APPENDIX A
RESUMES AND QUALIFICATIONS

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JOHN E. REDDINGTON

Work experience

January 2007 to present:

Principal Consultant, Probabilistic Risk Analysis: Lead fire PRA for the Davis-Besse fire PRA, including contractor oversight and coordination; specialization in HRA, including operations interface, model integration, dependency analysis and PWROG HRA Subcommittee; fire PRA peer reviews; currently technical lead for seismic PRA for FENOC fleet; mentor to junior and co-op engineers.

August 2004- January 2007:

Principal Programs Engineer, Fleet office Akron, OH: responsible for the fire protection program for the FENOC fleet

August 2003 to August 2004: Davis-Besse Nuclear Station Oak Harbor, OH

Training Manager: Responsible for direction and implementation of site's accredited training programs. Heavily involved with high intensity training required to get Davis-Besse back on line following a two year outage replacing the reactor head.

January 2001 to August 2003 : Davis-Besse Nuclear Station Oak Harbor, OH

Supervisor Quality Assurance Oversight for Maintenance:

Responsible for value added assessments based on performance as well as compliance. Ensure industry best practices are used as standards for performance in maintenance, outage planning, and scheduling.

1996 to January 2001,

Superintendent Mechanical Maintenance

Manage the short and long term direction of the Mechanical and Services Maintenance Departments. Responsible for 80 to 90 person department with a budget between 7 and 15 million dollars a year. Direct the planning, engineering, and field maintenance activities. Direct oversight of outage preparations and implementation. One year assignment working with Technical Skills Training preparing for accreditation.

1993 – 1996

Shift Manager

Act as the on-shift representative of the Plant Manager. Responsible for providing continuous management support for all Station activities to ensure safe and efficient plant operation. Establish short term objectives for plant control and provide recommendations to the Shift Supervisor. Monitor core reactivity and thermal hydraulic performance, containment isolation capability, and plant radiological conditions during transients and advise the operating crew on the actions required to maintain adequate shutdown margin, core cooling capability, and minimize radiological releases.

1991 – 1993

Senior System and Maintenance Engineer

Provide Operations with system specific technical expertise. Responsible for maintaining and optimizing the extraction steam and feedwater heaters, the fuel handling equipment and all station cranes.

Acted as **Fuel Handling Director** during refueling outages. Responsibilities Included maintaining the safe and analyzed core configuration, directing operation personnel on fuel moves, directing maintenance personnel on equipment repair and preventative maintenance.

1986 – 1991

Senior Design Engineer and Senior Reactor Operator student

Activities included modification design work and plant representative on the Seismic Qualification Utilities Group and the Seismic Issues subcommittee. Licensed as a Senior Reactor Operator following extensive classroom, simulator, shift training, and Nuclear Regulatory Commission examination.

1984 – 1986 Sargent & Lundy Engineers Chicago, IL

Senior Structural Engineer

Responsible for a design team of engineers for the steel design and layout to support the addition of three baghouses on a coal fired plant in Texas. Investigated and prepared both remedial and long term solutions to structural problems associated with a hot side precipitator.

1980 – 1984

Structural Engineer

Responsible for steel and concrete design and analysis for LaSalle and Fermi Nuclear Power plants. Performed vibrational load and stability analysis for numerous piping systems. Member of the on-site team of engineers responsible for timely in-place modifications to the plant structure at LaSalle.

1979 – 1980 Wagner Martin Mechanical Contractors Richmond, IN

Engineer/Project Manager

Responsible for sprinkler system design through approval by appropriate underwriter. Estimator and Project Manager on numerous mechanical projects up to 1.8 million dollars.

Education	1975 - 1979	Purdue University	West Lafayette, IN
	Bachelor of Science in Civil Engineering		
	1990- 1995	University of Cincinnati	Cincinnati, OH
	Master of Science in Nuclear Engineering		

Professional memberships

Professional Engineer, State of Illinois, 1984

Professional Engineer, State of Ohio, 1986

Senior Reactor Operator, Davis-Besse Nuclear Power Plant, 1990

Qualified Lead Auditor, 2003

SQUG qualified 1987

Other

Committee Chairman, Young Life Toledo Southside, Lake Erie West Region

Sunday School Teacher- College age young people.

DONALD J. WAKEFIELD

PROFESSIONAL HISTORY

ABSG Consulting Inc., Irvine, California
Senior Consultant, Operational Risk and Performance Consulting, 2000–Present

EQE International, Senior Consultant, 1997–2000

PLG, Inc., Irvine, California, Senior Consultant, 1983-1997

Cygna Energy Services, Associate, 1981–1983

General Atomic Company, Engineer, 1974-1981

PROFESSIONAL SUMMARY

Mr. Donald J. Wakefield has more than 30 years experience in all phases of the risk analysis of nuclear power plants and other complex facilities, including human reliability analysis. He has served as principal investigator and project manager for the risk assessment of several nuclear plants in the United States and the Far East. He served as a key risk analyst on assessments of a floating, production, offloading and storage facility (FPSO), an oil tanker, and for the handling of abandoned chemical weapons in China. Mr. Wakefield is also Project Manager for the development of ABS Consulting's RISKMAN® software for risk assessment applications. He is now serving as the Chairman of the Low Power and Shutdown PRA Standard Writing Group (ANS 58.22) and serves on the ASME's Committee on Nuclear Risk Management (CNRM) and ANS's RISC Committee.

PROFESSIONAL EXPERIENCE

In late 2006, Mr. Wakefield became the writing group chairman for the ANS PRA standard for Low Power and Shutdown Events (ANS-58.22). This standard is still in development. Mr. Wakefield has also been active recently in the modeling of shutdown events. He recently performed a review of the Seabrook Station, all power modes PRA model. He recently performed a Level 2 analysis for shutdown events of the KKG plant in Switzerland. These efforts are in addition to his past Level 1 shutdown studies for HIFAR in Australia, Takahama-3/4, and for other plants in Japan.

Mr. Wakefield recently served as the principle investigator for a fire risk analysis of the Watts Bar unit 2 plant to satisfy its FIVE licensing requirement. This study was performed using CAFTA.

Mr. Wakefield has also performed human reliability analysis for nuclear plants. He served as task leader for the human factors analysis of the Three Mile Island (TMI) Unit 1 PSA. Performed the original human factors analysis for the PSA and then, nearly 20 years later, worked with the plant safety staff to update the analysis using the EPRI HRA Calculator. More recently, Mr. Wakefield served as an independent reviewer for the South Texas Project upgrade to the latest EPRI HRA Calculator, and for a similar review effort for PG&E. Mr. Wakefield was co-author of the Electric Power Research Institute (EPRI) report on the SHARP-1 approach to HRA analyses for PSAs.

Mr. Wakefield served as principal investigator for the Beaver Valley Units 1 and 2 PSA performed to satisfy U.S. Nuclear Regulatory Commission (USNRC) IPE and IPE for external event (IPEEE) requirements.

Mr. Wakefield also provided expertise in developing and analyzing the Sequoyah and Watts Bar PSA plant models to satisfy the individual plant examination (IPE).

Mr. Wakefield served as project manager for the Salem PSA update and as technical consultant for a PSA of the new production (i.e., weapons materials) modular gas-cooled reactor.

Mr. Wakefield was a key contributor to accident sequence modeling, including human factors analysis, and seismic analysis for the Diablo Canyon PSA.

Mr. Wakefield served as principal investigator in charge of extending a fault tree linking PSA plant model for a pressurized water reactor in the Far East to accommodate the assessment of plant internal fires and seismic events.

Mr. Wakefield served as consultant specializing in accident sequence modeling and plant systems analysis for probabilistic safety assessments (PSA). Recently, he served as technical advisor and sequence model architect for a risk assessment model for the excavation and disposal of abandoned chemical weapons in China. The study considered weapon handling errors, plant fires and weapon explosions there from. This assessment looked at all initiating events and the sequence development extended to payouts resulting from worker and population exposures, building and equipment losses and from environmental cleanup costs. Mr. Wakefield served as the technical lead and coordinated inputs from the Knoxville, San Antonio, and Irvine offices for use by the ABS Tokyo office.

Mr. Wakefield served as senior analyst for the development of a QRA model for a Floating, Production, offloading and Storage (FPSO) facility hypothetically located in the Gulf of Mexico. This model, funded internally by ABS, looked at risk to the workers from pool fires and jet fires and environmental damage from potential oil spills. Also, in 1995, he performed risk assessment portion of an explosion analysis for the Agbami FPSO owned by Star Deep Water Petroleum Limited, and one for the GX Platform owned by Exxon Mobil for Mustang Engineering. He also served as advisor for the PSA of a new, double-hulled oil tanker.

Mr. Wakefield developed the CAFTA-based accident sequence model for a seismic margins assessment for the ACR-700 design for AECL.

Mr. Wakefield served as instructor for numerous PSA courses and provided extensive utility training sessions both in the U.S. and abroad. He served as course instructor to the US Nuclear Regulatory Commission for the risk assessment of external events and to describe the large event tree approach to sequence modeling.

Mr. Wakefield provides technical direction and project management for the development of ABS Consulting's RISKMAN® PSA software and administers the RISKMAN® Technology Group (a utility users' group). This user's group, now in its eighteenth year, funds the maintenance and development of RISKMAN® upgrades. Mr. Wakefield provides the interface between the user's group members, and the RISKMAN® development team.

Mr. Wakefield was a substantial contributor to a 5-year high temperature gas-cooled reactor (HTGR) risk assessment study. He developed numerous improvements to severe accident consequence computer programs for the HTGR. Quantified uncertainties in severe accident source terms and dose assessment for the HTGR, the first such assessment ever accomplished for any reactor type. Developed a procedure for prioritizing HTGR safety research programs using PSA and formulated an initial set of research recommendations. Prepared test specifications to implement research recommendations.

Mr. Wakefield has authored numerous scientific papers on the subject of probabilistic risk assessment methods including such topics as importance measures, comparison between event tree and fault tree linking, and human reliability analysis techniques.

EDUCATION

M.S., Nuclear Engineering, University of California, Berkeley, 1974
B.S., Engineering Mathematics, University of California, Berkeley, 1973,
with highest honors

MEMBERSHIPS, LICENSES, AND HONORS

American Nuclear Society
Phi Beta Kappa, National Scholastic Honor Society
Tau Beta Pi, National Engineering Honor Society
Regents Fellowship, University of California, 1974
Department of Engineering Certificate Award, 1973

SELECTED PUBLICATIONS

Wakefield, D.J., and Y. Xiong, "Importance Measures Computed in RISKMAN® for Windows," *PSAM 5, 5th International Conference on Probabilistic Safety Assessment and Management,* November 2000.

Johnson, D. H., D. J. Wakefield, and R. Cameron, "Use of PSA in Risk Management at a Research Reactor," presented at the *American Nuclear Society, International Topical Meeting on Probabilistic Safety Assessment (PSA '99)*, Washington, D.C., August 22-25, 1999.

Quilici, M., W. T. Loh, and D. J. Wakefield, "IPEEE Reports Survey," prepared for *Computer Software Development Co., Ltd., Tokyo, Japan*, PLG-1194, March 1998.

Wakefield, D. J., "PSA and RISKMAN® Software Training Course," presented to *Tennessee Valley Authority, Newport Beach, California,* PLG-1195, February 2-6, 1998.

Wakefield, D. J., and D. H. Johnson, "A Level 1+ Probabilistic Safety Assessment of the High Flux Australian Reactor," prepared for *Department of Industry, Science and Tourism, Canberra, Australia,* PLG-1200, January 1998.

Wakefield, D. J., and D. H. Johnson, "Summary Report - A Level 1+ Probabilistic Safety Assessment of the High Flux Australian Reactor," prepared for *Department of Industry, Science and Tourism, Canberra, Australia,* PLG-1201, January 1998.

Wakefield, D. J., and D. H. Johnson, "Technical Summary Report - A Level 1+ Probabilistic Safety Assessment of the High Flux Australian Reactor," prepared for *Department of Industry, Science and Tourism, Canberra, Australia,* PLG-1202, January 1998.

Wakefield, D. J., M. A. Emerson, K. N. Fleming, and S. A. Epstein, "RISKMAN® A System for PSA," Proceedings, *Probabilistic Safety Assessment International Topical Meeting, Clearwater, Florida,* pp. 722-729, January 1993.

Wakefield, D. J., R. K. Deremer, and K. N. Fleming, "Accident Management Insights Obtained During the Beaver Valley Unit 2 Individual Plant Examination Process," Proceedings, *Probabilistic Safety Assessment International Topical Meeting, Clearwater, Florida,* pp. 1049-1053, January 1993.

Contributing Author to:

"Sequoyah Nuclear Plant Unit 1 Probabilistic Risk Assessment Individual Plant Examination," PLG, Inc., prepared for *Tennessee Valley Authority,* 1992.

"Watts Bar Nuclear Plant Unit 1 Probabilistic Risk Assessment Individual Plant Examination," PLG, Inc., prepared for *Tennessee Valley Authority,* 1992.

Wakefield, D.J. and S.A. Nass, "Application of RISKMAN 2.0 to the Beaver Valley Power Station IPE," *Probabilistic Safety Assessment and Management Conference, Beverly Hills, California,* February 1991.

Read, J.W., and D.J. Wakefield, "Diesel Generator Technical Specification Study for Indian Point 3," PLG, Inc., prepared for *New York Power Authority,* PLG-0690, December 1989.

Wakefield, D.J., K.N. Fleming, et al., "Beaver Valley Unit 2 Probabilistic Risk Assessment," PLG, Inc., prepared for *Duquesne Light Company,* December 1989.

Wakefield, D.J., H.F. Perla, D.C. Bley, and B.D. Smith, "Enhanced Seismic Risk Assessment of the Diablo Canyon Power Plant," *Transactions of the Tenth International Conference on Structural Mechanics in Reactor Technology, Los Angeles,* August 1989.

Wakefield, D.J., H.F. Perla, et al., "Seismic and Fire Probabilistic Risk Assessment for a Typical Japanese Plant," PLG, Inc., prepared for *Mitsubishi Atomic Power Industries, Inc.,* February 1988.

Wakefield, D.J., "Three Mile Island Unit 1 Probabilistic Risk Assessment," PLG, Inc., prepared for *GPU Nuclear Corporation,* November 1987.

Wakefield, D.J., and C.D. Adams, "Quantification of Dynamic Human Errors in the TMI-1 PRA," *International Topical* Conference on Probabilistic Safety Assessment and Risk Management, Zurich, Switzerland, September 1987.

Fray, R.R., B.D. Smith, R.G. Berger, M.L. Miller, H.F. Perla, D.C. Bley, D.J. Wakefield, and J.C. Lin, "Probabilistic Risk Assessment for Pacific Gas and Electric Company's Diablo Canyon Power Plant," presented at the *International Conference on Radiation Dosimetry and Safety, Taipei, Taiwan*, March 1987.

Wakefield, D.J., A. Singh, et al., "Systematic Human Action Reliability Procedures (SHARP) Enhancement Project; SHARP1 Methodology Report," PLG, Inc., prepared for *Electric Power Research Institute*, 1987.

Wakefield, D.J., "Salem Nuclear Generating Station Reliability and Safety Management Program: Baseline Safety Assessment," PLG, Inc., prepared for *Public Service Electric and Gas Company*, July 1986.

Wakefield, D.J., "PRA Procedures for Dependent Events Analysis, Volume II, Systems Level Analysis," PLG, Inc., prepared for *Electric Power Research Institute*, December 1985.

PLG, Inc., "Application of PRA Methods to the Systems Interaction Issue," prepared for *Electric Power Research Institute*, PLG-0284, April 1984.

Wakefield, D.J., D.C. Iden, and G. Paras, "Oyster Creek Conceptual HPCI System Risk Reduction Study," prepared for *GPU Nuclear Corporation*, PLG, Inc., PLG-0308, December 1983.

Wakefield, D.J., R.K. Deremer, et al., "Probabilistic Risk Assessment and Systems Interaction Analysis Reference Manual," Cygna Energy Services Report to *Texas Utilities*, October 1982.

Wakefield, D.J., and D. Ligon, "Quantification of Uncertainties in Risk Assessment Using the STADIC Code," *International American Nuclear Society/European Nuclear Society Topical Meeting on Probabilistic Risk Assessment, Port Chester, New York*, September 20-24, 1981.

Fleming, K.N., D.J. Wakefield, et al., "HTGR Accident Initiation and Progression Analyses Phase II Risk Assessment," *United States Department of Energy Report*, GA-A15000, UC-77, April 1978

ABS Consulting
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FARZIN R. BEIGI, P.E.

PROFESSIONAL HISTORY

ABSG Consulting Inc., Oakland, California
Senior Consultant, 2004-Present
Technical Manager, 2001-2004
EQE International, Principal Engineer, 1990-2001

TENERA L.P., Berkeley, California, Project Manager, 1982-1990

PROFESSIONAL EXPERIENCE

Mr. Beigi has more than 29 years of professional structural and civil engineering experience. As a Senior Consultant for ABS Consulting, Mr. Beigi provides project management and structural engineering services, primarily for seismic evaluation projects. He has extensive experience in the areas of seismic evaluation of structures, equipment, piping, seismic criteria development, and structural analysis and design. Selected project accomplishments include the following:

- Most recently, Mr. Beigi has been involved in performing seismic fragility analysis of equipment and structures at Gösgen Nuclear Power Plant in Switzerland, Lungmen Nuclear Power Plant in Taiwan, Oconee Nuclear station in U.S., Point Lepreau Nuclear Plant in Canada, Beznau Nuclear Power Plant in Switzerland, Olkiluoto Nuclear Power Plant in Finland, and Neckarwestheim Nuclear Power Station in Germany.
- Provided new MOV seismic qualification (weak link) reports, for North Anna, Surry and Kewaunee nuclear plants to maximize the valve structural thrust capacity by eliminating conservatisms found in existing qualification reports and previously used criteria.
- At Salem Nuclear Power Plant Mr. Beigi developed design verification criteria for seismic adequacy of HVAC duct systems. He also performed field verification of as-installed HVAC systems and provided engineering evaluations documenting seismic adequacy of these systems, which included dynamic analyses of selected worst-case bounding samples.
- Mr. Beigi has participated in several piping adequacy verification programs for nuclear power plants. At Watts Bar and Bellefonte Nuclear Plants, he was involved in the development of walkdown and evaluation criteria for seismic evaluation of small bore piping and participated in plant walkdowns and performed piping stress analyses. At Oconee Nuclear Station, Mr. Beigi was involved in developing screening and evaluation criteria for seismic adequacy verification of service water piping system and performed walkdown evaluations, as well as, piping stress analyses. At Browns Ferry Nuclear Plant, Mr. Beigi was involved in the assessment of seismic interaction evaluation program for large and small bore piping systems.

- Mr. Beigi performed a study for the structural adequacy of bridge cranes at DOE's Paducah Gaseous Diffusion Plant utilizing Drain-2DX non-linear structural program. The study focused on the vulnerabilities of these cranes as demonstrated in the past earthquakes.
- Mr. Beigi has generated simplified models of structures for facilities at Los Alamos National Lab and Cooper Nuclear Station for use in development of building response spectra considering the effects of soil-structure-interactions.
- Mr. Beigi has participated as a Seismic Capability Engineer in resolution of the US NRC's Unresolved Safety Issue A-46 (i.e., Seismic Qualification of Equipment) and has performed Seismic Margin Assessment at the Browns Ferry Nuclear Power Plant (TVA), Oconee Nuclear Plant (Duke Power Co.), Duane Arnold Energy Center (Iowa Electric Company), Calvert Cliffs Nuclear Power Plant (Baltimore Gas and Electric), Robinson Nuclear Power Plant (Carolina Power & Light), and Bruce Power Plant (British Energy - Ontario, Canada). He has performed extensive fragility studies of the equipment and components in the switchyard at the Oconee Nuclear Power Plant.
- Mr. Beigi has developed standards for design of distributive systems to be utilized in the new generation of Light Water Reactor (LWR) power plants. These standards are based on the seismic experience database, testing results, and analytical methods.
- Mr. Beigi managed EQE's on-site office at the Tennessee Valley Authority Watts Bar Nuclear Power Plant. His responsibilities included staff supervision and technical oversight for closure of seismic systems interaction issues in support of the Watts Bar start-up schedule. Interaction issues that related to qualification for Category I piping systems and other plant features included seismic and thermal proximity issues, structural failure and falling of non-seismic Category I commodities, flexibility of piping systems crossing between adjacent building structures, and seismic-induced spray and flooding concerns. Mr. Beigi utilized seismic experience data coupled with analytical methods to address these seismic issues.
- As a principal engineer, Mr. Beigi conducted the seismic qualification of electrical raceway supports at the Watts Bar Plant. The qualification method involved in-plant walkdown screening evaluations and bounding analysis of critical case samples. The acceptance criteria for the bounding analyses utilized ductility-based criteria to ensure consistent design margins. Mr. Beigi also provided conceptual design modifications and assisted in the assessment of the constructability of these modifications. Mr. Beigi utilized similar methods for qualification of HVAC ducts and supports at Watts Bar, and assisted criteria and procedures development for HVAC ducting, cable trays, conduit and supports at the TVA Bellefonte nuclear power plant.

Mr. Beigi also has extensive experience utilizing finite element computer codes in performing design and analysis of heavy industrial structures, systems, and components. At the Texas Utility Comanche Peak Nuclear Power Plant, Mr. Beigi administered and scheduled individuals to execute design reviews of cable tray supports; evaluated generic design criteria for the design and construction of nuclear power plant systems and components and authored engineering evaluations documenting these reviews.

Mr. Beigi has also been involved in a number of seismic risk assessment and equipment strengthening programs for high tech industry, biotech industry, petrochemical plants and refineries, and industrial facilities. Selected project accomplishments include:

Most recently performed Seismic Qualification of Critical Equipment for the Standby Diesel Power Plants Serving Fort Greely, and Clear Air Force Station, Alaska. Projects also included design of seismic restraints for the equipment and design of seismic supports for conduit, cable tray, duct, and piping systems. Both facilities are designated by the Department of Defense as a Seismic User Group Four (SUG-IV) facility. Seismic qualification of equipment and interconnections (conduit, duct and piping) involved a combination of stress computations, compilation of shake table data and the application of experience data from past earthquakes. Substantial cost savings were achieved by maximum application of the experience data procedures for seismic qualification.

- Assessment of earthquake risk for Genentech, Inc., in South San Francisco, CA. The risk assessments included damage to building structures and their contents, damage to regional utilities required for Genentech operation, and estimates of the period of business interruption following a major earthquake. Provided recommendations for building or equipment upgrades or emergency procedures, with comparisons of the cost benefit of the risk reduction versus the cost of implementing the upgrade. Project included identification of equipment and piping systems that were vulnerable under seismic loading and design of retrofit for those components, as well as, providing construction management for installation phase of the project.
- Fault-tree model and analysis of critical utility systems serving Space Systems / Loral, a satellite production facility, in Palo Alto, CA.
- Seismic evaluation and design of retrofits for equipment, tools and process piping, as well as, clean room ceilings and raised floors at UMC FABs in Taiwan.
- For LDS Church headquartered in Utah, performed seismic vulnerability assessment and ranked over 1,200 buildings of miscellaneous construction types for the purpose of retrofit prioritization.
- Seismic evaluation and design of retrofits for clean room ceilings at Intel facilities in Hillsborough, Oregon.
- Assessment of programmable logic controls as part of year 2000 (Y2K) turn over evaluation at an automatic canning facility in Stanislaus, ca.
- Seismic evaluation and design of retrofits for equipment and steel storage tanks at the Colgate-Palmolive plant in Cali, Colombia.
- Design of seismic anchorage for equipment and fiberglass tanks at the AMP facilities in Shizouka, Japan.
- Evaluation and design of seismic retrofits for heavy equipment, and piping systems at Raychem facilities in Redwood City and Menlo Park, CA.
- Assessment of the seismic adequacy of equipment, structures and storage tanks at the Borden Chemical Plant in Fremont, CA.

- Design of seismic bracing for fire protection and chilled water piping systems at the Goldman Sachs facilities in Tokyo, Japan.
- Design of seismic retrofits for low rise concrete and steel buildings and design of equipment strengthening schemes at AVON Products Co. in Japan.
- Managed the design and construction of seismic retrofits for production equipment and storage tanks at Coca Cola Co. in Japan.
- Seismic evaluation and design of retrofit for equipment, piping and structures at the UDS AVON Refinery located in Richmond, CA.
- Seismic assessment and peer review of the IBM Plaza Building, a 31 story high rise building located in the Philippines.
- Seismic evaluation and conceptual retrofit design for the headquarters building of the San Francisco Fire Department.
- Equipment strengthening and detailed retrofit design for the Bank of America Building in San Francisco.
- Equipment strengthening and detailed retrofit design for Sutro Tower in San Francisco.
- Equipment strengthening and detailed retrofit design for Pacific Gas & Electric (PG&E) substations in the San Francisco area.
- Seismic evaluations and loss estimates (damage and business interruption) for numerous facilities in Japan, including Baxter Pharmaceuticals, NCR Japan Ltd., and Somar Corporation.

Seismic evaluation of concrete and steel buildings at St. Joseph Hospital in Stockton, Ca, in accordance with the guidelines provided in FEMA 178.

EDUCATION

B.S., Civil Engineering, San Francisco State University, San Francisco, CA, 1982

REGISTRATION

Professional Engineer: California
Seismic Qualification Utilities Group Certified Seismic Capability Engineer
Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

AFFILIATIONS

American Society of Civil Engineers, Professional Member

SELECTED PUBLICATIONS

M. Richner, Sener Tinic, M. Ravindra, R. Campbell, F. Beigi, and A. Asfura, "Insights Gained from the Beznau Seismic PSA Including Level 2 Considerations," American Nuclear Society PSA 2008, Knoxville, Tennessee.

U. Klapp, F.R. Beigi, W. Tong, A. Strohm, and W. Schwarz, „Seismic PSA of Neckarwestheim 1 Nuclear Power Plant," 19th International Conference on Structural Mechanics in Reactor Technology (SMIRT 19), Toranto, Canada, August 12-17, 2007.

A. P. Asfura, F.R. Beigi and B. N. Sumodobila. 2003. "Dynamic Analysis of Large Steel Tanks." 17th International Conference on Structural Mechanics in Reactor Technology (SMIRT 17), Prague, Czech Republic, August 17-22, 2003.

"Seismic Evaluation Guidelines for HVAC Duct and Damper Systems," April 2003. EPRI Technical Report 1007896. Published by the Electric Power Research Institute.

Arros, J, and Beigi, F., "Seismic Design of HVAC Ducts based on Experienced Data." Current Issues Related to Nuclear Plant Structures, Equipment and Piping, proc. Of the 6th Symposium, Florida, December 1996. Publ. by North Carolina State University, 1996.

F.R. Beigi and J. O. Dizon. 1995. "Application of Seismic Experience Based Criteria for Safety Related HVAC Duct System Evaluation." Fifth DOE Natural Phenomenon Hazards Mitigation Symposium. Denver, Colorado, November 13-14, 1995.

F.R. Beigi and Don R. Denton. 1995. "Evaluation of Bridge Cranes Using Earthquake Experience Data." Presented at Fifth DOE Natural Phenomenon Hazards Mitigation Symposium. Denver, Colorado, November 13-14, 1995.

ABS Consulting
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EDDIE M. GUERRA, E.I.T.

PROFESSIONAL HISTORY

ABSG Consulting Inc., Contractor, Presently

Paul C. Rizzo Associates, Inc., Pittsburgh, PA, Assistant Project Engineering Associate, Presently

Thornton Tomasetti, Inc., Philadelphia, PA, Structural Engineer Intern, January 2009–June 2009

Skanska USA, Inc., San Juan, Puerto Rico, Civil Engineering Intern, May 2008–July 2008

Network for Earthquake Engineering Simulation, Bethlehem, PA, Research Assistant, May 2007–July 2007

PROFESSIONAL SUMMARY

Mr. Eddie M. Guerra, E.I.T. is an Assistant Project Engineering Associate with Paul C. Rizzo Associates, Inc. (RIZZO). Mr. Guerra has been involved primarily in the structural design and analysis of power generation structures in both nuclear and wind energy sectors. Mr. Guerra specializes in structural dynamics, Performance Based Seismic Design methodologies and elastic and inelastic behavior of concrete and steel structures. He is fluent in both English and Spanish.

PROFESSIONAL EXPERIENCE

Nuclear:

AP1000 HVAC Duct System Seismic Qualification –

October 2010 - Present

SSM/Westinghouse Electric Company, Pittsburgh, Pennsylvania:

Engineer for the seismic qualification of AP1000 HVAC Duct System.

Structural dynamic analysis of all mayor steel platforms inside steel containment vessel.

Investigation on the interaction of steel vessel and HVAC system displacements due to normal operational and severe thermal effects.

Finite element modeling of HVAC access doors under static equivalent seismic loads.

Followed AISC, ASCE and SMACNA standards for the qualification of steel duct supports.

Wind:

Analysis and Design Revision of Wind Turbine Tower -

October 2010 - February 2011

Siemens, Santa Isabel, Puerto Rico:

Engineer for the analysis and design revision of a wind turbine tower to be constructed in Santa Isabel, Puerto Rico.

Developed design criteria based on local building code requirements and the International Electrotechnical Commission (IEC) provisions for wind turbine design.

Dynamic analysis of wind turbine.

Design revision of turbine tower shell, bolted flange connections and global stability of the tower.

EDUCATION

M. Eng., Structural Engineering, Lehigh University, Bethlehem, PA - May 2010
B.S., Civil Engineering, University of Puerto Rico, Mayaguez, PR - Dec. 2008

SKILL AREAS

Structural Analysis
Seismic Design
Reinforced Concrete Design
Structural Steel Design
Wind Aerodynamics
Wind Turbine Design
Plastic Steel Design
Foundation Design

COMPUTER SKILLS

STAAD, ANSYS, AutoCAD, ADAPT, SAP2000, RAM, MATHCAD, PCA Column, MS Office

REGISTRATIONS

Engineer-In-Training: Puerto Rico - 2009

MEMBERSHIPS

American Society of Civil Engineers (ASCE)
American Concrete Institute (ACI)
Network for Earthquake and Engineering Simulation (NEES)
U.S. Dept. of Labor (OSHA)
Society of Hispanic Professional Engineers (SHPE)

HONORS AND AWARDS

2010 Recipient of the Thornton Tomasetti Foundation Scholarship
Golden Key International Honor Society
Tau Beta Pi Engineering Honor Society
University of Puerto Rico at Mayaguez Dean's List

PUBLICATIONS

Guerra, Eddie M., "Impact Analysis of a Self-Centered Steel Concentrically Braced Frame," NEES Consortium, May - July 2007.

ADAM HELFFRICH, E.I.T.

PROFESSIONAL HISTORY

ABSG Consulting Inc., Contractor, Presently

Paul C. Rizzo Associates, Inc., Pittsburgh, PA, Assistant Project Engineer, 2009–Present

Penn DOT, Clearfield, PA, Intern, May 2008–August 2008

TNS, Indiana, PA, Surveyor, April 2007–August 2007

Shaler Area School District, Glenshaw, PA, Maintenance, May 2005–August 2006

PROFESSIONAL SUMMARY

Mr. Adam Helffrich joins Paul C. Rizzo Associates, Inc. (RIZZO) as a Project Engineering Associate. He recently received his Bachelor of Science in Civil Engineering from the University of Pittsburgh. Prior to graduating, Mr. Helffrich was an Engineering Intern with RIZZO.

PROFESSIONAL EXPERIENCE

UAE Site A (Alternate) NPP Site Selection/Site Characterization/PSAR and EIA – ENEC/KEPCO E&C, United Arab Emirates:

May 2009- August 2009

RIZZO prepared the site investigation and submittal of a PSAR and ER to the Regulatory Authority for the siting of Nuclear Power Plants (technology to be decided). Mr. Helffrich developed and reviewed boring logs for both sites; constructed drawings of cross sections for a site; and performed several checks and modifications to figures and slides for presentation purposes.

Calvert Cliffs NPP Unit 3 – UniStar, Calvert County, Maryland:

May 2009 – August 2009

Mr. Helffrich was responsible for cutting several cross sections of the sub surface for analysis purposes.

PREVIOUS EXPERIENCE

Penn DOT - Clearfield, Pennsylvania:

May 2008 - August 2008

Intern:

Conducted STAMPP program for roadway safety;
Worked independently and unsupervised through several counties;
Studied technical diagrams of roadways and foundations; and
Applied gathered knowledge in roadway safety reports.

TNS - Indiana, Pennsylvania:

April 2007 - August 2007

Surveyor:

Conducted Research surveys and polls for various clients

Shaler Area School District - Glenshaw, Pennsylvania:

May 2005 - August 2006

Maintenance:

Light Construction/Building Maintenance
Janitorial

EDUCATION

3-2 Pre-Engineer Program, Indiana
University of Pennsylvania, Indiana, PA, Graduated 2008

COMPUTER SKILLS

C++, Mathematica, AutoCAD

Resume of
Mohammed F. Alvi, P.E.

SUMMARY:

- Thirty-three years of experience as an engineering professional (27 years in nuclear)
- Professional Engineer, registered in the State of New York, USA
- Completed the Boiling Water Reactor (BWR) Plant Certification Course for Nine Mile Point Unit-1Nuclear Station
- Experience as a Structural Design Engineer, Engineering Supervisor for Structural/Mechanical Design and Plant Support Engineering, Manager Mechanical/Structural Design and Project Manager
- Innovative and resourceful engineer with problem solving skills
- Excellent leadership skills with proven record
- Excellent analytical, design, decision making, communication, organizational, and interpersonal skills
- Proficient in computer skills

EXPERIENCE:

June 2012 – Present

First Energy Nuclear Operating Company
Senior Consulting Engineer

Project Manager for Seismic Probabilistic Risk Assessment (SPRA) Project. Responsibilities include vendor oversight for 50.54(f) Letter Seismic 2.1 and 2.3 as well as technical overview of the SPRA project.

March 2008 – May 2012

Entergy Nuclear Operations
James A. Fitzpatrick Nuclear Power Plant
Oswego, New York
Supervisor, Mechanical/Civil Design Engineering

Responsible for supervising a group of 10 mechanical/civil/structural engineers at the James A. Fitzpatrick Nuclear Plant. Responsibilities included issuing plant modifications, evaluations, engineering changes, equivalency changes, supporting refueling and forced outages, acted as engineering duty manager, identified training needs, participated in the daily fleet telephone calls, resolved operability issues related to degraded conditions, assisted in resolving plant emergent issues, responded to US Nuclear Regulatory Commission (NRC) Resident questions, supported emergency response organization duties, etc. Oversight of construction activities, owner acceptance of A/E Consulting Firm design. Performed duties of acting design engineering manager, trained staff on technical/administrative skills, etc.

February 2007 –

Public Service Electricity & Gas (PSEG) Nuclear

February 2008 **Hope Creek Nuclear Generating Station**
Branch Manager, Mechanical/Structural Design

Responsible for managing a staff of 8 Mechanical/Structural engineers at Hope Creek Nuclear Generating Station. Responsibilities included analysis, design of Structures, Systems, Components, resolving operability issues, preparing design change packages, evaluating non-conforming conditions, addressing short and long term issues for the station, supporting outages, address training needs of the group, participate in Plant Health Committee, interface with resident NRC inspectors, etc.

I was also responsible for performing the duties as the site reviewer of all Structural/Mechanical related license renewal documents being prepared by the License Renewal Group. I was implementing the Hope Creek primary containment (Drywell and Torus) ageing management program to support the license renewal process. I was also assisting in the implementation of FatiguePro software at Hope Creek.

1988 – Oct. 2006 **Nine Mile Point Nuclear Station**
(Constellation Nuclear)
Oswego, New York
Engineering Supervisor/Principal Engineer

Responsible for analysis, design and maintenance of various nuclear power plant structures at Nine Mile Point Nuclear Station Units 1 & 2. Analysis includes design of reactor building superstructure, turbine building superstructure, yard structures, masonry wall design, piping analysis and supports for safety related systems, cable tray supports and various electrical and mechanical components supports, etc.

Supervised a group of 10 engineers/designers, coordinated projects with site engineering consultants, performed engineering evaluations and cost benefit studies for various projects for an economical design.

As one of the leaders of the engineering organization, I directed and supervised individuals technically and administratively to make sure the job is done correctly the first time and per schedule. I had the decision making authority for all structural engineering issues at the station.

License Renewal: I was also the Manager for Fatigue Monitoring Program for Nine Mile Point Nuclear Station, Units 1 & 2. I was involved in setting up the software "FatiguePro" at the station for a cost of $500K. This was in commitment to the Nuclear Regulatory Commission as part of License Renewal program for NMP station. This program included identifying the various transients that the plants were originally designed for, historical count of transients, identifying cumulative usage factors at critical locations, identifying what locations CUFs will be exceeded for a 60 year plant life and what actions were needed to resolve the same. Also addressed the environmental fatigue issues.

I was also responsible for managing all structural aspects of license renewal program at the station. This included preparation of program basis documents (e.g., masonry walls, bolting, monitoring of structures, etc.), scoping documents, ageing management program documents, time limiting ageing analysis (TLAAs), performed walkdowns for defining boundaries.

I was also part of the design team that gave a presentation to NRC license renewal team at Rockville, MD regarding the primary containment ageing management program for torus and drywell shell thickness at Nine Mile Point Unit-1.

Note: I was also the Nine Mile Point Nuclear Station Lead for the NRC Component Design Bases Inspection (CDBI) that was conducted in September/October 2006. I successfully lead the NMP team, supported the inspection with no major violations for the station. This project started in May 2006 which included self assessment (mock inspection), taking appropriate corrective actions prior to the actual inspection for a successful outcome.

Acting Manager, Engineering Unit 1 Nine Mile Point Nuclear Station

Performed the duties of an engineering manager, attended the daily leadership meetings, resolved the plant issues, prioritized and coordinated the work activities of various disciplines in Engineering, conducted branch staff and safety meetings, successfully resolved all engineering issues during this period for safe operation of the plant.

Supervisor, Civil/Structural Engineering, Unit 1
Nine Mile Point Nuclear Station

Responsible for all structural engineering issues at Nine Mile Point Unit. Major accomplishments as Structural Supervisor included implementation of Structural Maintenance Rule Program, development of various engineering specifications and drawings for the older vintage plant.

Attended various structural seminars on Seismic Qualification Utility Group (SQUG), concrete and masonry walls, structural maintenance program, completed various training on leadership skills, supervisory skills, performance appraisals, effective communication, Labor training, Leadership Academy and completed two weeks of training at Institute of Nuclear Power Operations (INPO)-Atlanta for Engineering Supervisors Professional Development Seminar.

1983 – 1988

Sargent & Lundy Engineers
Chicago, Illinois
Lead Structural Engineer

Responsible for analysis and design of various nuclear power plant structures using ACI and AISC codes, was responsible for designing pipe supports, conduit supports, pipe whip restraints, masonry walls, steel frames, used various in-house computer programs for analysis

design, performed walk-downs, performed structural calculations, resolved non-conformance reports, performed seismic qualification calculations, etc.

1978 – 1983 **Klein & Hoffman, Inc**
Consulting Engineers, Chicago, Illinois
Structural Engineer

Structural engineer responsible for analysis and design of schools, parking garages, industrial buildings, high rise buildings, sewage treatment plant structures, etc. Extensively used AISC and ACI codes and various in house computer programs for analysis and design.

EDUCATION:

- Master of Science (Structural Engineering), University of Illinois, Chicago (1977)
- Bachelor of Engineering (Civil), Bhopal University, India (1976)

PROFESSIONAL LICENSES/CERTIFICATIONS:

- Registered Professional Engineer, State of New York
- Boiling Water Reactor (BWR) Plant Certification Course for Nine Mile Point Unit-1 Nuclear Station

PROFESSIONAL SOCIETY MEMBERSHIP:

- Member, American Society of Civil Engineers (ASCE)

REFERENCES:

Provided upon request

CITIZENSHIP:

Citizen of the United States of America

Richard P. Mueller

Street Address
1116 Vine Street, East Liverpool, Oh, 43920
Phone Number 330-385-5633
Email address mue126@comcast.net

Work Experience

Duquesne Light Company and First Energy Corporation 9/8/1975 to 7/31/2011

Job Titles

House and Yard Laborer

Coal and ash handler

Nuclear Operator Beaver Valley Unit 1

Licensed Reactor Operator Beaver Valley Unit 1

Licensed Senior Reactor Operator Beaver Valley Unit 1 and Unit 2

Education

Degrees

Penn State University

Associate Degree in Nuclear Engineering Technology

Nuclear Power Plant Related Skills and Experiences

Operations lead for the last three NRC Triennial Fire Protection inspections.

Developed the Operations timelines and strategies for the latest Appendix R and Safe Shutdown procedures for Beaver Valley Unit 1 and Unit 2

10CFR50.59 and Independent Qualified Reviewer (IQR) qualified.

Operations lead for refueling outage scheduling and planning.

Developed alternate strategies and efficiency improvements for Operations procedures and tests.

Assisted in the development of the latest 10 year ASME testing program for Beaver Valley Unit 1 and Unit 2 .

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Certificate of Completion

John Reddington

Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

June 27, 2012
Date

R.P. Kassawara

Robert K. Kassawara
EPRI Manager,
Structural Reliability & Integrity

Certificate of Achievement

This is to Certify that

John E. Reddington

has Completed the Trial SQUG A46 Walkdown Screening and Seismic Evaluation Training Course Held November 20-25, 1987

Richard G. Starck II

Richard G. Starck[a], MPR Associates, Inc.
Training Coordinator

R.P. Kassawara

Robert P. Kassawara, EPRI
Program Manager

SQUG

Certificate of Achievement

This is to Certify that

Farzin R. Beigi

has Completed the SQUG Walkdown Screening
and Seismic Evaluation Training Course
Held May 3–7, 1993

Neil P. Smith, Commonwealth Edison
SQUG Chairman

David A. Freed, MPR Associates
SQUG Training Coordinator

Robert P. Kassawara, EPRI
SQUG Program Manager

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Certificate of Completion

Farzin Beigi

Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

June 13, 2012

Date

R.P. Kassawara

Robert K. Kassawara
EPRI Manager,
Structural Reliability & Integrity

SQUG

Certificate of Achievement

This is to Certify that

Eddie M. Guerra

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course

June 11-15, 2012

Glen Allen, Virginia

Paul D. Baughman, ARES Corporation
SQUG Instructor

Divakar Bhargava, Dominion Generation
SQUG Chairman

Certificate of Completion

Eddie Guerra

Training on Near Term Task Force
Recommendation 2.3
Plant Seismic Walkdowns

Nish Vaidya

Nish R. Vaidya
VP Advanced Eng Projects

July 6, 2012

SQUG

Certificate of Achievement

This is to Certify that

Adam L. Helffrich

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course

June 11-15, 2012

Glen Allen, Virginia

Paul D. Baughman, ARES Corporation
SQUG Instructor

Divakar Bhargava, Dominion Generation
SQUG Chairman

Certificate of Completion

Adam Helffrich

Training on Near Term Task Force
Recommendation 2.3
Plant Seismic Walkdowns

Nish Vaidya

Nish R. Vaidya
VP Advanced Eng Projects

July 6. 2012

SQUG

Presents this

Certificate of Achievement

To Certify That

Mohammed F. Alvi, P.E.

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course Held November 4th – 9th, 1992

David A. Freed, MPR Associates
SQUG Training Coordinator

Neil P. Smith, Commonwealth Edison
SQUG Chairman

R.P. Kassawara

Robert P. Kassawara, EPRI
SQUG Program Manager

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

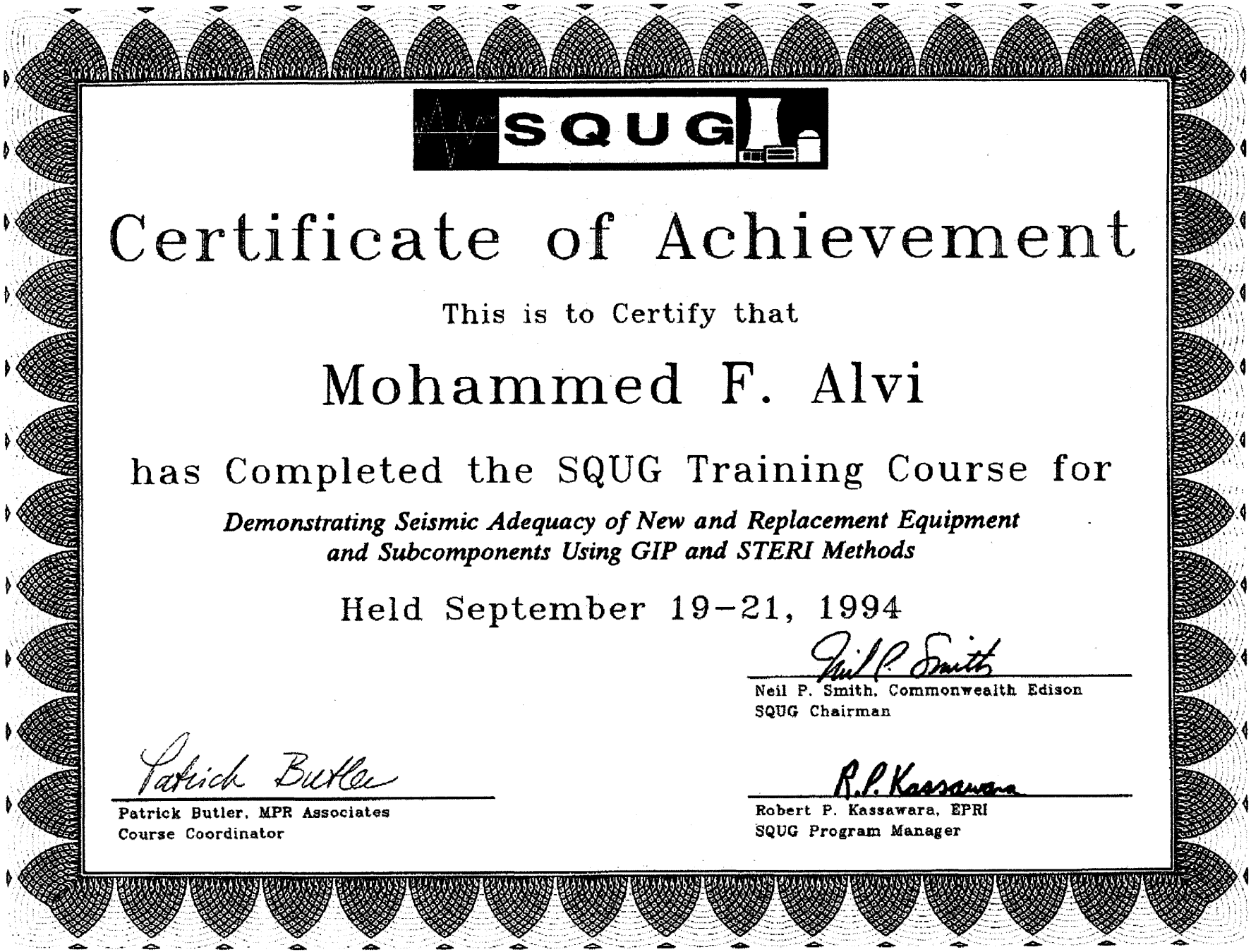
Certificate of Completion

Mohammed Alvi

Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

June 27, 2012
Date

R.P. Kassawara
Robert K. Kassawara
EPRI Manager,
Structural Reliability & Integrity


SQUG
Certificate of Achievement
This is to Certify that
Mohammed F. Alvi
has Completed the SQUG Training Course for
Demonstrating Seismic Adequacy of New and Replacement Equipment
and Subcomponents Using GIP and STERI Methods
Held September 19-21, 1994
Neil P. Smith, Commonwealth Edison
SQUG Chairman
Patrick Butler, MPR Associates
Course Coordinator
Robert P. Kassawara, EPRI
SQUG Program Manager

Certificate of Achievement

This is to Certify that

Mohammed Alvi

has Completed the

SQUG Relay Evaluation Training Course

Held August 25-27, 1992

Jess O. Betlack, MPR Associates

Certificate of Achievement

This is to Certify that

Mohammed Alvi

has Completed the

SQUG Equipment Selection Training Course

Held August 25–27, 1992

Paul W. Hayes, MPR Associates

Richard G. Starck II, MPR Associates