
PROFESSIONAL PROFILE

Position: Principal Engineer

Education: M.S., Structural Engineering and Structural Mechanics,
University of California
M.S., Engineering Science, University of Arkansas
B.S., Civil Engineering, New York University
A.A.S., Applied Science, Dutchess Community College

Registrations: Engineering - Mississippi, 1969
Civil Engineering and Surveying - California, 1973
Engineering - South Carolina, 1995
Civil Engineering - Georgia, 1996

Experience:

Over thirty-eight years experience in all aspects of civil and structural engineering including analysis, design and testing, and twenty-four years experience in the analysis, evaluation and design of nuclear power plant structures and systems. Specialties include stress analyses, geotechnical studies, soil dynamics, structural dynamics (seismic, missile impact, blast effects) and stability, vibration testing, analysis and evaluation, system and equipment qualification and development of seismic design specifications, criteria and procedures. Experienced with all major finite element and stress analysis programs and has extensive project management experience.

Work History:

Partner in Charge – 1995 to Present **Pantech Engineering of Georgia, GA**

Partner - 1998 to Present
Structural Dynamics Engineering, Augusta, GA

Chief Engineer - 1996 to 1998
Rieck Engineering Consulting, Augusta, GA

Technical Consultant - 1993 to 1996
EQE International, Inc., Aiken, SC

Resident Seismic Consultant - 1991 to 1993
Sargent & Lundy Engineers, Korean Power Engineering Company, Seoul,

Korea

Consultant/Project Engineer/Senior Engineer - 1974 to 1991
Gilbert/Commonwealth, Inc., Reading, PA

Research Structural Engineer - 1968 to 1974
U. S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS
Active Military Service, Specialist E5 - 1966 to 1968

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Civil Engineer - 1964 to 1966

U. S. Army Corps of Engineers, New York District, New York, NY

Organizations:

Earthquake Engineering Research Institute, Member

Vibration Institute, Member, Level II Certification

American Society of Civil Engineers, Member

American Nuclear Society, Member

American Concrete institute, Member

Security Clearances Held: DOD; S, TS, TS-CNWDI

Projects:

Salt Waste Process Facility; Savannah River Site, Aiken, SC (2011) Conducted NQA1 seismic calculations for HEPA filter design for salt waste facility process building.

UT-Batelle LLC., Spallation Neutron Source Target Systems, Oak Ridge National Laboratory, Oak Ridge, TN (2003) Conducted seismic evaluations and developed vendor qualification criteria for cryogenic hydrogen transfer lines located within the Target Core Vessel. Work included establishing the probabilistic seismic hazard for the vessel based on a 10,000 year seismic event.

AVANTech, Inc., Columbia, SC (2002,2003) Conducted structural analyses and design of radiation shielded process vessels using ASME Section VIII rules.

Knight Advanced Technologies, Chicago, IL (2001): Conducted seismic analyses, including soil-structure interaction effects, for Department of Energy Spallation Neutron Source Facility. Developed analytical models and distributed seismic loads to lateral load resisting structural elements.

Memphis Light, Gas and Water, J.J. Davis Pumping Plant, Memphis, TN (1999) Conducted seismic qualifications using experience data and developed anchorage designs of electrical cabinets and high service pumps.

Idaho National Engineering Laboratory, Idaho Falls, ID (1998-2000): Conducted seismic analyses, including soil-structure interaction effects, for an above ground, mounded, high security, materials storage facility. Developed equivalent lateral soil pressures on exterior walls and roof. Developed probabilistic site specific dynamic soil properties and surface response spectra. Developed equipment surcharge loads on buried waste storage tanks.

Chem-Nuclear Corp, Columbia, SC (1998): Conducted high energy pump vibration investigation of barge skid mounted reverse osmosis environmental cleanup module. Vibrations were found to be caused by pump cavitation and resulted in resizing of pump intake lines.

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Northeast Utilities, Waterford, CN, Millford Unit 3 NPP (1997) Technical Consultant investigating containment building settlement due to deterioration of underdrain high alumina content porous concrete and piping. Developed plan to extract underdrain concrete cores for testing and evaluation. Conducted analyses, evaluated results and wrote safety evaluation report.

Westinghouse Savannah River Company, Aiken, SC (1996): Technical Consultant to Structural Mechanics Group at the DOE Savannah River Defense Site. Developed structural capacities and conducted seismic soil-structure analyses for large reinforced concrete buildings and underground waste storage tanks. Developed seismic criteria for structure and equipment evaluations. Evaluated process critical site buildings for seismic and high wind effects. Wrote and updated structure vulnerability summary reports and CSI specifications. Conducted system interaction walkdowns and seismic margin and fragility evaluations.

EQE International, Inc., Aiken, SC: Southeast Regional Office; Conducted probable loss studies and developed seismic retrofit designs for commercial structures located in high seismic areas. Evaluated seismic adequacy of equipment and systems for Savannah River Site and Trans-Alaska Pipeline System.

Korea Power Engineering Company, Seoul, Korea, Ulchin 3 and 4 Nuclear Power Plants : Resident seismic consultant assisting in developing synthetic ground motions incorporating 1989 revision to the USNRC Standard Review Plan. Conducted rock-structure interaction studies for structures founded on varying site conditions and presented results to Korean licensing agency. Reviewed design specifications and criteria for reactor coolant system and reactor vessel internals design.

Oak Ridge National Laboratory, Oak Ridge, TN: Project Engineer for natural hazard (tornado winds and earthquake) evaluations of defense critical and hazardous material processing facilities. Work included developing acceptance criteria and conducting analytical hazard analyses consistent with DOE guidelines.

Tennessee Valley Power Authority, Knoxville, TN, Watts Bar and Sequoyah Nuclear Power Stations: Project engineer for seismic evaluation of in-place line run cable tray, conduit and air handling systems. Analyses included nonlinear low-cycle fatigue evaluations of system flexible rod supports. Reorganized Civil/Structural design criteria. Conducted analytical review of dynamic analyses evaluating the effects of postulated accident hydrodynamic loads on toroidal containment structure.

Texas Utilities Generating Companies, Fort Worth, TX, Comanche Peak Steam Electric Station:

Consultant to TERA Corporation, Berkeley, CA. Conducted independent review of NNPP structures and equipment designs including the containment mat design, storage tanks, underground systems, high energy pipe restraints, and reactor vessel and steam generator designs.

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General Public Utilities, Parsippany, NJ, Three Mile Island Unit 2 Nuclear Power Station: Designed removable seismic restraint and anchorage system for unloading system used in removing debris from damaged reactor vessel.

General Battery Corporation, Reading, PA: Developed prototype design concepts for storage battery container endwalls. The redesigned endwalls allowed battery internals to meet shock and vibration test requirements. Provided consultation and analyses for prototype battery carrying handle design. Designs considered non-linear properties of several types of plastics over extreme temperature ranges. Follow-up testing verified analytical predictions and design adequacy.

Chiyoda Chemical Engineering and Construction, Ltd., Toyoko, Japan: Presented five-day training session on seismic design of nuclear power plant structures, including equipment qualification and soil-structure interaction effects at company headquarters in Japan.

United States Air Force Ballistic Missile Office, Norton, CA: Task manager for nuclear hardness and survivability studies in support of a deep underground missile basing project. Studies included non-linear finite element analyses, detailed design for tunnel stability, and design of equipment shock isolation concepts subjected to postulated nuclear events.

Cleveland Electric Illuminating Company., Cleveland, OH, Perry Nuclear Station: Conducted large scale finite element thermal stress analysis of reactor vessel refueling seal table for increased operating temperatures. Conducted seismic analyses of reactor building and diesel generator buildings to address licensing concerns regarding interior structural eccentricities and soil-structure interaction effects. Presented training sessions on seismic qualification of equipment. Conducted analytical and design review of structural systems subjected to hydrodynamic loadings.

South Carolina Electric and Gas Company, Columbia, SC, Conducted structural seismic analysis and seismic qualification of equipment for increased seismic requirements due to regional seismicity and reservoir induced seismic effects. Designed restraints for rupture of high energy piping systems.

Rochester Gas and Electric Company, Rochester, NY, R.E. Ginna Nuclear Power Plant: Developed program to upgrade auxiliary structures to withstand increased tornado and extreme wind effects. Conducted dynamic analysis review of auxiliary building seismic upgrading program.

Korea Electric Power Company, Seoul, Korea, Ko-Ri Nuclear Unit 2: Interim resident construction engineer responsible for resolution of civil, architectural and structural field questions. Presented training sessions in area of seismic analysis, design and equipment qualification. Conducted seismic analysis of reactor containment and auxiliary structures, including development of design response spectra.

Kraftwerk Union AG, Erlangen, Germany: Resident Consultant in areas of seismic and dynamic analysis and design for pumps and pressure vessels. Assisted engineers in conducting stress analyses in accordance with American (ASME) criteria. Conducted analytical investigations into the sliding behavior of a polar crane subjected to postulated

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aircraft impact and seismic loadings. Conducted investigations into the development and use of non-linear response spectra for structural design.

Mitsubishi Heavy Industries, Ltd., Toyoko, Japan: Developed integrated containment and auxiliary structure design concept for nuclear power plants located in high seismic areas.

Electric Utilities of Slovenia and Croatia, Zagreb, Yugoslavia, Krsko Nuclear Power Plant: Conducted soil structure interaction investigations correlating plant seismic response to measured seismic free-field ground motions exceeding 0.50 g. Developed design concept of integrally combining reactor building and auxiliary structures on a common mat foundation.

U.S. Army Corps. of Engineers, Vicksburg, MS, Waterways Experiment Station: Tested, analyzed and designed full-scale and model underground structural systems subjected to simulated nuclear events and high explosive blasts. Contract and technical monitor for development of finite element program (SAP) by University of California. Conducted analyses of SAFEGUARD ABM structures and MINUTEMAN II missile silos and support structures subjected to postulated nuclear blasts. Analyzed and evaluated effects of dewatering on the New Orleans Navigational Canal lock walls. Conducted analyses predicting the breaching of the Auburn, California, North Fork Dam when subjected to reservoir explosion.

PUBLICATIONS:

"Statistical Soil-Structure Interaction Response of a Containment Building Considering Soil Property Variability," Co-author, 17th International Conference on Structural Mechanics in Reactor Technology, Prague, Czech Republic, August, 2003.

"Seismic Response of Statistically Varied Soil Column Profiles for SSI Analyses," Co-author, 16th International Conference on Structural Mechanics in Reactor Technology, Washington, DC, August, 2001.

"Seismic Soil Pressure Distribution on Walls of a Bermed Structure on a Layered Site," Co-author, American Society of Mechanical Engineers PVP Conference, Atlanta, GA, July, 2001.

"Impact of Power Spectral Density Function Licensing Requirement on Replicate Nuclear Power Plant Seismic Design," Co-author, 12th International Conference on Structural Mechanics in Reactor Technology, Stuttgart, Germany, 1993.

"Seismic Response of a Sliding Polar Crane for a Nuclear Power Plant," 6th International Conference on Structural Mechanics in Reactor Technology, Paris, France, 1981.

"Integrated Structural Design for Nuclear Power Plants Located in High Seismic Areas," 5th International Conference on Structural Mechanics in Reactor Technology, Berlin, West Germany, 1979.

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"Structural Design for Aircraft Impact Loading," Co-author, 4th International Conference on Structural Mechanics in Reactor Technology, San Francisco, 1977.

"Expedient Field Fortifications for Use Against Nuclear Weapons," Co-author, U. S. Army Waterways Experiment Station, Weapons Effects Laboratory, TR-N-74-7, September, 1974.

"Structural Analysis of the New Orleans Inner Harbor Navigational Canal Lock," U. S. Army Waterways Experiment Station, Weapon Effects Laboratory, MP-N-75- 8, August, 1975.

"Computer Program for Drawing Finite Element Grids," U.S. Army Waterways Experiment Station, Weapons Effects Laboratory, MP-N-76-2, September, 1976.