U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-528/84-36, 50-529/84-27 and 50-530/84-18

Docket Nos. 50-528, 50-529 and 50-530

License Nos. CPPR-141, 142 and 143

Licensee: Arizona Public Service Company
P. O. Box 21666
Phoenix, Arizona 85036

Facility Name: Palo Verde Nuclear Generating Station - Units 1, 2 and 3

Inspection at: Palo Verde Construction Site, Wintersburg, Arizona

Inspection conducted: August 20-24, 1984

Inspectors: R C Sorensen — 9/18/84
R. C. Sorensen, Reactor Inspector — Date Signed

PDN for — 9/18/84
P. P. Narbut, Reactor Inspector — Date Signed

David P Hollenbach — 9/18/84
D. Hollenbach, Reactor Specialist — Date Signed

Approved By: H Miller — 9/19/84
L. Miller, Jr., Chief — Date Signed
Reactor Projects Section 2

Summary:

Inspection on August 20-24, 1984 (Report Nos. 50-528/84-36, 50-529/84-27 and 50-530/84-18

Areas Inspected: Routine unannounced inspection by regional based inspectors of licensee followup of construction open items in Units 2 and 3, with some examinations carried over into Unit 1. In addition, operations activities and procedures involving Unit 1 were examined. The examined activities involved implementation of Three Mile Island Lessons Learned actions. The inspection involved 124 inspector-hours onsite by three NRC inspectors.

Results: Of the areas inspected, no violations or deviations were identified.

Note: R. Hoblitzell, Level III NDE Examiner for the Lawrence Livermore National Laboratory, performed inspection on behalf of the NRC in a consultant capacity on August 20, 1984.

DETAILS

1. Persons Contacted

The below listed technical and supervisory personnel were among those contacted:

a. Arizona Public Service Company (APS)

R. Forrester, Quality Assurance Engineer
*J. Allen, Operations Manager
*C. Crackel, Compliance Engineer
J. Smith, Compliance Engineer
K. Gross, Compliance Supervisor
T. Shriver, Manager, Quality Systems and Engineering
S. Shepard, Licensing Engineer
W. Quinn, Licensing Manager
F. Semper, I&C
D. Hutton, Quality Assurance Monitoring Engineer
B. White, Operations Engineer
W. Nelson, Senior Quality Engineer
D. Legg, Operations Engineer
M. Bajpai, Operations Engineer
N. Hellman,
G. Foster, Lead Reactor Engineer
D. Hoppes, Reactor Engineering Supervisor
J. Schlag, Supervising Radiation Physicist
S. Zerkel, Reactor Operator
K. Anderson, APS Level III NDE Examiner
R. Robbin, Quality Engineer Level III
R. Baron, Operations QA/QC
*C. Russo, Manager, Quality Audits and Monitoring
*A. Ramey, Quality Systems Supervisor
*S. Penick, QA Engineer
*W. Craig, Startup QC Supervisor
*W. Ide, Director, Corporate QA/QC
*D. Karner, Assistant Vice President Nuclear Production
*T. Bloom, Licensing Engineer
P. Moore, QA Engineer
*P. Coffin,

b. Bechtel Power Corporation (Bechtel)

*P. Huber, Project Quality Coordinator
*W. Stubblefield, Field Construction Manager
R. Vote, Assistant Project QA Manager
H. Guire, Lead QA Engineer, Quality Verification
J. Black, Resident Engineer
D. Freeland, Group Supervisor, Plant Design
H. Foster, Project QC Engineer
I. Williams, Maintenance Engineer

*Denotes those attending exit meeting, August 24, 1984.

In addition, the inspectors also talked with various other licensee and contractor personnel during the course of the inspection.

2. Licensee Actions on Previously Identified Items

Background

The inspector had previously discussed the topic of open NRC items with licensee management. Licensee management had stated that they were establishing a revised program of NRC item tracking and closeout utilizing their licensing group. During this inspection the licensee representatives were asked to present those items which they had evaluated and considered ready for closeout by NRC. The licensee's revised system, although not fully in place at the time of this inspection, did not function as well as anticipated. The following weaknesses were identified to licensee management at the exit interview:

- In some cases not all necessary information was available.
- In some cases not all actions had been taken.
- Initially, the personnel presenting items for closure had not reviewed the item for its readiness for closure.

At the exit interview, the licensee management committed to putting their NRC open item program fully in place which will include:

- An APS review for completeness.
- A compilation of necessary data (or reference to its location).
- A QA verification of actions taken.
- Presentation of the information by a knowledgeable representative.

The inspector examined 17 open items and closed 12 as detailed below.

a. (Open) Unresolved Item (50-528/83-34-01) Weld ripple images may mask true indications on radiographic film

This item identified during the team inspection resulted in a disagreement on ASME Code interpretation by the NRC Level III NDE examiner and the licensee's Level III examiners. The NRC contracted an independent Level III examiner from Lawrence Livermore National Laboratory (LLNL) to make an independent assessment. The LLNL reviewed the films in question on August 20, 1984 at the site. This item remains unresolved pending receipt of his evaluation.

Additionally during his review of film, the LLNL examiner discovered a film in which the weld marking was incorrect. Weld B of RC-051-S-001 was marked as Weld A. The licensee issued nonconformance report WC-1114 on August 20, 1984.

The licensee's action to resolve the NCR will be followed up in conjunction with this unresolved item.

b. (Closed) Follow-up Item (50-528/84-04-03) Trending of Craft Rework

This item concerned the fact that no management system had been established to trend craft rework of items which QC inspection had rejected. The practice in place had been that when QC was called for inspection of an item, and found it unacceptable, the item was turned back to craft for rework. No nonconformance was written, the QC inspector simply withheld the QC approval of the item. The NRC issue was that management was not availing itself of valuable information regarding crafts "first time excellence."

The licensee's response to this item was provided in letter ANPP-29759 TDS/TRB of June 15, 1984.

The inspector verified that the actions committed in that letter had been taken, specifically that:

> "Craft and field engineering rework items are being tracked and reported to management, and corrective action is being taken based on trends."

This item is considered closed.

c. (Open) Deviation Item (50-528/83-34-09) Acceptance Criteria for AWS D.1.1 welds

This item concerned acceptance criteria for structural welds. APS had committed in the FSAR to use AWS D.1.1 criteria with certain exceptions. The implementing specifications in use at the site were not in agreement with the FSAR commitments.

The licensee committed to corrective actions in letter ANPP-28597-JAR/BSK dated Janaury 11, 1984. The commitments were examined as follows:

- The licensee submitted FSAR change notice 1123 (FSAR Amendment 13) to the NRC by letter ANPP-29687 EVB/WFQ dated June 7, 1984. This change, if approved by NRC, will rectify the differences in commitments and practices regarding structural welding. However, the inspector verified that the FSAR has not been fully reviewed or accepted by NRC licensing. This item remains open pending that approval or other actions (the FSAR change is not approved).

- Additionally, the licensee initiated a review of other construction specifications against requirements and specifications to determine if there were other unidentified departures.

  The results of that review are presented in Bechtel letter (to APS) B/ANPP-E-114381 dated May 2, 1984. The letter states that

specifications related to controls, plant design, and electrical disciplines were found in full compliance with FSAR commitments. However, the letter stated Civil/Structural Specification 13-CM-365, 13-CM-370 and 13-CM-380 deviated from FSAR commitments. The licensee is preparing an additional FSAR change to rectify the departures (SAR CN 1167). The FSAR change had not been submitted to the NRC at the time of inspection. This additional FSAR change will require NRC evaluation prior to closing this item.

- The licensee committed to have field QA surveil (on a monthly basis) structural steel welded connections in response to this item. The inspector verified that the monthly surveillance was being performed when structural welding was in progress (ref. Bechtel Procedure 18.6 Rev. 3). This aspect is considered closed.

- The licensee committed to training welding QC and Field Engineers concerning AWS D.1.1 acceptance criteria. The inspector verified, by review of training records, that this had been done. This aspect is considered closed.

This deviation remains open pending NRC review and acceptance of the two FSAR changes discussed above.

d. (Closed) Deviation Item (50-528/84-15-15) N5 Data Reports did not have a signature for overall responsibility

The inspector reviewed the procedure change which implemented the review and signature for overall responsibility on the N5 data reports (ref. PCN 10 to WPP/QCI 26.4 Rev. 4 dated April 19, 1984). The licensee QA representative stated APS had performed a verification that 100% of the Unit 1 N5 reports had been signed off. The inspector reviewed a small random sample of packages in the document vaults and found that the overall responsibility signatures had been made. This item is considered closed.

e. (Closed) Violation Item (50-528/83-02-04) Pipe Supports not provided for a RD Piping run

This item had been previously followed up in reports 50-528/83-17 and 83-29. The remaining item involved further review of calculations provided.

The inspector reviewed the calculations with the responsible lead discipline design engineer. All questions were satisfactorily resolved. This item is considered closed.

f. (Open) Follow-up Item (50-528/83-02-03) Cold Springing of Pipe

This item was previously examined in report 50-528/83-17.

The remaining issues were examined, specifically:

° The licensee had committed to analyze nonconformances (where cold sprung conditions had been found after the fact) and determine the technical consequences had these conditions not been inadvertently found.

The licensee stated in letter ANPP 27867 - WEI/JAR of September 23, 1983, that analysis had been done on four nonconformance reports and if the cold sprung conditions had not been discovered the resulting stresses would not have exceeded allowable stresses. Three other nonconformances were determined to have insufficient data to allow analysis.

The inspector discussed the item with licensee management and stated that he did not consider that the analysis of four nonconformances provided a great deal of confidence that the condition of piping was satisfactory.

At the exit interview, the licensee management agreed to consider further action to provide further analysis. The licensee representative stated that since the writing of the September 1983 response other nonconformances had been identified which revealed cold sprung conditions. This item remains open pending further licensee action.

° The licensee also committed to consider additional craft training. The inspector reviewed craft training records for cold springing training conducted in June 1983 in response to the item. This aspect is considered closed.

g. (Closed) Follow-up Item (50-528/81-04-01) Tendon Data Record Discrepancies

This item had been previously followed up in Inspection Reports 50-528/83-22 and 83-29.

The inspector examined the remaining issues of (1) amending certain tendon records to include the engineering evaluation that had been performed and (2) the licensee's review of the subcontractors open nonconformances. The inspector found that the records had been amended as committed and the Unit 1 nonconformances had all been closed. This item is considered closed.

h. (Closed) Follow-up Item (50-528/83-22-02) WCS Training Records

This item concerned the necessity to annotate WCS training records to reflect the date they were generated. As stated in report 50-528/83-22 the WCS openly admitted he had signed training records on April 21 and 22, 1982, but had entered dates from April 10, 1981 to October 23, 1981 to reflect the dates of training.

The inspector verified that a letter had been generated reflecting the above and had been placed with the training records (reference

WCS QA Manager to file memo dated August 22, 1984). This item is considered closed.

i. (Closed) Follow-up Item (50-528/81-02-04) Storage and Maintenance

This item had been followed up in reports 50-528/83-11, 83-17, and 83-29. The remaining issue was to identify how long heaters had been deenergized in motor control centers and switchgear in the units and the technical consequences.

The inspector examined Bechtel to APS letter B/ANPP-E-11371 of April 4, 1984, which states the condition of the motor control centers and switchgear is acceptable based on equipment environmental qualification data, the general Palo Verde environment, monthly walkdowns conducted to check moisture indicators and desiccant bags, and a special February 1984 inspection which showed no detrimental conditions due to moisture.

This item is considered closed on the basis that the preoperational test program will verify equipment operability.

j. (Closed) Follow-up Item (50-528/83-17-03) Flexible Membrance Forging May Require Reexamination

The licensee had committed to determine if linear indications (discovered at WNP-3) were a problem applicable to Palo Verde.

The licensee presented a CE to APS letter dated April 23, 1984, in which CE states that analytical studies UT and PT were performed on the WNP-3 forging. The examination found no reportable indications. The forgings used at PVNGS are supplied by the same manufacturer.

The inspector visually examined the Unit 1 forging for any indication that might have opened up during Hot Functional testing. No visible indications were observed.

This item is considered closed on the basis that the indications found at WNP-3 were technically acceptable to the ASME Code.

k. (Closed) Follow-up Item (50-528/83-17-02) Safety Injection Tank, Nozzle to Safe-end Weld Radiographed Prior to Heat Treatment

On May 4, 1982, Combustion Engineering notified the NRC that the welds between the safety injection tank discharge nozzles and safe-ends were radiographed prior to heat treatment rather than after heat treatment as required by code. Palo Verde Units 1, 2 and 3 as well as other facilities were affected. CE's solution to this discrepancy was to re-radiograph the affected welds. In a letter to APS, dated March 22, 1984, CE stated, "All re-radiographs for Units 1, 2 and 3 have been reviewed and accepted by CE." This item is closed.

l. (Closed) Follow-up Item (50-528/83-22-01) Core Support Plate Welds

The item dealt with lack of penetration and backgouging of core support plate weld identified at WNP-3. The problem had been identified to WNP-3 as a result of work at CE's Avery facility on the Palo Verde Unit 3 core support plate. The licensee committed to resolve the weld condition for Units 1, 2 and 3.

The licensee presented two CE letters V-CE 30082 of April 13, 1984 and V-CE 30329 of June 4, 1984, which collectively state that the weld procedure used by CE was changed for the Unit 3 work so as not to require backgrinding which led to the problem discovered on Unit 3 at Avery during manufacture. The Units 1 and 2 weld procedures used did require back grinding the weld. The letters say that a review of fabrication documentation for Units 1 and 2 show that no further work is required for Units 1 and 2.

The licensee provided another letter V-CE-30766 dated August 2, 1984, which states a TVA assembly will be used for the Palo Verde Unit 3.

The inspector visually examined a sample of about 25% of the Unit 1 welds in question. No lack of penetration was observed. This item is considered closed.

m. (Open) Unresolved Item (50-528/81-04-02) Structural Weld Preheat Requirements are not in accordance with AWS D.1.1

This item was examined in report 50-528/83-29.

The remaining issue was to obtain NRC verification that the exception taken to AWS D.1.1 preheat requirements was acceptable. The exception had been taken in a 1980 FSAR change.

The inspector informed the licensee that the NRR review was complete, that the exception was being approved and SER Supplement 6 issuance is expected in September 1984. This item remains open pending the issuance of supplement 6 and will be closed at that time.

n. (Closed) Violation Item (50-528/84-15-03) Inappropriate Acceptance Criteria for Control of Reactor Vessel Movement during Hot Functional Testing

The violation was given for inappropriate acceptance criteria for reactor vessel movement criteria with no lower shims installed. In their response to the violation (ANPP-29924 WFQ/TJB dated July 10, 1984) APS stated no violation had occurred since CE had concurred to proceeding with hot functional testing with the shims installed.

In a supplemental letter (ANPP-29961 TDS/TRB dated July 13, 1984), the licensee provided technical justification that the lower shims are required only during a seismic event and restraint for displacement due to thermal growth would be served by the installed

upper shim assemblies. Therefore, the violation is rescinded and is considered closed.

o. (Open) Violation Item (50-528/84-15-01) Qualification of Welders After-the-fact

The licensee's response to the violation was letter ANPP-29924-WFQ/TJB dated July 10, 1984. The licensee contends post welding qualification meets the basic premise of the Code. The inspector has referred the question of ASME Code compliance to NRR for evaluation This item will remain open pending that evaluation.

Other licensee action was described in the response:

- All Unit 1 ASME weld records were being reviewed for welder qualification. The inspector was informed the review had just been completed but the results had not been formulated.

- Training sessions would be held with craft, field engineers and welding QC. The inspector reviewed the training records. This aspect is considered closed.

This item remains open pending completion of the actions indicated.

p. (Closed) Violation Item (50-528/84-10-03) Unqualified Quality Control Inspector

The licensee's response to this violation was provided in letter ANPP-29457 TDS/TRB of May 9, 1984 and was supplemented in response to NRC questions by ANPP-29844 WFQ/TJB of June 27, 1984.

The summary of the licensees investigation indicates a total of 4 QCE's, all from the welding discipline performed mechanical inspections on back shift when no mechanical inspectors were assigned. The root cause was stated to be incomplete QC staffing and improper direction by the Project QC Engineer.

Other licensee actions were:

- The new Project Quality Control Engineer interviewed each QCE to determine if the QC had performed inspections for which he wasn't qualified. No other instances were identified by those interviews.

- A review of 250 completed records (CIP's) from each discipline to verify the inspector of record was qualified for the task.

The inspector reviewed the results of this review recorded on a surveillance inspection report dated June 18, 1984 through July 15, 1984. The report shows 8 disciplines were examined. Work in all three units was examined. A total of 2000 CIP's were examined. No additional discrepancies were identified.

- One hundred percent of the Mechanical CIP's were reviewed and the results were recorded on four Nonconformance Reports (MC-2101, NC-1345, NA-1276 and MY-2100). All items accepted by unqualified inspectors were required to be reverified.

- Training would be conducted for all QC engineers. The inspector sampled one QCE from each inspection discipline and verified he had been retrained.

This item is considered closed based on the corrective action taken.

q. (Closed) Unresolved Item (50-529/83-12-01) Cable Tray Support Welds

This item was reopened in report 50-529/83-17 pending issuance of an nonconformance report and an evaluation as to why the engineering walkdowns for cable tray supports missed the undersize welds found by the inspector.

The nonconformance written was NCR EA-3226 of August 12, 1983. The NCR was dispositioned use as is (the as found welds were technically acceptable).

The licensee presented QA document 84-C-148 (DMH) dated April 30, 1984, which stated the raceway support validation walkdowns were performed to visually confirm the existence of required welds and approximate proper size. There was no intent to do a detailed weld inspection.

Additional rationale for acceptance was that all welds identified by NRC were technically acceptable as-is. Both cases identified by NRC were accepted by the same weld inspector. APS performed a field inspection of welds accepted by the same individual and found no other cases.

This item is considered closed on the basis that all discrepancies identified were acceptable as-is after analysis and no additional weld problems were identified.

3. Implementation of Three Mile Island Lessons Learned

The inspector reviewed the below listed items which represented a portion of a comprehensive and integrated plan to improve safety following the events at Three Mile Island, Unit 2 in March 1979. (The item numbers are from Enclosure 2 of NUREG-0737.)

II.G.1. Emergency Power for Pressurizer Equipment

NRC Position

Reference: NUREG-0737

Consistent with satisfying the requirements of General Design Criteria 10, 14, 15, 17, and 20 of Appendix A to 10 CFR Part 50 for the

event of loss-of-offsite power, the following position shall be implemented:

The pressurizer level indication instrument channels shall be powered from the vital instrument buses. The buses shall have the capability of being supplied from either the offsite power source or the emergency power source when offsite power is not available.

Licensee Commitment

Reference: PVNGS TMI-2 Lessons Learned Implementation Report.

PVNGS does not use PORVs or block valves.

Two channels of Class 1E level instrumentation are provided for PVNGS. Pressurizer level channels L-110X and L-110Y are indicated in the control room. Channel L-110X is also recorded in the control room.

The pressurizer level instrumentation is powered from 120V ac Class 1E instrument buses E-PNA-D25 and E-PNB-D26 (refer to FSAR Figure 8.3-4, sheet 1 of 2). These buses are normally powered through inverters from Class 1E batteries. The Class 1E battery chargers are powered from offsite power or from the diesel generators when offsite power is not available.

Inspector Findings

References:
DWG 13-E-PHA-005
DWG 13-E-MAA-002
DWG 13-E-PKA-001
DWG 13-E-PNA-001
DWG 13-E-PNA-002
DWG 13-J-RCE-074
DWG 13-J-ZZE-051
DWG 13-E-PHA-006

The inspector reviewed applicable drawings, toured the control room, and interviewed licensee personnel to determine compliance with the requirements.

PVNGS does not have PORVs or its associated block valves. Therefore, the only requirement applicable to PVNGS deals with the power supply for pressurizer level indication.

The inspector reviewed the applicable electrical drawings and determined that two redundant, independent means of pressurizer level indication exist at PVNGS, each powered from a separate vital instrument bus distribution panel. These buses can receive power either from a 5.5 MW emergency diesel generator (Class 1E) or from offsite power through 13.8 KV non-Class 1E intermediate buses.

The inspector noted that the pressurizer level indication powered from the vital instrument busses is clearly labeled L-110X and L-110Y in the control room for operator reference.

Therefore, the inspector concludes that the licensee has acceptably met the requirements pertaining to this TMI Action Plan item, and thus, this item is considered closed.

I.C.7 NSSS Vendor Review of Procedures

NRC Position

References: NUREG-0694
NUREG-0660

Obtain nuclear steam supply system (NSSS) vendor review of low-power and power-ascension test and emergency procedures as a further verification of the adequacy of the procedures.

Licensee Commitment

Reference: PVNGS TMI-2 Lessons Learned Implementation Report

FSAR Section 14.2.2.8 describes the responsibilities of the NSSS vendor representative on the Test Working Group which includes review of test procedures pertaining to or interfacing with their supplied systems.

APS will obtain the NSSS vendor review of emergency operating procedures that involve the NSSS vendor scope of supply.

Inspector Findings

References:
(a) PVNGS-JRB-M83-1446, Memo from J. R. Bynum to D. B. Amerine of CE.

(b) V-CE-20457, Letter of D. B. Amerine of CE to G. C. Andognini.

(c) V-CE-21714, Letter of D. B. Amerine of CE to J. D. Houchen.

(d) Procedure 70AC-0ZZ17, Test Results Review Group

(e) V-CE-18722, Letter of C. Ferguson of CE to G. C. Andognini

The inspector reviewed the references, interviewed licensee personnel and inspected a sampling of test procedure packages for evidence of NSSS vendor review.

The inspector determined that most low power test procedures and power ascension test procedures are prepared by Combustion Engineering (CE), the NSSS vendor for PVNGS. CE engineering groups review procedures prepared by the CE procedures group prior to issue to APS for use. Any low power or power ascension test procedures prepared by APS are forwarded to the CE project office for NSSS vendor review. Letter V-CE-20457 documents that CE has completed an engineering review of all low power test procedures. However, the inspector was unable to

determine whether CE has reviewed power ascension test procedures or emergency procedures at this time.

In addition, CE has designated a member to the Test Results Review Group to represent CE in matters pertaining to the review and approval of test procedures. The Test Results Review Group (TRRG) is a committee, with members from different disciplines within APS, that reviews test procedures for technical adequacy prior to submittal to the Plant Review Board for approval. The TRRG also reviews completed test procedures to ensure that the results are acceptable. The functioning of the TRRG is defined by Procedure 70AC-0ZZ17. The inspector learned that the CE representative is a full voting member on the TRRG concerning test procedure approval, but he only serves as a consultant concerning test results and does not vote on acceptance of test results.

The inspector considers that the CE representative on the TRRG, and his review of low power test procedures, in conjunction with the NSSS vendor's origination of low power test procedures, acceptably meets the requirements of the low power test procedure portion of this TMI Action Plan item.

Two questions that remain to be resolved, however, involve the omittance of the CE member from voting on test results, and the degree of review he would actually provide concerning test results. The licensee representatives did not address the inspector's concerns in this area and therefore, these two items will remain open pending further inspection.

II.E.3.1 Emergency Power for Pressurizer Heaters

NRC Position

Reference: NUREG-0737

The pressurizer heater power supply design shall provide the capability to supply, from either the offsite power source or the emergency power source (when offsite power is not available), a predetermined number of pressurizer heaters and associated controls necessary to establish and maintain natural circulation at hot standby conditions. The required heaters and their controls shall be connected to the emergency buses in a manner that will provide redundant power supply capability.

Licensee Commitment

Reference: PVNGS TMI-2 Lessons Learned Implementation Report

Based upon calculated insulation losses and previous plant operating experience for C-E plants, heat losses from the PVNGS pressurizer are expected to range from 100,000 to 500,000 BTU/h. Preoperational testing will determine the actual PVNGS heat loss. Assuming a conservative heat loss of 500,000 BTU/h., a heater capacity of 150KW is required to maintain normal reactor coolant system operating pressure.

The PVNGS pressurizer heaters are configured as follows:

The PVNGS pressurizer heaters (36 elements rated at 50 kW each, connected in 12 groups of 3 delta-connected elements each) have a total capacity of 1800 kW. The heaters are powered from the non-Class 1E and Class 1E distribution systems. Redundant heater capacity of 150 kW is available for manual loading on the diesel generators upon loss of normal (offsite) power. The diesel generators are sized to accommodate this heater capacity concurrent with a forced shutdown or LOCA (refer to FSAR Table 8.3-3). In the event that heater capacity beyond that powered from a Class 1E source (150 kW on each train) is required, heaters can be supplied from the non-Class 1E power system that is fed from the offsite power system.

Inspector Findings

References: DWG 13-E-MAA-001
DWG 13-E-MAA-002
DWG 13-E-PGA-003
DWG 13-E-PGA-002
DWG 13-E-RCB-010
PVNGS FSAR Section 8.3

The inspector reviewed the above drawings, the applicable portions of the FSAR, and interviewed licensee personnel.

The licensee has determined that 150 kW of pressurizer heaters is all that is required to initiate and maintain natural circulation at hot standby conditions.

The inspector noted that two redundant trains of pressurizer backup heaters with a total capacity of 150 kw each are provided for PVNGS, Unit 1. The power for one train is supplied from 480V load center E-PGA-L33 (Class 1E), and power for the other train is supplied from 480V load center E-PGB-L32 (Class 1E). A Class 1E circuit breaker on the load side of each 480V load center feeds the pressurizer heaters associated with that train and provides the Class 1E interface. This breaker trips, de-energizing the 150 kW of pressurizer heaters, on a safety injection actuation signal (SIAS). Subsequent loading of the heaters onto their associated emergency diesel generator is done manually from the control room. Each emergency diesel generator has sufficient capacity to power its associated pressurizer heaters, in addition to all Engineered Safety Feature (ESF) loads associated with that train, with several hundred KW of margin to spare. Thus, no ESF loads need be shed to energize the pressurizer heaters, and the danger of overloading the diesel generators is not a consideration.

In summary, the inspector considers the licensee to have complied with the requirements of this TMI Action Plan Item, and therefore, this item is considered closed.

II.D.3. Direct Indication of Relief and Safety-Valve Position

NRC Position

Reference: NUREG-0737, Palo Verde Safety Evaluation Report.

Reactor coolant system relief and safety valves shall be provided with a positive indication in the control room derived from a reliable valve-position detection device or a reliable indication of flow in the discharge pipe.

Licensee Commitment

Reference: PVNGS TMI-2 Lessons Learned Implementation Report

Positive indication of safety valve position will be provided in the control room. Monitoring will be provided by an acoustic monitoring system consisting of an accelerometer (acoustic sensor) mounted downstream of each valve. The sensing instrumentation will be environmetally qualified to function in a post-LOCA environment in accordance with Regulatory Guide 1.89. A plant annunciator alarm will be provided to alarm valve opening. The acoustic monitoring system will be powered from a reliable instrument bus with Class 1E backup power. The system is designed to meet the requirements of Revision 2 to Regulatory Guide 1.97.

Installation of positive pressurizer safety valve position indication and development of emergency procedures will be completed prior to fuel loading of PVNGS Unit 1.

Inspector Findings:

References:
(a) Bechtel DWG 30142B01001
(b) DWG 13-E-NNA-001
(c) DWG 13-E-MAA-002
(d) DWG 13-J-RZE-051
(e) Test Procedure 10407-J366-438-2

The inspector reviewed the above-mentioned drawings, toured the plant and the control room, and interviewed licensee personnel to determine the licensee's compliance with the applicable requirements.

The inspector noted that pressurizer safety valve position indication (VPI) does exist in the control room for all four safety valves. The safety valve VPIs consist of an acoustic monitor installed on the tailpiece downstream of each safety valve, with an in-line charge amplifier and remote readout in the control room. There is an alarm associated with the VPIs in the control room and an annunciator.

The VPIs are, in fact, powered from non-vital power, with Class 1E power provided as a backup from motor control center E-PHA-M31 through an auto and manual transfer switch.

The inspector observed that the VPIs have been vendor tested but have not been calibrated. The licensee representatives were reminded at the exit meeting that the VPI system must be calibrated, as required in the Palo Verde Safety Evaluation Report, prior to fuel load.

In addition, the inspector was unable to review the seismic qualification records, environmental qualification records, and human-factors analysis associated with the safety valve position indication.

The licensee representatives agreed to have this documentation available for the inspector's review during a future inspection. Therefore, this TMI Action Plan Item will remain open pending further inspection.

4. TMI Open Items

The inspector attempted to follow-up on TMI open items identified during a previous inspection. Concerning TMI Action Plan Item I.A.1.3.1, Limiting Overtime, the inspector had wished to know who may serve as designee for the Director of Nuclear Operations to authorize deviation from the overtime limitations.

The inspector was shown a copy of a memo specifying the individual plant superintendents as having the authority to allow exceeding the overtime limitations. The inspector expressed concern that this was not meeting the intent of the applicable requirement which states, "such deviation shall be authorized by the plant manager or his deputy or higher levels of management." The plant superintendent is manager of operations personnel only, and has no authority over radiation protection or maintenance personnel. Therefore, the inspector voiced concern with the licensee representative at the exit meeting that the individual plant superintendents are inappropriate for this responsibility and that higher levels of management are warranted. The licensee representative agreed to revise the memo accordingly.

Also, the inspector was shown copies of revised procedures that incorporate the inspector's comments concerning other TMI open items. The inspector expressed a willingness to review the procedures to close out open items, but will wait until the procedures have been approved by the Plant Review Board.

5. Exit Interview

The inspectors met with the licensee management representatives denoted in paragraph 1 on August 24, 1984. The scope of the inspections and the inspector findings as noted in this report were discussed.