s a well known fact that all work and no play can make the winter doldrums drag on and on. In an effort to kick-start the summer, RIZZO’s HR Department hosted a Spring BBQ, complete with games and music.

Employees wasted little time getting in line for lunch that day! Thanks to Phil Van der Lee and Jeff Schubert for being the grill masters of the afternoon!

“I most enjoyed the bean bag competitions! They pitted group against group in a fun, lightly competitive setting. Plus Ben Ringler lost*, which was great!”

~ Gillian Krezoski
Assistant Project Geoscientist

*Information confirmed by an anonymous source within the CADD Department

“The Spring BBQ provided a unique opportunity to mingle with other RIZZO employees who I hardly see in normal work days. And the food delicious! I hope this becomes a tradition at RIZZO.”

~ Rigobert Tibi
Seismologist

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Paul C. Rizzo Associates, Inc. (RIZZO) has always had a dedication to dams and water resources projects. The winter edition of the newsletter will take an in-depth look at this division of the firm, showcasing our work with small spillway design and construction, large dam rehabilitations, complete rebuilds, hydroelectric feasibility studies, project development, and inspections and rehabilitation design services for various types of dams, including conventional concrete, Roller Compacted Concrete (RCC), earthfill, rockfill, masonry concrete gravity, buttress, and timber crib dams.

The article will also offer a glimpse of RIZZO projects from around the globe, including the award-winning Wyaralong Dam in Australia, RCC work in Vietnam, and extended US contracts, among others.

RIZZO completed an evaluation of potential NPP site locations throughout the country and used multiple siting criteria (including seismic, availability of water, environmental and population criteria) and a ranking scheme to identify appropriate locations for the siting of nuclear power plants.

A Potential Failure Modes Analysis (PFMA) and an updated stability analysis were conducted at Keokuk. RIZZO assembled a Supporting Technical Information Document (STID) for the Project, including information on the project history, geology, hydrology and hydraulics, instrumentation, stability analyses, and operation and maintenance.