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May 20, 1985
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Mr. V.S. Noonan
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Transmittal of Resumes of Electrical and Mechanical Systems
Personnel
Comanche Peak Steam Electric Station
Independent Assessment Program - Phases 2 and 4
Job Nos. 83090 and 84056

Reference: Meeting between Cygna and the NRC, April 26, 1985, Bethesda, MD

Dear Mr. Noonan:

As follow-up to the above referenced meeting, the resumes for the electrical and mechanical systems project personnel are enclosed (Attachment A). In addition, Attachment B contains a representative sample of other Cygna personnel available for technical support as required.

Please call at your convenience if you require any further information.

Very truly yours,

N.H. Williams
Project Manager

NHW/dco

Attachments

cc: Mr. S. Treby (USNRC)
Mr. S. Burwell (USNRC)
Mr. J. Beck (TUGCO)
Mr. J. Redding (TUGCO)
Ms. J van Amerongen (TUGCO/EBASCO)
Mr. W. Horin (Bishop, Liberman et al.)
Mrs. J. Ellis (CASE)

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Attachment A
Systems and Electrical/I&C Project Personnel

Robert W. Hess
Paul A. Rainey
James P. Foley
Thomas R. Martin
Alan E. Moersfelder
Lawrence C. Maggio
James W. Dady
Randall J. Uhlar
Robert Craig Killough
James J. Oszewski
Robert P. Porter

ROBERT W. HESS

EDUCATION:

B.S., Engineering, University of Maryland, College Park, MD

Graduate Course Work in Engineering Administration, George Washington University,
Washington, DC

Basic Project Management Course, American Management Association

Air Conditioning and Refrigeration, Brevard Junior College, Cocoa, FL

Cryogenics, Genesys's Extension of University of Florida, Gainesville, FL

PROFESSIONAL REGISTRATION:

Professional Engineer, Mechanical, State of California

PROFESSIONAL AFFILIATIONS:

Member, American Nuclear Society

Member, American Institute of Aeronautics and Astronautics

PROFESSIONAL EXPERIENCE:

Mr. Hess has more than 18 years of experience in engineering and management. He is currently assigned as Manager, Plant Engineering. In this capacity he is responsible for the supervision of multiple discipline groups including mechanical, electrical, and instrumentation and control in the performance of systems analysis and design, systems modification, computer applications, and regulatory compliance projects. Recent project assignments have included independent design assessments for NTOL plants, a tornado hazards study for a SEP plant and support of a radwaste tracking computer program.

Formerly associated with NUS as General Manager of its Western Engineering Office, he was responsible for the management, direction and staffing requirements of all engineering and design projects. In an earlier position as Manager, Plant Engineering, his duties included technical direction and administrative activities associated with process development and system design of modifications to nuclear and fossil-fueled generating facilities. This included supervision of site investigations to determine system design requirements based on plant operations and site-specific constraints, technical approval of conceptual and detail design and management of assigned discipline engineers and designers to meet schedule and budget requirements. Specific projects included NUREG 0612 compliance reports for Trojan and Crystal River Power Plants, ATWS modification requirements study for BWR's, preparation of emergency implementing procedures for a SONGS-2 and 3, and modification of a pH control system for a fossil unit cooling tower.



ROBERT W. HESS
(continued)

As Project Engineer for the design of large waste treatment facilities for two fossil generating facilities, Mr. Hess was responsible for directing and sequencing project tasks to accomplish the work scope within budget and schedule, and maintaining formal communications with the client. This assignment required close coordination of design, procurement and construction efforts of process, mechanical, electrical, I&C, and civil/structural engineers.

Other assignments with NUS included responsibilities for conceptual and detail design of make-up water and wastewater treatment systems for both nuclear and fossil power plants. These projects included specification of demineralizer systems, floating roof make-up water storage tanks, sand filters, pumps and tie-ins to existing systems. Mr. Hess supervised engineers and designers in performance of discipline work scope within schedule and budget constraints; established system design criteria and coordinated inputs with other disciplines; prepared and supervised preparation of equipment specifications, construction bid packages, proposal bid evaluations, P&ID's, equipment and piping layout drawings and engineering manhour estimates. Various other project experience includes engineering design and analysis of radioactive waste treatment systems for nuclear power plants, design and review of RCP oil enclosure systems, fossil plant fire water system modifications, and addition of fire suppression systems to the cable spreading rooms. While assigned to a core spray system modification project, he coordinated field engineering efforts and client inputs during the analysis and modification design, in addition to being responsible for the preparation of specifications, drawings and construction work packages for the installation of mechanical modifications. Also, Mr. Hess prepared conceptual mechanical designs and weight analyses of shipping casks for solid waste generated by nuclear fuel reprocessing plants (concepts included both rail and truck-mounted casks for high- and low-level wastes).

Previously, Mr. Hess worked with Newport News Shipbuilding where he was responsible for the design and review of various fluid systems required for operation and support of a naval nuclear power plant. He participated in the formulation and composition of technical documents detailing and justifying system design characteristics, operating principles and maintenance requirements for primary shield water, reactor plant air and evacuation and nitrogen purge systems.

As Lead Systems Engineer with Grumman Aerospace Corporation, Mr. Hess was responsible for systems checkout and launch operations on the Lunar Module Propulsion Subsystems. His position required consideration of such items as test scheduling, manpower planning, review and approval of test procedures and direct supervision of engineers and technicians during pre-launch and launch operations. As Systems Engineer, he prepared and performed test procedures for fluid systems checkout, directed troubleshooting and repair of ground support and flight equipment, and participated in development and site start-up of high pressure gas and cryogenic loading equipment.



PAUL A. RAINEY

EDUCATION:

M.B.A. (in-progress), Clark University, Worcester, MA
B.S., Nuclear Engineering, Lowell Technological Institute, Lowell, MA
A.S., Nuclear Engineering, Wentworth Institute of Technology, Boston, MA
Knolls Atomic Power Laboratory Nuclear Power School and Prototype Training

PROFESSIONAL REGISTRATION:

Professional Engineer, Massachusetts

PROFESSIONAL EXPERIENCE:

Mr. Rainey has over 13 years of experience in the nuclear power industry including responsibilities in design, licensing, operation, construction, and testing. He is an Associate of Cygna and has been assigned as the Power Systems Supervisor.

Most recently he was responsible for the development of a plant specific training module for the Power Authority of the State of New York's Engineering Training Program. He also helped prepare a response to the NRC for the Yankee Atomic Electric Company, covering SEP topics III-5.A and III-5.B on the effects of High Energy Line Breaks Inside and Outside Containment.

Prior to joining Cygna, Mr. Rainey was a Supervising Engineer with Public Service of Indiana. In this capacity, he supervised several engineers involved in the design, procurement and construction of Mechanical Balance of Plant Systems at the Marble Hill Nuclear Power Plant. He was responsible for all Balance of Plant systems and components, as well as the development of a system functional review program.

Earlier Mr. Rainey was employed by the Yankee Atomic Electric Company as a Senior Systems Engineer. He was responsible for engineering on backfits from initial conceptual design through licensing, procurement, installation, and start-up testing. In this capacity, he acted as both the fluid systems designer and project manager responsible for the coordination of the required disciplines.

Mr. Rainey was a member of Yankee's Senior TMI Task Force which was responsible for reviewing the Yankee plants following TMI. He provided the Systems Engineering input for Yankee Rowe's Systematic Evaluation Program, and was Yankee's contact on NRC inspections at Rowe on pipe whip, safe shutdown, and fire hazards analysis.



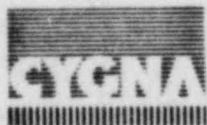
PAUL A. RAINEY
(continued)

Some of the backfits Mr. Rainey has experience with include a post LOCA recirculation system addition, auxiliary feedwater system addition, automation of main steam isolation valves, ECCS accumulation modifications, HPSI system modifications, start-up feedwater regulation, valve modifications, numerous TMI modifications, RHR orifice modifications, and hydrogen recombiner cooler replacement.

Mr. Rainey also worked for Gilbert Associates, Inc. and Stone & Webster Engineering Corporation, where he was responsible for numerous system designs.

PUBLICATIONS:

"ECCS Backfits at Yankee Rowe," presented at the 1978 American Nuclear Society Conference.



JAMES P. FOLEY

EDUCATION:

B.S., Nuclear Engineering, Lowell Technological Institute, Lowell, Massachusetts
Graduate Courses in Advanced Mathematics and Mechanical Engineering, Northeastern University, Boston, Massachusetts
Nuclear Reactor Safety Course, Massachusetts Institute of Technology, Cambridge, Massachusetts
Applications of Reliability and Risk Technology, George Washington University, Washington, D.C.

PROFESSIONAL AFFILIATIONS:

Member, AIF Committee on Systems Interaction

PROFESSIONAL EXPERIENCE:

Mr. Foley has over 16 years experience in the nuclear industry. His assignments have included Appendix R Fire Protection Reviews, licensing, and safety evaluations of both BWR and PWR plants, systems interaction, and safe shutdown analyses. He was the Senior Licensing Engineer responsible for the performance of Fire Hazards Analysis for the James A. Fitzpatrick plant, including safe shutdown analysis and modifications for fire suppression and protection systems. He was also Project Manager on a review of Fire Barriers for Fitzpatrick's vital equipment areas. The review resulted in recommendations for installation or replacement of fire doors, dampers, hatches and penetration seals. In a follow-on project, he was project manager for the detailed engineering of these recommended modifications.

Mr. Foley was Project Engineer for the Shoreham Fire Protection Program Review, which included the review and revision of administrative procedures and system descriptions, and the preparation of a final report which overviewed the complete program.

In prior assignments, he has been project engineer on projects involving complex system analyses including a Systems Interaction Analysis on the Perry Plant, and a study to assess the impact of non-safety system failures on plant safety on Pilgrim.

He has also performed various tasks relative to radiation protection and radwaste management including development of computer codes for shielding analysis. In addition, he has acted as Nuclear Engineer on a large PWR project, responsible for solid, gaseous, and radioactive waste systems.



JAMES P. FOLEY
(continued)

Mr. Foley has been responsible for developing corporate recommendations on several licensing issues including Systems Interaction Analysis, BWR pool swell, determination of safety classes for BWR systems, and foreign licensing.



THOMAS R. MARTIN

EDUCATION:

B.S., Electrical Engineering, University of Illinois

Introduction to Nuclear Power Plant Operations, Westinghouse PWR Simulator Training,
Pittsburg, Pennsylvania

PROFESSIONAL REGISTRATION:

Professional Engineer, Illinois

PROFESSIONAL AFFILIATIONS:

Institute of Electronic and Electrical Engineers

PROFESSIONAL EXPERIENCE:

As a Senior Engineer, Mr. Martin is responsible for the direction of engineers, designers, and draftsmen, and has repeatedly been successful in completing assigned work on schedule and within budget. Mr. Martin has over nine years of electrical engineering experience in nuclear power plant modification/retrofit projects, and electric utility transmission/distribution system designs and studies. He has been involved in numerous projects in response to TMI, as well as other more recent regulatory directives. He has participated in the design, procurement, and installation assistance of various projects and, therefore, has a well-rounded overview of the engineering process. He has been responsible for estimating engineering manhours for a wide variety of tasks, as well as field labor and material costs.

Some of the issues that Mr. Martin has been involved in include:

- o Appendix R to 10CFR50.48 concerning fire protection modifications. Mr. Martin was involved in engineering studies at both New York Power Authority's FitzPatrick Plant and Arkansas Power & Light's Arkansas Nuclear One Plant. Most recently, Mr. Martin performed a walkdown of Arkansas Nuclear One and compiled a report identifying where localized ponding from fire suppression systems could degrade the plant's safe shutdown capability. For Commonwealth Edison's Zion Station, he participated in a modification project which entailed rerouting cables, isolating control and instrumentation loops, and installing fire barriers and protection systems to ensure that the correct separation between redundant systems was maintained.



THOMAS R. MARTIN
(continued)

- o Installation of new process computers at four of Commonwealth Edison's operating nuclear units. Special attention to all installation details, especially cabling, input reterminations and signal conditioning, were made to minimize each unit's operating time without a computer monitoring function. During the changeover process, new computer input points were added, output devices were changed and relocated, qualified isolation was provided as required, and provisions were made for the implementation of SPDS.
- o Modification of reactor vessel level instrumentation at Commonwealth Edison's Dresden and Quad Cities Stations. The reactor vessel level instrumentation is being modernized as a result of equipment environmental qualification studies and to improve channel reliability and maintainability. This project included procurement activities, addition of nuclear safety-related components, addition of new divisional safety-related instrumentation trays, conformance to Appendix R requirements for instrumentation availability required for Safe Shutdown, and identification of the required Technical Specification changes and recommendations for methods to maximize the required instrumentation calibration cycles.
- o Capacity study for the 480 volt Auxiliary Power System at Commonwealth Edison's Zion Station. This study consisted of a complete plant walkdown to verify the as-built connected load, a formal recommendation to Commonwealth Edison, and preparation and bid evaluation assistance for a safety-related procurement specification.
- o Engineering evaluations of the adequacy of subtransmission distribution systems for future load growth for Public Service Indiana's Distribution System Planning Department. This required load forecasting, load flow analysis, voltage calculations, and cost comparisons of alternate designs. He compiled the results of these evaluations into formal recommendations to PSI's upper management.

As a result of his experience with various clients, Mr. Martin is familiar with different methods of design documentation and the preparation and revision of all forms of electrical schematics, single lines, wiring diagrams, physical details, and cable tabulations. He also has a thorough working knowledge of NRC regulations and industry standards.



ALAN E. MOERSFELDER

EDUCATION:

B.S. Electrical Engineering, Milwaukee School of Engineering, Milwaukee, WI

PROFESSIONAL REGISTRATION:

Registered Professional Engineer in Illinois, Wisconsin, Minnesota and Michigan

PROFESSIONAL AFFILIATIONS:

Member, Institute of Electrical and Electronic Engineers (IEEE)

Member, American Nuclear Society (ANS)

Senior Member, Instrument Society of America (ISA)

PROFESSIONAL EXPERIENCE:

Mr. Moersfelder has more than 14 years of experience in the power industry. He is the Manager of a Systems Engineering section and is currently serving as Project Manager for numerous BWR retrofit projects which involve electrical, instrumentation and control, mechanical, and general systems expertise. He is responsible for schedule and budget compliance, staffing and the quality of the engineering work performed in his section. He is also assigned as a Nuclear Security Administrator and is, therefore, responsible for requesting unescorted access to nuclear power plants as may be required during the course of various projects involving Cygna employees.

Mr. Moersfelder has participated in the following projects which were handled within the Systems section:

- o Process computer replacements and mini- and microcomputer modifications which implemented new hardware and software in power plant applications. These new data systems are needed to gather, store and process increasingly large amounts of information, maintain higher system reliability figures, respond faster to changing inputs and to improve displays and other Operator interfaces.
- o Safety Parameter Display system implementations which necessitated engineering improved hardware and software methods of displaying the status of the critical safety parameters to the Operators and through participation in verification and validation (V&V) programs to demonstrate SPDS compliance with regulatory requirements and guidance.



ALAN E. MOERSFELDER
(continued)

- o Regulatory Guide 1.97 projects which mandated the display of various plant parameters as defined in Tables A, B, C, D, and E of the Regulatory Guide. These projects included the changes needed to implement Regulatory Guide 1.97 requirements in the TSC and the EOF as well as in the main control room.
- o Detailed control room design review including human factors engineering aspects, resolution of HEDs, and control panel upgrades and modifications.
- o Equipment qualification related work as required by IEEE Standards 323 and 344. Typical work scopes included a search for existing documentation, organization of documentation files, development and monitoring of qualification programs and procurement of new equipment and/or components where necessary.
- o Modification work resulting from 10CFR50.48 Appendix R requirements. After participating in the selection of dedicated and alternate safe shutdown systems, the work involved relocating equipment to achieve separation, protecting individual or small groups of power and control cables, designing sprinkler systems to protect specific areas, and performing walkdowns to audit compliance with the regulations.

Before joining Cygna, Mr. Moersfelder developed and was Engineering Manager of the Systems Design Engineering Group for a major Chicago engineering consultant. The Systems Group grew to 19 engineers and designers who dealt with electrical, and control and instrumentation issues as they related to retrofit projects in the nuclear power industry. Major projects included the process computer replacements at Dresden and Quad Cities stations, process and area radiation monitoring systems, leak detection system upgrades, equipment qualification analysis and documentation, and Fire Protection-Appendix R related work for clients such as Commonwealth Edison Company, TVA, and Northern States Power Company.

Prior to that, Mr. Moersfelder was employed by Fluor Power Services as a Principal Engineer. His responsibilities included the technical aspects of process instrumentation, computer systems, main control panels, local instrument racks, annunciator systems, and dedicated automatic control systems. Under his direction, designs were documented in the form of piping and instrument diagrams, logic diagrams, functional block diagram, control schematics, system descriptions, instrument data sheets, installation details and procurement specifications. Among the projects he participated in were the backfits and modifications which resulted from the TMI incident. These projects were authorized by Wisconsin Public Service Corporation for the Kewaunee Nuclear Power Plant and by Northern States Power Company for their Prairie Island Nuclear Generating Station.



ALAN E. MOERSFELDER
(continued)

Mr. Moersfelder's previous industry experience includes several years with Sargent & Lundy as a Control and Instrumentation Project Engineer. his responsibilities included the technical direction of engineers involved in the design of Illinois Power company's Clinton Power Station and Cincinnati Gas and Electric's Zimmer Nuclear Power Station. While at Sargent & Lundy, he was appointed Procurement Specialists in the areas of main control panels and electrical analog panel meters. The responsibilities of a specialist included coordinating the generic review to qualify vendors who wish to bid on project procurement specifications.

As a result of his working experience, Mr. Moersfelder has a thorough understanding of utility practices, industry standard, and NRC regulations.



LAWRENCE C. MAGGIO

EDUCATION:

B.S., Electrical Engineering, Northeastern University, Boston

PROFESSIONAL AFFILIATIONS:

Institute of Electrical and Electronic Engineers Member, Industrial Application Society

PROFESSIONAL EXPERIENCE:

Mr. Maggio has over 13 years of electrical engineering and design experience on both nuclear and fossil-fueled power plants. As a senior electrical engineer at Cygna, he has performed an Appendix R cable modification study and has been involved with Design Change Packages for Virginia Electric and Power Company's Surry and North Anna stations. He has written 600 volt power and control cable specifications for these projects, and also for Boston Edison Company's Pilgrim Station.

Mr. Maggio was the Lead Electrical Engineer on the Vermont Yankee project where he performed and supervised the failure modes and effects analysis. This work determined how failure of auxiliary components affect the action and/or position of required safety-related components. He also performed an analysis regarding the effects of non-nuclear safety equipment upon environmentally qualified safety class equipment as part of this project. In addition, he performed a 4160 volt and 480 volt circuit breaker coordination study for the Vermont Yankee Station.

Mr. Maggio was involved with an Independent Design Review Audit of electrical engineering and design for Texas Utilities Services' Comanche Peak Station. He has also written the electrical portion for a HVAC system specification for Appendix R Environmental Enclosure for New York Power Authority's J. A. Fitzpatrick Station.

Prior to joining Cygna, Mr. Maggio was a Senior Electrical Engineer within the Thermal Power Division of Charles T. Main, Inc. He was responsible for the design of elementary and interconnection diagrams which included control and protective circuits for all electrical systems within power plants. He developed a system of execution and control for cable routing using a computerized circuit and raceway system. Mr. Maggio also designed cable tray, conduit, manhole and underground duct bank systems and in-plant 13.8 kV distribution pole line. His responsibilities also included the preparation of specifications, evaluation of bids, and review of manufacturers prints and equipment. He also determined the physical layout of electrical equipment including distribution transformers, switchgear, power centers, motor control centers, distribution and control panels.



LAWRENCE C. MAGGIO
(continued)

Earlier, Mr. Maggio worked as a Cooperative Education Student at Metcalf and Eddy where he performed electrical engineering, design, and drafting of sewage treatment plants, incinerators, and industrial facilities. As a Cooperative Education Student with Spencer-Kennedy, he was responsible for the design of Community Antenna Television Systems for numerous cities and towns.



JAMES W. DADY

EDUCATION:

Ph.D. Candidate, Electrical Engineering, California Western University, Santa Ana, CA
B.S., Electrical Engineering, Indiana Technical College, Fort Wayne, IN

PROFESSIONAL REGISTRATION:

Professional Engineer, Control Systems, California

PROFESSIONAL AFFILIATIONS:

Senior Member, Instrument Society of America

PROFESSIONAL EXPERIENCE:

Mr. Dady has more than 26 years of controls and instrumentation experience in the nuclear, petrochemical, mining and pharmaceutical industries. During the past 15 years, he has held positions such as Principal Instrument Engineer or Engineering Supervisor. Mr. Dady has more than seven years of BWR experience, all of which has been at the Perry, Grand Gulf, Susquehanna or Browns Ferry sites.

Mr. Dady has been involved in the design, installation, functional check-out and start-up of both NSSS and BOP systems. He routinely needs to read and interpret piping and instrument diagrams, instrument loop diagrams, elementary diagrams, instrument data sheets and specifications, and logic diagrams and system descriptions. Being in the field, he has had to coordinate the efforts of the A/E, NSSS vendor and construction people.



RANDALL J. UHLAR

EDUCATION:

M.B.A. (in progress), University of Louisville
B.S., Electrical Engineering, Ohio University

PROFESSIONAL EXPERIENCE:

As a Senior Engineer with Cygna, Mr. Uhlar has completed the electrical independent design review of the Comanche Peak Nuclear Power Station. His duties included reviewing the electrical calculations and design criteria to ensure their incorporation of the required IEEE, NUREG, and FSAR commitments for the Component Cooling Water system. Other responsibilities included developing checklist items for the walkdown portion of the review to ensure proper design implementation.

Prior to joining Cygna, Mr. Uhlar was a Senior Project Engineer at Public Service of Indiana in their Electrical Resident Engineering Department, participating in the restart of the Marble Hill project. He was responsible for initiating changes to the electrical contractors' specifications and design drawings due to interferences, design improvements or drawing inconsistencies. His duties included interfacing with Contractors' engineering, quality control, and purchasing personnel to resolve engineering construction restraints related to conduit, cable, termination, equipment, etc. He was also responsible for the coordination (area and manpower requirements) of the Category I Conduit Support Walkdown/Layout Program. Mr. Uhlar also served as the engineering supervisor for the non-safety related construction completion contract, having responsibility for providing technical support to questions arising during the completion of area and systems turnover.

Mr. Uhlar was employed by the L.K. Comstock Engineering Company, Inc., as an Electrical Area Engineer assigned to the Enrico Fermi II Nuclear Power Station. He provided technical support to craft supervision which ensured that installation of equipment conduit, cable and terminations complied with the required design specifications. His duties also included the design of seismic conduit supports and the initiation of drawing revisions due to field interferences and design improvements.

As an Electrical Field Engineer for the Foothill Electric Corporation at the Wm. H. Zimmer Nuclear Power Station, Mr. Uhlar was responsible for providing electrical technical support to craft supervision for various areas within the construction project. His duties included reviewing design drawings to ensure installation of responsible material within the design guidelines. This included the initiation of drawing revisions and additions for tray, conduit, and cable for power, control and instrumentation level. He interfaced with other discipline engineering personnel to coordinate area construction activities and owner engineering personnel for approval of design changes. Mr. Uhlar was also involved in several estimating evaluations for both time and material on replacement projects.



RANDALL J. UHLAR
(continued)

As an Assistant Field Engineer for the Dravo Corporation, Mr. Uhlar assisted in the field engineering and final completion for the material handling and coke battery area. His responsibilities included conduit routing, cable scheduling, and elementary diagram revisions and additions for power, control and instrumentation. He also assisted in the checkout, testing, and turnover of low voltage electrical equipment.

ROBERT CRAIG KILLOUGH

EDUCATION:

B.S., U.S. Naval Academy, Annapolis, MD

PROFESSIONAL EXPERIENCE:

Mr. Killough has 12 years experience in the nuclear power industry. This experience includes reactor operations, plant modification, maintenance, training, licensing and project management.

Mr. Killough is Manager of Cygna's San Francisco regional office. Previously, as a Division Manager he was responsible for all projects relating to licensing, systems engineering, environmental qualification, and testing. In this capacity, he has provided innovative design and aggressive licensing solutions in the tasks of solving systems related problems.

Mr. Killough was the Project Engineer for the 10 CFR 50.59 safety evaluation of plant modifications to replace recirculation, core spray and RHR system piping at Cooper Nuclear Station.

Additionally, Mr. Killough was the Project Manager for work involving a third party review of the design and engineering for the recirculation system piping replacement program at Monticello.

He has been the responsible manager for the systems design review portion of the Comanche Peak Independent Assessment Program involving electrical and mechanical disciplines.

Mr. Killough was solely responsible for the development of a Pressurized Water Reactor Technology training program written for the New York Power Authority.

Prior to joining Cygna, Mr. Killough was Manager of Plant Engineering for a major nuclear service firm. In that position, he directed plant modification projects and implemented the use of Computer Aided Engineering (CAE) in the design and modification process. He was also instrumental in the development of enhancements and modifications to the CAE system to make it compatible with power industry applications.

In addition, he served as project manager in a number of projects involving various disciplines including:



ROBERT CRAIG KILLOUGH
(continued)

- o Environment qualification of safety related electrical equipment for Monticello and Prairie Island Units 1 and 2.
- o Leak before break analysis of AFW steam supply piping to mitigate the consequences of high energy steam line breaks.
- o Development of Site Safety Committee Operating procedures for Northern States Power Company.
- o Design and analysis of plant modifications to address IE Bulletin 79-14.

Mr. Killough also has several years experience in the Navy Nuclear Power Program. While in the Navy he qualified as Chief Engineer, served as Officer in charge of Operator Training at the S3G Prototype for two years, qualified as Senior Refueling Engineer at the Mare Island Naval Shipyard and gained extensive experience in reactor operations and maintenance.

JAMES J. OSZEWSKI

EDUCATION:

B.S., Nuclear Engineering, University of Wisconsin

Graduate Course Work in Business, Golden Gate University

PROFESSIONAL REGISTRATION:

Professional Engineer, Mechanical, State of California

Professional Engineer, Nuclear, State of California

PROFESSIONAL AFFILIATIONS:

Member, American Nuclear Society

PROFESSIONAL EXPERIENCE:

Mr. Oszewski has more than 14 years of experience in engineering and management. He is currently assigned as a Division Manager, responsible for supervision of all systems engineering and licensing activities for the San Francisco office.

Prior to joining Cygna, Mr. Oszewski was associated with Bechtel Power Corporation as the Assistant Chief Nuclear/Environmental Engineer responsible for the management and supervision of nuclear and environmental engineering activities in the San Francisco Power Division.

Prior to that assignment, Mr. Oszewski was the licensing supervisor on the staff of the San Francisco Power Division Chief Nuclear Engineer. He supervised a group responsible for the development of corporate licensing positions for both nuclear and fossil plants, as well as providing guidance and assistance to projects in their development of plant unique licensing positions. The licensing guidance and assistance was provided to operating plant projects as well as CP and OL application projects.

Previously, Mr. Oszewski worked on the Arkansas Nuclear One - Unit 1 project for four years, initially as the project licensing engineer. He was subsequently promoted to nuclear group leader and then to assistant mechanical group supervisor with responsibilities for work planning, technical review, and report preparation in the areas of: reactor licensing, nuclear steam supply and turbine-generator interface, accident analysis, rad-waste design, operator dose reduction, and shielding. As the plant moved through pre-operational testing into commercial operation, he developed designs for plant modifications and served as engineering representative at the jobsite during their implementation.



JAMES J. OSZEWSKI
(continued)

He was a member of two Bechtel interoffice teams created to conduct an independent review of design and licensing activities on two Bechtel projects (Midland and Vogtle). His prior assignments included duties as a nuclear project licensing engineer and as system engineer responsible for design and component procurement, on various nuclear projects.



ROBERT B. PORTER

EDUCATION:

B.S., Electrical Engineering, University of New Brunswick

M.B.A., McGill University

PROFESSIONAL EXPERIENCE:

Mr. Porter is a Staff Consultant in controls and instrumentation at Cygna. He has more than 25 years experience in controls, electrical engineering, system design, computers and manufacturing, with responsibilities as vice president, project manager, engineering manager, contract engineer, and consultant with previous employers. This includes 17 years with BWR and heavy water reactors, utility thermal plants, commercial heating boilers, recovery boilers, steel annealing furnaces, and several processes including cement, pulp and paper, and iron refining.

Currently, Mr. Porter is assigned to BWR modification projects that were initiated either by TMI or other regulatory requirements. Most recently, he has been involved with NUREG 1.97 and NUREG 0737, Supplement I. He is familiar with the functions of BWR controls system and the associated General Electric documentation.

He is participating in an independent verification and validation of the SPDS for Illinois Power Company and with modifications to a BWR oxygen suppression system for Commonwealth Edison Company.

NUTECH Engineers

Mr. Porter participated in an independent audit of the engineering and construction plan for three new diesel generators, identifying potential for cost reductions and accelerating the installation schedule. for Commonwealth Edison, he operated and maintained the IHSI power supply, as a certified operator, and a Level II Mechanical Tester in accordance with ANSI N45.2.6-1978, heating 40 welds in the recirculation piping. He adjusted coil, applied thermocouples, and inspected their installations. He was instrumental in developing the organization and crew size for the drywell operations. He designed, checked out, and started up the first permanent recirculation water hydrogen/oxygen injection system at a nuclear station in the U.S.A. He instrumented stack gas monitoring, off-gas monitoring, and river water level and participated in a computer cutover to a Honeywell 4500. He prepared the approach for plant review of controls and instrumentation as required by Regulatory Guide 1.97 and is familiar with all aspects of its requirements. He developed the algorithms and approach as required to complete a safety parameters display system (SPDS). He is currently programming in Basic on an IBM PC, and is familiar with Fortran and PLI languages, as well as current microcomputer technology for office and factory automation.



ROBERT B. PORTER
(continued)

Brown & Root, Inc.

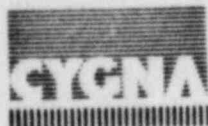
Mr. Porter designed and completed bid evaluations for retrofitting & baghouse to bypass an existing precipitator, and a programmable controller-based pulverizer steam inerting control system for two 500 MW coal fired steam generators. He prepared startup and operating procedures for all major control systems for a 500 MW coal fired Babcock steam generator. He designed, specified, and evaluated potential suppliers for a supervisory computer with distributed process controllers to fully automate a continuous annealing strip steel line. He instrumented two 600,000 lbs per hour steam generators and process controls for a petrochemical plant and food plant.

He completed heat cycle analyses and reporting of unit efficiency for 16 fossil fueled units ranging from 33 MW to 500 MW in size at six plants, for Nova Scotia Power Corporation and Public Service Company of New Mexico.

Bailey Controls Company

Mr. Porter designed, instrumented, checked out, and project managed many integrated control systems including combustion, steam temperature, feedwater, burner management, turbine run up and data logging for numerous fossil-fueled units ranging in size from 20 MW to 500 MW; and safety and alarm monitoring and auxiliary control systems for heavy water cooled, nuclear fueled 500 MW and 1000 MW units. He developed a training program and instructed newly hired technical employees in analog control for three years.

Mr. Porter's electrical engineering experience includes designing, checking out, and starting up electronic circuits, relay controls systems including logic and schematics, electric analog and digital control systems, specifying and purchasing electrical equipment. He taught college math, including functions and simulation at Purdue University.





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Attachment B
Additional Cygna Systems and Electrical/I&C Personnel

David J. Hampshire
Glenn A. Smith
Thomas L. Snyder
Kiang L. Zee
George D. Bradley
Per Bratland
Dean H. Casali
William J. Ciavarro
Fred C. DiCristofaro
Robert F. Foley
James F. Kelley Jr.
Adalbert Mayer
A. Patrick McCarthy
James Moscardelli
Ronald P. Pollara
Phillip W. Strauss
James A. Voelxen
Barton A. Waldo Jr.
Phillip V. Ziminsky Jr.
Wayne E. Schweidenback
Edward F. Mulrenan
Jeffrey Grundman

DAVID J. HAMPSHIRE

EDUCATION:

B.S. Mechanical Engineering, Washington State University, Pullman, WA

PROFESSIONAL REGISTRATION:

Registered Professional Mechanical Engineer, CA

PROFESSIONAL EXPERIENCE:

Mr. Hampshire has over six years of experience in the nuclear power industry. His experience includes licensing, high energy line break analysis and mechanical systems design.

Prior to joining Cygna, Mr. Hampshire was with Bechtel Power Corporation where he was a licensing and systems design engineer.

Projects that Mr. Hampshire has been involved in include:

Diablo Canyon Power Plant (1131 and 1156 MWe Pressurized Water Reactor)

Assigned to the licensing staff of Pacific Gas and Electric Company. Responsibilities include the review of violations to the Technical Specification and submittal of Licensee Event Reports to the Nuclear Regulatory Commission (NRC), tracking of licensing commitments made to the NRC and follow-up resolution. Other responsibilities include support to the legal department in the preparation of submittals to the Atomic Safety and Licensing Appeal Board.

Hope Creek Generating Station (1100 Mwe Boiling Water Reactor)

Responsibility for coordinating the submittal of question responses to the NRC to supplement their review of the Final Safety Analysis Report (FSAR). This responsibility involved reviewing responses to NRC questions against piping and instrumentation drawings, system logic diagrams and electrical schematics to ensure their accuracy; consolidating information provided by several sources to formulate responses; scheduling overtime and prioritizing workloads to ensure deadlines were met. Responsibilities prior to submittal of the FSAR included directing presentations on writing FSAR sections; developing a time schedule for writing, editing, reviewing, approving, and printing the FSAR; writing sections and reviewing those written by the client, NSSS vendor, and other Bechtel personnel; tracking expended manhours; and supervising the editorial and clerical staff.



DAVID J. HAMPSHIRE
(continued)

Arkansas Nuclear One (883 and 941 MWe Pressurized Water Reactor)

Advised the Project Licensing Engineer of potential licensing impacts resulting from proposed design changes. Reviewed proposed changes to the Technical Specifications. Determined fluid jet impingement loads for high pressure and temperature line breaks and determined head losses in piping systems. Verified available net positive suction head for pumps. Reviewed logic diagrams associated with the actuation of mechanical components.



GLENN A. SMITH

EDUCATION:

B.S., Engineering Design & Economic Evaluation,
University of Colorado

PROFESSIONAL REGISTRATION:

Registered Professional Electrical Engineer, California
Licensed Electrical Contractor, California

PROFESSIONAL AFFILIATIONS:

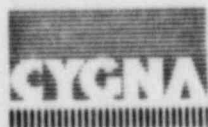
Member, Institute for Electrical and Electronic Engineers

PROFESSIONAL EXPERIENCE:

Mr. Smith has over 18 years of experience in the energy industry. Presently he is a Supervising Engineer responsible for electrical design and modification projects. He is also responsible for marketing and servicing Cygna's database software products.

Prior to joining Cygna, Mr. Smith served in various engineering and management positions with Bechtel Power Corporation. As Program Manager and Technical Specialist for Bechtel's circuit and raceway computer programs his responsibilities included writing specifications for program development projects, troubleshooting maintenance problems, training users, and managing the project teams concurrently supporting approximately sixteen databases. Recently completed tasks include writing a specification for an advanced circuit and raceway system to support operating power plants, and advising international and domestic clients regarding database development.

In earlier assignments, Mr. Smith was responsible for coordinating the development of Electrical and Control Systems engineering standards. In this capacity he also developed the Bechtel standard for environmentally qualifying nuclear safety systems equipment. In addition, he served as electrical engineering design supervisor for Arkansas Nuclear One - Unit 1. In this position he led the engineering, specification, licensing, installation, and construction teams for the steam line break instrumentation and control system, the plant security system, and various plant reliability improvements. Prior to assignments on Arkansas Nuclear One he was a field engineer assigned to Pilgrim Station, Unit 1. His experience with Bechtel dates back to 1966.



THOMAS L. SNYDER

EDUCATION:

B.S., Mechanical Engineering, New Jersey Institute of Technology, Newark, New Jersey

M.B.A., Drexel University, Philadelphia, Pennsylvania

PROFESSIONAL REGISTRATION:

Registered Professional Engineer in the states of New Jersey and Illinois

PROFESSIONAL AFFILIATIONS:

Member, American Society of Mechanical Engineers

Member, American Nuclear Society

Past Chairman, ANS Philadelphia Chapter

Member, ANS Reactor Operations Program Committee

PROFESSIONAL EXPERIENCE:

Mr. Snyder is Manager, Backfit Projects for Cygna. Mr. Snyder has over 16 years experience in the design and construction of nuclear and fossil power plants. Prior to joining Cygna, Mr. Snyder was manager of operations for Stearns Catalytic Corporation's Midwest Operations Center. In this capacity he was responsible for managing all of the operations activities in that office. He had the project management, the engineering management and the administrative management reporting to him on a direct basis. He was responsible for all of the projects performed in the Midwest Operations Center. He was also Project Manager for Commonwealth Edison Company's On-Site Radwaste Storage Facility design at Dresden, LaSalle, Zion and Quad Cities. He was responsible for the study of on-site Radwaste storage facility alternative designs for Iowa Electric Light and Power.

His previous assignment was as project manager on the Dresden Unit 1 decontamination/radwaste program. In this role, he was responsible to Dow Nuclear Services and Commonwealth Edison Company for the overall direction of the program which is now complete. The project peaked at 65 engineers, designers and support specialists responsible for the design and start-up of this \$38 million waste processing/volume reduction/solidification program. Mr. Snyder is also serving as project manager on a project for Kerr-McGee Corporation. The scope of this assignment involves the decontamination and decommissioning of a thorium oxide processing plant located in West Chicago.



THOMAS L. SNYDER
(continued)

While assigned to Catalytic's headquarters office in Philadelphia, Mr. Snyder was project manager on several plant modifications for Rochester Gas and Electric at their R. E. Ginna Nuclear Station.

Mr. Snyder also served as project manager for the engineering of select radwaste system modifications at Peach Bottom Atomic Power Station. Also as project manager, Mr. Snyder was responsible for an engineering study which addressed the radioactive waste disposal situation at Peach Bottom Station. This included interpreting and forecasting licensing, economic and technical parameters for various alternatives and culminated in the conceptual engineering design of a new radwaste processing facility.

Before joining Catalytic, Mr. Snyder served as a supervisory engineer for Public Service Electric and Gas Company. This experience included supervising the efforts of mechanical start-up of Salem No. 1 Nuclear Generating Unit. This work involved direction of start-up and testing of primary and secondary systems, scheduling assignment of work and documentation of results. Mr. Snyder was instrumental in developing the PSE&G nuclear start-up program which was first implemented on the Salem project.

Prior to the Salem start-up assignment, Mr. Snyder was responsible for a variety of capital improvement/maintenance projects for PSE&G's fossil fueled electric generating stations. A typical capital improvement/maintenance project assignment progressed from the investigation of an operating problem, through the recommendation/authorization stages to engineering and field support activities.

Previous assignments at PSE&G included system design and piping engineering on Salem Nuclear Generating Station, conceptual mechanical engineering on a 1100 MWe BWR nuclear power plant, and mechanical engineering on a 600 MWe coal-fired electric generating station.



KIANG L. ZEE

EDUCATION:

B.S., Electrical Engineering, San Jose State University, 1980, San Jose, CA

PROFESSIONAL REGISTRATION:

Professional Engineer, Electrical, State of California

PROFESSIONAL AFFILIATIONS:

Tau Beta Pi Engineering Honor Society

Eta Kappa Nu Engineering Honor Society

PROFESSIONAL EXPERIENCE:

Mr. Zee has over four years of experience in the nuclear and fossil power industries. His experience includes electrical distribution system design, protective relaying, battery systems, licensing activities, and circuit and raceway systems.

Prior to joining Cygna, Mr. Zee was with Bechtel Power Corporation where he was a systems engineer and a circuit and raceway engineer.

Projects that Mr. Zee has been involved in include:

Public Service Electric and Gas Company

As a systems engineer on the Hope Creek Nuclear Generating Station, Mr. Zee was responsible for the protective relaying and the relay coordination study of the in-plant distribution system, and system design calculations. He provided technical support for licensing activities; provided an analysis to verify the adequacy of the electrical distribution system to maintain shutdown capability during various postulated accident conditions; performed a study to determine the electrical system response to a total plant blackout; performed system voltage regulation studies during normal and degraded off-site grid voltage conditions, and over/under voltage conditions on the D.C. distribution system. He was involved in the design and implementation of overcurrent protection for electrical penetration modules. He performed various studies for fuse-fuse, breaker/fuse overcurrent coordination.



KIANG L. ZEE
(continued)

Montana Power Company

As a circuit and raceway engineer on the Colstrip Fossil Power Plant, Mr. Zee was responsible for all activities associated with a computerized circuit and raceway program which included input and retrieval of information from the computer database. He was also responsible for providing circuit routing for all power and control circuits as well as verifying and maintaining the accuracy of information in the database. He was involved in the development of utility program to optimize information retrieval and bulk report generation.



GEORGE D. BRADLEY

EDUCATION:

M.E., Nuclear Engineering, University of Virginia, Charlottesville, VA

B.S., Engineering Physics, Cornell University, Ithaca, NY

PROFESSIONAL REGISTRATION:

Engineer-In-Training, Massachusetts

PROFESSIONAL AFFILIATIONS:

Member, American Nuclear Society

PROFESSIONAL EXPERIENCE:

Mr. Bradley has over eight years of experience in the licensing and safety analysis of nuclear facilities. He is presently the Project Engineer for the Appendix R Review being performed for Northeast Utilities' Millstone I Nuclear Power Station. This project consists of a review of the station fire barriers, shutdown methods, emergency lighting, and the development a list of recommended modifications and exemptions. This work has resulted in significant reduction in the number of modifications recommended for the station.

Previously, he was the Lead Licensing Engineer for Appendix R projects at Vepco's Surry and North Anna Power Stations. In this position, he was responsible for developing safety analyses and performing licensing reviews of all Design Change Packages.

In addition, he participated in the field effort during installation of these packages and developed a separate Design Change Package which was required to resolve a critical path problem.

In previous assignments, he served as the Lead Licensing Engineer for a Systems Interactions Analysis Program for the Perry Nuclear Power Plant, a Fire Hazards Safety Analysis Study for a low level radioactive waste incinerator, and a toxic chemical evaluation for a Control Room Habitability Study performed for the Ginna Station.

Prior to joining Cygna, Mr. Bradley worked for Stone & Webster Engineering Corporation on the LMFBR Conceptual Design Study. His major responsibility was the coordination and assessment of balance of plant safety systems. This work involved provision of a final report which included a review of issues related to the Three Mile Island accident, unresolved Clinch River Breeder Reactor Plant issues, and the development of a Systems Interaction Program. Other duties included safety input to the design of systems in Stone & Webster's work package, and interfacing with CDS participants on all safety matters.



GEORGE D. BRADLEY
(continued)

Previous to that assignment, Mr. Bradley evaluated non-safety/safety interactions on several Stone & Webster projects. He was also responsible for ensuring Regulatory Guide compliance for North Anna 3 and 4, and performing final design calculations for quench and recirculation spray modifications for the Surry Power Station.

Initially, Mr. Bradley was assigned to the Licensing Division of Stone & Webster, where his responsibilities included work in the areas of fire hazards analysis, security, safety engineering, and systems interaction. He also participated in writing a report on Systems Interactions which was published in December 1978.

While attending college, Mr. Bradley worked as an Assistant Engineer for Vepco, where his duties included participation in a spent fuel cask drop analysis. He also reviewed Regulatory Guides, technical specifications, and documents from North Anna Units 3 and 4 to assess design compliance.

Mr. Bradley's initial duties were at the Surry Nuclear Power Station, where he was responsible for operational system changes and participated in a neutron flux surveillance program. During a two-month refueling period, he also worked in Quality Assurance, inspecting welding, maintenance, and operational procedures for proper implementation.

PER BRATLAND

EDUCATION:

B.S., Mechanical Engineering, South Dakota School of Mines and Technology

PROFESSIONAL REGISTRATION:

Registered Professional Engineer in New York, Pennsylvania, and Kansas

PROFESSIONAL AFFILIATIONS:

American Society of Mechanical Engineers

PROFESSIONAL EXPERIENCE:

Mr. Bratland has over 20 years of experience in the engineering and design of HVAC, plumbing, and fire protection systems for power plants and commercial and industrial buildings. His experience also includes the review of nuclear power plant fire protection systems design for compliance to NRC guidelines including participation in NRC site audits. He is presently a Mechanical Engineer with Cygna where he is involved in the engineering and design of the air conditioning and ventilation of several plant modification systems including several studies.

Prior to joining Cygna, Mr. Bratland was a Mechanical Engineer in the Thermal Power Division of Chas. T. Main, Inc. In this position he was responsible for the supervision of the engineering and design of all HVAC, plumbing and fire protection systems for an eight (8) unit 300 MW (each) oil-fired power plant in Kuwait. His responsibilities included system selection, calculation preparation, specifications, direction of engineering and design effort, client liaison, bid evaluation, and contractor meetings. Other responsibilities included the engineering, design and review of contractor drawings and documents for HVAC, plumbing, and fire protection for both foreign and domestic work.

Before joining MAIN, Mr. Bratland was employed by United Engineers and Constructors as a supervising discipline engineer. He was responsible for the supervision of the engineering and design, bid evaluation, and field liaison for all heating, ventilating, air conditioning, plumbing, and fire protection systems for a 250 MW and an 850 MW coal-fired power plants. Job assignments also included the responsibility for all HVAC work performed by the power division of UE&C's Boston office.



PER BRATLAND
(continued)

Earlier, Mr. Bratland was employed by the Stone and Webster Engineering Corporation where he held the positions of Principal and Support Mechanical Engineer. As a Principal, he was responsible for the supervision of the Facility Group whose duties included the system engineers, design coordination, specification writing, calculation preparation, procurement, bid evaluation, client and vendor liaison in all areas of HVAC, Plumbing, and Fire Protection work on major power plant construction projects. Work also included the overall fire analysis for various plant sites.

With the Phillips Petroleum Company, Mr. Bratland was responsible for miscellaneous mechanical engineering work for petrochemical and carbon black plants.

Prior experience in Europe included seven years of engineering assignments involving HVAC, plumbing, and fire protection for schools, office buildings, and commercial, industrial, and residential structures.



DEAN H. CASALI

EDUCATION:

Certificate in Industrial Electronics, Northeast Institute

General Engineering Courses, Northeastern University

PROFESSIONAL EXPERIENCE:

Mr. Casali has over fourteen years power plant engineering and design experience, specializing in instrumentation and control systems. He was recently assigned to the site engineering office at Boston Edison's Pilgrim Nuclear Station responsible for resolving I&C installation problems. In his last assignment he conducted an assessment of the instrumentation presently installed at the New York Power Authority's Fitzpatrick Nuclear Power Plant, which could comply with the requirements of R.G. 1.97 - Post Accident Monitoring. This assessment provided a report suitable for submittal to the NRC and a detailed recommendation for NYPA regarding modifications to comply with the regulatory guidelines. Other previous assignments he worked on maintenance procedures, and I&C surveillance test procedures for Long Island Lighting Company's Shoreham Nuclear Power Station. He also worked on equipment qualification tasks for Copes-Vulcan and various other equipment manufacturers.

Mr. Casali was assigned as Lead Control Engineer for Cygna's Systems Interaction Analysis Project for the Perry Nuclear Power Station. Mr. Casali was responsible for the review of control systems designs, and developing simplified instrumentation loop diagrams.

Before joining Cygna, Mr. Casali was employed by Stone & Webster Engineering Corporation in the Control Systems Division. While assigned as Principal Instrument Applications Engineer to LILCO's Shoreham Nuclear Power Station Unit 1, he was responsible for the supervision of the Instrument Group and review of the work performed by the group. This included the review and implementation of various code requirements as they pertained to instrumentation for various power plant systems. In this capacity he was also assigned to a task force assessing the environmental effect of pipe failure outside the primary containment on safety related instrumentation. He also participated in the installation of GE's Analog Transmitter Trip System replacing the old mechanical trip system. His other work included implementation of NRC Regulatory Guide 1.97, Post Accident Monitoring, as it affected installed instrumentation, and the need for additional instrumentation required to meet the regulation.

Mr. Casali was previously assigned to the James A. Fitzpatrick Nuclear Power Plant Project, responsible for writing specifications, obtaining bids, purchasing radiation monitoring equipment, gas analysis equipment, and instrumentation for conductivity, pressure, temperature, level, flow, and vibration. He was also responsible for coordinating the development of detailed electrical and instrumentation drawings, review and approval of manufacturer's drawings, preparation of instrument schedules, as well as assisting the construction forces with resolving installation problems.



WILLIAM J. CIAVARRO

EDUCATION:

B.S., Engineering Technology Electrical Engineering, Northeastern University

A.S., Electrical and Electronic Engineering, Franklin Institute of Boston

PROFESSIONAL EXPERIENCE:

Mr. Ciavarro has over sixteen years of experience in electrical and electronic engineering, including the design of electrical distribution systems; programmable control systems; control board wiring; and, the design/drafting of electrical systems.

His most recent assignment included breaker coordination studies for Connecticut Yankee, Millstone Unit 1 and Millstone Unit 2 for Appendix R. Mr. Ciavarro's responsibilities included verification and recommendations to insure that failure due to fire of non-Appendix R circuits will not result in loss of power supplies to essential Appendix R circuits.

In a previous assignment, Mr. Ciavarro was at the New York Power Authority's Fitzpatrick plant, where he was responsible for the revision of Ellis and Watts drawings and change requests for NYPA drawings. These responsibilities included the design of cable block diagrams, drawings for new enclosures, and revisions of existing drawings to provide a complete wiring package.

In a previous assignment at the Millstone 3 Station, Mr. Ciavarro supervised personnel checking internal wiring diagrams on main control board, motor control centers, computer termination cabinets, isolation cabinets, and cable block diagrams. His responsibilities also included design and checking wiring drawings on above mentioned equipment.

At the Millstone Station, Mr. Ciavarro also designed and checked wiring diagrams on motor control centers, main control board annunciator, and computer termination cabinets. He checked internal wiring point to point on main control board and primary relay panel per engineering sketches. Mr. Ciavarro also supervised the coordination of additions and changes to motor control centers which included updating one-lines, wiring diagrams, and front views and cable scheduling as a Senior Draftsman. He updated main one-line drawings, switchgear three-line and wiring diagrams, and checked to see that they conformed to the standards, and also revised cable block diagrams and rescheduled cable.

Mr. Ciavarro has been responsible for the supervision of personnel involved with design of electrical distribution systems for Power and Recovery Boilers for the Pulp and Paper Industry. The control systems were designed using Programmable Controllers, and on site field surveys were performed to design additions or modernizations to existing distribution systems. His responsibilities also included estimating and scheduling engineering man hours, material cost estimates, and preparing equipment specifications.



WILLIAM J. CIAVARRO
(continued)

Mr. Ciavarrro has also designed switchboards and panel boards in accordance with Underwriter's Laboratories Standards. He prepared high and low voltage switchgear front view drawings and wiring diagrams from specifying engineer's sketches and equipment manufacturer's drawings.

FRED C. DICRISTOFARO

EDUCATION:

B.S., Marine Engineering, United States Merchant Marine Academy

Certificate in Liquid Natural Gas Operations, Calhoon MEBA Engineering School

PROFESSIONAL LICENSES/REGISTRATION:

U.S. Coast Guard License, Third Assistant Engineer of Steam and Diesel Vessels of Unlimited Horse Power

Stationary Boiler Operator's License, State of Maine

Certified as Level II Mechanical Test Engineer per NRC Regulatory Guide 1.58, ANSI N45.2.6 and ASME Boiler and Pressure Codes, Section III, Division I and Division 2, and Section XI

PROFESSIONAL EXPERIENCE:

Mr. DiCristofaro has over six years of steam plant engineering, operations, testing, and maintenance experience. He is assigned as an engineer in Cygna's Systems Engineering Division responsible for performing a broad range of I&C engineering, licensing, testing, and plant service functions.

Mr. DiCristofaro is currently assigned to write and coordinate the Development of Pre-Operational Test Procedures for TMI Modifications at the Pilgrim Power Station. This includes Post-Accident Sample System and the H425/O425 Monitoring System. His primary focus is the Instrumentation and Control components of these systems. Other projects he has been involved in include:

- o The development of instrument installation procedures as part of Appendix R instrument Design Change Packages for Vepco.
- o The review, evaluation, and writing of Instrument and Control Surveillance Test Procedures to ensure all Technical Specification activities were covered in response to an NRC inquiry for the Shoreham project.

Before joining Cygna, Mr. DiCristofaro was employed by General Dynamics, Quincy Shipbuilding Division, as a Senior Test Engineer. His primary responsibilities were to coordinate and perform system acceptance tests on ship's main propulsion and auxiliary equipment. He supervised final assembly, hydrostatic testing, boilout and initial light-off of ship's main boilers. Other duties included Senior Watch Engineer whenever boilers were lit-off and to advise department supervisors on field modifications as required to resolve start-up difficulties.



FRED C. DICRISTOFARO
(continued)

For the Stone and Webster Engineering Corporation, Mr. DiCristofaro wrote and coordinated the development of mechanical test procedures for the Shoreham Project. These test procedures encompassed such systems as the Emergency Diesel Generators, Rad-waste Systems, and Leak Rate Testing. He was also the coordinator of the Hydrostatic Test Pressure Program for Shoreham. He prepared the Heavy Load Report in response to NUREG 0612. As a test engineer in the Shoreham Start-up Group, Mr. DiCristofaro developed and wrote flush and pre-operational test procedures as well as assisted in their performance.

He also served in the U.S. Merchant Marine for three years as a Watch Engineer. During this time his responsibilities included maintaining a 30,000 shaft horsepower diesel propulsion plant, liquid natural gas handling, and operating dual fuel boiler systems.

ROBERT F. FOLEY

EDUCATION:

A.S., Mechanical Engineering, Northeastern University

Electronic Technology, Wentworth Institute

PROFESSIONAL EXPERIENCE:

Mr. Foley has over 15 years of experience in instrumentation and controls engineering and design on nuclear and fossil power plants. He is presently an Instrumentation and Controls Engineer with Cygna and is presently assigned to the Site Engineering Office at Boston Edison's Pilgrim Nuclear Power Station, responsible for resolving I&C installation problems.

Prior to joining Cygna, Mr. Foley was employed by United Engineers and Constructors at the Seabrook Nuclear Power Station where he supervised the Instrumentation and Controls Start-up Interface Group. This group was responsible for resolving I&C Engineering problems from Start-up, PSNH Operations, Construction Management, and Electrical and Piping Contractors.

He was also responsible for approving engineering change authorizations, dispositions of nonconformance reports, and purchasing of instrumentation and controls for the site not purchased by Home Office Engineering.

Other projects include a field assignment at the Hoosier Energy Division, coal-fired Merom Stations Units 1&2 where he was responsible for resolving I&C problems during construction; supervision and coordination of I&C design for the Sunflower Electric Cooperative's coal-fired Holcomb Station; supervision of instrument installation for retrofit of burners and new burner management systems at Central Maine Power Company's oil-fired W. F. Wyman Station, Unit No. 3; and, preparation of specifications for BTG Board addition and electronic transmitters for off-gas modifications at Carolina Power & Light Company's Brunswick Nuclear Power Plant.

While employed at Chas T. Main, Inc., Mr. Foley was an Instrumentation and Controls Engineer responsible for the preparation of specifications of BTG Board, annunciator system, multipoint recorders, instrument data sheets for field purchased items at the C.D. McIntosh Jr. Coal-Fired Plant for the City of Lakeland, Florida. He was also responsible for factory checkout of coal handling, steam and water analysis, refuse handling, flue gas desulphurization, fly ash, bottom ash and BTG Board.

Earlier in his career with United Engineers and Constructors, Mr. Foley was responsible for the specifications and design of BTG Boards, steam and water analysis system, and liquid waste control board at the Hoosier Energy Division's Merom Station Units 1 and 2. He also developed loops and logic diagrams and data sheets for the liquid waste system and was responsible for instrumentation and controls for bottom and fly ash, water



ROBERT F. FOLEY
(continued)

treatment and refuse waste treatment systems. On the Grand River Dam Authority's coal-fired Oklahoma Unit No. 1 project, he was responsible for specifications and design of the BTG Board and steam and water analysis systems.

Previously, Mr. Foley was employed by the Stone and Webster Engineering Corporation where he was responsible for the instrument schedule, checking of instrumentation drawings, vendor drawings, and coordination between control engineering and design squads for Boston Edison's oil-fired Mystic Station Unit #7 project. He also assisted in the preparation of loop and logic diagrams and instrumentation of flow diagrams for Virginia Electric and Power Company's North Anna Nuclear project and for the Mount Storm Station coal-fired Unit 3 project, he assisted in the preparation of control loop diagrams and control system descriptions for plant HVAC systems.

With Jackson and Moreland, Mr. Foley was involved in the design of instrumentation piping and instrument racks for various steam power plant projects including General Electric's Appliance Pab- East, University of Massachusetts, MCI Bridgewater, J. H. Williams Company. He also developed flow diagrams for service water, cooling water, fly ash and bottom ash systems for Georgia Power Company's Yates Unit #6.

JAMES F. KELLY, JR.

EDUCATION:

B.S., Mechanical Engineering Technology, Southern Massachusetts University

PROFESSIONAL REGISTRATION:

Engineer-In-Training, State of Massachusetts

PROFESSIONAL AFFILIATIONS:

Member, Instrument Society of America

PROFESSIONAL EXPERIENCE:

Mr. Kelly has over four years of experience in the engineering and design of instrumentation and control systems for nuclear and fossil power plants.

Recent assignments have included responsible Controls Engineer for the I&C design change packages required for Appendix R modifications at Virginia Electric and Power Company's (Vepco) North Anna 1 and 2 and Surry 1 and 2 plants. As Controls Engineer for this project, he was responsible for all aspects of engineering design, procurement, and field construction support. Mr. Kelly also performed a study of the feedwater heater level controls and control valves for Boston Edison's Pilgrim Station.

Prior to joining Cygna, Mr. Kelly was employed by Stone and Webster as a controls engineer on the Somerset Station Coal Conversion Project for Montaup Electric Company. In this position he was responsible for the engineering procurement, and system start-up assistance for seven systems including the Fire Detection and Actuation System for the coal handling system; the Bottom Ash Handling System; additions to the Instrument Air System; Soot Blower Controls; Boiler and Burner Controls; and, Wastewater Treatment Controls.

While assigned to Vepco's Surry and North Anna projects, he was responsible for the preparation of design change packages used to install containment hydrogen analyzers. He was also responsible engineer for the redundant station air compressor design change packages, and the design change package which identified and obtained process analog control signals required for the Technical support center multiplexer system at Surry and North Anna.

In previous assignments, he provided controls support for the replacement of the boiler circulating pumps and associated support systems for Vepco's Chesterfield Power Stations Unit 5, controls for the addition of a new turbine-driven feed pump for the Maine Yankee Atomic Power Station, and an estimate for the controls equipment for the waste water treatment complex for the Clinch River Breeder Reactor Project.



JAMES F. KELLY, JR.
(continued)

Prior to joining Stone and Webster, Mr. Kelly was employed by Robies Refrigeration, Inc. where he was responsible for the design, installation, and start-up of commercial and residential HVAC and refrigeration systems.

He also served as a Machinists Mate in the U.S. Navy assigned to the Engineering Departments aboard the USS Puget Sound (AD-38) and USS Semmes (DDG-18).



ADALBERT MAYER

EDUCATION:

M.S., Mechanical Engineering, Northeastern University

B.S., Physics, Lynchburg College

A.A.S., Aeronautical Technology, Academy of Aeronautics

Mechanical Engineering, Rochester Institute of Technology

Engineering Management, Northeastern University

PROFESSIONAL REGISTRATION:

Registered Professional Engineer in the states of Delaware, Kansas, Massachusetts, New Hampshire, New York, and Virginia

PROFESSIONAL AFFILIATIONS:

Member, American Society of Mechanical Engineers

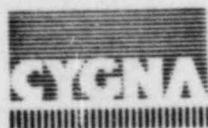
Senior Member, Association of Energy Engineers

PROFESSIONAL EXPERIENCE:

Mr. Mayer is a Mechanical Engineer with over 18 years of diversified power engineering experience ranging from analytical to detailed engineering and design of fossil and nuclear facilities.

Currently, Mr. Mayer is a Supervising Engineer at Cygna. His scope of responsibility includes mechanical engineering of fossil and nuclear projects. Recently, he was assigned as the Resident Mechanical Engineer at the Pilgrim Nuclear Power Station Site Engineering Office. There he was responsible for all the mechanical engineering associated with the station's outage and restart. He interfaced with construction supervision to resolve problems related to equipment, piping replacement and valve betterment.

Prior to joining Cygna, Mr. Mayer was employed by United Engineers and Constructors, Inc. On this last assignment, he was a Senior Site Mechanical/Nuclear Engineer at the Seabrook Station Site responsible for interfacing with the Owner's Start-Up and Test Group to trouble shoot problems related to start-up, test, operation, and maintenance of balance-of-plant and nuclear systems. He supervised an engineering and design staff that implemented field changes and coordinated the changes with other affected disciplines. In addition, Mr. Mayer checked, verified, and approved engineering change authorizations prepared by others. He also provided engineering/design support to ongoing construction.



ADALBERT MAYER
(continued)

Prior to this, Mr. Mayer was the Supervising Mechanical Engineer in charge of all mechanical engineering and design of the Holcomb Station Unit No. 1 Project, a 280-MW coal-fired generating facility in Holcomb, Kansas. His responsibilities included scheduling, preparing budgets and manpower forecasts, and functioning as construction and start-up liaison.

Also, while at United Engineers & Constructors as a Lead Nuclear Engineer, Mr. Mayer supervised the nuclear systems engineering and design of the Somerset Nuclear Station Project, a dual unit 2400-MW boiling water reactor (BWR-6) type generating station. He also functioned as the STRIDE Liaison Engineer to interface the nuclear island with the balance of plant.

As a Project Support Engineer with the Stone & Webster Engineering Corporation, Mr. Mayer was assigned to the North Anna Nuclear Station Project (PWR) where he was responsible for preparing fluid system flow diagrams with associated flow calculations, equipment and pipe sizing, and instrument requirements. He also prepared equipment specifications and technical bid evaluations, and reviewed manufacturer design documents. In addition, Mr. Mayer was the NSSS Responsible Engineer and Cognizant Engineer of the Containment Building, the Fuel Building, and the Safeguards Area.

As a Thermal/Hydraulics Engineer with the Babcock & Wilcox Company, Mr. Mayer was responsible for steady state and transient thermal-hydraulic analyses and design of steam supply and auxiliary systems.

PUBLICATIONS:

ASME Paper No. 68WA/NE-6 (1968), "A Computer Code for Performing Parametric Studies on Liquid Metal Fast Breeder Reactors".



A. PATRICK McCARTHY

EDUCATION:

B.S., Marine Engineering, Maine Maritime Academy

PROFESSIONAL REGISTRATION:

Third Assistant Engineer, Issued by U.S. Coast Guard

PROFESSIONAL AFFILIATIONS:

Senior Member, Instrument Society of America

Member, ISA SP67.10 Committee, Sample Line Piping and Tubing Standards for Use in Nuclear Power Plants

PROFESSIONAL EXPERIENCE:

Mr. McCarthy has over 17 years experience in engineering, design, licensing, and operation of nuclear and fossil-fueled power plants. Mr. McCarthy is the Manager of the Instrumentation and Controls Division and Project Manager for various projects.

He is presently directing Cygna's work at the Shoreham Nuclear Plant, which includes General Engineering Support to Long Island Lighting Company's Nuclear Engineering Department, Nuclear Operation Services Department, Plant Staff, and Operation Services Department, Plant Staff, and Project Engineering Office. Some of the major tasks performed under his direction include:

- o Development of Program Descriptions for the Maintenance, Fire Protection, and Instrument and Controls Departments
- o NUREG-0612 Heavy Load Handling Study and Procedure Development
- o Conceptual Design of Reactor Vessel Strong Back
- o Maintenance Procedure Development
- o Refueling Procedure Development
- o ANSI N18.7 Station Procedure Review
- o Diesel Generator Design Review Procedure Development
- o Development of Safeguards Information Program



A. PATRICK McCARTHY
(continued)

- o Engineering Support for LILCO Rate Case Testimony
- o Licensee Event Report Evaluations
- o Technical Review of the I&C Surveillance Test Procedures
- o Station Modification Procedures Development
- o Integrated Assessment of Interim Modification Program and Implementing Procedures
- o Engineering Support to the I&C Construction Department

Mr. McCarthy was previously assigned as Project Manager of an Appendix R Fire Hazards Evaluation for a Radwaste Incineration System. In addition, as Project Manager for an equipment qualification project, he was responsible for the seismic qualification of a series of vacuum pumps to be used in the processing of uranium fuel.

Before joining Cygna, Mr. McCarthy was employed by Stone & Webster Engineering Corporation for seven years, and held positions of increasing responsibility within their Controls System Division. His last assignment at Stone & Webster was as the Lead Control Engineer on the Millstone 3 Project, an 1150 MWe PWR currently under construction for Northeast Utilities. As a Lead Control Engineer, Mr. McCarthy was responsible for all aspects of engineering, design, procurement, licensing, and field construction support activities relating to instrumentation and controls for the project.

During his employment with Stone & Webster, Mr. McCarthy also held the positions of both Principal and Support Instrumentation Applications Engineer on the Shoreham Nuclear Project, an 820 MWe BWR currently under construction for the Long Island Lighting Company. As Principal, he was responsible for the supervision of the Instrument Applications Group whose duties include the application, procurement, design coordination, and client/vendor liaison in all areas of instrument application on the project. Specific tasks carried out included the installation of instruments and tubing, removal of mechanical trip system and installation of Automatic Transmitter Trip System, and implementation of environmental qualification and RG 1.97 post-accident monitoring requirements.

In addition to his project duties, Mr. McCarthy held the position of Controls Systems Division Specialist for Safety and Relief Valves, Control Valves, and Instrument Installation.



A. PATRICK McCARTHY
(continued)

Before joining Stone & Webster, Mr. McCarthy's was employed by the Crosby Valve and Gage Company for five years. He was initially hired as a Field Engineer assigned to special projects. As Project Engineer he was responsible for safety and relief valve design, fabrication, testing and installation, including the assurance of compliance to the ASME Boiler and Pressure Vessel Code, Section III.

Prior to joining Crosby Valve and Gage Company, Mr. McCarthy sailed for Grace Lines as a Third and Second Assistant Engineer.



JAMES MOSCARDELLI

EDUCATION:

A.S., Electrical Engineering Technology, Franklin Institute

PROFESSIONAL EXPERIENCE:

Mr. Moscardelli has over eight years engineering and construction experience with an emphasis on nuclear power projects. He is currently an Electrical Engineer at Cygna, responsible for the development of installation and operational procedures and preparation of electrical specifications. He is presently assigned to the Appendix R modification and Excore Neutron Flux Monitoring System project being performed for Vepco.

Previously, he was assigned to the Shoreham Nuclear Power Station where he performed technical reviews of I&C surveillance test procedures required to incorporate the Automatic Transmitter Trip System. Mr. Moscardelli also assisted in the development of Appendix R modifications for Nine Mile Point Unit 1, including a low-low-set fix to the pressure relief system. He participated in the development of system diagnostic instructions and cold-shutdown repair procedures.

Before joining Cygna, Mr. Moscardelli was employed by Stone & Webster Engineering Corporation in their Electrical Division. As a Staff Electrical Engineer, he was assigned to several projects for Virginia Electric Power Company including North Anna Units 1 and 2 and Surry Units 1 and 2. His duties included the development of electrical design change packages. These packages covered all requirements for installation of TMI-mandated modifications as well as the preparation of operationals and test procedures. While working on the North Anna plants, Mr. Moscardelli assisted in the development of electrical specifications and the review of electrical equipment environmental qualification per NUREG 0588.

Mr. Moscardelli gained field construction experience while employed by Vappi Construction Company. In this capacity he was assigned as a Field Engineer responsible for the layout and installation of cable and raceways for various buildings.



RONALD P. POLLARA

EDUCATION:

Graduate Studies in Electrical Engineering, Northeastern University

B.S., Electrical Engineering, Northeastern University

Bachelor of Engineering Technology, Electrical Engineering, Northeastern University

A.S., Electrical Engineering, Wentworth Institute

PROFESSIONAL AFFILIATIONS:

Institute of Electrical and Electronics Engineers

Power Engineering Society

PROFESSIONAL EXPERIENCE:

Mr. Pollara is the Electrical Division Manager in the Systems Engineering Department. In this capacity, he is responsible for technical policy, engineering procedure, schedule, budget, and client interface on all projects under his direction. He has over 12 years of experience in electrical engineering and design. He has been engaged in the design of both nuclear powered and fossil-fueled plants in the United States and the Middle East, including a two-year assignment at a nuclear power plant construction site.

Prior to becoming Division Manager, Mr. Pollara served as Electrical Project Engineer on several jobs involving the design of modifications for NRC fire protection regulations. In general, these projects included electrical system design, cost studies, preparation of specifications, bid electrical contractor. The clients are Boston Edison (Pilgrim Station), VEPCO (Surry 1 and 2 and North Anna Units 1 and 2), Northeast Utilities (Connecticut Yankee, Millstone Units 1 and 2) and New York Power Authority (Fitzpatrick). In particular, the Pilgrim modifications required the external rerouting of the diesel generator power and control circuits in an underground ductbank that extended halfway around the perimeter of the facility.

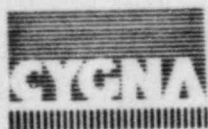
His earlier experience includes Lead Electrical Engineer for the Riyadh No. 7 (800 MW) Power Station in Saudi Arabia and the two generating units for the Jordan Electricity Authority.

Mr. Pollara has been involved in all phases of engineering and design of electric generating stations, gas turbines and SF₆ switchyards. His responsibilities have included the preparation and review of equipment specifications; calculations; relay coordination; schematic and wiring diagrams; equipment, ductline, conduit and tray layouts; sizing and scheduling of cables, equipment and raceways; preparation of instrumentation and logic diagrams; and, approval of vendor drawings and supervision and direction of project engineering and design forces.



RONALD P. POLLARA
(continued)

Earlier in his career, Mr. Pollara was a Senior Electrical Designer with Stone and Webster Engineering Corporation where he held electrical design positions on nuclear projects for Duquesne Light Company, Long Island Lighting Company, Virginia Electric & Power Company, and Boston Edison.



PHILIP W. STRAUSS

EDUCATION:

B.S., Mechanical Engineering, Kansas State University

PROFESSIONAL EXPERIENCE:

Mr. Strauss has over 13 years experience in engineering and design of both nuclear and fossil power plants. His experience includes all aspects of power plant engineering from conceptual design to commercial operation. He is the Manager of the Mechanical Division and Project Manager for various projects. In this capacity, he is directly responsible for technical direction, manpower planning, project execution, for all projects under his direction.

Projects have included pipe support and stress analysis in the power and pulp and paper industry diesel plant life cycle analysis, public safety and health assessment of an existing fuel oil storage facility, feedwater heater replacement study and an evaluation of a large steam district heating system.

Prior to joining Cygna, Mr. Strauss was employed by United Engineers and Constructors, Inc. as a Supervising Mechanical Engineer responsible for boiler house design and heat balance studies including all systems and specifications for Holcomb Station Unit 1. He was responsible for the preparation of specifications for the steam generator, induced draft fans, main condensor, feedwater heaters, baghouse and air compressors. He also supervised the preparation of the fly ash, bottom ash, auxiliary boiler, and pipe support specifications.

While employed by Stone & Webster Engineering Corporation, Mr. Strauss worked on various power plant projects. As Principal Mechanical Engineer, he supervised turbine and facilities engineers. His duties included scheduling, manpower loading, and engineering estimates. He was responsible for preparing major equipment specifications for components such as the main turbine generator, feedwater heaters, feed pumps, booster pumps, and condensate pumps. He was also responsible for trouble shooting faulty equipment to evaluate contractual commitments, and maintaining code compliance.

In his initial assignment for Stone & Webster, Mr. Strauss worked on Boston Edison's Mystic Station Unit 7. In this position, he was responsible for plant piping design including piping and pipe supports, valves, material selection, stress calculations, and pressure drop calculations.



JAMES A. VOELXEN

EDUCATION:

M.S., Mechanical Engineering, Northeastern University, Boston, Massachusetts

B.S., Physics, University of Virginia, Charlottesville, Virginia

PROFESSIONAL EXPERIENCE:

Mr. Voelxen has over 14 years of experience in power plant engineering, design, licensing, and operations. He is currently the Manager of the Systems Engineering Division in the Boston office of Cygna, responsible for all engineering activities associated with the electrical, mechanical, nuclear, and instrumentation and control disciplines. As the Project Manager for the TMI modifications at Pilgrim I, he is also responsible for the direction and coordination of project engineering and design services within the assigned scope of work. These include the design and installation of a Post-Accident Sampling System and H₂/O₂ Analyzer for the plant.

Prior to joining Cygna, Mr. Voelxen was employed by Stone & Webster Engineering Corporation, where he held the position of Principal Nuclear Engineer on projects such as Beaver Valley Unit 2, the James A. Fitzpatrick Nuclear Power Station, and the Stone & Webster Reference PWR. In this capacity, he was responsible for the engineering, design, procurement, licensing and construction support of all nuclear related systems for these projects.

During his employment with Stone & Webster, Mr. Voelxen also held the position of Principal Piping Engineer on the Beaver Valley Power Station Unit 2 Project. In this position, he was responsible for the engineering, design, and procurement of shop and field fabricated piping, manual and motor operated valves, and pipe supports and constraints.

Prior to joining Stone & Webster, Mr. Voelxen was employed by the Knolls Atomic Power Laboratory operated by the General Electric Company. His assignments were directly related to the supervision of operational, training, and support activities of the S3G Naval Nuclear Prototype Propulsion Plant located at the Kesselring Site in New York. During this period, Mr. Voelxen qualified as a Nuclear Plant Operator, was a Shift Supervisor of an operating shift, and became the Outage Coordinator for the S3G Prototype.



BARTON A. WALDO, JR.

EDUCATION:

B.S., Radiation Health Physics, Lowell University

U.S. Navy Nuclear Power School, Prototype and Engineering Laboratory School

PROFESSIONAL AFFILIATIONS:

American Society of Mechanical Engineers

American Nuclear Society

PROFESSIONAL EXPERIENCE:

Mr. Waldo has 15 years of power plant engineering, design maintenance and operations experience. He is currently a supervisory engineer at Cygna where he is involved in a broad range of plant engineering and design functions. He is presently serving on Long Island Lighting Company's Independent Safety Evaluation Group for the Shoreham Nuclear Power Station as the staff support group member.

Mr. Waldo is currently the Project Engineer for the TMI Project for Boston Edison's Pilgrim Station. He is responsible for overseeing the engineering and design, to support the installation of a Post Accident Sampling System, Containment Atmosphere Monitoring System, and Reactor Leak Detection System.

The tasks associated with this effort run the full gamut of mid-sized backfit project, i.e., piping and equipment layout and design, equipment specification, system design and installation packages, preparation of pre-operational test, operating and emergency operating procedures.

During the period Mr. Waldo was overseeing the TMI project, he also acted as the lead mechanical engineer at Boston Edison Company's Pilgrim Station Site Engineering Office (SEO) during their recent refueling outage (RFO No. 6). In this position, he was responsible for all of the mechanical engineering performed at the SEO. The work included disposition of "non-conformances"; preparation of Design and Installation Package revisions required to facilitate installation of the packages; preparation of a Design Package to install an air conditioning system for the stations telephone room computer system; preparation of a Design Package to install an environmental conditioning system to ensure post LOCA habitability of the Technical Support Center; and, review of the effect on the materials of the reactor water clean-up system of a chemical decontamination of the system.



Earlier, Mr. Waldo was Project Engineer for Cygna's Engineering Training Program designed for the Power Authority of the State of New York. As part of the Systems Engineering Division of Cygna, he has also conducted studies on the design of High Integrity Containers for the storage of radioactive wastes for Shoreham Nuclear Station and the design of a generic Interim Radioactive Waste Storage Building.

Prior to joining Cygna, Mr. Waldo held several positions of increasing responsibility with Stone & Webster Engineering Corporation. His last assignment was that of Lead Operation Services Engineer for the Shoreham Nuclear Power Station, responsible for the engineering, and design, for the Post Accident Sampling System.

Mr. Waldo also gained extensive Balance of Plant experience while at Stone & Webster. His work included the retrofit installation of a 15,000 hp, 28,000 gpm @ 2,100 ft. turbine driven feed pump. As Lead Operation Services Engineer, his responsibilities included reviewing the effect of the installation of pump and turbine on the start-up, normal operation, and emergency response of the condensate and feed systems. He was also responsible for the collection and review of system design and station operating parameters, optimization of system tie-in points, and development of specifications for all major pieces of equipment.

In addition to his work with feed pump retrofit, Mr. Waldo was the principal engineer on the Beaver Valley I Steam Generator Blowdown System betterment program which increased the blowdown rate from each steam generator from 60 to 200 gpm. As part of the system upgrade, a blowdown water recovery system was designed which included a flash tank, regenerative heat exchanger, and full-flow filter/demineralizer system. His responsibilities included the engineering, design, and specification of the blowdown filter/demineralizer system.

Mr. Waldo was also the Lead Operation Services Engineer of the Condensate System Betterment Program at Millstone 2. The condensate system was modified to include a full-flow condensate polishing system in addition to a condensate system cold cleanup loop and a neutralization sump overboard discharge filtration facility. His responsibilities included the engineering design and specification of the condensate regenerative waste overboard filtration system.

Other assignments for Stone & Webster included duties as Principal Engineer for the proposed decommissioning of the Shippingport Atomic Power Station.

Prior to joining Stone & Webster, Mr. Waldo served six years in the U.S. Navy nuclear submarine force as a Lead Engineering Laboratory Technician and Engine Room Supervisor.



PHILIP V. ZIMINSKY, JR.

EDUCATION:

B.S., Marine Engineering, Massachusetts Maritime Academy

Graduate Work, Mechanical Engineering, Northeastern University

PROFESSIONAL LICENSES/REGISTRATION:

United States Coast Guard, Third Assistant Engineer's License Steam and Diesel
Unlimited Horsepower

PROFESSIONAL EXPERIENCE:

Mr. Ziminsky has over six years of experience in the design, construction, and testing of fossil and nuclear power plants. He is presently a Lead Mechanical Engineer with Cygna, assigned to Boston Edison's Pilgrim I Project where he is involved in various mechanical tasks including feedwater heater vent and drain system design, diesel generator system review and repair, and system description preparation.

Mr. Ziminsky has recently completed an assignment to the Appendix "R" - Fire Protection Review project for Northeast Utilities Service Company. As a Mechanical Engineer, he was responsible for systems review on Millstone 1 and 2 Units.

Before joining Cygna, Mr. Ziminsky was a Mechanical Engineer with the Stone and Webster Engineering Corporation's Power Division. On the Shoreham Nuclear Power Station project, he was responsible for the design review of and report preparation for various mechanical components in the Transamerica Delaval Diesels. He also witnessed and participated in the start-up testing and operation of the Colt-Pielstick Diesels at the manufacturer's factory. Other responsibilities included coordination of the engineering and design for the turbine generator, reactor feed pumps, and reactor feed pump turbines and their associated systems.

While assigned to the Malakoff Electric Generating Station Project, he was responsible for the engineering, design, preparation of specifications, and procurement of the turbine generator, boiler feed pumps, ID fans, boiler feed pump turbines, miscellaneous pumps, and other equipment. He was also responsible for the engineering and design of various fluid systems including feedwater, steam seal, extraction steam, turbine water induction protection, and turbine lube oil.



PHILIP V. ZIMINSKY, JR.
(continued)

Other projects for Stone and Webster included work on Florida Power Corporation's Higgins Coal Gasification Project where he was responsible for the gas turbines, material handling equipment and their associated systems; Boston Edison Company's Mystic and New Boston Station's Coal-Oil Mixture (COM) Conversion Study where he was responsible for the design, engineering, economic evaluation, and final report preparation on the feasibility of the plants to burn COM; and, the Department of Energy Rivesville Fluidized Bed Project where he was responsible for the design, start-up, and trouble shooting of the bottom ash system. He was also involved in various synthetic fuel and coal conversion studies.

Prior to joining Stone and Webster, Mr. Ziminsky was employed by Farrell Lines Shipping Company as a Third Assistant Marine Engineer. His responsibilities included the proper operation and maintenance of a ship's boilers, steam turbines, diesels, heat exchangers, and refrigeration equipment. He supervised from two to eight men in the proper operation and maintenance of the ship's power plant.

WAYNE E. SCHWEIDENBACK

EDUCATION:

B.S., Electrical Engineering, Worcester Polytechnic Institute
Graduate Work, Electrical Engineering, Northeastern University

PROFESSIONAL REGISTRATION:

Engineer-In-Training, Massachusetts

PROFESSIONAL AFFILIATIONS:

Member, Institute of Electrical and Electronic Engineers

PROFESSIONAL EXPERIENCE:

Mr. Schweidenback has over eight years of experience in electrical engineering and design. He is presently an Electrical Engineer with Cygna, responsible for the preparation of electrical specifications, as well as identifying and revising documents such as wiring diagrams, one-line diagrams, elementaries, and computerized cable schedules.

Before joining Cygna, Mr. Schweidenback was an Electrical Engineer in the Thermal Power division of Charles T. Main, Inc. In this position, he was involved in the electrical system design of a 60 MW cogeneration facility for a major refinery. The facility consisted of two waste heat boilers providing electricity and steam for refinery use.

Previously, Mr. Schweidenback was employed at Stone & Webster Engineering Corporation, where he was assigned to the Millstone 3 Nuclear Power Plant. He was the Electrical Control Engineer responsible for the preparation of elementary wiring diagrams, protective relaying, and switchgear application design. His responsibilities included the design of turbine generator systems, diesel generator, safeguards systems, protective relay panels, and main control boards.

Other projects for Stone & Webster included work on the River Bend I Station where he was responsible for the design of HVAC and electrical distribution panels. He also worked on-site at the Presque Isle Station coal-fired installations, where his duties included supervision of control circuit checkout and operational tests.



EDWARD F. MULRENAN

SPECIALTIES:

- o Electrical Engineering
- o Field supervisor
- o Vendor Coordination

PROFESSIONAL EXPERIENCE:

Mr. Mulrenan is a lead electrical designer with over 27 years of experience in the design of electrical systems for power generating facilities. At Cygna, he is involved in the design of electrical plant modifications required to comply with Appendix R at Boston Edison Company's Pilgrim Station and Virginia Electric and Power Company's Surry Power Station.

Before joining Cygna, Mr. Mulrenan was a senior electrical designer with the Thermal Power Division of Chas. T. Main, Inc. where he was responsible for the design of electrical systems including review and approval of vendor drawings, supervision and direction of the design force, inspection of vendor supplied equipment, and coordination of work with other disciplines. Projects he was involved with include:

- o Four 750 MW lignite-fired units for Texas Utilities
- o 369 MW coal and refuse units at Lakeland, Florida
- o Upgrade of four 25 MW oil-fired units to 55 MW in Baghdad, Iraq

He was also responsible for field supervision at the Lakeland and Baghdad sites as well as Niagara and St. Lawrence Power Project for the New York Power Authority.

Within the Pulp Division of Chas. T. Main, Inc., Mr. Mulrenan was a senior designer responsible for the checking of electrical raceway and wiring drawings issued for production and the design and development of electrical raceways. The design included sizing and scheduling of cables, layout and design of relay panels, review and approval of vendor drawings, as well as field supervision and start-up assistance for a new groundwood mill and several paper machines. He was also involved in the electrical design and development of modifications on several water treatment plants. On the Niagara and St. Lawrence Power Project, Mr. Mulrenan was involved in the layout and preparation of working and finishing drawings, including one-line diagrams and conduit and lighting layout drawings.



EDWARD F. MULRENAN
(continued)

Earlier in his career, Mr. Mulrenan was an electrical design draftsman with Badger Manufacturing Company where he was responsible for the layout and preparation of working and finished drawings for petrochemical plants. He also assisted in the layout of interconnection drawings from schematics.



JEFFREY E. GRUNDMAN

EDUCATION:

B.S., Mechanical Engineering, University of Vermont, Burlington, Vermont

PROFESSIONAL REGISTRATION:

Professional Engineer, State of Illinois

PROFESSIONAL AFFILIATIONS:

Member, Tau Beta Pi, Engineering Honor Society

PROFESSIONAL EXPERIENCE:

Mr. Grundman has over six years of experience in the power industry. He is currently a Lead Engineer with design responsibilities involving mechanical systems and components on plant retrofit projects. His assignments at Cygna have been primarily with Commonwealth Edison operating nuclear plants.

Prior to joining Cygna, Mr. Grundman was a mechanical engineer in the Project Management Division of Sargent & Lundy. His experience includes a two-year construction site assignment as senior S&L representative for piping and piping supports at the Zimmer Nuclear Station. This position required extensive utility and construction contractor contact with overall procedural and technical supervision of 70 engineers and designers.

Mr. Grundman also was assigned to the Marble Hill and later the Byron/Braidwood Project Teams. For these projects, his duties included system functional reviews and formal and as-built piping analysis related activities. He had responsibility for the coordination of efforts between S&L Support Divisions, for the development and maintenance of project instructions and procedures, and for the design related interface with pipe support and miscellaneous equipment vendors.

