PDR

Arizona Public Service

PALO VERDE NUCLEAR GENERATING STATION
P O BOX 52034 PHOENIX ARIZONA 85072-2034

102-03589-WLS/AKK/DLK
January 19, 1996

WILLIAM L STEWART
EXECUTIVE VICE PRESIDENT
NUCLEAR

Mr. L. J. Callan
Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Dear Mr. Callan:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Supplemental Information on Proposed Self-Assessment

On December 12, 1995, Arizona Public Service (APS) submitted a proposal to conduct a self-assessment modeled after NRC IP 37550, "Engineering" and NRC IP 40500, "Effectiveness of Licensee Control in Identifying, Resolving, and Preventing Problems," as an alternative to the full scope NRC inspection scheduled for April 1996. In a telephone conversation between Mr. B. A. Grabo and your staff, Mr. C. Vandenburgh requested that additional details of the proposed self-assessment, including the approach to be used and specific system selection, be forwarded to Region IV on docketed correspondence. Enclosure 1 to this letter contains the supplemental information requested. Also included in this letter is Enclosure 2 which contains the resumes of the two consultants that will be members of the self-assessment team along with the resumes of recently added team members.

If you have any questions, please contact Burton A. Grabo, Section Leader, Nuclear Regulatory Affairs, at (602) 393-6492.

Sincerely,

WLS/AKK/DLK/pv

Enclosures

cc: Document Control Center
K. E. Perkins
K. E. Johnston
T. P. Gwynn
C. Vandenburgh

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ENCLOSURE 1

APPROACH AND SAMPLE SELECTION

PVNGS ENGINEERING TEAM SELF-ASSESSMENT
Approach and Sample Selection

The predominant feature of the Engineering Team Self-Assessment is the use of a vertical slice technique. The term "vertical slice" refers to the in-depth review of the selected safety systems in multiple functional areas. These areas include operations, maintenance, surveillance and testing, engineering design, design control, and quality assurance and self-assessment. The assessment will focus on engineering issues relative to the six functional areas. When a weakness in a functional area is identified, the assessment will be expanded to determine if a programmatic weakness exists. For example, if in one of the selected safety systems a weakness in motor operated valve torque switch settings is identified, then a preliminary review of programmatic controls for torque switches will be performed.

The Self-Assessment Team will determine if the selected systems are capable of performing the safety functions required by the design basis and licensing requirements and commitments and the testing is adequate to demonstrate that the system would perform all of the safety functions required. This includes verifying that system maintenance and material condition are adequate to ensure system performance under postulated accident conditions with an emphasis on the functionality of the selected safety systems. The assessment will evaluate engineering effectiveness relative to system and hardware operation and maintenance as opposed to a review of programmatic requirements.

GENERAL APPROACH

The team will use a combination of interviews, vertical slice techniques, and document reviews during the self-assessment. This approach will provide the objective evidence necessary to determine the overall effecti eness of the engineering organization and corrective action p.ogram. Detailed checklists will be used as guidance during the self-assessment and will provide documentation of the objective evidence collected.

The assessment team will meet daily to share results and compare findings. Through the synergism of the team meetings, observations in one functional area may lead to the discovery of problems in other functional areas.

Interviews

Interviews will be used to obtain information related to the effectiveness of internal and external engineering interfaces, engineering personnel's understanding of their various roles and responsibilities, and engineering responsiveness as an organization to plant operations. Standardized questions will be developed and used during the interviews in order to assure continuity between interviewees and to facilitate analyzing the information obtained. The interviews will also provide a means to identify strengths, weaknesses, and areas that require additional attention during the self-assessment.

Vertical Slice Methodology

Vertical slice investigation techniques will be used extensively during the self-assessment. This will enable the team to use an integrated approach to assess the overall results of engineering activities as they relate to maintaining the design basis and improving performance of the selected systems.

For example, the team will assess multiple engineering activities associated with the selected systems including:

- Modifications (temporary and permanent)
- Industry information evaluations
- Evaluation of Component failure data
- Response to corrective action documents
- Input to system testing requirements
- Operability and reportability determinations

The team will determine if there are any program-related root causes for identified performance deficiencies and analyze the implications of these deficiencies for potential adverse affects on other safety significant systems.

Document Reviews

The team will review documentation to assess areas of interest that may not be observable using other investigation techniques or may not be applicable to the selected systems such as:

- Management of engineering backlogs
- Definition of engineering organization responsibilities
- Adequacy of engineering procedures
- Effectiveness of onsite and offsite plant review committees
- Effectiveness of the Independent Safety Engineering (ISE) function

This will involve a review of procedures, committee meeting minutes, ISE reports, and other documents necessary to assess these areas. The purpose of reviewing documentation is to provide additional insight and supplement the information obtained using the vertical slice investigation techniques.

SPECIFIC APPROACH

The team will use the following performance objectives to assess overall engineering effectiveness. These objectives will be applied to the selected systems using the vertical slice approach to the extent possible.

Plant Modifications

- Verify the technical adequacy of the quality classification and procurement specifications for components and parts including the determination of critical characteristics for commercial grade item dedication.
- Verify that plant modifications were reviewed and approved by the required plant review committees.
- Evaluate the impact notification process and verify completion of the associated revisions to plant operating procedures, operator and other training programs, preventive maintenance tasks, inservice inspection and testing procedures, and plant configuration drawings.
- Assess the technical adequacy of 10 CFR 50.59 screenings and evaluations, including the identification of required FSAR revisions.
- Verify that appropriate post-modification testing requirements and acceptance criteria are specified.
- Verify that adequate 10CFR 50.59 and operational impact reviews were performed on partially completed modifications.
- Verify that design calculations and output documents:
  - were independently reviewed
  - referenced design basis information and were correctly used
  - clearly documented reasonable assumptions
  - satisfied regulatory requirements, PVNGS commitments, and industry practices
  - identified and tracked open items to resolution, and
  - considered design requirements for equipment qualification, electrical separation criteria, and seismic criteria.
- Assure field changes were documented and reviewed in a timely manner.
- Verify that the as-built drawings match the plant configuration.
- Verify that temporary modifications received the necessary design and safety reviews, were correctly installed and tested, and were adequately evaluated for effects on plant operations
- Verify that unauthorized modifications are not performed as maintenance activities without proper review.

Engineering Issue Resolution

- Verify that engineering used the Probabilistic Risk Assessment (PRA) in decision making where appropriate.
- Verify that material nonconformances were addressed in a timely manner and reviewed for operability and functionality.
- Verify that industry, vendor, and regulatory notifications (e.g., 10 CFR Part 21 notifications, Generic Letters, etc.) were reviewed in a technically correct and timely manner.

- Verify that engineering analysis of plant performance and equipment failure data results in appropriate corrective measures and plant equipment reliability improvements.
- Verify that engineering input for operability and reportability determinations provides a sound technical resolution with a clearly documented basis.

Corrective Action Effectiveness

- Verify that the resolution of significant deficiencies identifies the extent of the condition, identifies root cause, and prevents recurrence of the condition.
- Verify that the problems classified as adverse are properly trended and adequately corrected.

The team will use the information collected during document reviews and interviews, in conjunction with the specific objectives noted above, to reach an overall conclusion regarding engineering and ISE effectiveness.

Specific guidance for Audit Objective 3, "Identifying, Resolving, and Preventing Problems," is included in the original Proposed Self-Assessment submittal (Letter No. 102-03566-WLS/AKK/DLK, dated December 12, 1995). Those objectives will address the following areas using vertical slice techniques on the selected systems where possible:

- PVNGS' resolution of problems
- Corrective Action Program Effectiveness
- Operating Experience Feedback
- Self-Assessment Activities
- Onsite and Offsite Safety Review Committee Activities

SYSTEM SELECTION

Based on the PVNGS Individual Plant Examination (IPE), the following plant systems will be used for the Engineering Team Self-Assessment.

Emergency Diesel Generator (EDG)

The PVNGS PRA results indicate that the Loss Of Offsite Power (LOOP) event, including those that evolve into Station Blackout (SBO), is the largest single internal event contributor (39%) to Core Damage Frequency (CDF). The relative contribution is 18% for a LOOP event and 21% for SBO. Availability of the EDGs and associated circuitry during LOOP events reduces the CDF contributions associated with SBO.

Auxiliary Feedwater (AF)

Loss of steam generator cooling is the dominant safety function contributor to CDF (85%) resulting from various initiating events, such as reactor trips. PVNGS does not have Power Operated Relief Valves on the pressurizer and therefore, is unable to perform feed and bleed cooling. Loss of steam generator feed capability proceeds directly to core damage.

Three of the five methods of feeding the steam generators after the plant trips rely on AF systems. This includes two Q class AF trains (one motor-driven, one steam-driven) and a non-seismic class AF train.

The primary objective of the Engineering Team Self-Assessment is to assess the operational performance capability of these selected safety systems through an in-depth, multi-disciplinary engineering review to verify that the selected systems are capable of performing their intended safety functions. Generic safety significant findings will be pursued across the system boundaries on a plant-wide basis.

ENCLOSURE 2

TEAM MEMBER QUALIFICATIONS

KEVIN J. IEPSON

EDUCATION & TRAINING

- Master of Mechanical Engineering (MME), Villanova University, 1988
- Shift Technical Advisor (STA) Training Program, General Physics Corporation for Philadelphia Electric Co., Peach Bottom Atomic Power Station, 9/80 - 2/81
- Bachelor of Mechanical Engineering (BME), Villanova University, 1980

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS

- Member ASME
- Member IEEE
- Member ANS
- Member ISA, Working Group SP67.15

EXPERIENCE

Summary of Recent Project Experience

Mr. Iepson is currently assigned as the Project Manager for the Entergy Operation, Inc., Arkansas Nuclear One EQ File Reformat Project. The project is intended to change database software environments from dBASE IV to Microsoft Access, revise the format to consolidate information and eliminate duplication of information and activities, and to upgrade certain fields of information in the new database.

He recently completed a Nuclear Assurance Engineering Audit of the Arizona Public Service Palo Verde Nuclear Generating Station Environmental Qualification (EQ) Program. The audit used a vertical-slice technique in which numerous plant activities were reviewed, in particular the supporting analyses for the environmental conditions.

Prior to this project, Mr. Iepson performed an extensive evaluation of equipment which could become submerged as a result of increased postulated post-LOCA flood levels at Arkansas Nuclear One. The project involved extensive historical research on the previous utility position as well as determining the current state-of-the-art and industry positions.

Mr. Iepson has also been an active participant in the New York Power Authority (NYPA) James A. FitzPatrick Nuclear Power Plant (JAFNPP) Design Basis Document (DBD) Validation Project. He was the principal author of the project's validation procedure and plan. In addition, Mr. Iepson has performed two pilot validation projects and prepared the project validation reports. One of the validation projects was performed concurrently with an internal Safety System Functional Inspection (SSFI) of which he was a key member reviewing various programmatic issues and numerous mechanical calculations.

Relevant Experience

Mr. Iepson has nearly fifteen years experience in the areas of High Energy Line Break (HELB) and Compartment Environmental Response (CER) Analyses, Fluid Flow, Thermal Hydraulics, Plant Operation and Assessment, and Environmental Qualification (EQ). Mr. Iepson also has experience in testing and failure analyses. He has performed numerous self-assessments, audits, inspection, walkdowns, and other quality-related reviews. His work has been performed for utilities, independent laboratories, architect-engineers, consulting firms and the Nuclear Regulatory Commission.

8/89 to Present

Iepson Consulting Enterprises, Inc.
317 Cynwyd Rd., Bala Cynwyd, PA 19004-2636

President

Responsible for overall business operation and technical aspects within the corporation. Areas of technical specialty include Environmental Qualification (EQ), High Energy Line Break (HELB) and Compartment Environmental Response (CER) Analyses, Design Basis Document (DBD) development and validation, Safety System Functional Inspections (SSFIs), Physical Plant Inspections, Test Program Development and Execution, and Licensing/Regulatory Review and Inspection.

5/84 - 8/89

Schneider Engineers
111 Presidential Blvd., Bala Cynwyd, PA 19004

Manager, Nuclear Engineering and Design Section Systems Technology Department, Power Services Division

Responsible for overall technical and administrative management of section including project performance, cost, scheduling, business development and marketing, and personnel. The position required the preparation of the annual budget, section business plan, and proposals as well as presentations to current and prospective clients. In addition, technical participation on many projects was required.

Principal Engineer, Technology and Analysis Department, Power Services Division

In this position, he was responsible for the performance and management of numerous EQ projects including EQ audits and equipment walkdowns for the NRC and nuclear utilities. Mr. Iepson marketed engineering services including the preparation of management, technical and cost proposals. He was the project manager on numerous assignments including a Water Induction Protection System (WIPS) piping design and modification project at a coal-fired power plant; several High Energy Line Break (HELB) and Compartment Environmental Response (CER) analyses; a finite element analysis of a non-uniform building structure subjected to an HELB; and several Failure Modes and Effects Analyses (FMEAs) in support of the development of maintenance and surveillance programs for safety-related equipment.

5/81 - 5/84

Franklin Research Center
20th and Race Streets, Philadelphia, PA 19103

Senior Research Engineer, Nuclear Engineering Department, Qualification and Analyses Group

Mr. Iepson performed numerous EQ evaluations and assisted in the preparation of written Technical Evaluation Reports (TERs) for 71 operating reactors. He reviewed and evaluated testing of various equipment types for conformity to current standards and technical practices in both the United States and Europe. He has also performed qualification analysis and testing of equipment and prepared detailed technical reports on the results. In this position, Mr. Iepson participated in the development and maintenance of several computer databases for the NRC. In addition, he prepared technical, management, and cost proposals for a variety of evaluations, analyses, and testing programs.

6/80 - 5/81

Philadelphia Electric Company
2301 Market Street, Philadelphia, PA 19101

Test Engineer (Delaware Station) and Shift Technical Advisor (Peach Bottom Atomic Power Station)

In these capacities, Mr. Iepson was responsible for providing technical assistance to shift personnel during operational transients and accidents. He was responsible for evaluating plant equipment, personnel, and procedures for possible areas of concern and improvement. Another aspect of these positions was the performance of various plant equipment testing including periodic surveillance testing.

HECTOR L. JOINER

EDUCATION & TRAINING

- Master of Business Administration (MBA), National University, San Diego, CA, 1987
- Bachelor of Science in Electrical Engineering (BSEE), Prairie View A&M University, Prairie View, TX, 1984

EXPERIENCE

9/94 to Present — T. U. Electric Co.
Comanche Peak Steam Electric Station

Senior Engineer
Performed Technical Specification Quality Assurance Audits for plant modifications, regulator affairs, and plant performance monitoring for the Nuclear Engineering Overview Department per ANSI standards. Performed root cause analysis, assessed Industry Operating experience and prepared Independent Safety Engineering evaluations.

1/92 - 1/94 — Florida Power Corp.
Crystal River Nuclear Power Plant

Nuclear Project Engineer
Managed consultants and Engineering contractors for large construction projects budgeted at 3.5 million. Provided technical reviews and verification of electrical modification projects using industry standards and procedures. Developed criteria documents for electrical distribution (480/240/120V) in addition to high voltage systems (230 KV) electrical cable routing criteria and cable tray and fill installation criteria. Management of A/E projects which include maintaining schedule, budgets, and technical evaluations of electrical contracts.

1/88 - 1/92 — T. U. Electric Co.
Comanche Peak Steam Electric Station

Staff Engineer
Duties included the following: responsible for operation, design, and configuration of the 6.9 KV switchgear/distribution system, 650 MVA main transformers, 58 MVA startup transformers, 120 volt AC essential lighting, main control boards, auxiliary relays and terminiation cabinets, cathodic protection system, 118 volt and 208/120 volt distribution system and the grounding and lightning protection system.

Staff Engineer
Duties included the following: provided electrical design support, procurement and construction engineering for Nuclear Operations, Electrical Maintenance, Performance

and Test, Technical Support, and I&C in the closure of technical evaluations, nonconformance resolutions, deficiency reports, and permanent equipment transfers.

Electrical Engineer
Design of engineering electrical calculations for 480/208/120 volt distribution system, short circuit, voltage drop, coordination, cable sizing, grounding and lightning protection.

10/86 - 1-88 — **Holmes & Narver Engineering and Construction Co.**
Mercury, NV

Electrical Power & Grounding Engineer
Duties included the following: design of primary 34.5KV/4160V distribution system layout and 480/208/120 volt distribution for temporary construction of Nuclear Testing Facilities for the Nuclear Weapons testing program.

6/84 - 12/85 — **Nevada Power Co.**
Las Vegas, NV

Electrical Engineer
Distribution Engineering. Design modification for a 7.2 KV distribution system for commercial and residential construction.

JOHN B. MARTIN

EDUCATION & TRAINING

- Certificate in Nuclear Engineering, Bettis Reactor Engineering School. 1964, with honors
- United States Naval Officers' Candidate School, 1962. Graduated with distinction
- Bachelor of Science in Electrical Engineering, University of Illinois, Champaign, IL. 1962, with high honors

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS

- Meritorious Executive Award from President Reagan in 1981 and 1988
- Distinguished Service Award from NRC in 1985
- Senior Executive Service bonus awards each year

EXPERIENCE

Summary

Thirty-three years of experience in design, construction, operation and safety evaluation of naval and commercial nuclear reactor plants. Recognized national authority in assessment and resolution of problems in reactor safety, plant material condition, operations, engineering and self-assessment. Organized the NRC high-level and low-level nuclear waste programs. Held positions of increasing responsibility for design, construction, overhaul, refueling and operations of nuclear powered naval ships.

1993 - 1995 — **U. S. Nuclear Regulatory Commission**
Region III, Chicago, IL

Regional Administrator

Directed the NRC nuclear safety activities in the Midwestern states. This included nuclear safety inspection and assessment of 19 nuclear reactor sites as well as several thousand nuclear materials sites. Managed a staff of about 250 people. Major accomplishment in Region III has been to diagnose and identify those nuclear plants with poor safety performance. Worked successfully with utility executive management to gain their recognition of the problems. In most cases corrective actions have been taken or are well underway to greatly improve performance. At the same time, have acted to recognize those nuclear plants that are performing well and to reduce their regulatory burdens.

1983 - 1993

U. S. Nuclear Regulatory Commission
Region V, San Francisco, CA

Regional Administrator
Directed NRC activities in the seven Western states. This included reactor safety and management assessment of the eleven active nuclear power plants, several research reactors and several hundred materials licenses. During tenure at Region V, the primary focus was initial licensing and startup of new nuclear power plants. During this period eight nuclear plants made the transition from construction to operations. Safety and licensing problems were dealt with promptly such that there were no delays due to untimely NRC actions. All plant startups were successful. Safety performance of three already operating nuclear plants was improved substantially.

1976 - 1983

U. S. Nuclear Regulatory Commission
Washington, DC

Director, Division of Waste Management
Organized the Division of Waste Management at NRC. Accomplishments included: Formulating the Commission's waste management policy for high-level and low-level waste and for uranium mill tailings. Development, approval, and promulgation of the NRC regulations governing nuclear waste. Working with congressional staff to develop legislation which was consistent with and complementary to the NRC waste policies and rules.

These tasks were done within the time frames committed and within the budgets allotted. Interaction with public groups and states was successful such that wide acceptance of NRC approach was achieved.

Assistant Director for Fuel Cycle Licensing
Responsible for the licensing of all fuel fabrication plants, UF6 conversion plants and uranium mills. During this time, all licenses were brought up-to-date and decommissioning plans and attendant funding was worked out for all plants.

1972 - 1976

U. S. Navy Department
Schenectady Naval Reactors Office

Assistant Manager for Operations, reporting to Admiral Rickover
Managed the technical activities of the Naval Reactors program at Knolls Atomic Power Laboratory. This included (1) oversight of the construction program for the Trident Nuclear Reactor prototype, (2) directing government and laboratory research and development programs for naval reactor projects, (3) managing programs to significantly upgrade quality and radiological controls at the laboratory and prototype sites and (4) technical direction of government activities involving operation and maintenance of four naval prototype reactors.

1962 - 1972

U. S. Navy Department
Naval Reactors Office, Washington, DC

Chief of the Refueling Branch, reporting to Admiral Rickover
Was responsible for directing refueling activities for all submarine and surface ship refuelings at nine shipyards. There were more than 20 refuelings and 15 new core loads during this time. Also supervised design and procurement of all refueling equipment, new reactor fuel shipping equipment and spent fuel shipping equipment. Managed certification of shipping casks for spent naval nuclear fuel.

Held positions of increasing responsibility for design, construction and installation of major components for naval reactor plants: steam generators, pressurizers, reactor coolant pumps and major heat exchangers for both submarine and surface ship reactor plants. This included extensive experience with new component designs, failure analysis, maintenance and all technical aspects of reactor plant equipment.

R. MARK QUESINBERRY

EDUCATION & TRAINING

- Oregon State University — 110 hours (Junior standing) Studies focused on sciences including Chemistry and Mathematics (through calculus)
- Maintaining Equipment Qualification: APS
- Systems Training, APS
- Root Cause Analysis, APS (Failure Prevention, Inc.)
- QA Auditor Training, APS

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS:

- Level III Mechanical inspector per ANSI N45.2.6
- Level III General inspector per ANSI N45.2.6
- Level II Welding inspector per ANSI N45.2.6
- Certified QA Auditor
- Certified to perform QA Evaluation Activities

EXPERIENCE:

8/83 to Present — **Arizona Public Service Company**
Palo Verde Nuclear Generating Station

Senior Evaluator
Responsible for oversight activities of the Engineering functional area.

Re-Engineering Team Member
Quality Assurance representative assigned to the PVNGS Re-Engineering team to work with CSC Index personnel. Team assignment was to improve the processes and structure of the oversight organization.

Quality Control Foreman in Plant Modifications
Supervisory position in charge of independent inspections of Plant Modification activities.

Level III Mechanical and General Inspector
Responsible for certification and training of mechanical inspectors. Special assignments included QC lead over Pressurizer and Reactor Coolant hot leg inconnel 600 nozzle replacements (Unit 1 and 2); QC lead over Steam Generator handhole installation (Unit 2
Also certified as Level II Welding inspector.

4/75 to 8/83

Various companies
Trojan; Fast Flux Test Facility; Washington Nuclear Power, Units 1, 2, & 4

Quality Control Inspector
Certified Quality Control inspector in the Mechanical, Welding, Electrical, and Insulation disciplines per ANSI N45.2.6. Performed inspections and monitoring of work activities during construction of nuclear power plants. Performed pre- and post-maintenance review of work documents, procedures, corrective action documents, and plant change documents to verify that Quality requirements were met.

Foreman, Quality Control
Foreman of Quality Control inspections at several sites.