

ENGINEERING ASSOCIATE SERVICES

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Michael B. Plunkett P.E.

Education: BSME, 1969 University of New Haven
MSME, 1972 University of Rhode Island
P.E. Licenses: Rhode Island, Massachusetts, Connecticut, Maryland, Virginia

Summary of Experience:

Thirty years experience in the design analysis, inspection and auditing of piping, pipe supports and other mechanical components. Extensive experience performing design reviews, safety and hazards & engineering risk analyses, USQ evaluations to the requirement of 10CFR 50 including Appendix B, emergency planning and preparedness to the requirements of DOE G 151.1 in the areas of hazards surveys and assessments, fire protection systems, field inspections for the Nuclear Regulatory Commission (NRC), Department Of Energy (DOE), rate case reviews and expert witness testimony. In particular, specific hands-on working experience in design analysis, maintenance and field engineering for performance enhancement of piping systems including high energy steam, vacuum air systems for sludge removal, air and vacuum handling systems, buried piping and seismic qualification in accordance with ASME, ANSI, AWS, and NRC requirements. Extensive system experience on over 20 waste treatment facilities on the East Coast, including the USA's largest waste treatment facility, Deer Island in Boston Harbor.

- Experience in quality assurance and related disciplines. Performed numerous technical audits to assure compliance with ANSI N45.2.11, ASME Section III NQA-1, DOE G 151.1, 10CFR50 and NRC and public utility license requirements.
- Experience in design, analysis and field engineering of piping systems including high energy steam, fire protection, vacuum air systems for sludge removal, buried piping and seismic qualification in accordance with ASME, ANSI, AWS, NFPA 13 and NRC requirements. Extensive system experience on waste treatment plants including air and vacuum handling systems.
- Experience in piping and pipe supports (including Class IN), valves, pumps, equipment installation, manufacturing, Quality Assurance audits, ASME surveys, and field engineering. Extensive involvement in Generic Letter 89-10 Motor Operated Valve issues. Wrote the theory and provided the QA documentation for all EAS Weak Link Programs including job specific requirements.
- Certified ANSI/ASME N45.2.6 Level III Inspector for procurement surveillance for mechanical equipment including welded components.
- Experience in design, analysis and field engineering including mechanical equipment, air/vacuum systems, fire protection, and Environmental Qualification of Equipment (EQE) in accordance with ASME, ANSI, AWS, and NRC requirements. Experience using ADLPIPE, AUTOPIPE, STRUD, and numerous FEA Codes. Providing electric utilities with expert witness testimony for prudence and rate case hearings. Duties included providing a clear and concise report written in everyday language to support utility's rate case efforts.
- Performed review and oversight for the DOE Office of River Protection for the Waste Treatment Plant at Hanford, Washington. Responsibilities included review of the Contractor's Preliminary Safety Analysis Report (PSAR) & Risk Assignment Analysis, including evaluation to the requirements of 10CFR50. Also review of design documentation such as reports, design calculations, studies, design drawings, and construction authorization requests particularly in the area of HVAC design and mechanical components & fluid systems design. Prepared various portions of the project SER.

- Establish and maintained Quality Assurance Program for both Engineering and Manufacturing facilities to the requirements of ASME NQA-1

EXPERIENCE:

2000 to Present Engineering Associate Services

SUMMARY OF WORK PERFORMED FOR THE ENVIROMENTAL IMPACT STATEMENT (EIS) PROJECT AT HANFORD

Safety and Hazard Data gathering functions to support the EIS program. Scope of work required preparation of draft and final Safety Analysis Data Package. This package involved identification all accident and activities associated with the alternative technologies identified during internal scoping. Accident analysis included the evaluation of both probability and consequences of radiological and chemical accidents. Supplementary technology included: Pretreatment; Bulk Vitrification; Steam Reform; Sulfate Removal; Grout Containerization and TRU.

SUMMARY OF WORK PERFORMED FOR DOE AT HANFORD

Performed Reviews and Evaluations on the Safety Analysis Reports (PSAR) to the requirements of 10CFR50 for the Department Of Energy (DOE), Office Of Safety Regulations (OSR) Vitrification Facility. Review included detailed assessment of Emergency Planning, Risk Assessment and Preparedness Program including application, response, organization, hazard evaluations, program elements and training.

Scope of work included performing reviews on the following buildings:

- Low-Activity Waste (LAW)
- High-Level Waste (HLW)
- Balance Of Facility (BOF)

Authored the Mechanical & Structural sections of the Safety Evaluation Report (SER).

Detailed scope of Mechanical & Structural activities included:

- Ventilation Systems (HVAC).
- All Water, Steam and air Systems.
- Seismic Analysis on Mechanical Equipment & Structures.
- Piping, Tanks and Vessels.
- Melter Shell & Handling Cranes & Bogies.
- Offgas from Melter.
- Basemat
- Piping & Pipe Supports.
- Canister Drops & Glass Spills.
- Liquid Spills.
- Thermal evaluation of equipment Important To Safety.
- Fire Protection system
- Vessel Vent System
- Primary cooling water and chilled water system
- Natural Phenomena Hazards
- Spray Leaks
- Fire protection systems

Performed Technical Risk Assessments

- Hazards involving natural events, such as earthquakes, tornado, flooding, wind, snow/ash-fall, wind missile, lighting and fire.
- Risk analysis performed along with developing controls to mitigate events.
- Identification anticipated operational occurrences and accident.
- Ensure that equipment was designed to withstand the effects of natural phenomena Hazards (NPH) events such as earthquakes, wind, and floods without loss of ability to perform their specified safety function.
- Designs equipment to assure that the effects of natural phenomena (including lightning), and of normal operating, maintenance, testing, and postulated accident conditions on redundant channels do not result in loss of the protection function.
- Established Risk Guidelines for design and operational personnel.
- Establish controls to provide preventive and mitigative safety features for the facility relative to accidents and terrorist actions.
- Risk analysis performed in accordance with 10CFR68, “EPA Risk Management Program”

Detailed scope of work included, reviewing and accepting mechanical and structural Safety and Hazard calculations against the requirements of the Waste Treatment Plant Safety Requirements Document Volume II (SRD) and DOE Standard 1029-94. Also wrote dispositions on numerous mechanical and structural technical issues related to facility Safety and Hazards.

1978 to 2002 Engineering Associate Services

President / CEO:

Responsibility: For the design, analysis, inspection and auditing of piping, pipe supports, cable tray, pressure vessels, tanks and other mechanical components on nuclear, fossil and chemical plants. Also, extensive experience in ASME Codes Section III, VIII and IX, ANSI B31.1, B31.3, AWS D1.1 and field engineering assignments. Performing detailed ASME piping and structural calculation. Experience using ADLPIPE, AUTOPIPE, STRULD and numerous FEA Codes.

- Project Manager for the San Onofre NRC Generic Letter 89-10 MOV Weak Link analysis project.
- Responsible for implementation the Quality Assurance (QA) Program to the requirement of 10CFR50 Appendix B and NQA-1.
- Performed equipment reviews, vendor audits, calculation and specification reviews to insure compliance to FSAR. Included extensive on-site documentation review of mechanical equipment installation purchase and design.
- Performed detailed piping analysis in accordance with ASME III, ANSI B31.1, B31.3 and other applicable codes.
- Performed detailed pipe support designs and analysis in accordance with ASME, NF, AISC and other local building codes.
- Performed detailed piping transient (water hammer, thermal, turbine trip, etc) analysis in accordance with detailed specifications.
- Performed independent structural and pressure vessel evaluations and reviews.
- Evaluation of seismic qualification of equipment.

- Performed structural analysis of motor operated valves (MOV) in accordance with GL-89-10.
- Field inspection of mechanical and structural components.
- Retained as NRC consultant for detailed inspections (see attached list).

1972 to 1978 ITT Grinnell Corporation

Vice President Of Engineering

Major Responsibility: Responsible for formulation, recommendation and direction of product development programs to meet company needs. Responsibility for development of new products in accordance with the market's needs including: Sales, Engineering, Production and Field Engineering. Responsibility for engineering functions of U.S.A. and Europe subsidiary which included performing engineering risk evaluations during the due diligence stages of an ITT acquisition. During my tenure at ITT I was involved in three acquisitions.

General Responsibility:

- Total technical responsibility for existing product line in both U.S.A. and Europe.
- Supported the sales and marketing effort by developing technical criteria which both aided and trained the sales force in their endeavor to sell.
- Responsibility for developing both new and existing technical criteria for nuclear products including upgrading existing QA program to NQA-1 standards.
- Planned and directed approved development programs for improvement and cost reduction of existing products and for new products in accordance with approved product plans.
- Responsible for establishment of uniform specifications for materials, equipment and product, and for authorizing substitute materials and parts.
- Defined, developed, organized, supervised and coordinated the plans, problems and projects of the Product Development Department to ensure on- time completion within budgets.
- Responsible for interface with ITT Grinnell Legal for patent activity to protect new products.
- Responsible for definition of standard product requirements and specific technical specifications for each shock suppressor product application.
- Provided to Unit Management guidance on pricing, terms and conditions of sales.
- Ensured development of standard product designs to meet market requirements and ensured that each product for each application was properly designed to meet customer performance specifications.

1969 to 1971 Stone & Webster Engineering Corporation
Boston, Massachusetts
 Nuclear Consultant on various Power Plant Projects.

1965 to 1969 General Dynamic Electric Boat

Jr. Mechanical Engineer Reactor fluid section, S5G Project

MICHAEL PLUNKETT NRC EXPERIENCE			
OWNER	TYPE OF WORK PERFORMED	PLANT	YEAR COMPLETED
Texas Utilities Electric Co.	Design analysis and installation review of licensing commitments for pipe supports, mechanical components, cable trays, conduit electrical equipment, etc. Performed technical and licensing reviews to insure compliance to NRC Regulations, 10CFR50 Appendix B, and plant license requirements.	Comanche Peak	1990
Tennessee Valley Authority (TVA)	Performed independent design investigation on mechanical and structural components of plant emphasizing tanks, pressure vessels, piping and pipe support licensing issues. Review included a detail assessment of all operational procedures.	Watts Bar	1994
Several Nuclear Plants	Member of numerous inspection teams to evaluate FSAR compliance, operational readiness, responses to NRC Bulletins and licensing issues, etc.	Various Nuclear Plants	1984 to 1990
Tennessee Valley Authority (TVA)	Performed independent Design Investigation for mechanical components as part of inspection for the restart of Unit 2. Reviewed pressure vessels, various underground tanks to requirements of API standard 620.	Sequoyah	1987
Portland General Electric Co.	Pipe wall thinning review and root cause analysis included a detailed assessment of the normal operating history, abnormal events (i.e., pressure surges, steam/water hammer, etc.), flow velocity and temperature histories, and water/steam chemistry and stress distribution.	Trojan	1987
Generic Issue All Nuclear Plants	Reviewing response to unresolved safety Issue A-46 "Seismic Qualification of Equipment in Operating Plants". Involvement included reviewing the environmental and seismic qualification of safety related mechanical and electrical equipment, and required instrumentation. Equipment reviewed included pumps, motors, valves, tanks, motor control centers, generators, switches, relays, etc.	All Nuclear Plants	1987
Generic Issue PWR Nuclear Plants	Reviewed individual plant responses to IE Bulletin 88-11, "Pressurized Relief Line Thermal Stratification". Numerous plant inspections were performed together with audits of all these PWR owner's groups (Westinghouse, Babcock & Wilcox and Combustion Engineering). Technical evaluation reports were written for each inspection and audit.	All PWR Plants	1989
Philadelphia Electric Co. Entergy Operations, Inc. Omaha Public Power District Virginia Power Co.	Performed independent design investigation on mechanical and structural components of plant emphasizing 10 CFR50 appendix B licensing issues. Reviewed included pumps, valves, piping, supports, and building structure to AISC requirements.	Limerick Grand Gulf Ft. Calhoun North Anna	1984 to 1990
Northeast Utilities Independent Corrective Action Program (ICAVP)	Assess the licensee's ability to identify and resolve licensing-bases deficiencies and provide an additional assessment of the effectiveness of the ICAVP contractor(S&L). Focused on safe shutdown mechanical and structural system and components. An in-depth review of all operational procedures was performed.	Millstone #2&3	1997-1999
American Society Of Mechanical Engineers(ASME) & NRC	Member of Organizing Committee for NRC/ASME IST Symposium on Nuclear Power Facility Pumps and Valves	All Nuclear Plants	1989