U.S. NUCLEAR REGULATORY COMMISSION

Report No. 50-528/83-02

Docket No. 50-528 Licensee No. CPPR-141 Safeguards Group

Licensee: Arizona Public Service Company

P. O. Box 21666

Phoenix, Arizona 85036

Facility Name: Palo Verde Nuclear Generating Station - Unit 1

Inspection at: Palo Verde Construction Site, Wintersburg, Arizona

Inspection Conducted: January 4-7 and 17-21, 1983

Inspectors: P. P. Narbut, Reactor Inspector — 2/24/83 Date Signed

Date Signed

Date Signed

Approved by: T. Young Jr., Chief, Reactor Projects Section 2 — 2-25-83 Date Signed

Summary:

Inspection on January 4-7 and 17-21, 1983 (Report No. 50-528/83-02)

Areas Inspected: Unannounced inspection by a regional based inspector of allegations associated with Unit 1 welding and pipe fitting activities. The inspection involved 70 inspector-hours on site by one NRC inspector.

Results: Two items of noncompliance were identified. One item of noncompliance was identified by the allegations and concerned an undocumented weld in a safety-related floor drain (paragraph 3b). The other item of noncompliance was identified by independent NRC inspection and concerned failure to provide pipe hangers (paragraph 4.b).

DETAILS

1. Persons Contacted

a. Arizona Public Service Company (APS)

*E. E. Van Brunt, Jr., Vice President, Nuclear Projects Management
+*J. A. Roedel, Corporate Quality Assurance (QA) Manager
*D. B. Fasnacht, Nuclear Construction Manager
+*W. E. Ide, Site QA Supervisor
*R. J. Kimmel, Field Engineering Supervisor
*L. A. Souza, QA Engineer and Audit Supervisor
*B. S. Kaplan, Quality Systems Supervisor
*P. J. Moore, QA Engineer
K. Anderson, QA Engineer and APS Level III NDE Examiner
+D. Fowler, Construction
+A. Carter Rodger, Nuclear Projects

b. Bechtel Power Corporation (Bechtel)

*W. J. Stubblefield, Field Construction Manager
*R. M. Grant, Project Quality Control (QC) Supervisor
+*J. E. Pfunder, Site Project QA Engineer
D. R. Hawkinson, Project QA Supervisor
+M. A. Rosen, QC Engineer
T. Horst, Assistant Project Field Engineer
K. Jones, Structural Engineer
T. Villa, Structural Engineer
W. Shoaf, Piping Field Engineer
+*W. A. Miller, Project Field Engineer
+S. M. Nickell, Project Superintendent
J. Sabol, Pipe Support Engineer
H. Fredy, Assistant Resident Engineer
C. E. Berg, Unit 1 Superintendent

c. Hartford Insurance Company

R. Robbins, Authorized Nuclear Inspector

In addition, various other crafts, QC, and engineering personnel were contacted.

*Denotes those attending exit meeting on January 7, 1983.

+Denotes those attending exit meeting on January 21, 1983.

2. Background

Allegations regarding welding and piping were identified in a letter dated August 1, 1982, from the alleger to the NRC in Washington, D.C. The alleger was contacted by telephone by the Office of Investigations (OI) on December 7, 1982, and December 14, 1982. The alleger was interviewed by OI personnel on December 20, 1982. A total of ten allegations were made, eight of which were technical in nature. The eight technical allegations were inspected by NRC Region V personnel and are reported herein. Two of the eight technical allegations required additional investigation by OI and will be reported separately by OI. The remaining two non-technical allegations are being investigated by OI personnel and likewise will be reported separately by that organization.

3. Allegations Regarding Piping and Welding in Safety-Related Systems

a. Allegation: Regarding 14-inch stainless steel pipe to Safety Injection Tank 2A; the alleger provided a description of the location of the pipe and the personnel involved and stated:

> "When we started working the base metal developed black spots upon grinding and the tack welds were sugaring. This sugaring was not a normal condition for the metal and I knew it was not acceptable."

NRC Finding: The allegation was not substantiated.

The inspector contacted the alleger by telephone on December 29, 1982. The alleger stated, the black spots were round in appearance, were in the pipe base metal, and were about 1/16-inch in diameter, that there were several spots dispersed around the pipe, and that they were visible in the weld bevel area prior to welding.

Inspection established that the pipe spool in question was pipe spool S-003 on line E-159-GCBB-14" shown on DCN No. 19 to Drawing 13-P-SIF-136, Revision 10. The weld involved was W-004. The work was authorized on Modification Change Notice No. 1-10536-P. The modification changed the pipe spool designation from the vendors original designation of Spool 1 on subassembly 1-SI-159-S001 to S003 as described above.

The inspector examined the external surface of the pipe spool. No abnormalities were observed.

The inspector examined the vendors data report form (ASME Form NPP-1) for the spool in question. The code data report was certified by the Authorized Nuclear Inspector (ANI) on August 29, 1979, and showed that the pipe spool was in compliance to ASME Code Section III, Class 2, 1974 Edition through the Summer 1975 Addenda. The data report also showed the material to be welded pipe SA-312 TP 304. The data report also showed the original vendor welds had been radiographically examined and accepted.

The inspector examined the pipe vendors fabrication drawing for the subassesmbly in which the pipe spool was provided, Drawing F-203, Revision 2. The drawing showed the heat number of the spool in question to be F 70183. Piping material from the same heat number was used in two other spools in the subassembly which had likewise been successfully radiographed.

The inspector observed the pipe spool material had been certified acceptable by the vendors certification of compliance to chemical and physical properties dated September 11, 1979.

The inspector performed a code search for applicable requirements with the following results:

. Paragraph NC-2510 of the Code requires "Pressure retaining materials shall be examined and repaired in accordance with the material specification..."

. The material specification, SA-312, states in paragraph 3.1: "Material furnished under this specification shall conform to the applicable requirements of...Specification A-530..." SA-312 also requires testing for chemical and physical properties and a hydrostatic test in paragraphs 8, 9, and 10. In paragraph 12, SA 312 states only that "The finished pipes shall be reasonably stright and free from injurious defects..."

. The referenced specification, SA-530 and the test specifications referred to therein are silent regarding acceptance standards for defects in materials.

It is apparent the code requirements for piping materials depend on chemical and physical properties of the material coupled with hydrostatic test and non-destructive examination of weld joints to establish the material acceptability. There are no specific requirements for inclusions in the piping base metal. Some guidance can be extracted from the code in the section dealing with allowable indications in weld metal and adjacent piping base metal; that is, paragraph NC 5320 provides radiographic acceptance standards and allows a discontinuity of 1/4 inch for the pipe material thickness in question.

The inspector examined the radiographs of the weld in question and Radiograph Reports RT 23178, dated February 12, 1982, and RT 23326, dated February 19, 1982, with the APS Level III examiner. The radiographs were determined to be acceptable.

The inspector examined the hydrostatic test report for the pipe spool in question. The pressure test record is Test No. 1-4082-SI. The piping design pressure is shown as 700 psig. The pipe was tested at 890-910 psig and no leakage was observed. The test results were accepted by the field engineer and the quality control engineer on August 28, 1982.

The inspector noted the weld and adjacent piping base metal had also been liquid penetrant tested and accepted as shown on the field weld check list for weld W-004. Item 18A of the checklist was signed on March 12, 1982 indicating acceptance.

The inspector concluded the piping material was acceptable based on the absence of specific code requirements for inclusions, based on the satisfactory non-destructive examination results, and based on the satisfactory hydrostatic test results.

b. Allegation: Regarding a sump at the 40-foot elevation of the Auxiliary Building: The alleger provided location information and the names of personnel involved and stated:

> "His job was to remove a valve out of one of the four-inch lines. When he cut into the pipe and removed the valve, he found when he went to fit in the replacement valve that it was 1/2 inch short of the filling in the cut out section. He did fabricate a 1/2 inch section (pup) which he welded into the line. He buffed and ground the weld away from the valve so that there didn't appear to be a weld. PT check was made on these welds. No x-rays were done.
>
> This inserting of the 1/2 inch section of the pipe to fill in the space and then buff out the one weld so it isn't readily identifyable as a weld is contrary to construction practices I learned on installing piping in oil refineries or other nuclear power plants. I believe this rework was caused because the wrong type of valve had originally been installed and it had to be cut out and replaced with the right type of valve. I worked on these pipes during their original installation."

NRC Finding: The allegation was substantiated, however, the safety implications for operability were minimal.

The inspector initially examined the piping in the sump area and the piping and welding records for the line in question. The undocumented weld was not observed. The records did not indicate a 1/2-pup had been inserted.

The inspector recontacted the alleger January 6, 1983, and discussed in further detail the location of the undocumented weld. A reinspection of the piping revealed possible visual indications of an undocumented weld. Licensee personnel offered to perform a radiograph of the area which was performed on January 7, 1983. The inspector reviewed the radiograph with licensee personnel. The radiograph confirmed that an unauthorized weld had been performed and the weld surfaces on the outer diameter and inner diameter of the pipe had been ground evenly with the contour of the pipe to make visual detection of the weld difficult.

The undocumented weld is located on line B-012-XCCA-4" shown on Drawing 13-P-ZAE-200, Revision 6, Elevation View B. The line is a static head (unpressurized) floor drain to the sump. The sump serves five four-inch lines which are floor drains from various safety-related pump rooms and piping galleries and were considered safety-related due to cross room flooding considerations. Each line is isolated by a stop or check valve at the sump. The piping run is totally buried in concrete except for the approximately four-foot section that extends horizontally into the sump area and about a six-foot section that extends downward to the bottom of the sump.

Modification work was authorized by Field Change Request No. 31,061 of December 28, 1981; DCN No. 9 to 13-P-ZAE-200, Revision 6 of February 2, 1982; and MCN No. 1-10441-P of January 9, 1982. The modification involved removing a section of the horizontal pipe and installing a four-by-four-by-four-inch tee with a vertical run of four inch pipe and fittings and installing a one inch sockolet fitting on the remaining four-inch horizontal pipe and then installing a one inch vertical run of pipe and fittings on the sockolet. The centerline of the undocumented weld was located one inch north of the centerline of field weld FW-302 shown on MCN-1-10441-P. The toe of the sockolet weld (FW-303) overlapped the undocumented weld making it apparent that the undocumented weld was made before the sockolet weld was made.

The inspector reviewed welding records for the other weld joints involved in the modification and conducted interviews of the welders, quality control personnel, and the field welding engineer identified therein. Additionally, foreman who were identified as possibly involved in the work were interviewed. A total of twelve personnel were interviewed. None claimed responsibility for the unauthorized weld or acknowledged direct knowledge of its presence. One of the personnel interviewed acknowledged that he had heard a rumor to the effect that an unauthorized pup was installed but could not recall how he had heard it. Further interviews were conducted by OI investigators, and will be reported separately.

Bechtel Welding Standard WD-1, Revision 1, dated February 17, 1981, paragraph 1.3 states:

> "This procedure includes checklists and other forms to be used for documenting satisfactory accomplishment of the fabrication and examination processes. The use of these checklists and forms provides assurance that welding is performed and examined in accordance with specified procedures, that welding procedures and welders and/or welding operators are qualified in accordance with the ASME Code, Section IX, and that specified and certified materials are used for fabrication. Provisions are made for witnessing or inspecting by the Authorized Nuclear Inspector (ANI)."

The weld in question was unauthorized and was not documented in accordance with the specification above.

The installation of an unauthorized weld without documentation in line RD-B-012-XCCA-4", one inch north of weld FW-302 shown on MCN-1-10441-P is an apparent item of noncompliance (Enforcement item 50-528/83-02/01).

c. Allegation: Regarding a pump in the Radwaste Building; the alleger provided location information and stated:

> "While I was working on the 100 feet elevation of the Rad Waste Building in a small room with a relatively small pump that I understand moves rad waste material, an engineer, identity unknown, came into the room with three or four men. One of these men, I believe from what I heard of their conversation, was a manufacture's representative for the company who made the pump. The engineer was discussing the installation of a catch basin under the shaft that powered the pump. He was apparently dicussing this as he thought they would have leakage from the packing gland. I assumed the catch basin was to catch the waste leakage and then it would run into a floor drain. This did not seem proper to me for a pump moving rad waste material."

NRC Finding: The allegation was not substantiated in regards to the impropriety of installing a catch basin on a radwaste pump with leakage directed to a floor drain.

The inspector examined the pump in question which was determined to be a Moyno Inc. pump utilized in the solid radwaste system. The pump is tagged "Equipment Tag No. 1 NSRN Po2" and transfers waste from the Waste Feed Tank Mixer (SRN Q03 R20) to the Cement Processor (V 810 SRN Q01 R20) as shown on drawing 13-N-SRP-002, Revision 5.

The pump is mounted on a fixed pump skid which would collect any leakage from the pump shaft packing gland. The pump skid is fitted with drain piping to a floor drain in the pump room.

The floor drain directs any flow to the radwaste building sump as shown on drawing 13-M-RDP-004 (C-13), Revision 8. The sump collects any liquid from this room, and other rooms in the radwaste building such as valve galleries, the spent resin tank room and the dewatering pump room.

The sump is equipped with sump pumps which pump the collected waste from the sump to holdup tanks for processing.

The drain system in the radwaste building is treated as quality class "R."

The handling of any potential leakage from the radwaste pump shaft packing gland appeared to be typical and proper.

d. Allegation: Regarding pipe supports for large lines in the Main Steam Support Structure (MSSS), the alleger stated:

> "Myself and some of my co-workers are concerned that the pipe supports for the high pressure steam lines (24" to 30" in diameter) located where the piping passes through the Main Steam Support Structure (MSSS) are not adequate. The hangers themselves looked structurally adequate. Our concern is that these big heavy hangers holding these large steam lines are welded to only one inch-thick steel imbeds."

NRC Finding: The allegation was not substantiated in that review of the design calculations showed the embedments to be adequate.

The inspector examined the (MSSS) area and selected one hanger which appeared to have the smallest embedment plate. The hanger selected was SG 202-H001 described on a drawing of the same number Revision 2.

The hanger components are attached to a wide flange beam (W 24x76) shown on drawing 13-C-ZCS-710 Revision 8 (D-7).

The wide flange beam is attached to embedment plates (type "W") shown on drawing 13-C-ZCS-707, Revision 14 (D-7) at elevation 118'-10 3/4".

Type "W" embedments are described on drawing 13-C-00A-010, Revision 22 as two feet long, 18 inches wide and 1 1/4 inches thick attached to the concrete with six anchor bolts 22 inches long and 1 1/4 inches in diameter.

The inspector examined the embedment plate length and width the number of anchor bolts and bolt diameter and found them to be in accordance with the drawing requirements.

The inspector obtained the Bechtel calculations for the wide flange beam and the embedment capacity. These were reviewed by another NRC inspector experienced with structural design calculations. The calculations were checked for proper analytical approach, and for validity of assumptions. The shear connection strength was found to be within code allowables on the anchor bolts and the concrete. Therefore, it is concluded that the embedments used to support hanger SG 202-H001, associated piping loads and other structural loads appear to be adequate.

e. Allegation: Regarding laminations in 10 inch piping lines at the roof top of the control building, the alleger provided location information and the names of involved personnel and stated:

> "When I was working on some 10 inch piping at the 156 feet elevation (roof top) of the Turbine Building and the Control Building I observed cold laminations in this carbon steel piping.
>
> "When I started preparing this piping for welding and wire brushed the light greenish gray primer paint away I readily saw the cold laminations.
>
> "There are three chillers on the roof. This 10-inch pipe with the laminations is connected to the center chiller on the roof. This line reduces down to a four-inch pipe. I believe this pipe would now be insulated to protect it from the hot desert heat."

NRC Finding: The allegation was not examined after it was determined the lines in question were not safety-related.

The inspector examined the area and observed the insulation on the piping in question. The line in question was determined to be the piping from normal chilled water pump B discharge to Valve 1 PWCNV-115.

The piping is shown on Drawings 13-M WCP 001, Revision 10, and 13-P-WCP 202, Revision 6. The line is shown as 021-HBDB-10".

The chilled water system furnishes chilled water to the cooling coils of the air-handling units of the normal heating, ventilating, and air-conditioning (HVAC) systems for the containment, control, auxiliary, and radwaste buildings, and the nonnuclear process sampling system.

The chilled water system does not operate in an emergency and power to the chiller and circulating pump will trip.

Essential cooling is provided by another system, the essential cooling water system.

The Palo Verde Final Safety Analysis Report (FSAR), paragraph 9.2.9.1.1.1, states:

> "There is no safety design basis for the normal chilled water system."

The safety-related system, the essential chilled water system, is described in paragraph 9.2.9.2 of the FSAR which states:

> "The essential chilled water system provides the required chilled water flow for the following systems:

- Control room essential ventilation system
- Engineered safety features (ESF) switchgear, electrical penetration room cooling system
- Engineered safety features (ESF) equipment room cooling system
- Auxiliary feedwater pump room cooling system
- Essential cooling water pump room cooling system"

On the basis that the piping in question was not safety-related, the inspector identified the pipe specifics and the charge of laminations in that pipe to the responsible licensee representatives for their consideration and action if appropriate.

f. Allegation: Regarding a Large I beam in the Radwaste Building the alleger stated:

> "I am concerned the way welding was done for attaching piping supports to a large I beam with estimated dimensions of 12 inches in width by 30 inches to 36 inches in height located in the Rad Waste Building. This beam I believe is located at the 40 feet elevation. This beam is located at same elevation as the sump pump I discussed previously. The pipe support I am concerned about is welded onto this beam at about mid-span. I am concerned that this pipe support is welded across the width of the beam. I have always been taught to not weld across a beam as it weakens the beam. You can weld with the length of the beam and not have a degrading effect upon the steel." The alleger also provided a sketch of the area in which the I beam in question was located.

NRC Finding: The allegation was not substantiated in that there are no Code or Standard restrictions against welding across the width of an I beam. The inspector examined the I beam in question and selected the largest weld across the I beam flange for further study. The largest weld was associated with a safety injection line hanger, hanger 13-SI-307-H-005 shown on a drawing of the same number, Revision 5. The weld examined was the 5/16 inch fillet weld of a six-by-six-inch box beam (Item C) to the I beam (W 14x53). The inspector verified the weld size by measurement.

A code search of the AISC Manual of Steel Construction, Seventh Edition and the Structural Welding Code AWS D.1.1-1975 revealed no restriction on welding across the flange of an I beam other than a requirement in Section 7 of AWS D.1.1, paragraph 7.5.1 which states in regard to strengthening or repairing existing structures:

"The Engineer shall determine whether or not a member is permitted to carry live load stress while welding or oxygen cutting is being performed on it, taking into consideration the extent of cross section heating of the member which results from the operation that is being performed."

This section of the welding code could be considered guidance during construction of a large structure. The licensee's engineer (Bechtel) has included requirements in Procedure WPP/QCI No. 101.0, Revision 20, Welding Control, paragraphs 5.3.1 and 5.3.2, which provide the following engineering determinations:

"5.3.1 Welding across the bottom flange (tension flange) of an existing steel beam shall be limited to a weld length of twenty-five percent (25%) of the beam flange width, unless the weld size (throat thickness) is equal to or less than 0.75 times the flange thickness. The preheat and interpass temperatures shall be controlled at 500° F or less. Temperature indicating crayons may be used to verify the preheat and interpass temperatures.

5.3.2 Weld length is unlimited when welding parallel to the flange of an existing steel member."

The code section and the engineers procedure appear to be restrictions pointed at personnel safety during the process of erection using heat producing operations rather than restrictions which affect the final structural adequacy of the building.

The inspector measured the I beam flange thickness and determined it to be 3/4 inch which allows an unrestricted length of 5/16 inch welds. Therefore, the installation met the engineers procedural restrictions.

g. Allegation: In regards to siting concerns the alleger stated:

"In my letter to the NRC dated August 1, 1982, in the fourth paragraph I stated, "I do not know who inspected and approved the project site, but they overlooked two (2) very important items, one of them only a mile away." When I wrote this I was referring to the two old volcanoes that are located nearby to the site. I estimate one is one mile or 1 1/2 miles in front of Unit No. 1. The other one is down the road 4 or 5 miles. When I stayed at the Palo Verde Inn, located about 6 miles away, the water used at the Inn when it comes out of the ground is so hot that during the summer you can use it without adding hot water to take a shower. I feel there is a potential for problems because the hot water coming out of the ground indicates there is still a great deal of heat in this old volcanic area."

NRC Finding; None. This item will remain open pending evaluation by NRC Licensing.

This allegation has been forwarded to Geosciences Branch, Division of Engineering, Office of Nuclear Reactor Regulation of the NRC for evaluation.

Section 2.5 of the FSAR addresses the seismology of the site area. The seismology was evaluated in the NRC's Safety Evaluation Report for Palo Verde and its supplements (NUREG 0857 and Supplements Nos. 1, 2, and 3).

This item will be considered open until the alleger's concerns are specifically addressed. (Follow-up item 50-528/83-02/02)

h. Allegation: Regarding cold springing of pipe the alleger provided location information and the names of other persons involved. No formal statement was obtained for this allegation, however, the investigators notes indicated that an elbow out of a heat exchanger had been cold sprung (forced) into position for welding. Porta-powers (jacks) and come-a-longs (winches) were used to rotate the elbow and the piping it was attached to about 3/4 of one inch. Sufficient force was used to fail a nylon strap. Upon forced fitup, the tack welds were put in but the next welder refused to complete the weld. The pipe was then relaxed and the alleger left the area.

NRC Finding: The allegation was substantiated in that abnormal force was used per the statements of involved personnel and the alleged amount of cold springing exceeded the allowable amount in the licensee's procedures.

The inspector examined the piping in question and determined that it was a section of 20 inch essential cooling water line EW-001-HBCB-20, S002, shown on drawing 1P-EWF-201-1.

During the examination of the piping, the licensee representative accompanying the inspector declared that the licensee staff had been investigating a charge of cold springing on that same pipe. The licensee had conducted interviews of involved personnel and initiated an evaluation by Bechtel.

The inspector examined the licensee's information and determined the two allegations involved the same occurrence.

The piping involved was a 20-inch diameter pipe extending vertically down from the bottom of the "A" essential cooling water heat exchanger for approximately 7 feet and terminating in a 90^{0} elbow. The elbow was allegedly cold sprung (rotationally) about 3/4 inch (i.e., the pipe was in torsion).

The work being performed at the time of the occurrence was a modification in accordance with Modification Change Notice (MCN) No. 1318 dated February 1, 1980, and Field Change Request (FCR) No. 7903-P dated January 23, 1980, which removed a 6-inch length of pipe and replaced it with a 1'6 1/2" length, to be fit up to the horizontal run of pipe from the elbow.

The inspector examined the piping and welding records for the spool in question. The inspector verified that no record of cold springing had been made as is required by the licensee procedure.

The licensee Procedure WPP/QCI No. 202.0, Piping System Installation, Revision 15, and Specification 13-PM-204 allow limited amounts of cold springing of pipe to acheive fitup. Table II of 13-PM-204 shows that 52 feet of 20-inch diameter pipe would be required to accommodate 3/4 inch of cold spring. In this occurrence only approximately seven feet of pipe were available.

The inspector interviewed six personnel who were involved in the modification or in the work area at the time of the occurrence.

The information gathered confirmed the information gathered by the licensee interviews. The elbow and vertical pipe had been sprung into position using two come-a-longs and a porta power jack. Fitup and tack welding were accomplished on joints FW 302 and FW 301 on September 17, 1980, in this position. The rigging was then relaxed due to fear of getting caught. The pipe sprung back to a relaxed condition causing a mismatch at a unmade weld joint further down the line, weld W-003. The mismatch at weld W-003 was properly identified and corrected by recutting weld joint FW-302 realigning the pipe and rewelding (as joint FW-302C) on January 27, 1981 as authorized by MCN 1-2609 dated December 10, 1980.

The NRC Office of Investigations is conducting further interviews in this matter and will report their findings separately.

The piping as currently installed is no longer stressed. However, the excessive force used for initial fitup has not been analyzed for the possible effects on the piping which was cold sprung and the heat exchanger to which the piping was attached when it was cold sprung. These concerns were identified to the licensee on February 22, 1983, by telephone and will be followed up in a future inspection. (Follow-up item 50-528/83-02/03)

The licensee was also requested to assess the degree of confidence they have in general craft adherence to the cold springing requirements in the completion of their investigation of the allegation.

The regional assessment of the safety significance of this issue is as follows:

The ASME Boiler and Pressure Vessel Code does not have any specific restrictions for cold springing of pipe to acheive fitup. Paragraph NC 4231 states in regard to fitting and aligning methods that:

> "Parts that are to be joined by welding may be fitted, aligned and retained in position during the welding operation by the use of bars, jacks, clamps, tack welds or temporary attachments."

This would indicate that some degree of cold springing is anticipated.

Paragraph NC-3651, regarding stress analysis of piping systems states:

> "The design of the complete piping system shall be analyzed between anchors for the effects of thermal expansion, weight, and other sustained and occasional loads."

The term "other sustained loads" indicates the designer must include some consideration of cold springing stresses in his analysis of piping.

Therefore, the licensee has been asked to assess the degree by which his stress analysis accommodates cold springing of piping, that is, to what degree the cold springing limits in his field fabrication procedures are conservative, if at all.

The regional observations of piping work at Palo Verde have not indicated cold springing problems. The resident NRC construction engineer stated he has observed cold springing during his surveillances but within the procedural cold springing limits.

During the same time period that the cold springing occurrence was happening on the "A" Essential Cooling Water Heat Exchanger, cold springing being performed on the "B" Heat Exchanger piping in an adjacent compartment was questioned by QC personnel. Nonconformance report, NCR Number PA-1634 dated September 24, 1980 was written. The result of the NCR's investigative action was that the piping restraints were relaxed and the pipe movement measured. It was determined that the resultant movement met the procedural requirements. This NCR indicates the licensee's quality assurance system does focus attention on questionable cold springing occurrences.

The hydrostatic and functional tests performed on the systems in question prior to operation and the periodic tests performed as part of the inservice examination program provide assurances of operability of the systems. Additionally, the redundancy of the systems in question provide assurance of operability.

Based on the above, the inspector does not consider the substantiated allegation to be of immediate concern. This item will remain open pending the results of the licensee's investigation and the assessments discussed above.

4. Other items identified during the inspection not related to the allegations

a. During the investigation of the allegation described in paragraph 3a above dealing with 14 inch stainless steel pipe from the Safety Injection Tank, the inspector noted the piping welds had not been ground smooth for ultrasonic examination which is required for the preservice baseline examination required by 10 CFR 50.55a and the ASME Code 1974 Edition (to which the licensee is committed). The licensee provided letter ANPP-21983 WFQ/KEJ dated October 1, 1982, which was a preservice examination relief request to NRC Division of Licensing. The request proposes to use the 1977 Edition of the ASME Code for certain examination exemptions which would include the pipe in question. The inspector confirmed that NRC licensing personnel had the relief request for action and informed them of the field conditions observed. No further Region V action is required on this matter.

b. During the investigation described in paragraph 3, regarding an undocumented weld in floor drain piping, the inspector noted that the vertical piping added to the sump area piping by modification MCN No. 1-10441-P of January 9, 1982, did not include pipe hangers for the added sections of pipe.

The vertical sections of pipe were easily moved by hand; it appeared restraints were necessary to meet seismic criteria. The inspector verified that construction of the system was complete, and the piping had been inspected to specification and drawing requirements and turned over to APS startup. There were no outstanding items on the system (in regards to the pipe hangers) on the APS Master Tracking System.

The inspector determined that no hangers were specified on the applicable drawing, Drawing 13-P-ZAE-200, Revision 6. Therefore, the error appears to be an engineering oversight. Revision 6 to the drawing incorporated the design changes of Drawing Change Notices (DCN) No. 7 and 8 which added the piping. The inspector discussed the piping with the assistant resident engineer who approved the design changes. The inspector understood his explanation to be that he had overlooked

the need for hangers and that the home office review of the modification did not note the absense of hangers since the hanger group did not review the modification. The hanger group did not review the modification because they were not involved in approving the original drawing. They were not involved in the original drawing because the piping is embedded in concrete and did not require hangers (including the short section of non embedded piping which extended into the sump area).

The responsible engineer stated that as a result of the inspector's questions analysis had been performed and it was determined that hangers were required on each of the vertical lines. He stated that these hangers were being designed and would be installed upon the issuance of a design change. Licensee personnel stated the design change numbers will be DCP-1-1SS-RD-013, 2-CS-RD-013 and -3-CS-RD-013 for units 1, 2 and 3 respectively.

The responsible engineer also checked whether the licensee's IE Bulletin 79-14 program would have caught the hanger omission. The IE Bulletin 79-14 program checks the as-built piping systems against the seismic analysis assumptions to ensure the seismic analysis has not been invalidated by constructed differences in configuation. The engineer determined that the floor drain piping was not included in the IE Bulletin 79-14 program since the hanger group was not involved in the original design. Therefore, the program did not catch the hanger omission as it would have in a normal hangered piping system.

The Radioactive Drain piping system for the essential safety features equipment rooms is Seismic Category I, Quality Class Q as described in the Palo Verde Systems Descriptions Manual paragraph 2.4.

The failure to provide pipe supports for piping lines RD-B-153-XCCA-3" and RD-A-151-XCCA-3", the one inch lines to valves V049 and V051 (from lines RD-A-006-XCCA-4' and RD-B-012-XCCA-4" respectively) shown on drawing 13-P-ZAE-200, Revision 6 is an apparent item of noncompliance (Enforcement item 50-528/83-02/04).

5. Exit Interview

Exit interviews were conducted on January 7 and 21, 1983, with the personnel designated in paragraph 1 above. The technical issues of the allegations completed at the time of the individual exits were discussed. The independent inspector findings not related to the allegations (discussed in paragraph 4) were also discussed.