U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-528/85-19, 50-529/85-21 and 50-530/85-15

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

License No: NPF-34

Construction Permit Nos. CPPR-142 and 143

Licensee: Arizona Nuclear Power Project
P. O. Box 52034
Phoenix, Arizona 85072-2034

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

Inspection at: Palo Verde Site, Wintersburg, Arizona

Inspection conducted: May 13-17, 1985

Inspector: L. R. Kanow 7/1/85
L. R. Kanow, Reactor Specialist Date Signed

Approved By: Talbert Young Jr. 7-1-85
T. Young, Jr., Chief, Engineering Section Date Signed

Summary:

Inspection on May 13-17, 1985 (Report Nos. 50-528/85-19, 50-529/85-21 and 50-530/85-15)

Areas Inspected: Routine unannounced inspection by a regional based inspector of activities associated with implementation of selected TMI Action Items, and routine follow-up of various allegations. The inspection involved 34 inspector-hours by one NRC inspector.

Results: No violations of NRC requirements or deviations were identified.

DETAILS

1. Persons Contacted

a. Arizona Nuclear Power Project (ANPP)

*D. B. Karner, Assistant Vice President, Nuclear Production
*L. A. Souza, Assistant Corporate QA/QC Manager
*D. Wootten, Senior Nuclear Safety Engineer
*J. C. Matteson, Transition QA/QC
*T. J. Bloom, Licensing Engineer
*R. J. Burgess, Field Engineering Supervisor
*J. E. Smith Jr., Compliance Engineer
*K. Gross, Supervisor Compliance
*C. N. Russo, Manager, Quality Audits and Monitoring
*W. Quinn, Manager, Licensing
*J. Olsen, Licensing
*G. Perkins, Manager, Radiological Services
*S. G. Penick, Quality Monitoring Supervisor
D. Wittas, Mechanical Quality Engineer Supervisor
R. Fullmer, Vendor QA Supervisor
B. Albert, Licensing Engineer
M. Jones, Licensing Engineer
N. W. Lossing, Supervisor, Quality Investigations
A. McClure, QA/QC Investigator

b. Bechtel Power Corporation (Bechtel)

*D. R. Hawkinson, Project QA Manager
*T. L. Horst, Project Field Engineer
*M. A. Rosen, Quality Control

*Denotes those attending the exit interview on May 17, 1985.

2. Inspection Methodology

The allegation characterization statements contained in this report are either a paraphrasing of the staff's understanding of the alleger's concern or statements taken from the allegation source documents. The characterization statements do not represent a staff assessment, conclusion, or position.

APS first received the allegations from an alleger. This report refers to these allegations as the "A" list. NRC Region V interviewed the alleger. During this interview on August 23, 1984, the alleger provided a list of allegations (without detailed explanation of their significance or meaning). This list of allegations is referred to as the "B" List. An Allegation Board meeting was held on November 9, 1984, and summarized the key technical issues, which are referred to as the "C" List. Subsequent interview with the alleger provided another list of allegations known as the "D" List.

APS originally received most of these allegations, and investigated them extensively. The staff reviewed APS's findings and conducted independent

inspections where necessary. The staff found that the following allegations were addressed and resolved by APS as a result of the APS investigation. This was documented in APS letter to NRC dated March 7, 1985 and April 15, 1985. The staff's assessment of the allegations below centered primarily on assessing the completeness and adequacy of the rather extensive APS evaluations. The staff's position is that the technical issues were acceptably addressed by the APS evaluation and that APS management acted in a responsible manner in the conduct of activities addressed by the allegations below. No further staff action on these allegations are required.

3. Allegation No. "B" List No. 2, 3, 11,"C" List No. 6

a. Characterization

Test equipment specifications were arbitrarily modified (e.g., rod oven thermometers, micrometers, Holiday detectors, Ashcroft pressure gauges).

b. Implied Significance

Arbitrarily modifying equipment specifications could have resulted in work that was performed with test equipment outside the set-forth accuracies and/or has not been properly evaluated for acceptability. This could affect the ability of systems required to achieve and maintain the designed safety functions.

c. Assessment of Safety Significance

The staff addressed this allegation by reviewing the licensee's investigation and supporting documentation. The licensee wrote CAR No. CO-85-0061 dated March 20, 1985 to identify and correct deficiencies regarding accuracy tolerances. Arizona Nuclear Power Project (ANPP) letters dated March 7, 1985 and April 15, 1985 documenting investigation results were reviewed.

ANPP investigation concluded the following:

Work Plan Procedure WPP 7.0 entitled "Calibration and Control of Construction Measuring and Test Equipment," allows the Instrument Calibration Laboratory Engineer (ICLE) to establish accuracies for Measuring and Testing Equipment based on project requirements. This accuracy may be different than that specified by the manufacturer, depending on the use of the M&TE.

(1) Rod oven thermometers were found to have an accuracy specified by the ICLE different from that of the manufacturer's specified accuracy. The licensee found that based on Bechtels' Material and Qualification Services (M&QS) test data, this would not have an adverse affect on the quality of the completed weld. A review of weld rod holding oven temperature monitoring logs revealed that approximately seven instances out of approximately 10,000 records were less than the required

temperature. These instances were recorded on NCR WX-1350. This condition was evaluated as having no safety significance.

(2) Ashcroft pressure gauges addressed in CAR No. CO-85-0061 was found to have an ICLE specified accuracy different from that of the manufacturers specified accuracy. Bechtel reviewed documented hydrostatic test records including documentation of pre-test and post-test calibrations and percent accuracy of test gauges and calibration equipment used. These records were found to meet required accuracies. Bechtel's evaluation concluded that there was no case where the ICLE specified accuracy could have had an adverse affect on hydrostatic test results.

(3) Holiday detectors require field adjustments but not a rigorous calibration. The manufacturer operating instruction and Palo Verde procedure No. 202.4 Rev. 2, "Holiday Testing", references Project Specifications 13-PM-204 and 13-PM-205. The specifications define field adjustment of the detectors. The licensee also held discussions with cognizant personnel to assure that personnel understood the procedures. No discrepancies were noted.

(4) ANPP's investigation concerning micrometer specifications revealed that the micrometers are calibrated utilizing gauge block sets traceable to the National Bureau of Standards (NBS). In ANPP's review of five micrometer sets, one was found to be accepted although it exceeded the manufacturers tolerance. This deficiency was documented on a Defective Instrument Report, DIR-92 dated June 29, 1981, and was found not to affect any previous installation.

d. Staff Position

The staff concluded that although ICLE specified accuracies were different from the manufacturer's accuracy as in the case of the rod oven thermometers and pressure gauges, this allegation was unsubstantiated in that the ICLE specifications were not arbitrarily modified. The staff assessed and concurred with the licensee's evaluation discussed above.

e. Action Required

None. This item is closed.

4. Allegation No. "B" List No. 13, "C" List No. 7

a. Characterization

The use of weld volt-amp monitors were arbitrarily suspended and the weld monitors were not calibrated when they were used.

b. Implied Significance

Failure to use weld-amp monitors during welding of Charpy V-notch (CVN) tested materials could result in the reduction of notch toughness properties of the material with increasing heat input. This could cause materials being welded to not meet design toughness.

c. Assessment of Safety Significance

The staff addressed this allegation by reviewing the licensee's investigation and supporting documentation. The licensee wrote Procedure Change Notice No. 27 dated July 30, 1979, regarding the deletion of the requirement for a voltage and amperage check for material regarding CVN testing in Procedure WPP/QCI No. 101.0. Justification for the deletion was established by Bechtel Research and Engineering, Materials and Quality Services Department in the report, "Technical and ASME Code Considerations for Notch Toughness Tested Welding Procedure Qualification," dated May 1978, and a M&QS data report on monitoring welding procedures. Prior to deletion of the voltage-amperage check, the instruments were maintained and calibrated by M&TE lab until decontrolled on February 12, 1981.

d. Staff Position

Based on the above safety assessment, the staff concluded that this allegation was unsubstantiated in that the suspension of the weld-amp monitors was not arbitrary and therefore does not represent a safety concern.

e. Action Required

None. This item is closed.

5. Allegation No. "B" List No. 19, "C" List No. 10

a. Characterization

Welding oxygen monitors were not properly calibrated.

b. Implied Significance

Improperly calibrated oxygen monitors could result in root oxidation. This could result in inadequate welds and consequently reduced structural integrity of the plant.

c. Assessment of Safety Significance

The staff addressed this by reviewing the licensee's investigation and supporting documentation. The licensee found that the welding oxygen monitors used requires a field adjustment but not a rigorous calibration. The M&TE cal lab performs a functional check of each unit prior to its leaving the lab. The manufacturer's operating procedure is attached to the side of each unit for use by personnel

performing the field adjustment. The licensee concludes that this complies with the manufacturer's instructions.

The inspector visually verified that the manufacturer's operating procedure are attached to each unit for personnel reference.

d. Staff Position

The staff assessed and concurred with the licensee's evaluation discussed above.

e. Action Required

None. This item is closed.

6. Allegation No. "B" List No. 21, "C" List No. 13

a. Characterization

Test equipment vendor calibration standards were not traceable to the National Bureau of Standards (NBS).

b. Implied Significance

Failure to maintain traceability to NBS could result in improper calibration of test equipment. This could affect the ability of systems required to achieve and maintain the designed safety functions.

c. Assessment of Safety Significance

The licensee conducted a review of the calibration standards used by the Bechtel Metrology Laboratory and found that two out of approximately 215 vendor calibrated items were not traceable to NBS. Further investigations revealed one item was traceable to NBS and the second item had not been used. This item is required to have verification of traceability to NBS prior to use by the licensee. Based on the investigation, the licensee concluded that vendor calibrations are traceable to NBS.

d. Staff Position

The staff concurs with ANPP that this allegation was unsubstantiated and does not represent a significant safety concern.

e. Action Required

None. This item is closed.

7. Allegation No. "C" List No. 12

a. Characterization

Micrometer ratcheting torque wrenches were frequently used improperly.

b. Implied Significance

Improperly torqued bolts may affect the structural integrity of joints, and consequently the structural integrity of the plant.

c. Assessment of Safety Significance

This allegation was similar to a previous allegation addressed in Inspection Report 50-528/84-59, regarding "Improper Use of Tools." CAR No. CE-84-0298 was generated to correct and improve mishandling of tools. The licensee monitored the usage of micrometer type torque wrenches and observed the craft personnel clicking the torque wrenches ten times after adjusting and prior to performing bolt torquing as recommended by the manufacturer.

The inspector observed the demonstration of the accuracy of a micrometer type torque wrench first with clicking the wrench ten times and then without clicking the wrench ten times. The instrument was found to produce the required torque within the allowable tolerance in both cases.

d. Staff Position

Based on the above assessment the staff concluded that this allegation does not represent a safety concern.

e. Action Required

None. This item is closed.

9. Allegation No. "A" List 39

a. Characterization

Verbal instructions which were not reflected in specific written procedures were being given by the Bechtel Cal Lab Supervisor.

b. Implied Significance

The procedures used to calibrate M&TE should be documented procedures to ensure approved procedures are used. Using verbal instructions in lieu of formal written procedures could possibly result in incorrect calibration of M&TE. This could affect the ability of systems required to achieve and maintain the designed safety functions.

c. Assessment of Safety Significance

The staff addressed the allegation by reviewing the licensee's investigation and supporting documentation. The licensee discussed the concern with the calibration lab personnel who disclosed that, in fact, the previous Bechtel Cal Lab Supervisor would sometimes provide verbal technical direction to cal lab personnel regarding how to calibrate M&TE which was not reflected in the documented calibration procedures. The cal lab personnel indicated that they would seek direction from the cal lab supervisor when the manufacturers technical manuals were vague or missing detail. This direction would be given verbally. The licensee did not determine any situations that were considered safety significant regarding the verbal instructions.

The licensee issued CAR No. CP-84-0141, dated August 22, 1984, to address this issue. The corrective action taken as documented in the CAR was to reinstruct the cal lab technicians to follow only written procedures when performing calibration activities, and when necessary, to prepare documented instructions to provide for needed direction.

In addition, the licensee monitored the cal lab activities on October 9, 23, and 26, 1984. No conditions of procedure violations or verbal direction were observed.

d. Staff Position

The staff has no evidence that the verbal instruction resulted in any equipment calibration errors that are considered safety significant.

e. Action Required

No additional action is required.

10. Allegation "D" List No. 2

a. Characterization

Improper calibration of pressure gauges at the site due to M&TE which was calibrated offsite in a different portion of the country at a different atmospheric pressure.

b. Implied Significance

Improper calibration of pressure gauges could result in systems being under - or over-pressurized. This could affect the safe operation of the plant.

c. Assessment of Safety Significance

ANPP's investigation revealed that a change in the value of gravity between the location the dead weight tester was calibrated and that

of PVNGS has a negligible affect on the accuracy of the tester. The local value of gravity is currently being used by the Bechtel M&TE lab. Additionally, a review of the calibration report performed by the Navy Standards Laboratory dated January 19, 1984, determined that corrections for air buoyancy relating to changes in atmospheric pressure had been considered during the calibration of the dead weight tester.

d. Staff Position

Based on the above assessment, the staff concluded that this allegation did not represent a significant safety concern.

e. Action Required

None. This item is considered closed.

11. TMI Action Plan Requirements

a. (Closed) TMI Item I.C.I "Short-Term Accident and Procedures Review-Inadequate Core Cooling/Transients and Accidents"

Summary:

NUREG-0737 requires licensees to perform analyses of transients and accidents, prepare emergency procedure guidelines, upgrade emergency procedures, including procedures for operating with natural circulation conditions, and to conduct operator retraining. Supplement 1 to NUREG-0737 (Generic Letter No. 82-33), dated December 17, 1982, requires that each applicant submit a Procedure Generation Package (PGP) at least three months before the date of formal operator training on the upgraded procedures. Additional clarification was provided in NUREG-0578.

Background:

The initial C-E Owners Group analysis of Inadequate Core Cooling (ICC) is documented in Report CEN-117, "Inadequate Core Cooling. A Response to NRC IE Bulletin 79-06C, Item 6 for Combustion Engineering Nuclear Steam Supply Systems." This report was submitted to the NRC staff for review on October 31, 1979. Subsequently, "Operational Guidance for Inadequate Core Cooling" was prepared by the C-E Owners Group based on the analyses in Report CEN-117. This operational guidance was submitted to the NRC staff for review by the C-E Owners Group on December 10, 1980.

The initial C-E Owners Group analyses of transients and accidents (non-LOCA) are documented in Report CEN-128, "Response of Combustion Engineering Nuclear Steam Supply System to Transients and Accidents." This report was submitted to the NRC staff for review on April 1, 1980. The analysis in CEN-128 considered a single active failure for each system called upon to function for a particular event passive and multiple failures were not considered.

The initial C-E Owners Group development of emergency procedure guidelines was completed in the first quarter of 1980. These emergency procedure guidelines are documented in Report CEN-128. This report was submitted to the NRC staff for review on April 1, 1980. Early in 1981 workshops were held by the CE Owners Group (CEOG) to provide a formal process by which the emergency procedure guidelines documented in Report CEN-128 would be revised to account for multiple failure considerations. The revised emergency procedure guidelines were submitted to the staff on June 30, 1981 as CEN-152.

As documented in the Palo Verde Safety Evaluation Report (SER) dated November 1981, the CEOG submitted CE Emergency Procedure Guidelines (CEN-152) to the staff for review on June 30, 1981. These guidelines reflected the reanalysis of transients and accidents, and incorporates inadequate core cooling. Based on preliminary staff comments on the revised guidelines, CE and CEOG agreed to incorporate staff comments into a revised guideline (CEN-152, Revision 1).

Findings and Conclusions:

The licensee uses the Emergency Procedure Guidelines to develop the Emergency Procedure Generation Package (PGP). The PGP is then used to generate the Emergency Operating Procedures (EOPs).

As documented in Palo Verde SSER 6, the staff issued a safety evaluation which approved the CEOG Emergency Procedure Guidelines (CEN-152, Revision 1) on July 29, 1983. On July 15, 1983, the PGP for PVNGS 1-3 was formally submitted for staff review. The submitted PGP was separated into five parts as follows:

- A plant-specific technical guideline
- A plant-specific writer's guide
- A description of the program for EOP verification
- A description of the program for EOP validation
- A description of the program for training operators on the upgraded EOPs

NRR performed a review of each of the five parts and concluded that the licensee's program for preparing and implementing EOPs was acceptable. This TMI item is considered closed.

The inspector noted that three months following the staffs evaluation of CEN-152 Revision 2, the licensee committed to submit a schedule for revising the PGP to be in conformance with CEN-152 Revision 2 and the EOPs to be in conformance with the revised PGP. The Emergency Procedure Guidelines (CEN-152 Revision 2) was accepted by NRR in a letter dated April 16, 1985. A review of the implementation of the above commitment and a review of operator training will be verified during a future inspection (OI-85-19-01).

b. (Open) Item III.D.1.1, "Primary Coolant Outside of Containment"

Summary:

NUREG-0737 requires a program to reduce leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident to as-low-as practical levels. This program shall include the following:

(1) Immediate leak reduction

(a) Implement all practical leak reduction measures for all systems that could carry radioactive fluid outside of containment.

(b) Measure actual leakage rates with system in operation and report them to the NRC.

(2) Continuing Leak Reduction -- Establish and implement a program of preventive maintenance to reduce leakage to as-low-as-practical levels. This program shall include periodic integrated leak tests at intervals not to exceed each refueling cycle.

NRR reviewed ANPP's leak testing and leak preventative maintenance program and found them acceptable as documented in Palo Verde SSER 2.

At the time of the inspection, an actual measurement of leakage rates had not been performed.

This item will remain open pending a review of ANPP's measurement of actual leakage rates and subsequent report to the NRC.

11. Management Meeting

The inspector met with the licensee management representatives denoted in paragraph 1 on May 17, 1985. The scope of the inspection and the inspectors' preliminary findings as noted in this report were discussed.