ARIZONA PUBLIC SERVICE COMPANY
P. O. BOX 21666 · PHOENIX, ARIZONA 85036

February 1, 1984
ANPP-28770-EEVB/ACG

Mr. John B. Martin
Regional Administrator
U.S. Nuclear Regulatory Commission
Region V
1450 Maria Lane, Suite 210
Walnut Creek, California 94596

Dear Mr. Martin:

Please substitute the attached pages 29 and 30 of Attachment C for the corresponding pages of such attachment enclosed with the advance copy sent to you yesterday of the letter, dated January 31, 1983 (ANPP-28749-EEVB/WEI) from E. E. Van Brunt, Jr., Vice President, Nuclear, Arizona Public Service Company, to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, which constitutes the Response to Enforcement Letter and Notice of Violations, dated December 12, 1983, File: 84-070-026.

Such response of Arizona Public Service Company will be sent formally today by certified mail.

Very truly yours,

E. E. Van Brunt

E. E. Van Brunt, Jr.
Vice President, Nuclear

EEVBJr:ACG:jaw

Attachment

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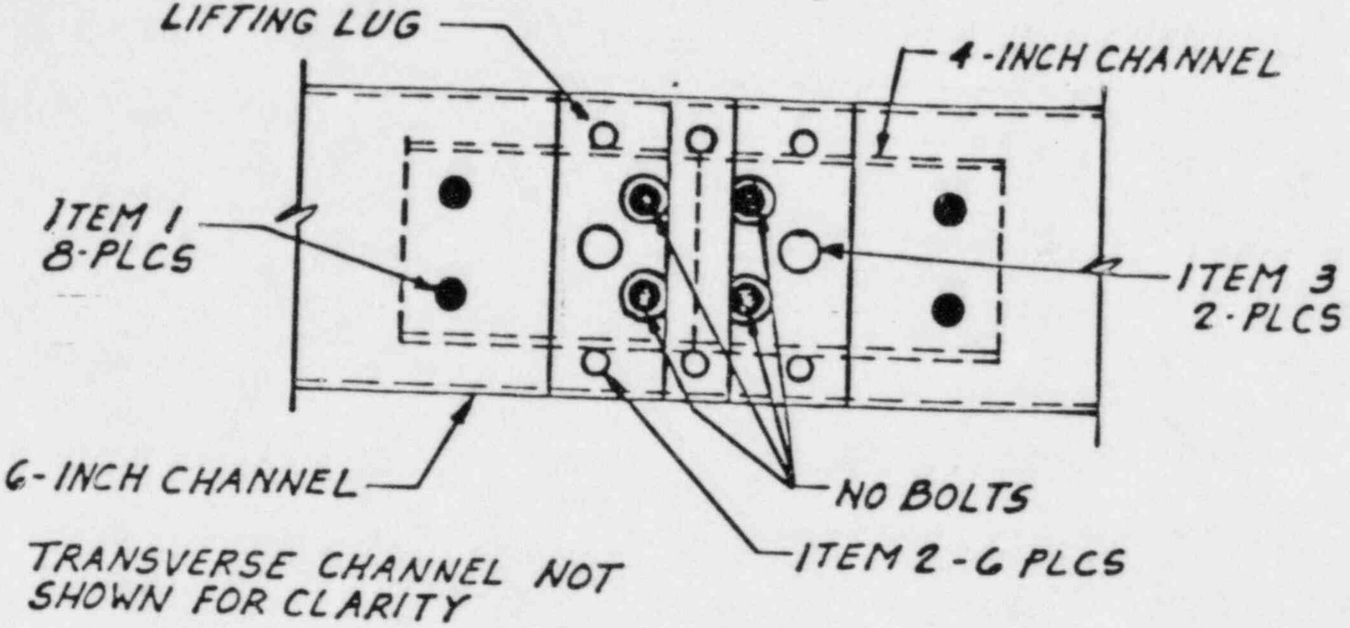
FIGURE 1 - FRONT LIFTING LUG ASSEMBLY (Two per cabinet)



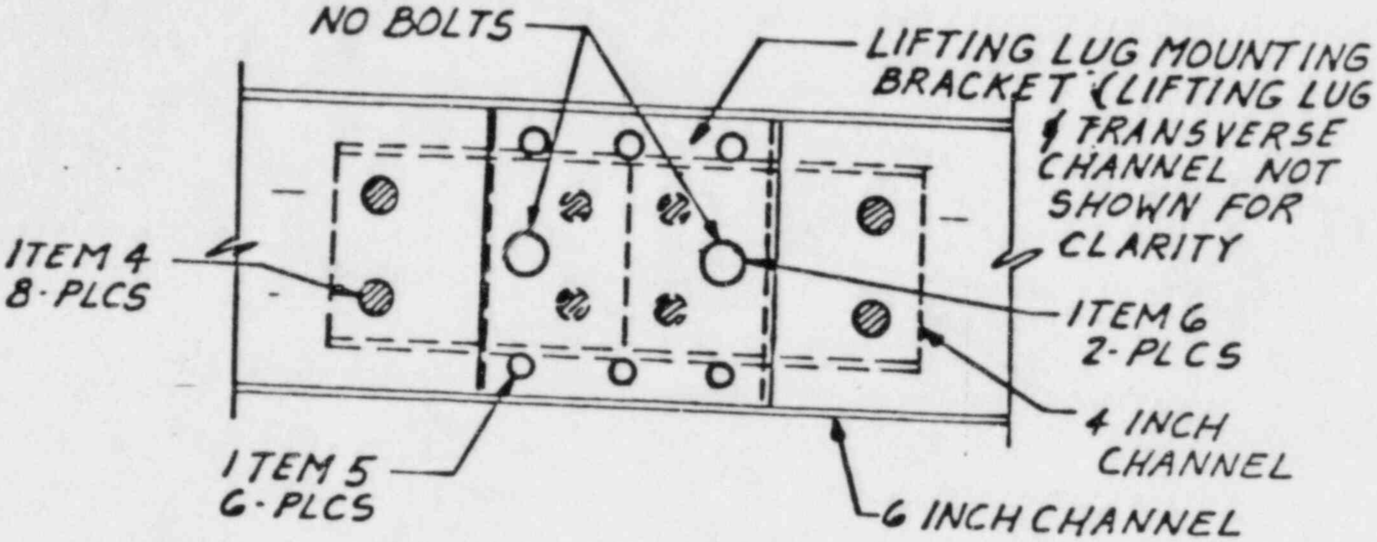
Item 1 - Holes for 3/8 inch diameter mounting bolts which attach the C4 support girt to the C6 base. These bolts are required after lifting lug removal.

Item 2 - Mounting holes for the lifting lugs attachment bolts. No bolts are required after lifting lug removal.

Item 3 - Holes for 5/8-inch diameter bolts used to attach the lifting lug. These bolts are not required after lifting lug removal.

Note A - After lifting lug removal 2-5/8-inch diameter bolts (Item 3) may be installed as a substitute for the 4-3/8-inch diameter bolts (Item 1).

FIGURE 2 - BACK LIFTING LUG LOCATION (Two per cabinet)



Item 4 - Holes for 3/8-inch diameter mounting bolts which attach the C4 support girt to the C6 base (See Note B).

Item 5 - Mounting holes for the lifting lug attachment bolts. No bolts are required after lifting lug removal.

Item 6 - Holes for 5/8-inch diameter bolts used to attach the lifting lug. These bolts are required to be reinstalled after lifting lug removal.

Note B - The C6 lifting lug mounting bracket, which is welded in place, covers the four middle 3/8-inch diameter bolt locations. This makes installation of the middle 3/8-inch diameter bolts impossible. The two 5/8-inch diameter bolts shall be reinstalled as a substitute after lifting lug removal.

December 7, 1983
EN 83-79

OFFICE OF INSPECTION AND ENFORCEMENT
NOTIFICATION OF SIGNIFICANT ENFORCEMENT ACTION

Licensee: Arizona Public Service Company
Palo Verde Nuclear Generating Station, Unit 1
Docket No. 50-528

Subject: Proposed Imposition of Civil Penalties - $80,000

This is to inform the Commission that a Notice of Violation and Proposed Imposition of Civil Penalties in the amount of $80,000 will be issued on or about December 12, 1983 to the Arizona Public Service Company. This action involves the failure to maintain an adequate quality control program for systems turned over to Operations and Startup from construction and falsification of records relating to electrical termination cards.

It should be noted that the licensee has not been specifically informed of the enforcement action. The regional Administrator has been authorized by the Director of the Office of Inspection and Enforcement to sign this action. The schedule of issuance and notification is:

Mailing of Notice	December 12, 1983
Telephone Notification of Licensee	December 12, 1983

A news release has been prepared and will be issued about the time the licensee receives the Notice. The State of California will be notified.

The licensee has thirty days from the date of the Notice in which to respond. Following NRC evaluation of the response, the civil penalty may be remitted, mitigated, or imposed by Order.

Contact: Gerald Klingler, IE 24923 J. Axelrad, IE 24909

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PRELIMINARY INFORMATION - NOT FOR PUBLIC DISCLOSURE UNTIL DECEMBER 12, 1983

~~8312140066~~ PDR

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

Docket No. 50-528
EA 83-30
EA 83-130

DEC 12 1983

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

Attention: Mr. T. G. Woods Jr.
Executive Vice President

Gentlemen:

A special construction appraisal inspection was conducted by this office on September 6-16, 26-30, October 31 and November 1, 1983, of activities at the Palo Verde Nuclear Generating Station authorized by NRC Construction Permit No. CPPR-141. A report of the results of the inspection, No. 50-528/83-34, was forwarded to you on November 11, 1983. The inspection concentrated on an examination of hardware and was intended to assess whether the construction of Unit No. 1 had been performed in accordance with quality requirements by comparing the as-built condition to the design requirements. The results of this inspection, along with the results of a special inspection referenced below, were discussed on November 23, 1983 during an enforcement conference held at the Region V offices between Mr. K. Turley, Chairman of the Board, Mr. T. G. Woods, Jr., and other members of your staff, and Mr. J. B. Martin and other members of the NRC staff.

The results of the inspection revealed several violations of NRC requirements. We are concerned that these violations indicate that your management systems and quality assurance program are not fully effective. The majority of these deficiencies appeared to be minor in nature but some were significant and reflected a weakness in quality assurance and/or a lack of management control by the Arizona Public Service Company's Operations and Startup Groups. Although the inspection focus was on construction, a number of problems identified indicate that deficiencies may have resulted from activities performed after the systems or components had been turned over to Operations and Startup. We are concerned with the difficulty in reconstructing the circumstances which led to the deficiencies found. For example, it wasn't until the enforcement conference that the circumstances concerning capping of the containment pressure sensing lines became clear.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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We are also concerned with the number of construction defects found in the as-built and accepted items that should have been identified by your quality control inspections. Notwithstanding that most of the items may be considered minor in nature, the number of such items reflects adversely on the quality of the final quality control inspection effort of your quality assurance program at the time of system turnover to operations. Although further opportunities existed to detect these deficiencies prior to plant operations, our concern is that they had already evaded several management and quality assurance controls. This failure to detect deficiencies raises a question of the effectiveness of those controls.

A special inspection was also conducted during the period between June 1, 1982 and March 11, 1983. A report of that inspection was sent to you April 22, 1983, at which time we indicated that enforcement action concerning the apparent violation discussed in the report would be the subject of later correspondence. The findings of the special inspection disclosed that certain records of safety-related electrical terminations, that you had required to assure proper control of quality, had been signed by craftsmen other than those who actually had done the work and the records also identified crimp tool numbers other than those used to do the work. This was done with the knowledge of the supervision of the responsible craftsmen. NRC places great emphasis on the integrity and credibility of persons performing safety-related activities and the accuracy of the records of such activities. As you are well aware, the records must truly reflect the quality of the work activities. Preparation of inaccurate or misleading quality-related records is considered by the NRC to be a very serious matter, especially when such action is being directed by or with the knowledge of supervisory personnel.

To emphasize the need for Arizona Public Service Company management to ensure implementation of an effective quality assurance program that controls all phases of safety-related activities, that identifies and corrects deficiencies, and that assures that information recorded in safety-related documents is accurate, we propose to impose civil penalties for the items set forth in Section I of the Notice of Violation that is enclosed with this letter. We recognize that NRC's handling of the violation concerning the electrical termination records has been untimely as explained to you at the enforcement conference. The violations in the Notice have been categorized at the severity levels described in the General Statement of Policy and Procedure for Enforcement Actions, 10 CFR Part 2, Appendix C. The base value for each Severity Level III violation is Forty Thousand Dollars ($40,000). After consultation with the Director of the Office of Inspection and Enforcement, I have been authorized to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties in the cumulative amount of Eighty Thousand Dollars ($80,000).

You are required to respond to the enclosed Notice of Violation and Proposed Imposition of Civil Penalties and are requested to respond to the Notice of Deviation. In preparing your responses, you should follow the instructions specified in the Notices. Your responses should address the corrective actions taken or planned including those actions necessary to assure control of activities that may affect safety-related structures, systems, and components. Your written reply to this letter and Notices will be the basis for determining whether additional enforcement actions are warranted.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosure will be placed in the NRC's Public Document Room.

Sincerely,

John B. Martin
Regional Administrator

Enclosures:
1. Notice of Violation and Imposition of Civil Penalty
2. Notice of Deviation

cc w/enclosures:
J. Bynum, APS
E. E. Van Brunt, Jr., APS
G. C. Andognini, APS
K. Turley, APS

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Sincerely,
Original Signed by
John B. Martin

John B. Martin
Regional Administrator

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cc w/enclosures:
J. Bynum, APS
E. E. Van Brunt, Jr., APS
G. C. Andognini, APS
K. Turley, APS

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APPENDIX A

NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTIES

Arizona Public Service Company
Palo Verde Nuclear Generating Station
Unit No. 1

Docket No. 50-528
Construction Permit No. CPPR-141
EA 83-30
EA 83-130

A special inspection to assess the adequacy of construction activities at the Palo Verde Nuclear Generating Station Unit No. 1 was conducted during the period of September 6 through November 1, 1983. The results of this inspection indicate violations of regulatory requirements as set forth in Section I below. The violation in Section I indicates that the licensee's quality assurance program has not been fully effective in assuring that activities conducted subsequent to construction did not degrade safety-related structures, systems, and components. The items in Section II below, although mostly minor in nature, reflect inadequate quality control inspection of a large number of deficiencies which should have been identified during final quality control inspections.

The NRC staff recognizes that further opportunities existed for your management and Quality Assurance systems to detect these deficiencies prior to plant operations. Our concern is that these deficiencies had eluded several levels of management and Quality Assurance controls already.

The NRC is concerned that the inspectors were, in many cases, unable to determine from the records whether the defective conditions were a result of inadequate construction or whether the conditions were the result of uncontrolled activities after construction completion. We are also concerned with the difficulty in reconstructing the circumstances which led to the deficiencies found. For example, it wasn't until the enforcement conference that the circumstances concerning capping of the containment pressure sensing lines became clear.

Another special inspection was conducted during the period of June 1, 1982 through March 1, 1983, the results of which disclosed that information recorded on certain safety-related electrical termination records was inaccurate. The item is also included in Section I below.

To emphasize the need for improvements in implementation of an effective quality assurance program that assures the accuracy of recorded information, controls all phases of safety-related activities and identifies and corrects deficiencies, the Nuclear Regulatory Commission proposes to impose civil penalties in the amount of Eighty Thousand Dollars ($80,000). In accordance with the NRC Enforcement Policy, 10 CFR Part 2, Appendix C, and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205, the particular violations and the associated civil penalties are set forth in Section I below:

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I. VIOLATIONS ASSESSED CIVIL PENALTIES

A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part that: "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety."

Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality as evidenced by the following examples:

1. On September 10, 1983, it was determined that the containment pressure instrumentation was incapable of performing its intended safety function in that caps had been installed on the sensing lines. Construction of the containment and pressure sensing systems had been completed, turned over from the constructor to the licensee, and tested. Subsequently, the quality assurance organization directed that the caps be installed without following established QA procedures for correcting potential deficiencies. No administrative requirement existed to assure that the caps would have been discovered until the next scheduled containment leak rate test, pursuant to the operating license requirements. This containment pressure instrumentation is required to automatically initiate the HPSI and other safety systems on high containment pressure.

2. On September 7, 1983, the manual operator for valve SI V470 on the suction of the HPSI "A" pump was disconnected and resting on the sprinkler system piping. Construction of the subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition which included a missing stud nut and leaking flange.

3. On September 28, 1983, the position indicator for valve SI V402 on the suction of the HPSI "B" pump was positioned so that the valve could only be opened 30 to 35 percent of its full open position. Construction of this subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition.

4. On September 14, 1983, 87 3/8-inch bolts were missing from the base frames for six motor control centers (MCC) of the vital AC onsite power distribution system. These bolts are necessary to ensure the structural integrity of the MCCs.

This is a Severity Level III Violation, (Supplement II).
(Civil Penalty-$40,000)

B. Criterion V of Appendix B to 10 CFR Part 50 requires that, "Activities affecting quality shall be prescribed by documented instructions...and shall be accomplished in accordance with these instructions...." Also, Criterion XVII requires that, "Sufficient records shall be maintained to furnish evidence of activities affecting quality...." Bechtel work plan procedure/quality control instruction WPP/QCI-255.0, "Cable Terminations," requires that termination installation cards be completed for all Class 1E electrical terminations. These cards include the signature of the electrician making the termination and the crimp tool number of the crimp tool used to make the termination.

Contrary to these requirements, the record of Unit 1 Class 1E electrical termination 1ESI22AC1RE2 dated November 13, 1981 was signed by an individual other than the person who actually performed the work as documented. Additionally, the serial number of the crimp tool used on this termination record appears not to be the serial number of the crimp tool actually used to make the termination. Approximately 50 to 100 of the estimated 7,000 to 8,000 termination cards for the class 1E electrical terminations may have been similarly completed by individuals other than those who had performed the work.

This is a Severity Level III Violation (Supplement VII).
(Civil Penalty $40,000)

II. VIOLATIONS NOT ASSESSED A CIVIL PENALTY

A. Appendix B of 10 CFR 50, Criterion V, as implemented by Chapter 17 of the licensee's PSAR and FSAR requires, in part, that: "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, or drawings."

1. The separation and identification criteria as identified in the FSAR Section 8.3.1 are described, in part, by the following Bechtel Documents: (a) "Cable and Raceway Physical Separation Guide," Drawing 13-E-ZAC-077, Revision 2, and (b) "Installation Specification for Cable Splicing, Termination and Supports," Specification No. 13-EM-306, and "The Installation Specification for Electric Cables and Cable Trays," Specification No. 13-EM-300.

   Tray fill requirements in the above specifications requires that cabling in random filled cable trays shall not extend above the siderails of the tray.

   Contrary to the above requirement, in random filled tray 1EZJ4AATSCE, cables were projecting above the level of the tray siderails.

   This is a Severity Level IV Violation (Supplement II).

2. The separation requirement, as described in the above specifications, identifies the minimum separation distance between safety-related open-top trays and non-safety-related totally enclosed trays or raceways (conduct) as one inch.

   Contrary to the above requirements:

   a. Non-safety-related conduit 1EZADCNRQ506 for thermostat 1EQFNT1243C in HPSI A pump room was separated from safety-related group 1 junction box 1EZACCAKKJ03 by less than one inch.

   b. At diesel generator E-PEA-G01, non-safety-related flexible conduit 1EZG1ANRX11 at junction box 4 was in contact with safety-related flexible conduit 1EZG1AARR20 at junction box 6.

   c. In 4160-volt switchgear cubicle E-PBA-503L, non-safety-related flexible conduit 1EZJ1ANRR52 was separated from safety-related wiring by less than one inch (required separation is one inch).

   d. In 4160-volt switchgear cubicle E-PBA-503K, non-safety-related flexible conduit 1EZJ1ANRR51 was separated from safety-related wiring by less than one inch (required separation is one inch).

   This is a Severity Level IV Violation (Supplement II).

3. The separation requirement as described in the above specifications requires that each circuit and raceway be given a unique permanent alphanumeric identification and colored dots (round emblems) along their lengths at intervals not greater than 15 feet.

   Contrary to the above requirements:

   a. A separation group 1 cable tray located in HPSI pump room A was not marked with red color identification (round emblems) between points 1EZACEATCBA and 1EZACCARC03.

   b. Round blue identification emblems were missing from channel D conduit (PT-351) for a distance of approximately 40/50 feet at the 120-foot elevation.

   c. Temporary alphanumeric identification on cable tray 1EZAIDBTXF had not been replaced with permanent identification.

   This is a Severity Level IV Violation (Supplement II).

4. IEEE Standard 384-1974, "Criteria for Separation of Class IE Equipment and Circuit Breakers," endorsed by the Licensee in Section 8.3.1 of the FSAR in Section 5.1.2, states, in part, "Exposed Class IE Raceways shall be marked in a permanent manner at points of Entry and Exit from an Enclosed Area."

Contrary to the above requirements, at the time of the inspection the following separation group I conduits were not identified by alphanumeric markings:

a. Conduits 1EZJ1AARC12, 14, and 16 on both sides of the wall between group I, 4.16 KV switchgear area and channel A remote shutdown panel area at the 100-foot elevation.

b. Conduit sleeves 1EZJ1BARC13, 14 and 15 on control building wall in channel B remote shutdown area at the 100-foot elevation.

This is a Severity Level IV Violation (Supplement II).

B. Appendix B of 10 CFR 50, Criterion V, as implemented by Chapter 17 of the licensee's PSAR and FSAR requires, in part, that: "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, or drawings."

Contrary to the above requirement and the specifications listed below, the following conditions existed at the time of the inspection.

1. Section 11.0 of Bechtel Specification 13-~~CM-~~320, "Erection of Structural and Miscellaneous Steel," states, in part, "Installation shall be in accordance with AISC Specification for Structural Joints using ASTM A325 or A490 bolts." Paragraph 5(a) of the AISC specification requires that A325 bolts, 7/8-inch diameter be tightened to at least a minimum tension of 39 Kips. An acceptable method of obtaining this tension is described in paragraph 5(e), "Turn-of-Nut Tightening," which requires that bolts be brought to a "snug tight" condition plus an additional 1/3 to 2/3 turn, depending on the bolt length.

   Contrary to these requirements, on September 7 and 13, 1983, four A325 bolts were finger loose. Using a calibrated torque wrench, two A325 bolts showed a tightness of less than 39 Kips. These bolts were located in the structural steel beams as itemized in NRC Inspection Report No. 50-528/83-34, pages VII-3&4.

   This is a Severity Level IV Violation (Supplement II).

2. Bechtel Specification 13-CM-307, "Design, Installation and Testing of Concrete Anchors," establishes requirements for bolt embedment depth, spacing, torquing, and case-by-case Licensee approval for use.

   Contrary to these requirements, concrete expansion anchors were deficient in that 15 bolts were undertorqued, washers were missing under two nuts, three bolts were insufficiently spaced from other bolts or unused holes, three unused holes were ungrouted, and two cases existed where prior Licensee approval was required and not obtained. These anchors were located in various safety-related raceway supports, and are itemized in NRC Inspection Report No. 50-528/83-34, pages VII-8&9.

This is a Severity Level IV Violation (Supplement II).

3. Procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, "Nuclear Pipe Hangers and Supports Installation," Appendix I, requires the QC Engineer to verify each completed task on the "CIP for Nuclear Pipe Supports."

   . . .

   The inspection requirement on the CIP for "Task 1" is to verify that the support assembly is correct per approved engineering drawings and specifications.

   Contrary to the above, in September 1983, Unit 1 pipe supports were found to be incorrectly installed per approved drawings and specifications but had been verified correct by the Piping QC Engineer. Specifically, supports SI-100-H003, H005, and H036; SI-101-H00A; and SI-106-H001 were found with items which did not meet drawing requirements as described in Inspection Report 50-528/83-34, pages V-3, 4, and 5. The supports had been accepted by Piping QC Engineers during the period between November 29, 1979 and November 20, 1981.

   This is a Severity Level IV Violation (Supplement II).

4. Procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, "Nuclear Pipe Hangers and Supports Installation," Appendix I, requires the QC Engineer to verify each completed task on the "CIP for Nuclear Pipe Supports." The "CIP" inspection requirements for Task 8 require the Welding QC Engineer to verify that field welding is complete. For Task 9, he is to check the vendor welding for size and length. Additional instructions to the Welding QC Engineer in Appendix I instruct him to verify welding acceptability.

   Contrary to the above, in September 1983, Unit 1 pipe supports were found with unacceptable weld conditions which had been reported as acceptable by the Welding QC Engineers. Specifically, pipe supports SI-100-H005, H010, H015, and H034; SI-102-H00B; SI-106-H011; and SI-176-H001, and H003 were found with unacceptable weld conditions. The supports had been verified acceptable during the period July 14, 1980 to September 15, 1982. The welds and deficiencies are described in NRC Inspection Report No. 50-528/83-34, pages V-5, 6 and 7.

   This is a Severity Level IV Violation (Supplement II).

5. Specification 13-PM-204, Revision 12, dated April 7, 1983, paragraph 12.1.2, states the design and location of all pipe supports shall be the responsibility of project engineering. Paragraph 12.1.4 states pipe supports designed by engineering will be shown on drawings and all design details will be shown including miscellaneous steel.

   Contrary to the above, in September 1983, Unit 1 pipe support SI-100-H012 contained a miscellaneous steel member. The member was not shown on the pipe support drawing, 13 SI-100-H012, Revision 1, and was used to provide support to an instrument air line.

   This is a Severity Level IV Violation (Supplement II).

6. Procedure WPP/QCI No. 204, Revision 3, "Piping Systems Release for Insulation", Appendix I requires that piping systems be checked for unacceptable surface damage prior to insulation of the piping.

   Contrary to the above, pipe spool 1SI-009 S-002 was certified acceptable for insulation on November 14, 1982, with an unacceptable pit in the pipe which violated minimum wall requirements.

   This is a Severity Level IV Violation (Supplement II).

C. Appendix B of 10 CFR 50, Critierion IX, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: "measures be established to assure that special processes including welding are controlled and accomplished in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

FSAR Section 3.8.1.6.6 states: "Welding is done in accordance with AWS D1.1-72, Revision 1, 1973, Structural Welding Code." Bechtel Drawing 13-S-ZAS-536, Revision 3, requires a 5/16-inch fillet weld when attaching structural steel vertical members to horizontal members. Drawing 13-C-ZAS-570, Revision 8, requires a 5/16-inch fillet weld when attaching structural steel to embedded plates. Additionally, AWS D.1.1, Paragraph 10.17, states that undercut shall be no more than 0.01-inch deep when its direction is transverse to primary tensile stress in the part that is undercut, and not more than 1/32-inch deep for all other situations.

Contrary to the above requirements, at the time of the inspection, the size of structural steel fillet welds was less than required by the drawings and undercut in welds exceeded the requirements of AWS D1.1. These welds were located in various safety-related structural steel and are itemized in NRC Inspection Report No. 50-528/83-34, pages VII-4, 5, and 6.

This is a Severity Level IV Violation (Supplement II).

D. 10 CFR 50 Appendix B, Criterion XVI states, in part, that: "Measures shall be established to assure that conditions adverse to quality such as failures,...deficiencies,...defective material and equipment, and nonconformances are promptly identified and corrected."

Borg Warner valve assembly drawing number 77770-1 requires that the stud nuts connecting the bonnet to the valve body be torqued to a value of 160-200 foot-pounds.

Contrary to the above, on September 15, 1983, the inspector observed torque verification performed on valve number V-470 which resulted in the identification of loose stud nuts connecting the bonnet to the valve body.

This is a Severity Level IV Violation (Supplement II).

E. Appendix B, of 10 CFR 50, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety."

Contrary to the above requirement, pipe support SI-89-H008 was found during the September 1983 inspection with rubber seal material in between the Flourogold slide plates, Items 54 and 55 on the drawing. The applicable support drawing does not permit the use of rubber material. The rubber material may impair the sliding function. The support had been accepted by QC on November 29, 1979.

This is a Severity Level IV Violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, Arizona Public Service Company is hereby required to submit to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555 and a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region V, 1450 Maria Lane, Suite 210, Walnut Creek, California 94596, within 30 days of the date of this Notice a written statement or explanation, including for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons for the violation, if admitted; (3) the corrective steps which have been taken and the results achieved; (4) the corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority to Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Arizona Public Service Company may pay the civil penalties in the cumulative amount of $80,000 or may protest imposition of the civil penalties, in whole or in part, by a written answer. Should Arizona Public Service Company fail to answer within the time specified, the Director, Office of Inspection and Enforcement will issue an order imposing the civil penalties proposed above. Should Arizona Public Service Company elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, such answer may: (1) deny the violations listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties, in whole or in part, such answer may request remission or mitigation of the penalties. In requesting mitigation of the proposed penalties, the five factors contained in Section IV(B) of 10 CFR Part 2, Appendix C should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply purusant to 10 CFR 2.201, but may incorporate statements or explanation by specific reference (e.g., giving page and paragraph numbers) to avoid repetition. Arizona Public Service Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedures for imposing a civil penalty.

Upon failure to pay any civil penalties due, which have been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalties, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

FOR THE NUCLEAR REGULATORY COMMISSION

JBMartin

John B. Martin
Regional Administrator

Dated at Walnut Creek, California
this 18 day of December 1983

APPENDIX B

NOTICE OF DEVIATION

Arizona Public Service Company
Palo Verde Nuclear Generating Station
Unit No. 1

Docket No. 50-528
Construction Permit No. CPPR-141
EA 83-30
EA 83-130

As a result of the inspection conducted between September 6-16, 26-30, October 31, and November 1, 1983, and in accordance with the NRC Enforcement Policy, 10 CFR 2, Appendix C, the following deviation was identified:

> FSAR Section 3.8.1.6.6, Structural and Miscellaneous Steel, states:
>
> "Welding is done in accordance with AWS D1.1-72, Revision 1, 1973, Structural Welding Code. The acceptance criteria for visual inspection of welding is done in accordance with AWS D1.72, Revision 1, 1973."
>
> Contrary to this commitment, Appendix A, Visual Inspection Criteria, for Structural Steel and Miscellaneous' Metal Welding to Meet Design Requirements, to Specification 13-CM-320, Erection of Structural and Miscellaneous Steel, permits acceptance of undercut, incomplete fusion (rollover or overlap), and underfilled weld craters in amounts or circumstances not allowed by the AWS Code as described in NRC Inspection Report No. 50-528/83-34, pages VII-5 and 6.

You are hereby requested to submit to this office within thirty days of the date of this notice, a written statement or explanation regarding the above deviation describing corrective steps taken, the results achieved (or corrective steps that are planned), and the date when corrective action will be completed.

12-12-83
Date

Tolbert Young Jr.
T. Young, Jr., Chief
Reactor Projects Section No. 2

~~8312160311 PDR~~

ARIZONA PUBLIC SERVICE COMPANY
P. O. BOX 21666 · PHOENIX, ARIZONA 85036

January 31, 1984
ANPP-28749-EEVB/WEI

Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Response to Enforcement Letter and Notice of Violations, dated December 12, 1983
File: 84-070-026

Dear Sir:

Arizona Public Service Company (APS), Project Manager and Operating Agent for the Palo Verde Nuclear Generating Station (PVNGS) and licensee under CPPR-141 issued in Docket No. 50-528, submits herewith its response to the enforcement letter, dated December 12, 1983, from the Regional Administrator, Region V, and to Sections I.A. and II of the Notice of Violations (Notice), dated December 12, 1983, transmitted with such letter. The allegations made in Sections I.A. and II of the Notice stem from the unannounced inspection of Palo Verde Unit 1 in September, 1983, by the Region V Construction Assessment Team (CAT).

The response consists of five parts set forth in Attachments A through E to this letter:

Attachment A	-	APS Management Actions Responsive to the Construction Assessment Team (CAT) Inspection and the Notice of Violation
Attachment B	-	APS Response to Certain Issues Common to Several of the Alleged Violations
Attachment C	-	APS Response to Section I.A. of the Notice of Violation for Which a Civil Penalty Is Proposed
Attachment D	-	APS Response to Section II of the Notice of Violation for Which No Civil Penalty Is Proposed

~~8402070133 PDR~~

8,

Attachment E - APS Separate Answer, Filed Pursuant to 10 CFR 2.205, Protesting the Assessment of the Civil Penalty Proposed by Section I.A. of the Notice of Violation

Attachment A explains in detail the comprehensive actions which APS management has taken in addressing the general observations made by the Regional Administrator for Region V in the enforcement letter. The first step taken was the initiation of intensive internal and independent audits of the Palo Verde startup program. The audits were comprehensive in scope covering all activities that take place during startup -- tests and inspections, construction, maintenance and quality control. The findings of such audits led to a series of follow-up actions:

-- The suspension of startup work and testing coordinated by the APS Startup organization.

-- The organization of a broadly based task force to evaluate and recommend measures which strengthen and improve management control of activities performed during startup.

-- Establishment of an improved work control program for work performed during startup.

-- Changes in organizational structure to improve controls of interfaces between the organizations involved in startup work.

-- Renewed efforts in the training and indoctrination of all Palo Verde personnel to implement our goals of safety and quality.

-- Institution of a comprehensive reinspection program reaching beyond the limited scope of the CAT Inspection.

Attachments B, C and D address the specific alleged violations in Sections I.A. and II of the Notice. The violation alleged in Section I.A., for which a $40,000 civil penalty is proposed, is denied. The grounds for the denials include:

-- Inaccuracies in the allegations.

-- Lack of safety significance.

-- Improper assignment of severity levels.

Attachment D, which addresses Violations in Section II of the Notice for which no civil penalty is proposed, requests that the severity levels assigned to such violations be reduced.

These attachments also describe the steps taken and to be taken to correct the conditions found during the CAT Inspection and to preclude their recurrence.

Attachment E protests the civil penalty assessed in Section I.A. and requests its complete remission. In the alternative, the attachment requests mitigation of the penalty.

Apart from the alleged violations stemming from the CAT Inspection (i.e., Sections I.A. and II), the Notice also includes in Section I.B. an alleged violation resulting from an NRC investigation of allegations made in the Spring of 1982 by an individual who was then or had previously been employed at the site. The report of such investigation has not been made public nor disclosed to APS. For that reason, APS requested an extension of time to respond to the alleged violation until all of the information on which it is based is made available. This request has been granted, and APS will make a full and complete response to Section I.B. within the extended time.

At this time, however, we are submitting as Attachment F a partial response to Section I.B. of the Notice. Attachment F addresses some of the technical aspects surrounding the alleged violation. It does not address the elements of the alleged violation relating to the persons involved and their respective responsibilities, because (i) information obtained by the NRC on such elements has not been made available to us; (ii) we have restricted our investigation of these elements on advice of counsel that such an investigation by APS could be construed as interfering with an ongoing federal investigation; and (iii) the matter has been referred to and is currently under review by the Department of Justice.

Since the partial, technical response to Section I.B. may have some relevancy to the matter of the intent of the individuals involved, we suggest that consideration be given to providing such response to the Department of Justice. We have no objection if you follow this course.

We previously sent you on January 11, 1984, a copy of our response to the Notice of Deviation which accompanied the Notice of Violation.

If there are any questions concerning these matters, please do not hesitate to contact me.

Very truly yours,

E. E. Van Brunt, Jr.

E. E. Van Brunt, Jr.
Vice President, Nuclear

EEVBJr:ACG:jaw

Attachments

cc: J. Martin, Region V, NRC
L. Vorderbrueggen, NRC
G. Fiorelli, NRC
K. L. Turley
T. G. Woods, Jr.
W. E. Ide

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President, Nuclear of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Edwin E. Van Brunt
Edwin E. Van Brunt, Jr.

Sworn to before me this 31st day of January, 1984.

Jean A. Wyatt
Notary Public

My Commission Expires:
My Commission Expires March 11, 1986

ATTACHMENT A

APS MANAGEMENT ACTIONS RESPONSIVE TO THE CONSTRUCTION ASSESSMENT TEAM (CAT) INSPECTION AND THE NOTICE OF VIOLATION

9.

APS MANAGEMENT ACTIONS RESPONSIVE TO THE CONSTRUCTION ASSESSMENT TEAM (CAT) INSPECTION AND THE NOTICE OF VIOLATION

From the very inception of the Palo Verde project, the senior management[1] of APS has actively participated in the management of the project, the quality assurance program established for the project, and the interfaces with the two major contractors engaged in the project, i.e., Bechtel and Combustion Engineering. This intimate involvement of senior management is seen as a major contributing factor to the successes and record of achievements which Palo Verde has attained up to date. Senior management is deeply committed to maintain this record of achievement throughout the startup and operation of Palo Verde.

While the CAT Inspection resulted in the finding "that basic construction appeared to be generally satisfactory,"[2] the number of deficiencies which were found (al-

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[1] "Senior management" when used in this document refers to those officers of APS who are members of its Board of Directors, currently the Chairman of the Board of Directors and Chief Executive Officer, President and Chief Operating Officer, Executive Vice President, Arizona Nuclear Power Project, and Executive Vice President, Finance.

"Project management" when used in this document refers to the APS' Vice President, Nuclear Projects and Vice President, Nuclear Operations and, unless the text indicates otherwise, Bechtel's Vice President and Manager of Domestic Operations, Project Manager, Construction Manager and Project Engineering Manager.

[2] CAT Inspection Report, page 2.

though acknowledged by the CAT Inspection team to be for the most part "minor in nature") and, particularly, the general observations reflecting upon the effectiveness of management control of the transition from construction to operation have served to intensify and deepen APS' senior management involvement and participation in the startup of Palo Verde. There can be no question that the CAT Inspection has achieved the purposes of Appendix C to 10 CFR Part 2.

The CAT Inspection finding of an apparent "weakness in quality assurance and/or a lack of management control by the APS Operations and Startup Groups"[3] was not a total surprise to APS management. Because of concerns respecting this area, APS project management (<u>i.e.</u>, the Vice President, Nuclear Operations) had instituted preparation of a series of administrative controls in May, 1983. These new controls and associated procedures were implemented on September 27, 1983. On August 30, 1983, separate reviews of prerequisite data in the electrical area and the mechanical, instrumental and control, and fire protection areas were instituted by the APS Vice President, Nuclear Operations. This action was followed on September 9, 1983, with the designation of a Startup Data Review Task Force which was given the charter to:

(i) Review the acceptance criteria used in the preceding data reviews;

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[3] CAT Inspection Report, page 2.

(ii) Review the management systems used in startup;

(iii) Review the adequacy of the Discipline Test Schedule;

(iv) Review the reportability of information obtained under Section 50.55(e); and

(v) Develop appropriate corrective action recommendations.

Consequently, it is evident that, prior to the CAT Inspection, APS project management had detected the existence of problems in the startup work and, prior to the CAT Exit Meeting, had instituted some corrective measures.

As a result of the discussions at the CAT Exit Meeting on September 30, 1983, APS project management, under the intensive direction and guidance of senior management, has undertaken a comprehensive series of additional actions, including

(i) unifying the responsibility and authority for engineering, construction, startup, operation and maintenance of Palo Verde under one vice president;

(ii) restructuring organizational groups to provide improved control of interfaces;

(iii) establishing a defined control program for all work and testing performed subsequent to transfer of systems, subsystems and areas by Bechtel construction;

(iv) retraining of personnel to the new work control program;

(v) reinspecting or reviewing major portions of work and tests previously performed; and

(vi) improving the effectiveness of quality control activities during construction and startup.

Perhaps most importantly, APS management has renewed its efforts to indoctrinate the personnel at Palo Verde with two concepts:

(a) safety and quality continue to be the two primary goals in completing Palo Verde; and

(b) meticulous attention to detail in the performance of work and completing requisite documentation is vital in achieving those primary goals.

The discussion that follows describes in greater depth the nature, scope and timing of the foregoing APS management actions.

The NRC Enforcement Letter dated December 12, 1983, pointed out two overall management control and quality assurance program deficiencies observed during the CAT Inspection. The management deficiencies perceived by the CAT are:

1. Lack of effective management controls and weaknesses in quality assurance programs implemented during startup.4/

2. The Construction Quality Control inspection program allowed a number of minor deficiencies to go undetected.

4/ "Startup" means all of the work and testing performed from the time a system is transferred from Bechtel construction to the APS Startup organization to the time that the system is accepted by PVNGS Nuclear Operations. This includes Prerequisite Testing and Phase I Preoperational Testing, as defined in the PVNGS FSAR, Section 14.2.1.

These NRC concerns had also been expressed at the Exit Meeting held by the NRC with APS senior management[5] after the completion of the CAT Inspection on September 30, 1983, and the Enforcement Conference held on November 23, 1983.

After the CAT Inspection began on September 6, 1983, APS project management initiated a number of positive actions, some of which were implemented before the Exit Meeting on September 30, 1983. The actions taken encompassed a detailed investigation of the concerns expressed by the NRC. The results of the investigation were reported to, and analyzed by, APS and Bechtel senior management. Where problems were noted, management initiated action to evaluate possible solutions not only for the specific problem identified, but also to determine and correct the root cause. The proposed solutions were presented to management and action was taken to assure that overall management controls would ensure activities affecting quality were properly planned, controlled, carried out and documented. The specific actions taken are noted below for each of the NRC concerns.

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[5] Project management, other project personnel at the managerial level, and officers of each of the other utilities participating in Palo Verde also attended the Exit Meeting.

I. Management Control and Quality Assurance During Startup

Even before the end of the CAT Inpsection, it was clear that the NRC perceived a weakness in the management controls and quality assurance program as implemented during the Prerequisite and Preoperational Testing phase of the plant. This subject was discussed briefly at the meeting between the CAT and members of project management on September 16, 1983, that was held to provide a status report on the CAT Inspection.

As previously noted, project management was already aware of some documentation, interface and control problems during this phase of the project. The problems were thought to be partially a result of the several reorganizations and changes in the administrative program implemented during startup. Also, as previously noted, a task force had been designated on September 9, 1983, to consider these matters and a new series of administrative controls and associated procedures, which had been in preparation during the preceding months, were implemented on September 27, 1983.

Nonetheless, having heard the concerns expressed at the Exit Meeting by the CAT inspectors and members of NRC Region V management, the Vice President, Nuclear Operations requested immediately thereafter that APS Corporate Quality Assurance conduct a detailed audit of safety-related systems and all activities which occurred from the time of transfer of a system from construction to startup until the acceptance of the system by PVNGS Nuclear Operations, including activities performed by Bechtel construction and APS Maintenance. This internal audit was conducted to give APS senior and project management an overall evaluation of the effectiveness of the programs and controls in use during the startup phase of the project. The internal audit was conducted in two parts by separate groups. The first was an audit of the activities performed by the APS Startup organization and Bechtel. This audit was conducted using fifteen auditors under the direction of the Startup QA/QC Manager from October 17 through November 6, 1983. The second part of the audit, which ran concurrently, audited the activities of APS Maintenance. The results of these audits indicated several weaknesses in program control, particularly at interfaces between organizations and in some cases the lack of proper implementation of the prescribed controls.

Additionally, APS senior management, shortly after the CAT Exit Meeting on September 30, 1983, commissioned an independent assessment to evaluate the construction, startup and operations programs with respect to regulatory compliance and readiness to receive an operating license. The assessment was conducted by a team which was led by an experienced person from another utility. Members of the assessment team included other personnel from the other utility, from Bechtel (but not associated with the project) and from the Palo Verde project. This independent assessment, with recommendations for improvements, was presented to APS senior management in late December, 1983.

In response to the deficiencies identified by the internal audit, the APS Vice President, Nuclear Operations formed the Project Management Interface Task Force on November 22, 1983, to provide recommendations for project-integrated corrective action to resolve the program and control problems identified by the audits and CAT Inspection. Additionally, recognizing that the deficiencies identified by the audits could have an overall effect on the validity of testing and the acceptability of work performed, he ordered on November 23, 1983, all safety-related work and testing coordinated by the APS Startup organization be suspended until a unified project review and evaluation was conducted. This suspension of work did not include repair work being performed by Combustion Engineering on nuclear steam supply system components because of the adequacy of the independent controls on this work provided by Combustion Engineering, Bechtel and APS.

The Project Management Interface Task Force was composed of senior project personnel from the major organizations of APS and Bechtel involved in the project who were temporarily relieved of all other responsibilities. The Task Force was chartered to develop and recommend a consistent, integrated program to respond to the problems perceived, including consideration of various Corrective Action Requests then pending. The Task Force was also directed to develop a recommended program which would be suitable to provide necessary and consistent management controls and to regain, through review, inspection or retest, any loss of control that may have been present. This action was designated to assure that, in the final analysis, it could be demonstrated that startup had been performed in a controlled manner and was supported by documented evidence. The Task Force recommendations, developed after discussions with all levels of APS and Bechtel, were completed and presented to APS senior management on January 17, 1984.

To resolve the deficiencies discovered during the various evaluations and audits and to implement many of the management actions and controls recommended by the Task Force and the Assessment Team, APS management has taken, or has in process, a number of management actions including:

1. Organization restructuring.
2. Development and implementation of a program for resumption of work and testing under controlled conditions.
3. Development and implementation of a program to assure that requirements for an operating license have been or will be satisfied.

These actions described more fully below, which have been, are being or will be implemented, will be incorporated in project programs and procedures and will be revised as appropriate in accordance with established procedural controls.

1. <u>Organization Restructuring</u>.

On January 5, 1984, the management organization for Palo Verde was significantly changed as shown on Figure 1. The key element of this restructuring is that the APS managers of all project activities, <u>i.e.</u>, engineering, construction, startup, operation and maintenance, will now report and be responsibile to a single point of control, <u>i.e.</u>, the APS Vice President Nuclear.

Following this change, the Vice President, Nuclear instituted the position of Transition Manager, Figure 2. This position provides a single manager with the authority and responsibility for all activities necessary to accomplish and control the transition from the construction phase to full power operation. Figure 3 shows the Transition Manager's organization which provides the resources to accomplish all necessary tasks. The key element of this step is that the Transition Manager provides a means for centralized management and coordination of the interfaces among the several organizations of APS, Bechtel and Combustion Engineering.

2. <u>Recommencement of Startup Work</u>.

A program and schedule is being developed to allow testing and work to resume in a planned, controlled

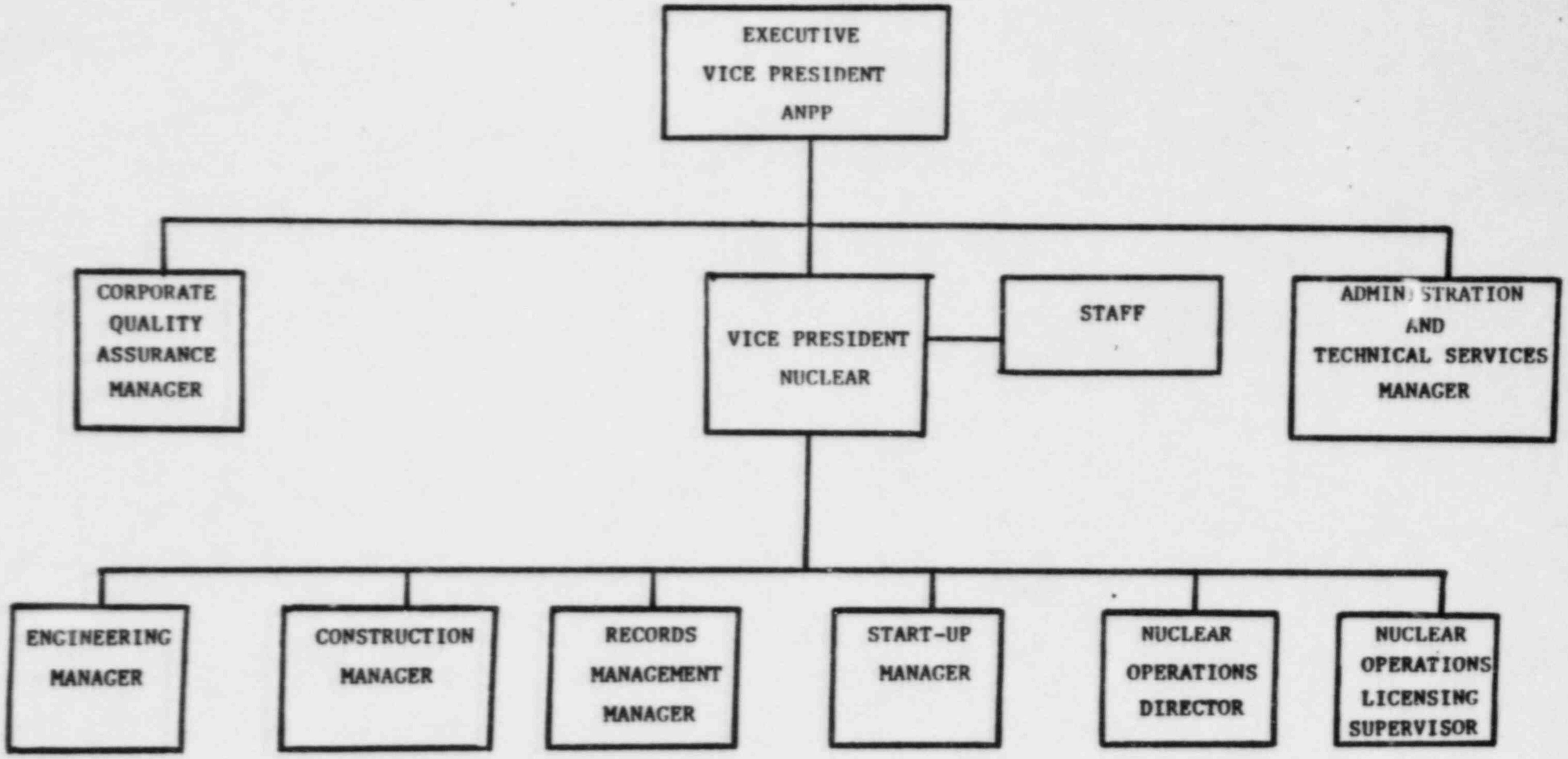


FIGURE 1

ATTACHMENT A

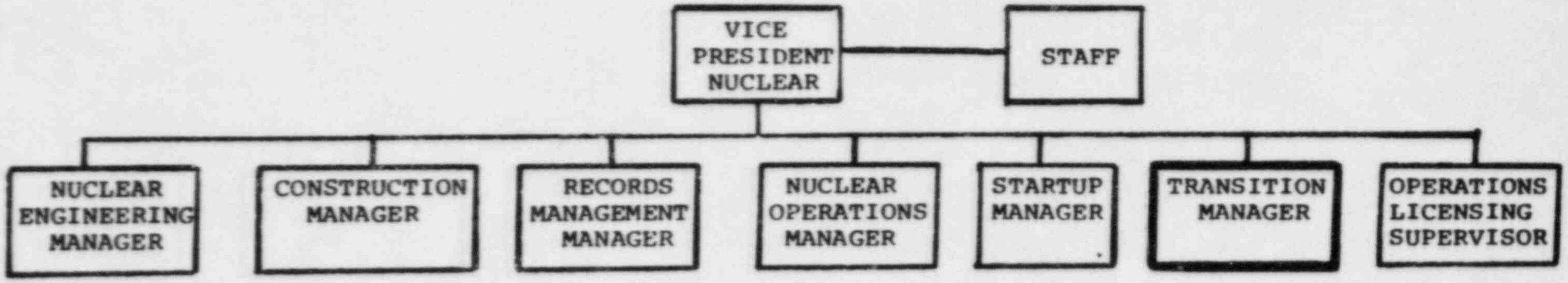
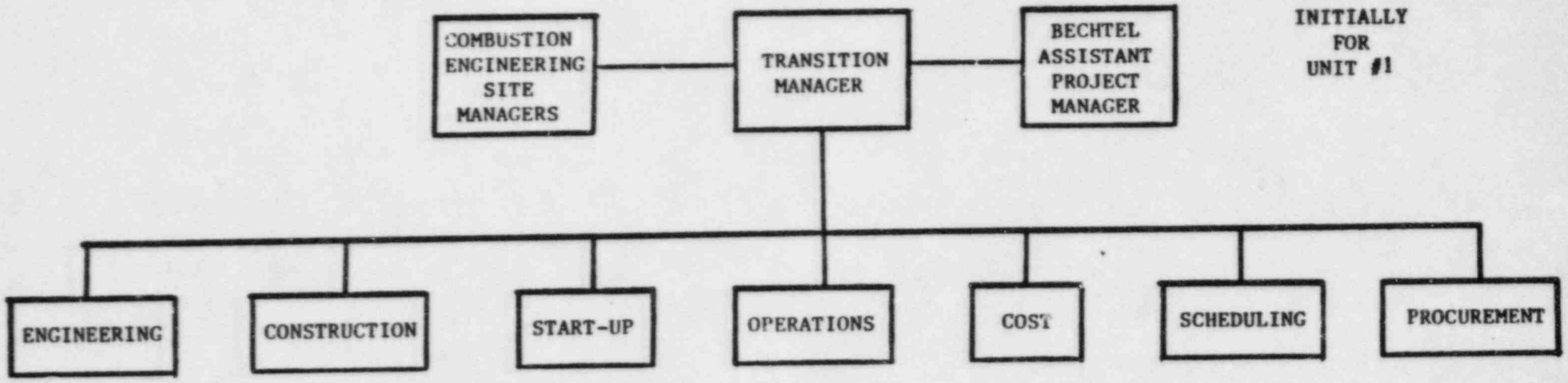


FIGURE 2

ATTACHMENT A



INITIALLY
FOR
UNIT #1

FIGURE 3

ATTACHMENT A

manner. The plan consists of four basic actions defined below.

a. Determine the priority of work and testing required.

This step is taken so that work and testing can be resumed in a planned fashion, starting with the most critical activities. It also allows resumption of work and testing sequentially in a controlled manner so that the effectiveness of the program can be evaluated, and any additional required corrective action can be taken in a timely fashion.

b. Ensure that subsystem configurations are known.

A series of walkdowns to specified criteria have been and are being conducted to assure that the configuration of each subsystem is known prior to the resumption of testing. Since it is possible that some undocumented changes were made in the configuration of systems, management has determined that prior to resumption of any preoperational testing, the actual configuration of the component or system must be verified against design drawings. Deviations are documented and evaluated by engineering and the deisgn is updated or configuration changed to conform with the design. In this manner, when tests are performed in the future, management will be assured of their validity because the system will have been in the proper design configuration. Additionally, the information as to present configuration will allow the project to evaluate any effects this may have had on the validity of previous Preoperational Testing.

c. Revision of Procedures.

The procedures necessary to perform a test or work activity on a component or system will be evaluated and revised as required prior to the resumption of testing to assure that activities will be performed in a controlled, documented manner. This activity will assure that no work on that component or system will be performed unless authorized and documented so that the configuration and status of a system is known. Additionally, it will assure that testing is performed in accordance with, and controlled by, procedure, and results are properly documented.

d. Training.

Prior to resuming testing, personnel involved will receive training into the need for meticulous attention to detail in their work activity and documentation and the need for complete accuracy. Training will also be provided, as appropriate, in the procedures to control testing and work activities, the equipment problem tagging system, and the procedure for monitoring proper housekeeping and protection of equipment.

Having planned what work and testing will be performed, knowing the configuration of the subsystem, having assured that the proper procedural controls are in place, and having trained personnel in the procedures and programs, work and testing will be resumed gradually on a system or subsystem basis to assure proper control and to provide for the evaluation of these controls.

3. Program to Assure all Requirements Have Been Satisfied.

In addition to the action taken to resume testing, APS management recognizes the need to assure that, when a system is accepted by PVNGS Nuclear Operations, installation, maintenance, and testing and retesting activites required by design and licensing commitments have been performed and documented. Any deficiencies in these areas must be identified and evaluated. In order to gain this assurance, several actions and reviews have been initiated. Some of the major activities initiated are listed below.

a. Review of Work Authorization Documentation.

A review is being conducted of work authorization documents from the commencement of preoperational testing on a system to the present. This will provide a basis for determining system status and the need for any system retesting.

b. Review of Discipline Test Schedule.

The Discipline Test Schedule is being reviewed to ensure that each safety-related component requiring testing was evaluated to ensure required testing is listed.

c. Review of Preoperational Test Data.

The safety-related Preoperational test data is being reviewed to ensure that the test was completed and correctly documented or the test will be repeated to provide the necessary documentation.

Prior to a system being accepted by PVNGS Nuclear Operations, it will be verified that Preoperational Testing has been approved and satisfies design and licensing requirements. Deviations from the above criteria will be noted and evaluated prior to system acceptance. With this action, management will have assurance that all systems accepted by PVNGS Nuclear Operations have been properly tested.

In addition to these measures, APS project management has taken or is considering additional steps in response to recommendations of the Project Management Interface Task Force to simplify and coordinate areas where interface problems have existed in the past. Actions initiated in this area include:

1. Increasing the Unit Shift Supervisor's level of involvement in activities by requiring his concurrence prior to the start, and his notification of completion of all testing and work activities.

2. Responsibility for control of cleanliness and housekeeping has been promulgated and project personnel have been trained accordingly.

3. The control of material and components in the plant, especially when the components are disassembled, is being strengthened.

4. The responsibility for configuration control within APS, and establishing the interfaces for configuration control transfer from Bechtel to APS, has been assigned to one department, Nuclear Engineering. A Configuration Control section within Nuclear Engineering, headed by a dedicated supervisor, has been established.

5. A more detailed integrated project schedule for activities within the transition period is being developed to provide the ability to better plan and control activities.

6. The nonconformance process to be used during the the transition period has been more clearly defined.

7. Procedures utilized by one organization that may affect the activities of another organization are being evaluated to assure that they properly interface.

8. The responsibility transfer, at time of system transfer and acceptance, is being more clearly defined to ensure that the responsibility for performance of such things as maintenance and housekeeping are understood.

9. The flow path for quality-related records is being more clearly defined to ensure the location and responsibility for control of these records is clearly defined.

10. The work control program utilized during the transition period is being revised to more clearly define and clarify who can perform work and the procedure utilized to perform the work and associated inspection.

In summation, APS management actions have resulted in in-depth examinations and evaluations of the management controls and the implementation of the quality assurance program during startup. On the basis of such examinations and evaluations, action has been or is planned to be taken to strengthen such controls and improve such implementation. In the view of APS management, such actions provide increased assurance that Palo Verde will be completed in a fashion that will meet all Regulatory Requirements. To the extent experience indicates further improvements should be made, APS management commits to do so.

II. Weakness in the Quality Assurance Program During Construction Which Allowed Deficiencies to Go Undetected.

A. Correction of Deficiencies.

During and subsequent to the CAT Inspection deficiencies in the Project Quality Assurance/ Quality Control Program identified by the NRC and the Project were documented, evaluated, and corrective action was taken immediately where appropriate. Shortly after the Exit Meeting on September 30, 1983, a broad-based reinspection program was initiated in areas where the CAT Inspection had indicated an inspection problem. These reinspections were conducted to more clearly identify the extent of the problem and to assist in determining the cause and extent of corrective action necessary.

Where appropriate, as indicated in Attachment D, 100% reinspection is being conducted. Additionally, in other areas, such as raceway identification, a new inspection is being added later in the construction process to identify and correct deficiencies.

Where the reinspection effort revealed a number of deficiencies which, when evaluated, had no effect on the ability of the plant to operate, or the safety of the plant, an engineering analysis was conducted to determine the "acceptance criteria" (as distinguished from "inspection criteria") necessary to assure the component or structure would meet its design function. Where such acceptance criteria were determined to be significantly less stringent than the "inspection criteria" which had been utilized during inspection and the reinspection results indicated that the deficiencies noted during reinspection did not violate the acceptance criteria, additional reinspection was and will be deemed inappropriate. In these cases, any deficiency found previously or in the future would have been or will be identified but dispositioned "accept-as-is."

With this approach, the conservatism in the inspection criteria in relation to the acceptance criteria provides assurance that, even with errors in inspection, adequate design margins are preserved. In each case where this approach was adopted, as indicated in Appendix D, the inspection criteria was not changed. Where this approach is used in the future, the acceptance criteria used to evaluate any deficiencies found during inspection will be established by engineering analysis or will the criteria established in Attachment D.

It should be noted that Palo Verde is licensed to a seismic design loading of 0.2g, but has been designed to 0.25g, a fact which adds considerable margin in the design. In performing the above-stated engineering analyses, no credit has been taken for added conservatism in the seismic design loading; all analyses have been performed at 0.25g.

The details of corrective action taken can be found in the responses to the Notice of Violation in Attachments C and D.

B. Management Meeting.

At the Enforcement Conference on November 23, 1983, the NRC Regional Administrator stressed the need for meticulous attention to detail and accuracy in completing documentation. On the first work day following the Enforcement Meeting, a meeting was held by the then Vice President, Nuclear Projects, and the APS QA/QC Construction Manager with Bechtel Site and APS Site Construction Management to review the discussions at the Enforcement Conference. In this management meeting, the need for meticulous attention to detail and accuracy was stressed. Following these meetings, the APS Construction QA/QC Manager met with Bechtel QC personnel to assure they understood the requirement for meticulous attention to detail and accuracy during inspection.

On November 30, 1983, at the request of the APS Chairman of the Board and Chief Executive Officer, a meeting of APS and Bechtel senior management and other key project personnel was held to discuss the results of the CAT Inspection and the Enforcement Conference. During the meeting it was concluded that a number of management steps were necessary to investigate the cause for the deficiencies noted and to determine appropriate corrective actions. The steps agreed upon included: (i) an investigation by Bechtel engineering management to determine if tolerances used at PVNGS were appropriate; (ii) a study by the Bechtel Manager of Quality Assurance of the Project Construction QA/QC Program and activities to determine what improvements could be made; and (iii) retraining of project personnel using a video tape made by the APS Chief Executive Officer. This retraining would stress that each individual was to perform his job with meticulous attention to detail and with complete accuracy in completing documentation. These activities are discussed further below.

C. Tolerances.

An independent review was concluded of the erection tolerances for pipe supports to identify if the lack of clearly stated and adequate but flexible tolerances was the cause of some of the lack of conformance of pipe supports with applicable drawings. The review, conducted by the Bechtel Manager of Engineering, Los Angeles Power Division, indicated that the tolerances had been a problem earlier in the project, but that current project procedures are realistic. No further change in tolerances appears warranted or desirable at this time.

D. Bechtel Management Study of Construction Quality Program.

The Bechtel Manager of Quality Assurance conducted a quality program improvement study of construction activities and the control under the quality program and procedures. The study was conducted in order to evaluate what improvements could be made to increase the effectiveness of the controls implemented during construction. Specifically, the review was to ensure that deficiencies in construction would be properly identified, documented and evaluated. The study results made several recommendations which are being reviewed and evaluated by project management. In areas where the recommendations could have a significant impact on the overall effectiveness of the quality program, action will be initiated

Specifically, one of the findings noted that in the past there was an attitude in QC which allowed engineering evaluation and disposition of a deficiency to become the standard by which inspections were conducted. For an example, if minor deviations in weld size were identified by QC inspectors and these deviations were consistently accepted by engineering without rework, the QC inspectors concluded that these conditions were acceptable, that they would be dispositioned in the same manner if documented, and therefore there was not point in documenting the deviation. In this respect, the QC inspector, in essence, was performing an engineering function rather than a strict inspection function.

In the meeting between the APS Construction QA/QC Manager and Bechtel quality control personnel, one of the items discussed was the function of QC to identify deviations and the function of engineering to evaluate the deviations. It was stressed particularly that meticulous attention to detail means <u>all</u> deviations to drawing and specification requirements should be identified and documented.

Also, the Bechtel Project Quality Control Engineer has held training sessions with the Quality Control leads and inspectors to emphasize the requirement to perform inspections to the drawing or specification requirements and to emphasize that "judgment calls" by QC inspectors are not permitted.

Another finding of the study was that statistical analysis should be employed to aid in the understanding and evaluation of inspection results and in the planning for inspection verification. The use of statistical methods and analysis is currently under review and evaluation for use in the planning and evaluation of Quality Assurance overview of the adequacy of QC inspection as explained below.

E. Indoctrination and Training.

To assure that project personnel, at PVNGS, in Phoenix and in California, understand that management expects and, in fact, demands, meticulous attention to detail and complete accuracy in their work and associated documentation, a video tape was prepared by the APS Chief Executive Officer explaining these issues. This tape is being presented, along with an explanation and training program, to project personnel. Additionally, this tape is being incorporated into the indoctrination program for future Palo Verde personnel, both on-site and offsite.

F. Evaluation of Effectiveness of QC Inspection.

Two programs have been initiated to evaluate the effectiveness of QC inspection at Palo Verde.

The Project Quality Control Engineer had initiated a program to evaluate the effectiveness of inspections by each QC supervisor. This program consists of the QC supervisor performing a reinspection of an installation inspection made by one of his inspectors on a weekly or monthly basis. Discrepancies noted will be identified and evaluated as nonconformances. The QC supervisor will also present periodic training sessions on the errors noted, to all of his inspectors. Additional corrective action will be taken if warranted. This program is designed to increase the effectiveness of QC by providing training in areas where errors are made.

In addition, Bechtel Quality Assurance will perform sample reinspection of QC inspections in areas where problems have been noted. Some of these areas, such as pipe defects, are highlighted in Attachment D. A corrective action reverification plan has also been initiated by Bechtel QA to assure that significant corrective action taken by the Project in response to Deficiency Evaluation Reports and Corrective Action Reports have actually been successful in preventing recurrence. Corrective action for deficiencies noted will be taken, as appropriate.

The actions described above address the generic problems that may have led to the deficiencies in construction quality control. Corrective action is being taken to resolve these problems, and a system to monitor the effectiveness of these controls and to identify other problems has been established.

ATTACHMENT B

APS RESPONSE TO CERTAIN ISSUES
COMMON TO SEVERAL OF
THE ALLEGED VIOLATIONS

APS RESPONSE TO CERTAIN ISSUES COMMON TO SEVERAL OF THE ALLEGED VIOLATIONS

1. Definition of Construction-Startup Responsibilities

1.1 The CAT Inspection Report, the Enforcement Letter and Section I.A. of the Notice of Violation are premised on a misinterpretation that construction is verified to be complete when systems, subsystems and components are transferred by Bechtel construction to the APS Startup organization.[1/] This misconception was also apparent in the discussions during the exit interview and the Enforcement Conference when members of the inspec-

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[1/] See: (1) CAT Inspection Report

(a) ". . . a number of problems identified indicated that some of the deficiencies may have resulted from activities performed after the system or component had been turned over to operations and startup." (page 2)

(b) "The inspections in this area [electrical and instrumentation] revealed deficiencies in the thoroughness of the final inspections and/or in control of maintenance following testing." (page 2)

(c) "Again the inspections in this area [mechanical] revealed deficiences in the thoroughness of the final inspections and/or in maintenance following testing." (page 2)

(d) "Most deficiencies appear to result from inadequate inspections prior to or inadequate control of systems after turnover to operations and startup." (page 3)

(footnote continued on following page)

tion team stressed deficiencies in the "turnover" process and in the walkdown of systems at the time of turnover. Most significantly, during the Enforcement Conference, it became apparent that at least some CAT inspectors were unaware that at Palo Verde Prerequisite Testing is conducted by and is the responsibility of APS Startup after transfer by Bechtel.

1.2 It must be recognized that the Startup Program put in place by APS for Palo Verde is unique. Prerequisite Testing, which is normally associated with completion of construction, has been the responsi-

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1/ (footnote continued from previous page)

(2) Enforcement Letter

(a) ". . . a number of problems identified indicate that deficiencies may have resulted from activities performed after the systems or components had been turned over to Operations and Startup." (page 1)

(b) ". . . the number of such items reflects adversely on the quality of the final quality control inspection effort of your quality assurance program at the time of system turnover to operations. (page 2)

(3) Section I.A. of the Notice of Violation

(a) "The items in Section II [sic] below, although mostly minor in nature, reflect inadequate quality control inspection of a large number of deficiencies which should have been identified during final quality control inspections." (page 1)

(b) "Construction of the containment and pressure sensing systems had been completed, turned over from the constructor to the licensee, and tested." (page 2) bility of the Vice President, Nuclear Operations, and not the construction organization.

1.3 Procedures in place recognize that the walkdown performed at transfer by construction are designed to determine the status of completion of construction. A method has been developed to track construction items not complete at time of transfer.

1.4 The unique Palo Verde Startup Test Program is explained in the PVNGS FSAR, Section 14.2.1 - Summary of Test Program and Objectives. It is there explicitly stated --

> ". . . The Startup Test Program consists of Prerequisite Testing <u>plus</u> the following four phases:
>
> -- Phase I Preoperational Testing
> -- Phase II Fuel Loading and Post Core Hot Functional Testing
> -- Phase III Initial Criticality and Low Power Physics Testing
> -- Phase IV Power Ascension Testing."

The FSAR goes on to define "Prerequisite Testing" as follows:

> "Prerequisite Testing consists of tests and inspections required to assure construction is complete and that systems are ready for Preoperational Testing. The completion of Prerequisite tests on each system results in system release to operations for the commencement of Preoperational (Phase I) Testing. . . .
>
> <u>Prerequisite testing will verify that construction activities</u> associated with the respective structures, components, and systems <u>have been satisfactorily completed. Prerequisite testing will consist of construction, and preliminary</u>

> tests and inspections which typically include, but are not limited to, initial instrument calibration flushing, cleaning, circuit integrity and separation checks, hydrostatic pressure tests and functional tests of components." [Underscoring supplied for emphasis.]

1.5 Thus, under the Palo Verde scheme of things, it is clear that:

a. Transfer of systems or subsystems by Bechtel to APS Startup is not intended to and does not signify completion of construction.

b. Such transfer is made prior to Prerequisite Testing of components.

c. Prerequisite Testing is the responsibility of the APS Startup organization.

d. The walkdown of systems at the time of transfer of systems by Bechtel to APS Startup is not and was never intended to be a "final inspection" or a "final quality control inspection effort."

e. The completion of construction is signified by the acceptance of a system, subsystem or area by PVNGS Nuclear Operations, not the APS Startup organization. Final inspection is completed at this time and is signified by such acceptance. (See PVNGS Station Manual).

f. System configuration is verified by PVNGS Nuclear Operations at the time of acceptance. (See PVNGS Station Manual).

1.6 In light of the foregoing, it was and is incorrect to assume that the "turnover" of systems and components to the APS Startup organization marked the completion of construction or that final quality control inspections took place or were intended to take place on transfer from Bechtel to APS. The

FSAR makes it clear that construction activities by Bechtel continue after transfer and the Prerequisite Testing Program itself, conducted by the APS Startup organization, is an integral part of the completion of construction.

1.7 It is also inaccurate to infer or characterize the transfer of systems and components "from the constructor to the licensee" as a "turnover to operations". It is clear from the FSAR that transfer to the PVNGS Startup organization does not constitute a acceptance to PVNGS Nuclear Operations.

1.8. Prior to a system being accepted by PNVGS Nuclear Operations, the configuration of the system will be verified for conformance to design drawings. It will also be verified that all required testing has been performed and the results are acceptable. This process provides an acceptable means, after subsequent transfer to the APS Startup organization, of detection and resolution of a large number of the deficiencies noted during the CAT Inspection.

1.9 None of the safety-related systems or components inspected by the CAT inspector had been accepted by PVNGS Nuclear Operations.

2. Evaluation of Assignment of Severity Level IV Violation

2.1 APS disagrees with the assignment of Severity Level III to the violation alleged in Section I.A. of the Notice and with the assignment of Severity Level IV to the violations alleged in the following subsections of Section II of the Notice:

II.A.1. Cable Overfill;
II.A.2. Separation;
II.A.3. Raceway Identification;
II.A.4. Raceway Identification;
II.B.1. Structural Steel Bolting;
II.B.2. Concrete Anchor Bolt Installation;
II.B.4. Pipe Support Welding;
II.B.5. Pipe Support Drawings;
II.B.6. Pipe Pit;
II.C. Structural Steel Welding;
II.D. Valve Bolts;
II.E. Seal Material on Pipe Support.

2.2 In each case, as described in Attachments C and D, an evaluation has been conducted to determine whether the condition which had been found could have had a significant safety impact. In each case, except II.B.3, it was concluded that the noted conditions were not safety significant. These violations do not meet the requirements found in Appendix C to 10 CFR to have "more than minor safety or environmental significance" to be classified as Severity Level III or IV violations. Steps were taken immediately (i) to correct the deficient condition that had been found, (ii) to investigate and evaluate the generic aspects of each deficiency, and (iii) to develop and implement appropriate corrective action, where necessary. In total, the response of APS has been prompt, comprehensive and meaningful. (See Appendix A).

In light of the apparent discrepancy between the safety significance of the alleged violations and the definition of Severity Level III and IV violations and the immediate corrective action taken, it is requested that, with the exception of II.B.3, they be reclassified as Severity Level V.

ATTACHMENT C

APS RESPONSE TO SECTION I.A. OF THE NOTICE OF VIOLATION FOR WHICH A CIVIL PENALTY IS PROPOSED

APS RESPONSE TO SECTION I.A. OF THE NOTICE OF VIOLATION FOR WHICH A CIVIL PENALTY IS PROPOSED

PART I

RESTATEMENT OF ALLEGED VIOLATION I.A.1

"I. VIOLATIONS ASSESSED CIVIL PENALTIES

"A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: 'The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety.'

"Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality, as evidenced by the following examples:

"1. On September 10, 1983, it was determined that the containment pressure instrumentation was incapable of performing its intended safety function in that caps had been installed on the sensing lines. Construction of the con-

> tainment and pressure sensing systems had been completed, turned over from the constructor to the licensee, and tested. Subsequently, the quality assurance organization directed that the caps be installed without following established QA procedures for correcting potential deficiencies. No administrative requirement existed to assure that the caps would have been discovered until the next scheduled containment leak rate test, pursuant to the operating license requirements. This containment pressure instrumentation is required to automatically initiate the HPSI and other safety systems on high containment pressure.

. . .

"This is a Severity Level III Violation, (Supplement II). (Civil Penalty-$40,000)"

APS RESPONSE TO ALLEGED VIOLATION I.A.1

1. Admission or Denial of Violation

   1.1 APS admits the following conditions and facts cited in paragraph I.A.1:

      1.1.1 Such systems had been transferred by Bechtel construction to the APS Startup organization.

      1.1.2 Certain Preoperational Tests of such systems had been completed.

1.1.3 The APS quality assurance organization directed that caps be installed on the sensing lines.

1.1.4 Caps were installed on such lines pursuant to the direction of the APS quality assurance organization.

1.1.5 The installation of the caps on the sensing lines was not documented.

1.1.6 Containment pressure instrumentation is designed to automatically initiate the HPSI and other safety systems on high containment pressure.

1.2 APS denies the following facts alleged, explicitly or implicitly, in paragraph I.A.1:

1.2.1 Denies that the containment pressure sensing systems had been "turned over" to or accepted by PVNGS Nuclear Operations.

1.2.2 Denies that the walkdown to assure system configuration which is associated with the acceptance by PVNGS Nuclear Operations had been conducted.

1.2.3 Denies that no administrative requirement existed to assure that the caps would have been discovered until the next scheduled containment leak rate test.

1.3 In light of the foregoing admissions and denials and for the reasons hereinafter set forth, APS denies that the undocumented capping of the containment pressure sensing lines prior to acceptance by PVNGS Nuclear Operations, constitutes a violation of Regulatory Requirements.[1/]

[1/] The term "Regulatory Requirements" as used in this document has the same meaning given to such term in Footnote 2 to Appendix C of 10 CFR Part 2.

2. Reasons Why No Violation Occurred

2.1 The capping of open lines to prevent the entry of dirt or materials into such lines prior to operation is a proper and prudent action. It is consistent with the requirements of ANSI N45.2.3 for housekeeping during construction and the practices and procedures enforced at PVNGS from the commencement of construction.

2.2 At the time of the CAT Inspection in September, 1983, there was no Regulatory Requirement that caps installed on open lines during construction or testing and prior to acceptance by PVNGS Nuclear Operations be documented.

2.3 The caps installed on the containment pressure sensing lines are testing caps provided per drawing 13-M-HCS-001 and are required for initial and subsequent testing. The removal of the caps during operation is properly a matter to be governed by operating procedures and not construction or startup procedures.

2.4 There was no Regulatory Requirement in existence at the time of the CAT Inspection in September, 1983, that an operating procedure be in place to inspect for the presence of and removal of the caps on the containment pressure sensing lines.

2.5 There was, in fact, an administrative requirement in existence at the time of the CAT Inspection which would have assured detection and removal of the test caps on the sensing line. The closeout of I&E Information Notice 83-23, action on which had been initiated by APS prior to the CAT Inspection, required action and verification of such action to assure the removal of testing caps on the containment pressure sensing lines prior to and during operation.

2.6 Under such circumstances, it is unreasonable and improper to assert that a violation of Regulatory Requirements had occurred in September, 1983, solely on an assumption that the presence of caps would remain undetected because of a future violation of a future Regulatory Requirement.

2.7 Acknowledging that it would have been prudent and good practice to have documented the placement of the caps on the sensing lines (as well as any other changes in the configuration of systems during startup), the lack of such documentation does not by itself demonstrate by example the lack of control of activities affecting quality where it cannot be demonstrated that other administrative requirements would not be effective to detect the presence of and provide for the removal of the sensing line caps.

3. Corrective Steps Which Have Been Taken and The Results Achieved

3.1 The containment pressure sensing lines are capped, and this capping is controlled and documented through the use of the temporary modification system.

4. Corrective Action Which Will Be Taken

4.1 To enhance the control of activities during the startup period, work will be performed under an approved work control program. (See Attachment A, pages 10-16.) This action will provide assurance that changes to the configuration of a system are approved and documented.

4.2 Additionally, Bechtel Construction Work Plan Procedures (WPP/QCI) are being revised to require that work performed on a system which has been jurisdictionally transferred to the APS Startup organization be authorized in writing by the APS Startup organization.

4.3 Station Manual Procedure 41ST-1ZZ13 will be revised to specifically address removal/verification of removal of containment pressure sensing line caps prior to entry into Mode 5.

4.4 Similarly, the Surveillance Procedure 36-ST-9SB03, which is done on a refueling outage frequency, will include a step that requires a blowdown and visual inspection of the lines.

5. Dates When Full Compliance Will Be Achieved

5.1 Full compliance has been achieved with respect to specific conditions cited.

5.2 The revisions of Station Manual Procedure 41ST-1ZZ13 and Surveillance Procedure 36-ST-9SB03 are in the approval process which will be completed on March 23, 1984 and prior to fuel load, respectively.

5.3 All other action will be completed by February 29, 1984.

PART II

RESTATEMENT OF ALLEGED VIOLATION I.A.2

"I. VIOLATIONS ASSESSED CIVIL PENALTIES

"A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: 'The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety.'

"Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality as evidenced by the following examples:

. . .

"2. On September 7, 1983, the manual operator for valve SI V470 on the suction of the HPSI "A" pump was disconnected and resting on the sprinkler system piping. Construction of the subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition which included a missing stud nut and leaking flange.

. . .

"This is a Severity Level III Violation, (Supplement II). (Civil Penalty-$40,000)"

APS RESPONSE TO ALLEGED VIOLATION I.A.2

1. Admission or Denial of Violation

1.1 APS admits the allegations in paragraph I.A.2 of the Notice that:

1.1.1 On September 7, 1983, the manual operator for valve SI V470 on the suction of the HPSI "A" pump was disconnected and resting on the sprinkler system piping; and

1.1.2 There was no record of the defective and/or nonconforming condition which included a missing stud nut.

1.2 Further, in answer to the alleged violation, APS avers that, contrary to the allegations in paragraph I.A.2, the following conditions existed on September 7, 1983:

1.2.1 Preoperational testing of the subsystem was in progress.

1.2.2 The subsystem had not been presented for acceptance nor accepted by PVNGS Nuclear Operations.

1.2.3 Preoperational Testing required prior to acceptance of the subsystems of PVNGS Nuclear Operations would have resulted in the discovery and correction of the deficient condition.

1.2.4 The condition of the valve was in a near open position and this would have allowed the subsystem to operate in accordance with the design intent.

1.2.5 The valve is used in the subsystem only to provide isolation during maintenance or repair of the HPSI "A" pump.

1.2.6 The condition of the valve in the subsystem, if left uncorrected, would have had no impact on the safe operation of the HPSI system, and, therefore, was not significant to safety.

1.3 In light of the foregoing admissions and averment of facts, APS denies that the undocumented status or condition of the subsystem on September 7, 1983, constituted a violation of any Regulatory Requirement for which the assignment of Severity Level III is permitted under Appendix C to 10 CFR Part 2. In support thereof APS states:

1.3.1 Appendix C to 10 CFR Part 2 provides that Severity Level V is to be assigned to violations that have minor safety or environmental significance. Severity Level IV is to be assigned were the violation is "of more than minor concern, <u>i.e.</u> <u>if left uncorrected</u>, [it] could lead to a more serious concern." [Emphasis supplied.]

1.3.2 Since the nonconforming condition has been determined to have no safety significance <u>even if left uncorrected</u>, it is not proper to assign Severity Level III to the violation.

1.3.3 The violation is distinguishable from the other examples cited in the Notice (see Attachment E, pages 3, 4, 9, 10), and therefore the only basis on which the assignment of Severity Level III may be, <u>i.e.</u>, "multiple examples," does not exist.

2. Reasons for the Conditions Existing on September 7, 1983

2.1 Two problems existed which resulted in the condition found. First, the bridle which was supplied by Roto Hammer was too short, thereby, allowing the rising stem to contact the top of the bridle before full valve opening was achieved. Second, with the adapter retaining nut missing, the rising stem pushed the bridle/adaptor assembly up and off the stem nut, disengaging the actuator from the valve.

2.2 Investigation of these problems reveals that the remote actuator was installed by Bechtel in January, 1983, after the system had been transferred to the APS Startup organization. There is no procedural requirement to inspect the length of the bridle to confirm the vendor chose and supplied the required size to accommodate valve stem travel.

2.3 After installation of the remote operator and stroking in January, 1983, and before the last known operation in August, 1983, the valve was disassembled and improperly reassembled. This resulted in the missing adaptor retaining nut, the missing bonnet stud nut, the loose bonnet bolts, and the leaking bonnet flange.

3. Corrective Steps Which Have Been Taken and The Results Achieved

3.1 The noted deficiencies were corrected as documented by SFR 1SI-292.

3.2 The condition has been evaluated for safety significance. The observed condition, if left uncorrected, would have had no impact on the safe operation of the HPSI system. The valve was in a near open position and this would have allowed the system to operate as per design intent. The valve is used in the system only to provide isolation when servicing the HPSI "A" pump. The final report for DER 83-87 will document this evaluation.

3.3 Roto Hammer has been notified of this condition and is supplying the correct assemblies for Units 2 and 3.

3.4 Construction has revised the installation procedure (Special CIP 521.0) to require documented verification that the bridle being installed is the size specified for the particular valve for all future installations on the project.

4. Corrective Steps Which Will Be Taken

4.1 The Construction Inspection Procedures will be revised to clarify the method of ensuring that the position indication is proper. Additionally, Bechtel Engineering is preparing a walkdown package to reinspect all safety-related valves in Units 1 and 2 utilizing Roto Hammer remote operators. Any nonconforming conditions will be documented and included in the final report to DER 83-87.

4.2 To assure that work performed during startup is properly controlled, work performed on any permanent plant equipment will be performed under an approved Work Control Program. This will ensure that any changes to, or deviations from the plant design configuration, either temporary or permanent, are approved and documented prior to beginning the work activities. Performance of work or test activities on any permanent equipment within APS' jurisdictional control will be required to be concurred with by the Unit Shift Supervisor for the unit affected. The above requirements will ensure that the plant design configuration and system status are maintained in a known, approved state. (See Attachment A, pages 11, 15.)

4.3 APS will expand the Startup Work Authorization (SWA) procedure such that when a discrepancy is observed on equipment in the startup jurisdiction, a SWA or Startup Field Report (SFR) will be initiated. A copy of the SWA will be forwarded to the Unit Shift Supervisor for his information and to determine if a tag should be hung to identify the problem locally. All tags will be tracked and controlled by Operations personnel, with a copy of closed SWA's also forwarded to the Shift Supervisor to allow timely removal of tags.

4.4 The operations phase Work Control Procedure will be similarly expanded to assure prompt identification of discrepancies, local identification tagging of previously identified significant problems, and tracking of tags until resolution.

4.5 Before acceptance of a system or subsystem by PVNGS Nuclear Operations from the PVNGS Startup organization, a PVNGS Nuclear Operations acceptance walkdown will be conducted on the system to confirm that the system configuration is in accordance with design.

4.6 APS project management will issue a directive to all PVNGS Startup and Nuclear Operations personnel informing them of their responsibility to identify, pursue, and assure resolution of discrepancies identified in an expeditious manner. Personnel will also be instructed not to perform work without the proper authorization and controls.

4.7 Locked open/closed safety-related major flow path valves (not including such valves as instrument root, vent and drain valves) in Unit 1 without remote position indication will be operated to verify operability and position indication, prior to fuel loading.

4.8 A generic surveillance test procedure will be developed to verify all major flow paths valves in Units 2 and 3 of PVNGS are fully operable and position indication is representative of valve position.

4.9 The appropriate operations phase generic valve repair procedures will include requirements to verify valve operability and position indication prior to return to service. This will be completed prior to fuel loading.

5. Date When Full Compliance Will Be Achieved

5.1 The deficient condition of valve SI V470 has been corrected.

5.2 The corrective action specified in paragraphs 4.1, 4.2, 4.3 and 4.6 will be completed by February 15, 1984.

5.3 The corrective action specified in paragraphs 4.4, 4.5, 4.7, 4.8 and 4.9 will be completed prior to fuel loading.

5.4 The final report for DER 83-87 will be issued by April 15, 1984.

PART III

RESTATEMENT OF ALLEGED VIOLATION I.A.3.

"I. VIOLATIONS ASSESSED CIVIL PENALTIES

"A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: 'The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety.'

"Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality as evidenced by the following examples:

. . .

"3. On September 28, 1983, the position indicator for valve SI V402 on the suction of the HPSI "B" pump was positioned so that the valve could only be opened 30 to 35 percent of its full open position. Construction of this subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition.

. . .

"This is a Severity Level III Violation, (Supplement II). (Civil Penalty-$40,000)"

APS RESPONSE TO ALLEGED VIOLATION I.A.3

1. Admission or Denial of Alleged Violation

1.1 APS admits the allegations in paragraph I.A.3 of the Notice that:

1.1.1 On September 28, 1983, the valve could only be opened 30 to 35 percent of its full open position.

1.1.2 There was no record of this condition.

1.1.3 The subsystem of which the valve is a component had been transferred by Bechtel construction to the APS Startup organization.

1.1.4 Preoperational Testing of the subsystem was in progress in September, 1983.

1.2 In answer to the alleged violation, APS avers that the following conditions existed on September 28, 1983:

1.2.1 The subsystem had not been presented for acceptance nor accepted by PVNGS Nuclear Operations.

1.2.2 Preoperational testing of the subsystem had not been completed.

1.2.3 No work on the valve had been performed which had not been properly controlled by work control procedures.

1.2.4 The condition of the valve was such that it could have been opened sufficiently to allow the subsystem to operate in accordance with the design intent.

1.2.5 The condition of the valve, if left uncorrected, would have had no impact on the safe operation of the HPSI System, and, therefore, was not significant to safety.

1.3 In light of the foregoing admissions and averments of fact and the matters stated in Attachment B, pages 6-7, APS denies that the undocumented condition of the subsystem existing on September 28, 1983, constituted a violation. In support thereof APS states as follows:

1.3.1 The discrepant condition was not significant to safety and therefore did not constitute a Severity Level III violation.

1.3.2 Appendix C to 10 CFR Part 2 provides that Severity Level V is to be assigned to violations that have minor safety or environmental significance. Severity Level IV is to be assigned where the violation is "of more than minor concern, *i.e.*, *if left uncorrected*, [it] could lead to a more serious condition." [Emphasis supplied.]

1.3.3 Since the nonconforming condition has been determined to have no safety significance even if left uncorrected, it is not proper to assign Severity Level III to the violation.

1.3.4 The violation is distinguishable from the other examples cited in the Notice (see Attachment E, pp. 3, 4, 9, 10), and therefore the only basis on which the assignment of Severity Level III may be made, i.e., "multiple examples," does not exist.

2. Reasons for the Conditions Existing on September 28, 1983

2.1 During the installation of remote operators, Construction is not required to verify length of stroke. The valve is stroked by an APS operator using the remote operator from stop to stop. In this case, the travel was restricted by the valve stem position indicator nut not being properly set on the valve stem. The indicator nut hit the top of the valve yoke and prematurely stopped valve travel in the open direction. Since the valve is stroked remotely, it would not be obvious that valve travel was being restricted. Therefore, the APS operator and Construction Engineer assumed the valve was full open when, in fact, it was not.

2.2 The HPSI system was being tested at the time of the inspection. Testing has not been completed.

3. Corrective Steps Which Have Been Taken and the Results Achieved

3.1 The restriction on the operation of valve SI V402 to 30 to 35 percent of its full open position caused by the position indicator has been evaluated for safety significance. The observed condition, if left uncorrected, would not preclude the operation of the HPSI system in accordance with design intent. Bechtel Engineering has performed an evaluation which erifies that the system will perform to design intent with the valve open only 30 to 35 percent. This evaluation has been confirmed with Borg Warner, the valve supplier, via telephone notes TN-E-3516. The final report for DER 83-87, initiated to address flow restriction due to deficiencies in SI V470, will contain the evaluation which documents this analysis.

3.2 Construction has revised the installation procedure (Special CIP 521.0) to require verification that the stem is free to travel from full closed to full open without interference.

4. Corrective Steps Which Will Be Taken

4.1 The deficiency noted on SI V402 will be addressed as part of the valve stroking required by Work Order 024447 and SWA 15578.

4.2 To ensure that no other similar deficiencies exist and that none will occur in the future, the Construction Inspection Procedures will be revised to clarify the method to ensure that the position indication is proper.

4.3 Locked open/closed safety-related major flow path valves (not including instrument root, vent and drain valves) in Unit 1 without remote position indication will be operated to verify operability and position indication, prior to fuel loading.

4.4 A generic test procedure will be developed to verify all major flow path valves in Units 2 and 3 of PVNGS are fully operable and position indication is representative of valve position.

4.5 The appropriate operations phase generic valve repair procedures will include requirements to verify valve operability and position indication prior to return to service. This will be completed prior to fuel loading.

5. Date When Full Compliance Will Be Achieved

5.1 The deficient condition of valve SI V402 will be corrected prior to acceptance of this subsystem by PVNGS Nuclear Operations.

5.2 The corrective action specified in paragraph 4.2 will be completed by February 15, 1984.

5.3 The corrective action specified in paragraphs 4.3, 4.4 and 4.5 will be completed prior to fuel loading.

5.4 The final report for DER 83-87 will be issued by March 15, 1984.

PART IV

RESTATEMENT OF ALLEGED VIOLATION I.A.4.

"I. VIOLATIONS ASSESSED CIVIL PENALTIES

"A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: 'The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety.'

"Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality as evidenced by the following examples:

. . .

"4. On September 14, 1983, 87 3/8-inch bolts were missing from the base frames for six motor control centers (MCC's) of the vital AC onsite power distribution system. These bolts are necessary to ensure the structural integrity of the MCC's.

"This is a Severity Level III Violation, (Supplement II). (Civil Penalty-$40,000)"

APS RESPONSE TO ALLEGED VIOLATION I.A.4

1. Admission or Denial of Violation

1.1 APS denies that on September 14, 1983, 87 3/8-inch bolts were missing from the base frames for six motor control centers (MCC) of the vital onsite power distribution system.

1.2 APS denies that any bolts which are necessary to ensure the structural integrity of the MCC's are missing.

1.3 Accordingly, APS denies the alleged violation.

1.4 In support of such denial, APS submits that it is apparent from the CAT Inspection Report, dated November 11, 1983, and the Notice that no specification or other requirement has been cited to establish the number or sizes of bolts required for mounting MCC's to maintain their structural integrity. It appears that (i) the allegation that 87 bolts are missing resulted from counting unused holes in the base frames for six MCC's and (ii) the allegation that all or some of the "missing" bolts are necessary to ensure structural integrity is based on an unsupported assumption.

2. Reason for the Conditions Observed

2.1 The NEMA III nonwalk-in cabinets which house the motor control centers (MCC's), tag nos. 1-E-PHA-M33, 35, 37 and 1-E-PHB-M34, 36 and 38, were constructed and mounted per General Electric installation drawings.

2.2 See Figures 1 and 2 for the connection details and the location of the bolts on the front and back side of the cabinets, respectively. The lifting lugs as shown on the vendor drawings were used to handle the NEMA III cabinets during shipping from Mebane, North Carolina, to the Palo Verde jobsite, and during their installation. After completing the installation, the lifting lugs were removed as they created a safety hazard by protruding into aisle space. The installation drawings did not indicate that the lifting lugs must remain in place, and since the lugs posed a safety hazard by projecting into the walkways, it was deemed appropriate that they be removed.

2.3 On the front side of the cabinets (See Figure 1), the four 3/8-inch diameter bolts (Item 1) that the lifting lug fits over were either removed when the lifting lugs were removed, or were never installed by General Electric (GE) prior to shipment. For the front side, the 3/8-inch diameter bolts serve as part of the connection between the front base channel (C6, and a parallel channel (C4) which, in turn, is connected to a transverse channel (C4). On the back side of the cabinets (see Figure 2), the two 5/8-inch diameter bolts (Item 6) which connect the lifting lug to the base channel (C6) were not reinstalled after the lifting lugs were removed. It was not apparent from the vendor drawings that these bolts also serve as part of the connection between the back base channel (C6) and a parallel channel (C4) which, in turn, is connected to a transverse channel (C4).

2.4 The front and back connections of the cabinet at each lifting lug location have other bolts which were in place after removal of the lifting lugs.

2.5 Since the drawing did not adequately specify the bolting arrangement with the lifting lug removed, the subject bolts were overlooked during a subsequent Bechtel Engineering audit of safety-related equipment installations attached to structures. The audit was concerned with as installed attachment of the equipment to the structure (<u>i.e.</u>, slab and wall) compared to the installation drawings and the qualification report and did not review the assembly of the cabinets. It should also be noted that the audit team found that the installation of the MCC's and the NEMA III cabinets was incomplete, that the MCC's mounted in the NEMA III cabinets were not consistent with the qualification of the MCC's, and that an engineering evaluation was required. As a result of the engineering evaluation, DCP 1SE-PH-035 was issued to have the installation modified. However, the original issue of the DCP did not address the subject bolts.

2.6 As a final point, it may be stated that the installation of these MCC's is unique, because these MCC's are the only type mounted inside NEMA III cabinets which are designed to protect the electrical equipment from the effects of the Auxiliary Building sprinkler system. No other safety-related equipment is installed in this manner.

3. Corrective Steps Which Have Been Taken and the Results Achieved

3.1 Bechtel Engineering investigated the alleged violation concerning missing bolts from the base frames as shown in Figures 1 and 2 for the six motor control centers (MCC's). The results of the investigation as documented in calculation 13-CC-ZQ-E01, Revision 2, indicated that the seismic qualification of the MCC's would not be invalidated under the as-installed condition, nor would the condition affect the structural integrity of the system under any design loading. General Electric has reviewed the results of the Bechtel analysis and concurs with the conclusions. (TN-

E-3503, dated 12/27/83, and B/ANPP-E-110302, dated 12/29/83). Therefore, the missing 3/8-inch diameter bolts from the base frames for six motor control centers of the vital AC onsite power distribution system are not necessary to ensure the structural integrity of the MCC's. The final report for DER 83-84 will document this evaluation.

4. Corrective Steps Which Will Be Taken

4.1 Although the missing four 3/8-inch diameter bolts on the front side and the two 5/8-inch diameter bolts on the back side of each lifting lug location are not considered safety significant and are not required, they will be installed in Unit 1 per revised and clarified GE drawings and as documented by DCP 1SE-PH-035, Modification 1.

4.2 Installation work, using updated and clarified drawings in Units 2 and 3, is currently ongoing and installations will be completed in accordance with these documents.

4.3 Bechtel Construction Work Plan Procedure (WPP/QCI) 258.0 is being revised to require Engineering approval prior to the removal of any temporary attachment from installed equipment.

4.4 Bechtel has initiated a review of the documents of safety-related equipment installations in Unit 1, 2 and 3 attached to structures to permit a selective verification such installations as appropriate. The review and verification will determine if the safety-related equipment was installed per vendor drawings and instructions. The results will be documented by DER 83-84.

5. Date When Full Compliance Will Be Achieved

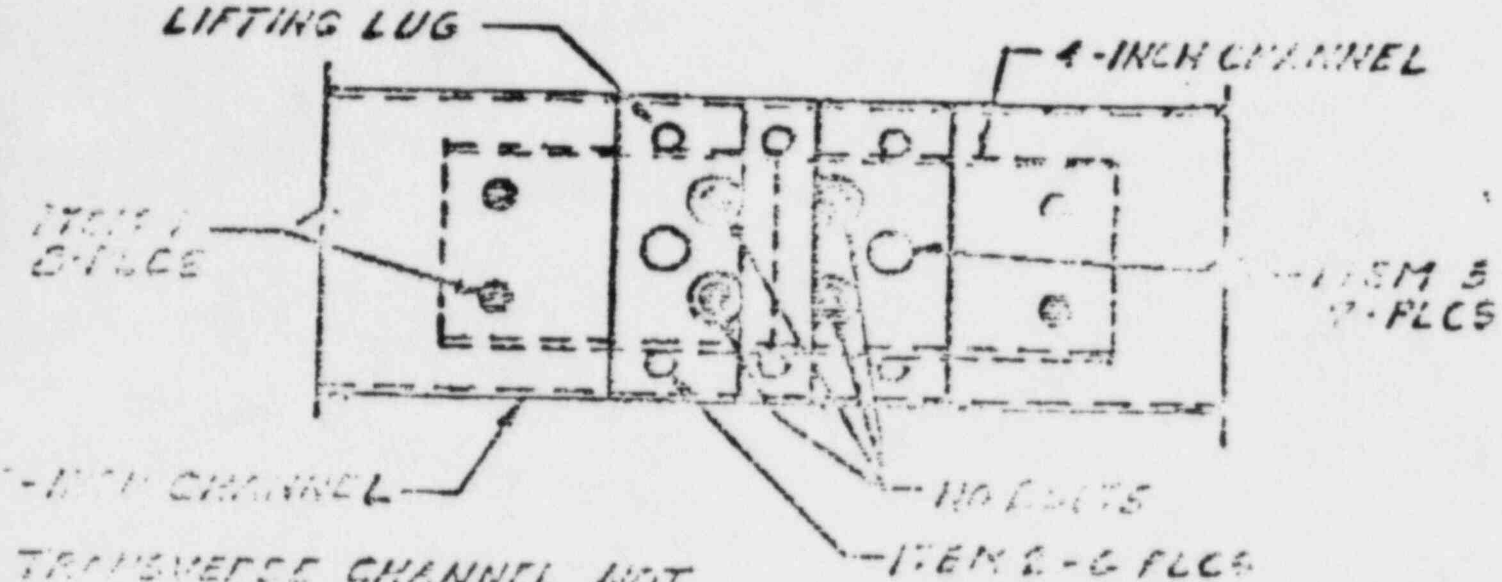
5.1 A PCN to WPP/QCI 258.0 will be issued by January 31, 1984.

5.2 Design Change Packages 1SE/2SE/3CE-PH-035 will be completed prior to fuel load in each unit.

5.3 The final report for DER 83-84 will be issued by May 15, 1984.

5.4 The four 3/8-inch diameter bolts and two 5/8-inch diameter bolts for Unit 1 MCC's will be installed prior to fuel load.

FIGURE 1 - FRONT LIFTING LUG ASSEMBLY (Two per cabinet)



TRANSVERSE CHANNEL NOT SHOWN FOR CLARITY

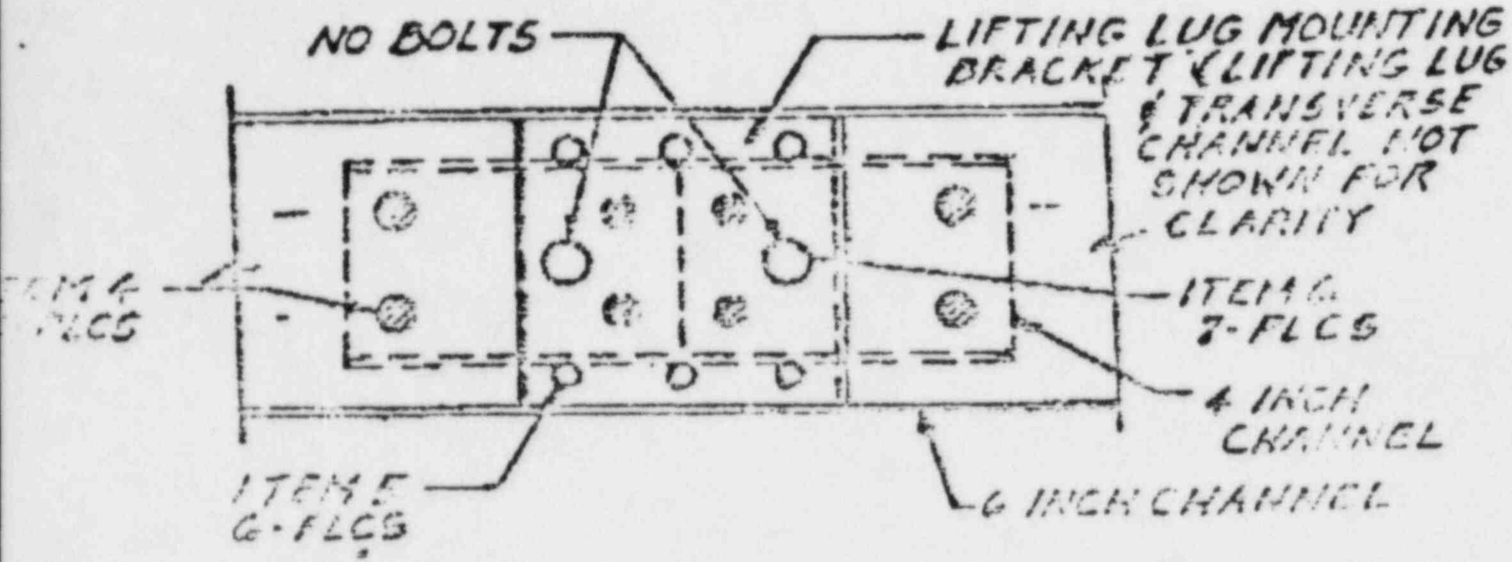
Item 1 - Holes for 3/4 inch diameter mounting bolts which attach the [illegible] support pipe to the C6 base. These bolts are required after lifting lug removal.

Item 2 - Mounting holes for the lifting lug attachment bolts. No bolts are required after lifting lug removal.

Item 3 - Holes for 5/8-inch diameter bolts used to attach the lifting lug. These bolts are not required after lifting lug removal.

A - After lifting lug removal [illegible]-inch diameter bolts (Item 3) may be installed as a substitute for the 6-3/8-inch diameter bolts (Item 1).

FIGURE 2 - BACK LIFTING LUG LOCATION (Two per cabinet)



Item 4 - Holes for 3/8-inch diameter mounting bolts which attach the C4 support girt to the C6 base (See Note B).

Item 5 - Mounting holes for the lifting lug attachment bolts. No bolts are required after lifting lug removal.

Item 6 - Holes for 5/8-inch diameter bolts used to attach the lifting lug. These bolts are required to be reinstalled after lifting lug removal.

Note B - The C6 lifting lug mounting bracket, which is welded in place, covers the four middle 3/8-inch diameter bolt locations. This makes installation of the middle 3/8-inch diameter bolts impossible. The two 5/8-inch diameter bolts shall be reinstalled as a substitute after lifting lug removal.

FIGURE 1 - FRONT LIFTING LUG ASSEMBLY

(Two per cabinet)

Item 1 - Holes for 3/8-inch diameter mounting bolts which attach the C4 support girt to the C6 base. These bolts are required after lifting lug removal unless Note A applies.

Item 2 - Mounting holes for the lifting lugs attachment bolts. No bolts are required after lifting lug removal.

Item 3 - Holes for 5/8-inch diameter bolts used to attach the lifting lug. These bolts are not required after lifting lug removal.

Note A - After lifting lug removal, two 5/8-inch diameter bolts (Item 3) may be installed as a substitute for the four 3/8-inch diameter bolts (Item 1).

FIGURE 2 - BACK LIFTING LUG ASSEMBLY

(Two per cabinet)

Item 1 - Holes for 3/8-inch diameter mounting bolts which attach the C4 support girt to the C6 base. These bolts are required after lifting lug removal unless Note A applies.

Item 2 - Mounting holes for the lifting lugs attachment bolts. No bolts are required after lifting lug removal.

Item 3 - Holes for 5/8-inch diameter bolts used to attach the lifting lug. These bolts are not required after lifting lug removal.

Note A - After lifting lug removal, two 5/8-inch diameter bolts (Item 3) may be installed as a substitute for the four 3/8-inch diameter bolts (Item 1).

ATTACHMENT D

APS RESPONSE TO SECTION II
OF THE NOTICE OF VIOLATION FOR
WHICH NO CIVIL PENALTY IS PROPOSED

APS RESPONSE TO SECTION II
OF THE NOTICE OF VIOLATION FOR
WHICH NO CIVIL PENALTY IS PROPOSED

PART I

NOTICE OF VIOLATION II.A.

"Appendix B of 10 CFR 50, Criterion V, as implemented by Chapter 17 of the licensee's PSAR and FSAR requires, in part, that: 'Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, or drawings.'"

VIOLATION II.A.1

"1. The separation and identification criteria as identified in FSAR Section 8.3.1 are described, in part, by the following Bechtel documents: (a) "Cable and Raceway Physical Separation Guide," Drawing 13-E-ZAC-077, Revision 2, and (b) "Installation Specification for Cable Splicing, Termination and Supports," Specification No. 13-EM-306, and "Installation Specification for Electric Cables and Cable Trays," Specification No. 13-EM-300.

"Tray fill requirements in the above specifications requires that cabling in random filled cable trays shall not extend above the side rails of the tray.

"Contrary to the above requirement, in random filled tray 1EZJ4AATSCE, cables were projecting above the level of the tray side rails."

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.A.1

(1). Admission or Denial of the alleged Violation:

The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6-7.

(2). Reasons for the Violation:

This specific condition concerns a case which occurred due to the close proximity of an HVAC duct to the tray in a congested area.

(3). Corrective Action Steps Which Have Been Taken and Results Achieved:

The noted deficiency has been documented on NCR EJ-3403 and dispositioned "rework". The corrective action for this case requires the control cables in the tray to be reorganized to provide clearance with an HVAC duct.

Overfilled trays are not a repetitive problem, because tray fill is monitored by the EE580 Circuit and Raceway Program. When 30 percent fill is reached (e.g., this is the ratio of cross-sectional area of tray to cross-sectional area of the cable) the computer program refuses to accept any more cable in that tray section. At that time, the designer has the option of overriding the computer restriction and including additional cables, provided that an evaluation is performed to establish that heat load criteria are not exceeded and that cable tray is not filled beyond a reasonable capacity to contain the cable. Based on positive results from the evaluation of each such case, the 30 percent computer fill may be exceeded. Thirty percent computer fill in general corresponds to 100 percent tray fill since the cables become interwoven during the pulling process. Where there is no safety impact, tray fill is allowed to go above the side rails. Specification 13-EM-300 has been revised by FCR 72.521-E to permit cables to extend above the tray rails where there is no tray cover, provided that proper separation has been maintained. Transfer Procedure (WPP/QCI)31.0 has been revised to provide that no cable is in contact with other equipment. Bechtel supervision in Unit 1 conducted a training session with eight electricians on the revised specification requirements. The electricians conducted a 100 percent review of all Unit 1 uncovered cable trays. Conditions found which deviate from the revised specification requirements/allowances are being corrected.

Bechtel Construction has reviewed this same installation in Units 2 and 3 and has taken steps to overcome the congestion caused by the HVAC duct.

(4). <u>Corrective Steps Which Will Be Taken To Avoid Further Violations</u>:

To preclude recurrence of nonconforming tray fill in Units 2 and 3, a PCN to Bechtel Construction Work Plan Procedure (WPP/QCI) 31.0 is being prepared to require an inspection for tray fill to the requirements of Specification 13-EM-300 as described above at the time of the area release walkdown prior to acceptance by Nuclear Operations.

Field Engineering and QC will perform a 100 percent reinspection of all safety-related uncovered cable trays in Unit 1. Unit 2 will reinspect any safety-related cable tray that has been released to PVNGS Nuclear Operations. All deviations found will be corrected.

(5). <u>Date When Full Compliance Will Be Achieved:</u>

The completed reinspection of Unit 1 will be completed by March 1, 1984.

Inspections of Unit 2 and 3 will be completed prior to fuel load of each unit. Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillances - will be revised to specifically establish a monthly program for an overview of previously accepted installation by QC by February 28, 1984

VIOLATION II.A.2

"2. The separation requirement, as described in the above specifications, identifies the minimum separation distance between safety-related open-top trays and non-safety-related totally enclosed trays or raceways (conduit) as one inch.

"Contrary to the above requirements:

"a. Non-safety-related conduit 1EZADCNRQ506 for thermostat 1EQFNT1243C in HPSI A pump room was separated from safety-related group 1 junction box 1EZACCAKKJ03 by less than one inch.

"b. At diesel generator E-PEA-G01, non-safety-related flexible conduit 1EZG1ANRX11 at junction box 4 was in contact with safety-related flexible conduit 1EZG1AARR20 at junction box 6.

"c. In 4160-volt switchgear cubicle E-PBA-503L [sic], non-safety-related flexible conduit

1EZJ1ANRR52 was separated from safety-related wiring by less than one inch (required separation is one inch).

"d. In 4160-volt switchgear cubicle E-PBA-503K <u>[sic]</u>, non-safety-related flexible conduit 1EZJ1ANRR51 was separated from safety-related wiring by less than one inch (required separation is one inch).

"This is a Severity Level IV Violation (supplement II)."

<u>RESPONSE TO VIOLATION II.A.2</u>

(1). <u>Admission or Denial of the Alleged Violation:</u>

The conditions described do exist, but items "a" and "b" are not violations because the PVNGS FSAR or quality program addresses them. Item "a" is not a violation of separation criteria requirements because conduit 1EZADCNRQ506 is for a telephone circuit. Low-voltage circuits for telephone and/or computer systems have been analyzed and found as having no adverse effect on adjacent Class IE cables; therefore, they are considered exempt from the separation criteria requirement. A change to the FSAR, SARCN1114, was initiated prior to the inspection (8/25/83) to clarify that Regulatory Guide 1.75 is not applicable to low energy circuits.

Item "b" is not a violation, since the noted deficiency is in an area which has not received the final inspection and acceptance per Bechtel Construction Work Plan Procedure (WPP/QCI) 251.1. It is planned that these kinds of conditions will be identified and corrected as required by Regulatory Guide 1.75 during completion of walkdown, which is specifically designed to focus on all tray, conduit, and wiring separation requirements. The walkdowns per WPP/QCI 251.1 have not been completed in many areas of Unit 1 because the implementation of late design changes in many cases would have impacted compliance with the separation requirements.

The violation described in Items "c" and "d" is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2). Reasons for the Violation:

The root cause of the violation described in Items "c" and "d" can not be positively identified. The Class 1E vendor installed wiring within the cabinet may have been moved or disturbed during work or testing to come within one inch of the non-Class 1E flexible conduit. Alternately, the flexible conduit may have been installed incorrectly.

(3). Corrective Actions Taken to Date and Results Achieved:

The specific conditions found were documented on Startup NCR's SE-2916 and SE-3293 or corrected on the spot.

To broaden the data base for evaluation of the conditions originally found, Bechtel Construction conducted a similar review on the Containment Spray Pump "A-Train" and the Charging Pump "A-Train". One other separation problem was identified during this review and was documented on NCR EJ-3646. The conditions of noncompliance with separation criteria applicable to conduit installations as documented by the referenced NCR's have been reviewed for safety significance. The review indicates that the conditions, which are all considered minor, if left uncorrected would have no impact on the ability to operate the plant and/or achieve a safe shutdown. The final Construction QC walkdown inspections for conduit-to-conduit and conduit-to-tray have not been completed by Construction and Quality Control. The list of released areas not inspected per WPP/QCI 251.1 has been submitted for inclusion into the Master Tracking System (MTS) to assure completion prior to fuel load.

(4). Corrective Steps Which Will be Taken to Avoid Further Violations:

To assure compliance with these requirements Construction will conduct retraining sessions with Field Engineers and QC Engineers to re-emphasize the importance of separation inspections.

Inspection for separation is currently covered in the installation procedures and documented on raceway installation and termination cards. The separation inspection required by WPP/QCI 251.1 may or may not be completed as part of the area release walkdown required by WPP/QCI 31.0. A PCN to WPP/QCI 31.0 is being prepared to require a note on the area release document noting that the 251.1 walkdown has not been completed as part of (or before) the area release walkdown. This will provide that the open item will be tracked on MTS.

The Field QA Surveillance Program will be upgraded to include a selective sampling of QC accepted installations on a monthly basis to continually assess effectiveness of the inspection program in vital areas of tray and conduit.

SAR Change Notice 1142 has been initiated to clarify that Regulatory Guide 1.75 is not applicable to low energy circuits such as telephone and paging circuits. This SAR Change Notice provides additional clarification to that already provided concerning low energy circuits such as fire detection, previously provided in SAR Change Notice 1114.

(5). Date When Full Compliance Will be Achieved:

- o Completion of all Unit 1, 2, and 3 walkdown inspections will be completed prior to fuel load for each unit.
- o The revision to WPP/QCI 31.0 and the associated retraining session will be completed By February 15, 1984.
- o SAR Change Notices 1142 and 1114 will be incorporated into a future amendment of the FSAR.
- o Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillance - will be revised to specifically establish a monthly program for an overview of previously accepted installations by QC by February 28, 1984.

VIOLATION II.A.3

"3. The separation requirement as described in the above specifications requires that each circuit and raceway be given a unique permanent alphanumeric identification and colored dots (round emblems) along their lengths at intervals not greater than 15 feet.

"Contrary to the above requirements:

"a. A separation group 1 cable tray located in HPSI pump room A was not marked with red color identification (round emblems) between points 1EZACEATCBA and 11EZACCARC03.

"b. Round blue identification emblems were missing from channel D conduit (PT-351) for a distance of approximately 40/50 feet at the 120 feet elevation.

"c. Temporary alphanumeric identification on cable tray 1EZAIDBTXCF had not been replaced with permanent identification.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.A.3

(1). Admission or Denial of Alledged Violation:

The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2). Reasons for the Violation:

For items "a" and "b", the project has experienced problems with retaining these markings in place. These markings were disturbed and fell off. For item "c", the work had not been completed due to an oversight.

(3). Corrective Steps Which Have Been Taken and Results Achieved:

The specific problems identified were corrected as follows:

a. Red dot missing in HPSI "A" room corrected on the spot.

b. Blue emblems missing for 40 to 50 feet at 126 elevation corrected on the spot.

c. Temporary I.D. was replaced by permanent I.D. as documented on NCR EA-3332.

To broaden the data base for evaluation, Construction conducted a review of raceways associated with Charging Pump "A-Train" and Containment Spray Pump "A"-Train" for similar raceway identification problems. Of 220 raceways reviewed, 13 were found to have some deficiency. These are documented on NCR's EJ-3645 and EJ-3647. As a result of this evaluation, a 100 percent reinspection program for safety-related raceway will be implemented in Unit 1 to assure compliance with this requirement.

The condition of missing raceway/conduit alphanumeric identifications and color codings as identified by the NRC violation have been evaluated for safety significance. The evaluation indicates that the noted conditions, if left uncorrected, would have no impact on the ability to operate the plant and/or achieve a safe shutdown, since the cables are also color coded. The condition does not constitute a significant construction deficiency requiring extensive repair or redesign to establish conformity with design requirements.

(4). Corrective Steps Which Will be Taken to Avoid Further Violations:

To preclude recurrence in Units 2 and 3, PCN 57 has been issued to WPP/QCI 31.0 requiring raceway identification verification at the time of area release walkdown.

Field Engineering and QC Engineering personnel will be trained regarding the additional inspection element added as a result of the procedural revision.

The Field QA Surveillance Program will be upgraded to include a selective sampling of QC accepted installations on a monthly basis to continually assess effectiveness of the inspection program in vital areas of raceway identification.

(5). Date When Full Compliance Will be Achieved:

Retraining of responsible personnel, and completion of the 100 percent reinspection program for Unit 1 will be completed by March 15, 1984.

- o Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillance - will be revised to specifically establish a monthly program for an overview of previously accepted installations by QC. This revision will be issued by February 28, 1984.

VIOLATION II.A.4

"4. IEEE Standard 384-1974, 'Criteria for Separation of Class IE Equipment and Circuit Breakers,' endorsed by the Licensee in Section 8.3.1 of the FSAR in Section 5.1.2, states, in part, 'Exposed Class IE Raceways shall be marked in a permanent manner at points of Entry and Exit from an Enclosed Area.'

"Contrary to the above requirements, at the time of the inspection, the following separation group I conduits were not identified by alphanumeric markings:

"a. Conduits 1EZJ1AARC12, 14, and 16 on both sides of the wall between group I, 4.16 KV switchgear area and channel A remote shutdown panel area at the 100-feet elevation.

"b. Conduit sleeves 1EZJ1BARC13, 14, and 15 on control building wall in channel B remote shutdown area at the 100-foot elevation.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.A.4

(1). Admission or Denial of the Alleged Violations:

The violation is admitted but the Severity Level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2). Reasons for the Violation:

The first condition is attributed to an oversight by the Field Engineer. The omission is attributed to oversights by area release walkdown personnel; this requirement was not included as a specific inspection element in the Construction walkdown procedure.

(3). Corrective Steps Which Have Been Taken and Results Achieved:

The specific problems identified were corrected on the spot.

To broaden the data base for evaluation, Construction conducted a review of raceways associated with Charging Pump "A-Train" and Containment Spray Pump "A-Train" for similar raceway identification problems. Of 220 raceways reviewed, 13 were found to have some deficiency.

These are documented on NCR's EJ-3645 and EJ-3647. As a result of this evaluation, a 100 percent reinspection program for safety-related raceway will be implemented in Unit 1 to assure compliance with this requirement.

The conditions of missing raceway/conduit alphanumeric identifications and color codings as identified by the NRC violation have been evaluated for safety significance. The evaluation indicates that the noted conditions, if left uncorrected, would have no impact on the ability to operate the plant and/or achieve a safe shutdown. The condition does not constitute a significant construction deficiency requiring extensive repair or redesign to establish conformity with design requirements.

(4). Corrective Steps Which Will be Taken to Avoid Further Violations:

To preclude recurrence in Units 2 and 3, PCN 57 has been issued to WPP/QCI 31.0 requiring raceway identification verification at the time of area release walkdown.

Field Engineering and QC Engineering personnel will be trained regarding the additional inspection element added as a result of the procedural revision.

The Field QA Surveillance Program will be upgraded to include a selective sampling of QC accepted installations on a monthly basis to continually assess effectiveness of the inspection program in vital areas of raceway identification.

(5). Date When Full Compliance Will Be Achieved:

Retraining of responsible personnel, and completion of the 100 percent reinspection program in Unit 1 will be completed by March 15, 1984.

Project Quality Program Manual will be revised to specifically establish a monthly program for an overview of previously accepted installations by QC by February 28, 1984.

PART II

NOTICE OF VIOLATION.II.B.

"Appendix B of 10 CFR 50, Criterion V, as implemented by Chapter 17 of the Licensee's PSAR and FSAR requires, in part, that: 'Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances, and shall be accomplished in accordance with these instructions, procedures, or drawings.'

"Contrary to the above requirement and the specifications listed below, the following conditions existed at the time of the inspection."

VIOLATION II.B.1.

"1. Section 11.0 of Bechtel Specification 13-CM-320, 'Erection of Structural and Miscellaneous Steel,' states, in part: 'Installation shall be in accordance with AISC 'Specification for Structural Joints using ASTM A325 or A490 bolts.' Paragraph 5(a) of the AISC specification requires that A325 bolts, 7/8-inch diameter be tightened to at least a minimum tension of 39 Kips. An acceptable method of obtaining this tension is described in paragraph 5(c), 'Turn-of-Nut Tightening,' which requires that bolts be brought to a 'snug tight' condition plus an additional 1/3 to 2/3 turn, depending on the bolt length.

"Contrary to these requirements, on September 5 and 13, 1983, four A325 bolts were finger loose. Using a calibrated torque wrench, two A325 bolts showed a tightness of less than 39 Kips. These bolts were located in the structural steel beams as itemized in NRC Inspection Report No. 50-528/83-34, pages VII-3&4. "This is Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.B.1

(1) Admission or Denial of the Alleged Violation:

The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2) Reasons for the Violation:

(a) Loose Bolts:

The NRC performed visual inspection of 368 bolted connections of platform and structural steel in the Auxiliary and Containment buildings. Four bolts were found in one connection of an Auxiliary Building personnel access platform which were "finger loose." During a review after the NRC identified the loose bolts, Bechtel QC identified two additional bolts in another connection of the same platform which were also "finger loose." Bechtel Quality Assurance performed a similar visual surveillance of 43 connections and found no loose bolts; however, one bolt did not meet the specified thread engagement. (Reference NCR CC-4333). Subsequent to this, Bechtel Engineering performed a visual review of structural steel connections in the Auxiliary and Containment Buildings of Units 1, 2 and 3. A total of 361 connections containing 2,192 bolts were reviewed. One connection containing four "finger loose" bolts, one connection with one loose bolt, and one connection with one bolt having insufficient thread engagement were identified. These connections were in the Unit 1 Containment Building at elevation 120'-0".

In the cases found by these inspections, the loose bolts tend to be located in clusters, not randomly located within connections and have been painted in the loosened condition indicating that proper installation was never completed. This indicates that the reason for the violation is oversight by both craft and QC inspection.

The two connections which had four loose bolts are standard AISC, bearing type, clip-angle connections consisting of six bolts in each connection. The remaining two bolts in each of these connections were found to be tight. Per general drawing 13-C-00A-001, all structural steel bolted connections are bearing type with the maximum number of rows of bolts permittable unless noted otherwise on the design drawing. Providing this type of connection is conservative in two respects:

(1) Conservative loads are used to design the members and the connections typically are adequate with fewer than the maximum number of bolt rows.

(2) By the nature of AISC specified design allowables, design of connections is more conservative by a substantial margin than that of the connected member.

Also, bearing type connections do not rely on tension in the bolt to transfer load and, in fact, as long as the bolts remain in the connection adequate load transfer will occur. The nut in this case is purely a retaining device and theoretically could be replaced by anything which would ensure that the bolt did not fall out of the connection (<u>i.e.</u>, cotter pin).

This concept is reinforced in the commentary on the AISC Specification for Structural Joints (8/14/80), Section C6, page 22, where it is stated in part: ". . . The performance of the bolt in bearing is not dependent upon high tension. Visual evidence of wrench impacting is adequate indication that the nut has been tightened sufficiently to prevent it from loosening or falling off accidentally."

Combining the above facts with the results of all the inspections, which indicate 99.5% of the connections do not have loose bolts, Bechtel Engineering has evaluated that the loose bolts in bearing type connections is not prevalent and is not safety significant. No further inspection of bearing type joints is warranted.

The connection which Bechtel QC identified as having two loose bolts is a beam to wall connection consisting of three bolts total. The remaining bolt in this connection was found to be tight. This connection is typical of structural steel connections at concrete interfaces and in skewed connections in that the holes are slotted in the horizontal direction to allow for irregularities in the cast in place concrete walls and for fabrication tolerances, respectively. If lateral loads are present that must be transmitted through these connections, then the bolts would be required to be friction-type. Although this particular joint is slotted in the horizontal direction, no horizontal loads are required to be transmitted by this connection and the vertical loads may be transferred as in a bearing type connection. The same conservatisms which were mentioned earlier also apply here. A further discussion of friction type connections is presented in Part II.B.1.b.

(b). Undertorqued Bolts:

The NRC also performed calibrated torque wrench testing on 62 high strength bolts which were not visually loose. Two bolts were determined by the NRC to show a torque or tension less than the minimum required by AISC. Bechtel Construction conducted an identical inspection of 115 other randomly selected high strength bolts and found four bolts, of the 115 bolts inspected, that were tight but did not meet torque requirements. A further investigation was made by Bechtel Engineering by performing a calibrated torque wrench test on 183 additional bolts in the Unit 1,2, and 3 Auxiliary and Containment Buildings. This investigation indicated that 95% of the bolts checked in the Containment Buildings were torqued correctly. Of the remaining 5%, only a slight rotation (1/12 to 1/16 turn) was required to bring the bolts up to the required torque.

As before, it is pointed out that for the most part, the structural steel joints in the Containment and Auxiliary Buildings are bearing type and do not depend upon tension for load transfer. AISC uses the same installation procedure for bearing or friction type connections to minimize the changes of craft error in installing the bolts as bearing type when they should be friction type. It also ensures against accidental loosening of the nut and possible loss of the bolt from the connection.

For those joints in Containment which require friction type bolts, design margins are such that at least one bolt in any connection may be undertorqued or even loose without affecting the load carrying capacity of the joint. The 5% of the bolts which are indicated to be undertorqued are acceptable based on this fact and the aforementioned design conservatisms. Bechtel Engineering will, however, perform a further investigation of accessible, critical, friction type connections inside the Containment to assure connection adequacy.

In the Auxiliary Building, a higher percentage of bolts than that in Containment was shown to be undertorqued. This is of little significance primarily for the following reasons:

The majority of the main structural steel in the Auxiliary Building is used for supporting the wet weight of the concrete slabs during construction. It has already served its primary function. The remaining main structural steel, which supports grating, does not have slotted holes and all connections are bearing type. The platforms inside the Auxiliary Building are for personnel access only. The steel is lightly loaded and the connections are bearing type. Secondary steel which spans between main beams and supports HVAC ducts or cable trays in all buildings do have slotted holes in the horizontal direction. These beams are, however, lightly loaded and tension (even if it were less than the AISC minimum) in any one of the four connection bolts would provide load transfer. In the highly unlikely event that all four bolts, two on each end, were loose, structural integrity would still be maintained and failure of the beam or the system it supports would not occur. Subsequent review of the Design drawings for Category I Buildings other than the Containment show that the connections described for the Auxiliary Building are typical. It is therefore concluded that no critical friction-type connections are present in these buildings and no further investigation is warranted outside of Containment.

As a further point of information concerning this subject, the newest AISC Specification for Structural Steel Joints (8/14/80) no longer recognizes the calibrated torque wrench methodology because of "the large variability of torque-to-tension relationships for seemingly similar bolts and conditions."

(3). Corrective Steps Which Have Been Taken and Results Achieved:

(a) Loose Bolts:

(i) The loose bolts in the two structural joints of platform A-C-6 at elevation 51'-6" in the Auxiliary Building which were identified by the NRC and Bechtel QC have been replaced and torqued to AISC requirements in accordance with NCR CA-4308.

(ii) The loose bolts identified by the Engineering walkdown will be corrected as documented by NCR CC-4496.

(b) Undertorqued Bolts:

(i) An inspection was made by Bechtel Engineering using a calibrated torque wrench. Although a number of bolts were found to be undertorqued, the condition is not safety significant. No further investigation is warranted in Category I buildings other than the containment.

(4). Corrective Steps Which Will be Taken to Avoid Further Violations:

(a) Loose Bolts:

(i) No further steps will be taken.

(b) Undertorqued Bolts:

(i) Since this data indicates that approximately 5% of the structural steel bolts installed may be undertorqued, Bechtel Engineering will prepare and implement a walkdown program which will provide for reinspection of the accessible critical structural steel connections in all Containment Buildings in Units 1, 2, and 3. These connections by their location and design will be determined as essential for the structures to function under design basis conditions. The connections inspected will be those which require a friction type bolt in order to transfer lateral loads. Based on the results of this reinspection program, decisions can be made on what further actions must be implemented.

The Field QA Surveillance Program will be upgraded to include a QA overview of structural steel bolt/ welded connections accepted by QC on a monthly random sample. This activity is also included in the approved Field QA Audit Schedule.

(5). Date When Full Compliance Will be Achieved:

o The reinspection program of the accessible critical connections in Units 1, 2, and 3

Containment Buildings will be completed by April 20, 1984.

- o Revision to Project Quality Program Manual, Procedure 18.6, "Project Quality Assurance Surveillance," will be issued by February 28, 1984.

VIOLATION II.B.2

"2. Bechtel Specification 13-CM-307, 'Design, Installation, and Testing of Concrete Anchors,' established requirements for bolt embedment depth, spacing, torquing, and case-by-case Licensee approval for use.

"Contrary to these requirements, concrete expansion anchors were deficient in that 15 bolts were undertorqued, washers were missing under two nuts, three bolts were insufficiently spaced from other bolts or unused holes, three unused holes were ungrouted, and two cases existed where prior Licensee approval was required and not obtained. These anchors were located in various safety-related raceway supports, and are itemized in NRC Inspection Report No. 50-528/83-84, pages VII-8&9.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.B.2

(1). Admission or Denial of Alleged Violation:

The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2) Reasons for the Violation:

Expansion anchors of various types are used on this Project only when all other viable alternatives are exhausted. Expansion anchors are categorized by Specification 13-CM-307 into four groups, "A" through "D", depending on their application and safety significance. Group "A "expansion anchors are used for safety-related pipe supports and hanger connections. Only Rock Bolt Expansion Anchors are used in Group "A". Group "B" includes all electrical cable tray supports and Category I HVAC duct supports. Approved Hilti, Ramset, or Drillco expansion anchors may be used for Group "B". Group "C" includes pipe supports and hanger connections for the fire-protection piping and for all other project classifications not included in Group A, B, or D. Approved Hilti, Ramset or Drillco expansion anchors are used for Group "C". Case-by-case approval by APS is required for expansion anchors used in Groups A, B, and C. Group "D" includes electrical raceway (except cable tray), aluminum sheathed cable, non-class IE systems, instrument tubing, sensing lines, local panels, communication systems, non-category I HVAC supports, and miscellaneous platform and stair systems where load is transferred in shear only. Hilti, Ramset or Drillco expansion anchors may be used for Group "D". No case-by-case approval, testing or documentation is required since the criteria for the use of these anchors were pre-established. The expansion anchors for all groups are designed conservatively using large factors of safety and in accordance with I&E Bulletin 79-02. Further factors of safety are applied when vibratory or impact loadings may be present.

With respect to the 15 Hilti KWIK-bolt expansion anchors which were found by the NRC to be undertorqued, test data has shown that Hilti KWIK-bolt expansion anchors lose a significant amount of their initial torque, up to 30 percent in some cases. It was also shown that this loss does not significantly affect the anchor's load carrying capacity. The high factor of safety utilized in design ensures the proper functioning of the anchor. Subsequent to the NRC inspection, Bechtel QC reinspected, at random, an additional 226 concrete expansion anchors in various areas of the Auxiliary, Control and Containment Buildings. Of those, one bolt was found to be slightly undertorqued, but not loose, and one was stripped (turned in hole but would not pull out) such that it could not be torqued. None of the other type of violations identified by the NRC were found during the reinspection effort. Prior to, and continuing after the NRC inspection, a systematic walkdown of electrical raceway supports has been in progress. The purpose of this walkdown is to ensure compliance with the design drawings and specifications. It encompasses Units 1, 2, and 3 and supplies as-built information for Bechtel Engineering review and disposition. Deficiencies such as those found by the NRC CAT inspection are routinely identified, documented and dispositioned by Bechtel Engineering. Most of these discrepancies are found to be acceptable and are dispositioned Use-As-Is and are documented on FCR's or as-built drawings. Those which are deemed unacceptable are corrected and documented by NCR's.

The deficiencies found by the NRC which are relative to concrete expansion anchors have been evaluated by Bechtel Engineering and it has been determined that none of the conditions would have adversely affected the safety of plant operations. Left undetected, none of the deficiencies would have caused failure of the systems they support. This is due, in part, to the high amount of redundancy designed into each system. Based upon these considerations, none of the conditions identified are safety significant.

Based on the fact that the HPSI "A" room has undergone a significant amount of modification which is not typical of most of the plant, Bechtel Engineering feels that the number of deficiencies found is not representative of the overall quality of installation. To provide additional data concerning these installations, a reinspection in Units 1, 2, and 3 of expansion anchors will be performed and the results evaluated. Torque will be checked to 70 percent of the installation torque value. This inspection torque, based on the previously mentioned test results, is the torque which the in-situ anchors are expected to exhibit.

Failure to obtain APS' approval prior to installation of concrete anchors is attributed to oversight. All the responsible individuals involved in approving concrete anchor installations have reviewed this violation and applicable specifications.

(3). Corrective Steps Which Have Been Taken and Results Achieved:

The problems identified by the NRC concerning concrete anchors were either corrected on the spot, as documented on NCR's WA-3396, EA-3400, and EA-3405 or were covered by FCR 62,238-C. These violations were all found in the HPSI "A" Room and in the Auxiliary Building wraparound section at Elevation 100'-0".

(4). Corrective Steps Which Will be Taken to Avoid Further Violation:

A procedural change to require 100 percent QC inspection for all accessible safety-related concrete expansion anchor installations is being processed. The original inspection sampling requirement was 10 percent; however, the implemented practice of inspection as verified by the reinspection program, has been approximately 90 percent.

Bechtel Engineering has revised Specification 13-CM-307 by issuing SCN 3570. This change improves the administrative process by which APS approval is obtained before concrete expansion anchors can be used. An additional SCN to Specification 13-CM-307 will be issued to reflect the QC procedural change mentioned above.

In accordance with the revised specification, Engineering must include a reference to the APS authorizing correspondence on any design document issued to Construction showing expansion anchors.

As part of the transfer process, as established by WPP/QCI 31.0 a punchlist is assembled of all work remaining in the area that must be completed prior to the area release. Grouting of unused holes is included on that punchlist.

The Field QA Surveillance Program will be upgraded to include a selective sampling of QC accepted installations on a monthly basis to continually assess effectiveness of the inspection program in vital areas of concrete expansion anchors.

(5). Date When Full Compliance Will be Achieved:

- The revisions to Specification 13-CM-307 and Construction procedure WPP/QCI 24.1 will be issued by February 28, 1984.
- The expanded evaluation of the installed concrete anchors will be completed and documented by April 1, 1984.
- Project Quality Program Manual will be revised to specifically establish a monthly program for an overview of previously accepted installations by QC by February 28, 1984.

VIOLATIONS II.B.3 and II.B.4

"3. Procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, 'Nuclear Pipe Hangers and Supports Installation,' Appendix I, requires the QC Engineer to verify each completed task on the 'CIP for Nuclear Pipe Supports.'

"The inspection requirement on the CIP for 'Task 1' is to verify that the support assembly is correct per approved engineering drawings and specifications.

"Contrary to the above, in September, 1983. Unit 1 pipe supports were found to be incorrectly installed per approved drawings and specifications but had been verified correct by the Piping QC Engineer. Specifically, supports SI-106-H003, H005, and H036; SI-101-HOOA; and SI-106-H001 were found with items which did not meet drawing requirements as described in Inspection Report 50-528/83-84, pages V-3, 4, and 5. The supports had been accepted by Piping QC Engineers during the period between November 28, 1979, and November 20, 1981.

"This is a Severity Level IV Violation (Supplement II)."

"4. Procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, 'Nuclear Pipe Hangers and Supports Installation', Appendix I, requires the QC Engineer to verify each completed task on the 'CIP for Nuclear Pipe Supports'. The 'CIP' inspection requirements for Task 8 require the Welding QC Engineer to verify that field welding is complete. For Task 9, he is to check the vendor welding for size and length. Additional instructions to the Welding QC Engineer in Appendix I instruct him to verify welding acceptability.

"Contrary to the above, in September 1983, Unit 1 pipe supports were found with unacceptable weld conditions which had been reported as acceptable by the Welding QC Engineers. Specifically, pipe supports SI-100-H005, H015, and H034; SI-102-H00B, SI-106-H011 and SI-176-H001 and H003 were found with unacceptable weld conditions. The supports had been verified acceptable during the period July 14, 1980 to September 15, 1982. The welds and deficiencies are described in NRC Inspection Report No. 50-528/83-84, pages V-5, 6, and 7. "This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATIONS II.B.3 and II.B.4

(1). Admission or Denial of Alleged Violation:

The violations are admitted but the severity level assigned to Item II.B.4 is inappropriate for the reasons stated herein, and in Attachment B, pages 6 and 7.

(2). Reasons for the Violations:

During the NRC inspection of the Safety Injection System, 12 pipe supports were found which did not meet the criteria of the design drawing and applicable tolerances allowed by Procedure WPP/QCI 201.1. The basic concern seems to involve the size and quality of welds which were performed by the craft and accepted by Quality Control In reviewing the violations, many of the problems are a result of unclear procedures for inspecting welds. Along circumferential areas of piping, problems arise when a pipe stanchion or a pipe lug is prepared to fit up to a pipe (see Figure 1).

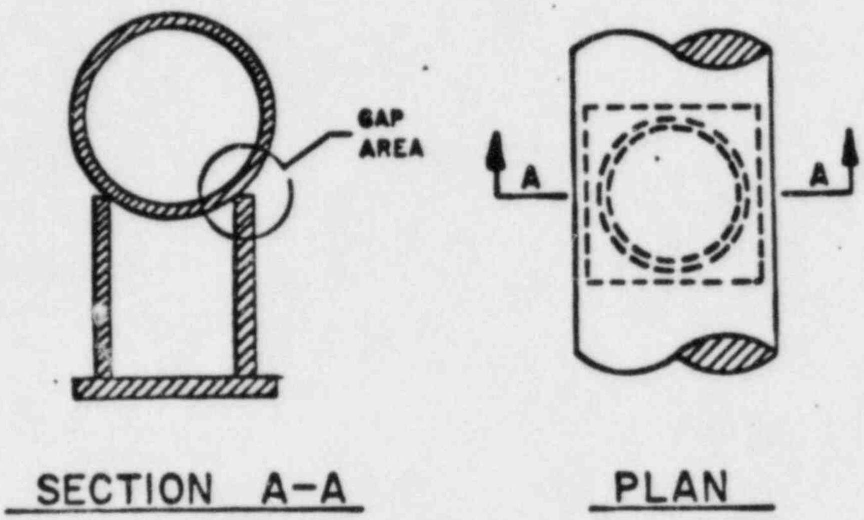


FIGURE 1

As shown in Section A-A of Figure 1, the normal fit-up of pipe spools and support stanchions leaves a gap between the inside and outside diameters of the stanchions. Although the design drawing specified the pipe spool to support stanchion attachment weld to be an all-around fillet weld, this attachment weld was in many cases made by filling in the gap between the spool and the stanchion. This method of welding is structurally equivalent to the fillet weld specified on the design drawing.

Another common problem detected on welded piping attachments such as support stanchions, was the omission of the fillet weld cap on a full penetration weld required by the design drawing. Fillet weld caps are normally specified on all support stanchions with full penetration attachment welds to provide a smooth stress path transition between the pipe spool and the stanchion. Due to the size ratio between the pipe and the support stanchions used on this project, however, the majority of all stanchions do not actually require the fillet weld cap required by the design drawings to ensure the structural adequacy of the support.

Even though these cases do not cover all discrepencies found, they are an example of the types of occurrences observed. When designing miscellaneous steel structures certain criteria are used by Engineering which tend to establish a large factor of safety in the structure. To meet stiffness requirements, deflection allowables are established. By designing the structure to meet these allowables, stresses in the members of the structure are kept significantly below the allowables established by code. For small bore piping, actual stresses tend to be not more than 20% of allowables while for large bore piping stresses are generally never more than 60% of allowables. In addition, weld sizes are usually governed by code minimums and not strength requirements.

(3). Corrective Steps Which Have Been Taken and Results Achieved:

Specific pipe support items identified by these violations have been corrected by the following NCR's.

Violation II.B.3:	PA-7141, PA-7149, PA-7151, and PA-7154
Violation II.B.4:	PA-7154, PA-7155, PA-7170, PA-7171, PA-7229, PA-7230, and PC-7238

Since a number of supports on safety-related systems were found to be "substandard" with regards to design requirements, the project elected to implement a major and comprehensive reinspection program. The following types and categories of supports and racks were included in this reinspection program:

a. All ASME Nuclear Class 1 pipe supports.

b. All ASME Nuclear Class 2 and 3 pipe supports included in the Condensate Transfer and Storage System, the Essential Chilled Water System, the Essential Cooling Water System, the HVAC -Containment Building, and the Containment Hydrogen Control System.

c. All pipe supports in the In-Service Inspection Program which includes the Auxiliary Feedwater System, the Chemical and Volume Control System, the Reactor Coolant System, the Main Steam System, and the Safety Injection and Shutdown Cooling System.

d. All other safety-related pipe supports inspected and accepted by Construction QC prior to June, 1980.

The reinspection program included 2199 pipe supports and pipe racks. All inspections of the program were completed on December 16, 1983. A total of 2,047 pipe supports and 104 pipe racks were reinspected. A total of 48 pipe supports were not accessible for reinspection. All nonconforming conditions noted during the reinspection program were documented on NCR's PX-7370 and PX-7313.

These NCR's identify a total of 1,269 nonconforming conditions on 807 different pipe supports or pipe rack assemblies.

The majority of nonconforming conditions were concerning welds. A total of 925 (72.9%) of all conditions reported addressed weld quality, weld size and weld length/location deficiencies. Weld quality includes the general quality of weld (example, weld splatter) and accounts for 93 (7.4%) of all deficiencies. Weld size is the evaluation of all welds either undersize, oversize or cases where the size of weld is unclear on the applicable design documents. This case accounts for 565 (44.5%) of all deficienceis. Weld length/location accounts for all incomplete welds, short welds, intermittent spacing incorrect, missing welds and incorrect locations of welds and accounts for 267 (21%) of all deficiencies. All weld deficiencies were evaluated as not having an adverse affect for the respective systems with the following justifications: (1) All linear indications which resulted in code violations were removed. (2) As stated previously, Bechtel Engineering has included enough conservatism to account for construction practices; and (3) Of all the undersize welds which violated the AISC, AWS or ASME Code requirements, 87% were 1/16" undersize, 11% were 1/8" undersize, and the remaining 2% were noted as being 3/16" undersize. The welds which were 3/16" undersized were on obtuse angles where accurate measurements could not be made, or in low stress areas where the minimum AISC weld size was not required for strength. The design of the subject pipe support welds have been qualified as described in Bechtel's M&QS Report GRS-020-02, which is included with DER 80-3. The "as-built" calculations indicate that the designs are sufficient to carry the project design loads. Therefore, the installed and as-designed pipe supports are acceptable without repair. This condition is viewed as not reportable under the requirements and reportability criteria of 10 CFR 50.55(e), because if the condition had not been detected, it would not have constituted a significant safety hazard. While the majority of the problems involved weld deficiencies, the most severe problems involved deficiencies in pipe support configurations and in pipe support components. Pipe support configuration deficiences include fabrication problems, such as existing members larger or smaller than specified on the design drawing, and pipe support damage, such as members distorted or missing or unauthorized disassembly of bolted connections. A total of 165 (13%) of all reported deficiences involved pipe support configuration problems. Pipe support component deficiencies include those aspects of component installation, such as trueness and correct installation per manufacturer's recommendation. A total of 135 (10.6%) of all reported deficiencies involved pipe support component problems.

The most severe deficiencies identified by the reinspection program include five supports which have undocumented disassembly after final Construction QC acceptance.

These include hangers 1EC013H00E, 1EC014H00M and 1EC061H00J which were found with the high strength bolts removed; hanger 1EC015H00E had a member completely removed; and hanger 1SI220H007 which had one of two snubbers disconnected at one end. These conditions represent an overall failure rate of 0.2 percent and are evaluated as safety significant.

The evaluation of the reported hanger configuration and component deficiencies also indicates that the adequacy of 41 pipe supports with problems in their categories have been rendered indeterminate. The various problems include: (1)

components skewed beyond manufacturers tolerance, (2) component pipe clamp bolt loose, (3) strut lock nut loose, (4) strut retainer ring missing, (5) cotter pins missing and (6) various jam nuts missing. In each of the above cases, the locking device used to keep the component from vibrating loose is missing. A missing locking device will not cause a failure of the support but could lead to component failure.

In connection with this reinspection program, Quality Assurance conducted an overview of the QC reinspection program on a random sample of 99 pipe supports to assess inspection effectiveness. This resulted in rejection of 7 pipe supports accepted by QC during this reinspection program for a 7 percent error rate. CAR S-83-56 was issued to QC to establish cause and obtain the necessary corrective measures to avoid recurrence. All deficiencies found as a result of this overview program were dispositioned as "Use-As-Is".

In summary, the reinspection program can basically be separated into one group of weld problems and another group of support configuration problems. Weld problems definitely encompass a larger number of supports. However, the problems are all acceptable as far as strength is concerned and did not render the support incapable of its required function. Even though strict inspection criteria was not followed in accepting these welds, all supports have been accepted and are fully functional for the design conditions. Support configuration problems are not as numerous, but they do have a much greater severity level. Almost all configuration deficiencies show evidence of correct installation at one time, even though their present condition of disassembly was not documented.

(4) Corrective Steps Which Will be Taken to Avoid Further Violation:

The scope of the reinspection program was adequate to determine the types, severity, and frequency of deficiencies which can be expected throughout each of the units. This information indicates, that the remainder of Unit 1 safety-related pipe supports require reinspection to address the safety significant problems found during the reinspection program. No additional reinspection for weld size, length or quality is required based upon the evaluated acceptance rate in the reinspection program.

The revised procedure for control of work performed during startup coupled with the use of

Bechtel Construction procedures to cover disassembly and reassembly of supports during startup will preclude recurrence.

The following training sessions including specialized training by Bechtel's Material and Quality Services (M&QS) on inspection techniques have been conducted with QC and Field Engineering personnel:

- o October 20, 1983 - Instruction of Pipe Support and Welding QCE's by Bechtel M&QS on proper use of fillet weld gauges and on visual weld inspection criteria.
- o October 27, 1983 - Instruction of Pipe Support and Welding QCE's and Welding FE's by Bechtel M&QS on proper use of M&QS weld gage for skewed fillet welds.
- o December 7, 1983 - Reinstruction of Pipe Support and Welding QCE's by PFQCE on weld reinspection acceptance criteria.
- o December 14, 1983 - Reinstruction of Pipe Support and Welding QCE's by Lead Welding QCE on pipe support accept/reject criteria.

To improve and direct the Quality Assurance activity relative to the installation and QC acceptance of pipe supports and other key construction activities, the following Quality Assurance program improvements are being implemented:

a. A corrective Action Reverification Program is being established by Bechtel Jobsite QA. The purpose of this program is to reverify the effectiveness of previous corrective actions taken for selected quality problems which:

  - o Were serious enough to have been reported to the NRC (DER's)
  - o Have a history of recurrence (trends/audits/surveillance CAR's)
  - o May be generic (Bechtel Power Divisions CIDS computer program).

  Procedural guidelines are in the process of formulation to establish the selective methodology, establish frequency of reverification, and document results on appropriate forms.

b. The Field QA Surveillance Program will be upgraded to include a selective sampling of QC accepted installations on a monthly basis to continually assess effectiveness of the inspection program in vital areas of pipe supports.

(5) Date When Full Compliance Will be Achieved:

- o The physical work to resolve all nonconformances requiring rework was completed January 20, 1984.

- o The revised final report for DER 83-74 will be issued by February 28, 1984.
- o QA verification of corrective action taken by QC for Bechtel CAR S-83-56 will be completed by February 15, 1984.
- o Project Quality Program Manual, Procedure 16.0 - Corrective Action - will be revised to include the corrective action reverification program and issued by February 28, 1984.
- o Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillance - will be revised to specifically establish a monthly program for an overview of previously accepted installations by QC. This revision will be issued by February 28, 1984.

VIOLATION II.B.5

"5. Specification 13-PM-204, Revision 12, dated April 17, 1983, paragraph 12.1.2, states the design and location of all pipe supports shall be the responsibility of project engineering. Paragraph 12.1.4 states pipe supports designed by engineering will be shown on drawings and all design details will be shown including miscellaneous steel.

"Contrary to the above, in September, 1983, Unit I pipe support SI-100-H012 contained a miscellaneous steel member. The member was not shown on the pipe support drawing, 13-SI-100-H012, Revision I, and was used to provide support to an instrument air line.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.B.5

(1) Admission or Denial of the Alleged Violation:

The violation is admitted, but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2) Reason for Violation:

This condition is attributed to oversite by Bechtel Engineering.

(3) Corrective Steps Which Have Been Taken and Results Achieved:

The noted procedural deficiency is documented on APS Corrective Action Request C83-142N. The identified pipe support drawing has subsequently been revised.

Bechtel Engineering will review all Unit 1, 2 and 3 pipe support drawings for the existence of any non-documented attached supports. Normal design practice is to assure that multiple supports are clearly cross-referenced on the drawings. The attaching support and the support being attached to are shown in phantom with support numbers on their respective counterpart drawings. Similarly, the design calculations of each support include the load effects from all supported piping. Loads from attaching supports are identified in the calculation with the support numbers indicated.

A review of this condition has determined that it is not safety significant.

(4) Corrective Steps Which Will be Taken to Avoid Further Violations: .

Revised calculations, hanger drawings, design change package, and DER's which apply to Units 1, 2 and 3 will be prepared if necessary as a result of the investigation.

Bechtel Engineering has notified all responsible design personnel of the design document requirement.

(5) Date when Full Compliance will be Achieved:

The investigation by Bechtel Engineering will be completed by March 1, 1984.

VIOLATION II.B.6

"6. Procedure WPP/QCI No. 204.0, Revision 3, 'Piping Systems Release for Insulation', Appendix I requires that piping systems be checked for unacceptable surface damage prior to insulation of the piping.

"Contrary to the above, pipe spool 1SI-009 S002 was certified acceptable for insulation on November 14, 1982, with the unacceptable pit in the pipe which violated minimum wall requirements.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.B.6

(1). Admission or Denial of the Alleged Violation:

The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2). Reasons for the Violation:

This violation was caused by an oversight by the QC Inspector. An unclear procedure contributed to the oversight.

(3). Corrective Steps Which Have Been Taken and Results Achived:

The identified condition and another condition identified by the NRC CAT Team were documented on NCR's SM-2976 and PA-7138. Both conditions were evaluated by Engineering as not violating minimum required wall requirements and were dispositioned "Use-As-Is". The depth of the indication did exceed the manufacturer's tolerance for minimum wall (12.5% of nominal). However, in the investigation of this condition, Engineering determined that the minimum wall thickness required by design (calculation ZZ-584) had not been violated. This, therefore, does not represent a safety significant condition.

The WPP/QCI 204.0 for surface inspection of piping prior to release for insulation was revised and expanded for clarification. Specifically, the procedure was changed from a simple "accept" buy-off to separate buy-offs for surface damage, arc strikes, and cleanliness. The reference to ED-1 for visual acceptance criteria was deleted and the specific evaluation requirements were put into the procedure. When the visual criteria is indeterminate, a minimum wall evaluation is described that must be documented on the Construction Inspection Plan (CIP). If, after that evaluation, the surface indication is not acceptable, the procedure now requires that an NCR be prepared.

In order to determine the likelihood that some unacceptable surface indications could exist on piping insulated prior to the procedure changes, a review of approximately 550 "Q" class spools was made in Unit 1. This sample included spools that had been previously insulated but were currently "uninsulated" for some reason, and spools that had yet to be insulated. Although many spools were reported with minor blemishes, abrasions, or indications, all but five were acceptable to the visual criteria. The five indications were evaluated and found to be acceptable to the current criteria. No nonconforming indications were found.

The sample size approximately 550 represents 22 percent of the 2,532 "Q" spools requiring insulation. It has been concluded, therefore, that no detrimental surface irregularities exist on "Q" piping insulated prior to the procedure change.

(4). Corrective Steps Which Will be Taken to Avoid Further Violations:

To maintain high inspection standards for the work being performed in Units 2 and 3, formal training for piping field engineers, QC engineers, and subcontract engineers was conducted after the procedure was changed. Three PCN's have subsequently been issued against WPP/QCI 204.0.

The Field QA Surveillance Program will be upgraded to include a QA overview of piping systems released for insulation per WPP/QCI 204.0 on a continuous monthly basis, to assure correct disposition/resolution of surface damage and maintenance of cleanness, prior to application of insulation. WPP/QCI 204.0 is included in the approved Field QA Audit Schedule. This activitiy will specifically cover Unit 2 and 3 systems released for insulation.

(5). Date When Full Compliance Will be Achieved:

WPP/QCI 204.0 revisions and retraining of responsible personnel have been completed. Revision to

Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillance - will be issued by February 28, 1984.

PART III

NOTICE OF VIOLATION II.C

"Appendix B of 10 CFR 50, Criterion IX, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: 'measures be established to assure that special processes including welding are controlled and accomplished in accordance with applicable codes, standards, specifications, criteria, and other special requirements.'

"FSAR Section 3.8.1.66 states: 'Welding is done in accordance with AWS D1.1-72, Revision 1, 1973, Structural Welding Code.' Bechtel Drawing 13-S-ZAS-536, Revision 3, requires a 5/16-inch fillet weld when attaching structural steel vertical members to horizontal members. Drawing 13-C-ZAS-570, Revision 8, requires a 5/16-inch fillet weld when attaching structural steel to embedded plates. Additionally AWS D1.1, Paragraph 10.17, states that undercut shall be no more than 0.01-inch deep when its direction is transverse to primary tensile stress in the part that is undercut, and not more than 1/32-inch deep for all other situations.

"Contrary to the above requirements, at the time of the inspection, the size of structural steel fillet welds was less than required by the drawings and undercut in welds exceeded the requirements of AWS D1.1. These welds were located in various safety-related structural steel and are itemzed in NRC Inspection Report No. 50-5283-84, pages VII-4, 5, and 6.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.C.

(1) Admission or Denial of the Violation:

The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

(2) Reasons for the Violation:

The engineering deviations to AWS D1.1-72, as included in the construction procedures and construction specification, had not yet been included in the applicable sections of the FSAR.

Field Engineering and Quality Control Inspection personnel did not identify or document minor deviations from weld specification requirements which had previously been accepted by project engineering on a nonconformance report without rework.

(3) Corrective Steps Which Have Been Taken and Results Achieved:

The noted violations concerning miscellaneous steel welding were documented on NCR CA-4320 for resolution. The findings from Bechtel's reinspection program are documented on NCR's CA-4366 and CA-4415. NCR CA-4366 prompted the generation of DER 83-72 to provide an evaluation for safety significance under the requirements of 10 CFR 50.55(e).

The structural and miscellaneous steel welding requirements as contained in Specification 13-CM-320 were revised for clarification and ease of interpretation by Field Change Requests (FCR) 72,146-C and 71,023-C, and Specification Change Notice (SCN) 3568. Areas specifically addressed were weld undersize, oversize, and undercut. The changes covered both welding requirements and inspection accept/reject criteria. An additional review was performed by Bechtel Engineers to assure that all deviations to AWS D1.1 meet the project design requirements. Responsible Field Welding Engineering and Welding QC personnel were trained not only on the specification changes but also retrained on weld inspection techniques and the use of weld inspection tools and implements.

(a) A training session on the use of skewed fillet weld gauges was conducted on October 27, 1983, with all Welding QC Inspectors and all Welding Field Engineers.

(b) Training sessions were conducted with Welding QC Inspectors on October 20, 1983, and December 7, 1983, to provide instruction on the clarified criteria and to reinforce existing inspection criteria.

Reinspection of 348 additional structural welds was completed on November 7, 1983 and the evaluation of observed conditions is as follows:

Out of the 348 welds inspected, a total of twenty or approximately six percent were found to be undersized; eighteen welds were between 1/32" and 1/16" undersized while two were 1/8" undersized. This condition is not safety significant.

Oversize welds are of concern when they could result in lamellar tearing of the base metal. Particular concern is given to lamellar tearing when base materials greater than one inch in thickness are overwelded. The major purpose of limiting oversized welds on material less than one inch thick comes from economical and distortion considerations. The oversized welds identified here have been visually examined for excessive distortion and any indication of lamellar tearing. No cracking or unusual distortion was observed. The design margin used for this type of connection is generally about 30 percent. Only a few connections were designed up to the allowable loads.

All design loads for the reinspected weld conditions were approximately 80 percent of the allowable loads. As is expected for the majority of the cases, where design loads approximate allowable loads, margin still exists (e.g., approximately 15 percent which can be demonstrated by testing or dynamic analysis).

A review of the undersize structural steel welds identified by NCR's CA-4320, 4366, and 4415, comprising all the undersize welds identified by the NRC inspection plus those found by the Bechtel reinspection program, have been evaluated for safety significance. The review by Bechtel Engineering found that all identified weld sizing defects could be dispositioned "Use-As-Is" since, if left uncorrected, none of the defects would represent a saf[illegible] significant condition.

Combining t[illegible]ery conservative design loading require[illegible], the conservative AISC minimum weld requirements, and results of the reinspection which resulted in all weld/ defects being dispositioned "Use-As-Is", Bechtel Engineering concludes that the structural and miscellaneous steel welding already completed in Units 1, 2, and 3 is adequate, and is not safety significant. Based on this evaluation, no additional reinspection of structural steel welds in Units 1, 2 and 3 is warranted.

(4) Corrective Steps Which Will be Taken to Avoid Further Violations:

The FSAR will be revised by SAR Change Notice 1123, which will incorporate the specific welding requirements currently contained in Specification 13-CM-320. The exceptions taken to AWS D1.1-72, Revision 1, 1973, and the justification for the exceptions will be incorporated into the FSAR. This change clarifies the licensing document to incorporate the flexibility permitted by the Code. The change also provides consistency between the implemented practice reflected in the construction specification, as allowed by the Code, and the licensing document.

A re-review by Bechtel Engineering to provide additional assurance of consistency between the licensing documents and the other currently implemented construction specifications is currently being completed and will be documented by the final report issued for Deficiency Evaluation Report 83-72.

The Field QA Surveillance Program will be upgraded to include a QA overview of structural steel welded connections accepted by QC. This selective sampling on a monthly basis will assure that ongoing activities are in compliance with specifications and AWS D1.1 requirements. The WPP/QCI governing this activity will also be included in the approval Field QA Audit Schedule.

(5) Date When Full Compliance Will be Achieved:

- o A draft revision to FSAR Section 3.8.1.6.6 and 3A.10 will be submitted for NRC review by March 31, 1984, and incorporated into Amendment 13 to the FSAR.
- o Additional training of Welding QC and Field Engineering to reinforce inspection criteria will be conducted by January 31, 1984.
- o The final report for DER 83-72 will be issued by March 15, 1984.
- o Revision to Project Quality Program Manual, Procedure 18.6 - Project Quality Assurance Surveillance - will be issued by February 28, 1984.

PART IV

NOTICE OF VIOLATION II.D

"10 CFR 50 Appendix B, Criterion XVI, states in part, that: 'Measures shall be established to assure that conditions adverse to quality such as failures . . . deficiencies . . . defective material and equipment, and nonconformances are promptly identified and corrected.' Borg Warner valve assembly drawing number 77770-1 requires that the stud nuts connecting the bonnet to the valve body be torqued to a value of 160-200 foot pounds.

"Contrary to the above, on September 15, 1983, the inspector observed torque verification performed on valve number V-470 which resulted in the identification of loose stud nuts connecting the bonnet to the valve body.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.D

1. Admission or Denial of the Alleged Violation:

   The violation is admitted but the severity level assigned is inappropriate for the reasons stated herein and in Attachment B, pages 6 and 7.

   Reason for the Violation

   As noted in the response to the violation noted in section I.A.2, SI-470 was incorrectly assembled because of incorrect supplied parts from a supplier, although the assembly was controlled and documented. However, subsequent to the installation, the valve was partially disassembled and improperly assembled.

2. Corrective Steps Which Have Been Taken and the Results Achieved:

Valve SI V470 has been repaired as documented by SFR 1SI-292.

3. Corrective Steps Which Will be Taken to Avoid Further Violations:

To preclude recurrence on Units 2 and 3 and to provide a documented inspection on future valve installations, Construction will revise WPP/QCI 202.0 to require verification that all vendor bolts, studs, and nuts are intact at the time the installation CIP is completed. The responsible personnel will be trained regarding the additional procedure requirement.

To assure work performed under the jurisdiction of APS is properly controlled, work performed on any permanent plant equipment will be performed under an approved Work Control program. This ensures that any changes to, or deviations from the plant design configuration, either temporary or permanent, are approved and documented prior to beginning the work activities. Performance of work or test activities on any permanent equipment within

APS' jurisdictional control must be concurred with by the Operations Shift Supervisor. The operations phase Work Control Procedure will be similarly expanded to assure prompt identification of discrepancies, local identification tagging or previous identified significant problems, and tracking of tags until resolution. The above requirements will ensure that the plant design configuration and system status are maintained in a known, approved state.

APS will expand the Startup Work Authorization (SWA) procedure such that when a discrepancy is observed on equipment in the startup jurisdiction, a SWA or SFR will be initiated. A copy of the SWA will be forwarded to the Shift Supervisor for his information and to determine if a tag should be hung to identify the problem locally. All tags will be tracked and controlled by Operations personnel, with a copy of closed SWA's also forwarded to the Shift Supervisor to allow timely removal of tags.

Before acceptance of a system or subsystem by PVNGS Nuclear Operations, a PVNGS Nuclear Operations Acceptance Walkdown will be conducted on the system to confirm that the system configuration is in accordance with design. APS management will issue a directive to all APS Startup and Operations personnel informing them of their responsibility to identify, pursue and assure resolution of all discrepancies identified. Personnel will also be instructed not to perform work without the proper authorization and controls.

4. <u>The Date When Full Compliance Will Be Achieved:</u>
   - 4.1 Construction procedures will be revised and personnel trained by February 28, 1984.
   - 4.2 Startup procedures will be revised and personnel trained by March 1, 1984.

PART V

NOTICE OF VIOLATION II.E

"Appendix B, of 10 CFR 50, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires, in part, that: 'The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety.'

"Contrary to the above requirement, pipe support SI-89-H008 was found during the September, 1983, inspection with rubber seal material in between the Flourogold slide plates, Item 54 and 55 on the drafing. The applicable support drawing does not permit the use of rubber material. The rubber material may impair the sliding function. The support had been accepted by QC on November 29, 1979.

"This is a Severity Level IV Violation (Supplement II)."

RESPONSE TO VIOLATION II.E

1. Admission or Denial of Violation:

   The violation is admitted but the severity level assigned is inappropriate for the reasons stated below and in Attachment B, pages 6 and 7.

2. Reasons for the Violation:

   The investigation of this violation revealed that the sealant subcontractor had spilled sealant material some time earlier in the area. The cleanup effort did not include an inspection for possible effect on equipment in the immediate area, and some material remained between the sliding plates until found by the NRC.

3. Corrective Steps Which Have Been Taken and the Results Achieved:

During reinspection of approximately 2,100 safety-related pipe supports, detailed in the response to Violations II.B.3 and II.B.4, all observed deficiencies were documented, including sealant material on or in the supports. As a result, two additional supports were found with sealant material between the pipe and the restraint.

The conditions found by the NRC and during Construction's reinspection effort are documented on NCR PA-7169 and NCR PX-7370, Items 300 and 364, and dispositioned "rework."

This condition has been evaluated for safety significance. It was determined by Bechtel Engineering that the presence of the sealant material would not have impaired the function of the support. The sample size representing approximate 19 percent of all "safety-related" supports, the relatively few incidents found, and the evaluation that there is no safety-related problem, indicate that no additional reinspections are warranted for sealant material on supports.

4. Corrective Steps That Have Been Taken to Avoid Further Noncompliance:

To preclude recurrence on all Units, Subcontract Notices have been sent to both penetration sealing subcontractors directing them to notify the Bechtel Subcontract Coordinator of any spillage. Upon such notification, the immediate area of the spillage will be inspected by Bechtel to assure proper cleanup has been achieved.

Both sealing Subcontractors have acknowledged the SCN's in writing, stating that their personnel had been trained in the new requirement that spills be reported to the Bechtel Subcontract Coordinator in the future.

5. Date When Full Compliance Will Be Achieved:

Full compliance has been achieved.

ATTACHMENT E

APS SEPARATE ANSWER, FILED PURSUANT TO 10 CFR 2.205, PROTESTING THE ASSESSMENT OF THE CIVIL PENALTY PROPOSED BY SECTION 1.A. OF THE VIOLATION.

SEPARATE ANSWER OF APS FILED PURSUANT TO 10 CFR 2.205 TO SECTION I.A. OF THE NOTICE OF VIOLATION

1. Pursuant to 10 CFR 2.205 and the Notice of Violation, APS denies the violation alleged in Section I.A. of the Notice and protests the imposition of a civil penalty therefor. As grounds for such denial and protest, APS states as follows:

1.1 The allegation in Section I.A. of the Notice that APS violated Criterion II of Appendix B, 10 CFR Part 58 is based solely upon the four "examples" cited in such section, to-wit:

1.1.1 The installation of caps on the containment pressure sensing lines without the documentation required by established QA procedures and in the absence of any administrative requirement which would assure removal of the caps prior to operations.

1.1.2 The absence of any documentation recording the disassembled, nonconforming condition of the manual operator of valve SI V470 on HPSI "A" pump.

1.1.3 The absence of any documentation recording the nonconforming condition of the position indicator for valve SI V402 on HPSI "B" pump.

1.1.4 The absence of bolts from the base frames of such MCC's necessary to ensure the structural integrity of six motor control centers (MCC's).

1.2 Two of the four examples cited did not constitute a violation of Criterion II of Appendix B to 10

CFR Part 50 or any other Regulatory Requirements[1] as demonstrated by Attachment C.[2]

1.2.1 The installation of caps on the containment pressure sensing lines (the first example) was not a violation for the reasons stated in Sections 1 and 2 of Part I of Attachment C, pages 2-5.

1.2.2 No bolts necessary to ensure the structural integrity of six MCC's (the fourth example) were missing as demonstrated by Sections 1-3 of Part IV of Attachment C, pages 23-27.

1.3 With respect to the second and third examples cited in Section I.A., APS denies that the undocumented, nonconforming condition constituted a Severity Level III violation, because the existence of the condition, if left uncorrected, would not have prevented the HPSI system from operating in accordance with its design intent and, therefore, was not significant to safety.

It is questionable in the absence of safety significance whether the discrepant condition meets the test of a Severity Level V violation, <u>i.e.</u> "minor safety concern." It clearly does not meet the test of a Severity Level IV violation,

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[1] The term "Regulatory Requirements" as used in this document has the same meaning as that given to the term by footnote 2 in Appendix C to 10 CFR Part 2.

[2] References in this document to Attachments A, B and C mean those attachments to the letter, dated January 30, 1983, from APS to the Director, Office of Inspection and Enforcement, submitted in answer to the Notice of Violation.

since it is explicit in Appendix C of 10 CFR Part 20 that Severity Level IV applies only to a condition "of more than minor concern; *i.e.*, if left uncorrected, they could lead to a more serious concern." (10 CFR 2, App. C, Section III).

Severity Level III applies only to "significant violations involving a deficiency in a licensee quality assurance program for construction related to a single work activity (*e.g.*, structural, piping, electrical or foundations) . . . and normally involves multiple examples . . ." (10 CFR 2, App. C., Supp. II, para. C.1.). (Emphasis supplied).

Section I.A. of the Notice does cite four examples, but it is clear that the second example is a work activity that is not any way related to example no. 1 (instrumentation) or example no. 4 (electrical). It is also distinguishable from example no. 3 (which APS denies is a violation), because example no. 3 did not involve a failure to follow work procedures during preoperational testing.

1.4 For foregoing reasons, APS denies that Section I.A. alleges a Severity Level III violation and protests the assessment of the civil penalty as proposed.

2. In the alternative, if the foregoing protest of the imposition of a civil penalty for the violation alleged in Section I.A. of the Notice is disallowed, in whole or in part, APS requests the remission or mitigation of the civil penalty proposed by the Notice. In support of such request and addressing the five factors discussed in Section IV.B. of Appendix C to 10 CFR Part 2, APS submits the following:

2.1 APS acknowledges that (i) the discrepant conditions identified in the four examples cited in Section I.A. did exist in September, 1983, (ii) there was no documentation or record of such discrepant conditions, and (iii) such conditions were identified by the CAT. Nonetheless, consideration of these acknowledged facts must be tempered by the following considerations:

2.1.1 The subsystems and equipment referred to in first, second and third examples had not been accepted by PVNGS Nuclear Operations. (See Section 1 of Parts I, II and III of Attachment C, pp. 3, 9, and 17, respectively.)

2.1.2 The transfer of such subsystems and equipment by Bechtel construction to the APS Startup organization did not mark the completion of construction under the PVNGS startup program. (See PVNGS FSAR, Section 14.2.1, pp. 14.2-1 and 14.2.2 and Attachment B, pp. 1-5.)

2.1.3 The subsystems and equipment referred to in the first, second and third examples were undergoing Preoperational Testing in September, 1983. (See Section 1 of

Parts I, II and III of Attachment C, pp. 2, 9, and 17, respectively.)

2.1.4 The existence of conditions which do not conform to conditions required for operation is inherent in any incompleted construction.

2.1.5 Under the foregoing circumstances, the imposition of a civil penalty for a lack of documentation or a failure of APS to detect the discrepant condition can be based only upon an assumption that documentation and correction would not have resulted from the completion of Preoperational Testing then in progress or from inspections preceding acceptance by PVNGS Nuclear Operations of the discrepant conditions.

2.1.6 It is unfair and unreasonable to impose a civil penalty upon an assumption that a violation of a Regulatory Requirement will occur in the future.

2.1.7 Each of the discrepant conditions cited in the second, third and fourth examples has been analyzed to be not significant to safety. The significance to safety of the first example rests solely on an unreasonable assumption of a future failure to meet Regulatory Requirements. Consequently, the conditions cited in the examples do not meet the criteria established by Appendix C to 2 CFR Part 2 for assignment of Severity Level III.

2.1.8 The assignment of Severity Level III to violations cited in the four examples is not warranted under the circumstances where

(i) None of the examples are significant to safety;

(ii) There are no multiple examples related to a single activity (see section 2.6 hereof at page 10); and

(iii) The deficiency is a lack of documentation of the status or condition of subsystems or equipment still in Preoperation Testing.

2.1.9 The severity level assigned to the lack of documentation respecting the status of subsystems and equipment still undergoing Preoperational Testing should not exceed Severity Level V, or Severity Level IV at the most, if such deficiency is considered "symptomatic of program deficiencies, rather than isolated concerns." (10 CFR Part 2, Appendix C, Section IV, B).

2.2 Prior to the CAT Inspection, APS had (i) identified the concerns identified in the Enforcement Letter and expressed by the CAT inspectors and the Regional Administrator during the Exit Meeting and the Enforcement Conference, (ii) had initiated corrective action, and (iii) had initiated steps to determine reportability under 10 CFR §50.55(e). (See Attachment A.)

2.3 On its own initiative, APS has promptly taken comprehensive measures (i) to improve the PVNGS Startup program, (ii) to assure proper implementation of its quality assurance program, including, among other things, proper documentation, and (iii) to assure that work, inspections and tests previously performed during the Startup program were accomplished satisfactorily. (See Attachment 2-3)

2.3.1 With respect to the timeliness and scope of the measures taken by APS to address the concerns raised by the CAT Inspection, Attachment A addressed such matters more fully and is incorporated herein by reference. In summary, however, the record shows corrective measures were initiated by APS prior to the completion of the CAT Inspection. The scope and intensity of such measures was subsequently increased with the direct involvement and guidance of APS senior management.[3]

Thus, in addition to the internal audit initiated by the Vice President, Nuclear Operations, immediately following the Exit Meeting on September 30, 1983 (see Attachment A, pp. 6-7), APS senior management commissioned an independent assessment conducted by a team consisting for the most part of members with no direct responsibility for PVNGS and headed by a qualified individual from another utility. This independent assessment was instituted promptly after the CAT Exit Meeting and before the CAT Inspection Report was issued. (See Attachment A, pp. 7-8).

On November 23, 1983, after completion and review of the internal audit, start-up work was suspended, on the sole initiative of APS, until a satisfactory work control program could be developed and implemented. (See Attachment A, p. 8).

On January 5, 1984, shortly after completion and review of the independent audit, the management structure for Palo Verde was reorganized. (See Attachment A, p.10).

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[3] "APS senior management" means those officers of APS who are also members of its Board of Directors, currently the Chairman of the Board of Directors and Chief Executive Officer, the President and Chief Operating Officer, the Executive Vice President, Arizona Nuclear Power Project, and the Executive Vice President, Finance.

All of these actions, as well as others cited in Attachment A, demonstrate not only timeliness, but of equal importance, the dedication of APS management to complete Palo Verde in a manner which will prevent recurrence of the problems which have been identified.

2.3.2 With respect to improvements in the Startup program, APS has instituted a structural reorganization which (i) unifies under one officer the responsibility and authority for engineering, construction, startup, operation and maintenance of PVNGS, (ii) establishes improved means for controlling the interfaces between separate organizations within APS and between such organizations and outside organizations such as Bechtel and Combustion Engineering, and (iii) clearly defines and limits the role and responsibility of the PVNGS Startup organization to Prerequisite and Phase I Preoperational Testing and relieves it of responsibility for functions for which it has neither authority nor resources (e.g., engineering, construction, procurement, maintenance). (See Attachment A, p. 10).

2.3.3 Both APS and Bechtel have instituted reviews and reinspection programs which reach far beyond the limited scope of the subsystems and areas inspected by the CAT. (See Attachment A, pp. 6-8, 13-14, 17-25).

2.3.4 Renewed efforts have been instituted for training and indoctrination of project personnel to the high standards of safety and quality established for PVNGS with meticulous attention to detail. (See Attachment A, pp. 4, 12, 19-20, 23).

2.4 The enforcement history at PVNGS is demonstrably excellent. There has been no failure to implement previous corrective action committed to because of prior similar problems.

2.5 There is no evidence that APS management had prior notice of the specific non-conforming conditions cited as examples in Section I.A. of the Notice as a result of a licensee audit or a specific NRC or industry notification. There is evidence of APS management's awareness of problems in the PVNGS Startup program and of its efforts to evaluate and resolve them; and some remedial steps had been taken prior to the end of the CAT Inspection. (See Attachment A, pp. 2-3).

2.6 The factor of multiple occurrences referred to in Section IV.B. of 10 CFR Part 2, Appendix C is not applicable to Section I.A. of the Notice, because each of the examples cited is distinguishable from the others.

2.6.1 The first example (capped containment pressure sensing lines) is an undocumented condition in an instrumentation system that existed during Preoperational Testing. The condition would have been nonconforming during operation. It was not the result of an unauthorized work activity; on the contrary, it was a prudent action which was consistent with established practice implemented during construction and Preoperational Testing. The only missing element was the lack of documentation which was not required.

2.6.2 The second example (the disassembled and improperly reassembled remote actuator on valve SI 470) resulted from an unauthorized work activity during Preoperational Testing in violation of established work procedures.

2.6.3 The third example (valve SI V402 with a position indicator that prevented full open valve operation) was a condition existing in a piping system during Preoperational Testing.

2.6.4 The fourth example (bolting of MCC's) was a condition in the electrical system which resulted from a construction activity. This construction activity did not violate any drawing or specification. The condition was not nonconforming because it did not affect the structural integrity of the component involved.

3. Finally, APS requests assignment of the severity level of the deficiencies noted in Section I.A. be reduced to Severity Level IV or V, and the concomitant remission of the civil penalty, because at least three of the four examples cited in Section I.A. have been analyzed to have no safety significance even if left uncorrected. Consequently, none of these, singly or collectively, meet the criteria established for assignment of Severity Level III by Appendix C to 10 CFR Part 2.

With respect to the first example cited in Section I.A., it can only be treated as significant to safety if it is assumed that future inspections and future implementation of Regulatory Requirements will be ineffective in detecting and correcting the capped conditions of the containment pressure sensing line. It is improper to assign safety significance to the capped condition solely on the basis of such assumption. It is equally improper to assign Severity Level III to the lack of documentation covering the capped condition and to assess a civil penalty for the absence of such documentation.

Further, collectively, the four examples do not fall within the category of "multiple occurrences" as defined in paragraph C., Supplement II of Appendix C, 10 CFR Part 2 as set forth in Section 1.3 of this Attachment, pages 3, 4.

ATTACHMENT F

ALLEGED IMPROPER COMPLETION OF ONE OR MORE ELECTRICAL TERMINATION CARDS

ALLEGED IMPROPER COMPLETION OF ONE OR MORE ELECTRICAL TERMINATION CARDS

Section I.B. of the Notice of Violation alleges that a violation of Criteria V and XVII of Appendix B to 10 CFR Part 50 resulted from the improper completion of one electrical termination card and possibly 50 to 100 additional cards. The alleged improprieties in the completion of such card (or cards) were (i) the signature of an electrician indicating that he had made the electrical termination described on the card when, in fact, he had not done so, and (ii) the identification of a crimping tool by serial number as having been used to make the termination crimp when, in fact, a different crimping tool had actually been used.

This matter was not the subject of the CAT Inspection, but arose from an allegation made by an individual who then was or previously had been employed at Palo Verde. The the allegation, which was made to two Region V investigators and one Region V inspector on June 2, 1982, and some of the results and conclusions of the ensuing investigation are included in the Report of the Special NRC Inspection issued April 22, 1983.

Such report covers the period of the special inspection and investigations of several allegations conducted from June 1, 1982, through March 11, 1983. The report, while disclosing the allegation respecting termination cards, did not disclose the name of the alleger nor the names of employees interviewed in the course of the special inspection.[1/] No further disclosures of the special inspection and investigations have been made to APS. We have been informed that the NRC Office of Investigation has also made a report of its investigation, and has referred the matter to the Department of Justice for review. The Regional Administrator was unable to discuss the report of the Office of Investigation at the Enforcement Conference, because it was under review by the U.S. Department of Justice.

Following receipt of the April 22, 1983, Inspection Report, APS conducted a limited review of the matter. This review of the matter was limited, because, on advice of counsel, it was deemed that any attempt to contact and interview employees who might be the subject of the investigation could be construed as interference in a federal investigation.

On the basis of the limited review (principally a review of the April 22, 1983, Inspection Report and a record

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[1/] The alleger disclosed his identity at a news conference in Phoenix on July 14, 1983. The report referred to some of the employees interviewed as: "A", "B", "C", "D", "E", "F", "G", "H" and "J".

check), it appears to the best of APS' information and belief that the matter arose as a result of the need to replace certain electrical termination cards which had been lost and the absence of any procedure governing the replacement of such lost cards. This deficiency in procedures was corrected by revision of Work Plan Procedure/Quality Control Inspection Instruction (WPP/QCI) 255.0 on July 12, 1982. The following explanation of this procedure will assist in the understanding of this problem.

WPP/QCI 255.0 requires the craftsman performing a termination to complete the front side of a termination card where the termination is identified by (i) recording the date when the termination is made and the serial number of the crimping tool used and (ii) signing the card. The date, serial number and the craftsman's signature is not required and is not used to establish the quality of any termination. Indeed, under Appendix B to 10 CFR Part 50 quality control inspections of any work may not be conducted by any persons performing or responsible for the work. Thus, the signature of the craftsman and the crimping tool serial number are not and cannot be used or relied upon under NRC regulations to establish the acceptability of a termination.

The acceptability of a termination is determined and verified by visual inspections performed first by a Termination Engineer and subsequently and independently by a Quality Control Engineer. Each of these individuals is required by WPP/QCI 255.0 to inspect each termination, and, if the termination is found to be acceptable, to record such fact by initialing, signing, and/or stamping appropriate spaces on the back of the termination card. These inspections are conducted in accordance with specifications set forth in 13-EM-306, and the acceptance criteria used are those established by Amp Special Industries for ring tongue terminals which are acceptable for use in nuclear power plants.

The crimp tool serial number and date recorded on the front of termination cards provides a means for identifying specific crimps accomplished during certain time periods. By utilizing this number and dates a total listing of all terminations made by a specific tool during a given time period may be obtained from the computerized data base developed from the information on the front of the termination cards. The capability to obtain such a listing is not required or useful for quality control purposes. It can be useful, however, if or when a crimping tool is found to be out of calibration, to identify the terminations made by that tool in the period between calibrations which will have to be reinspected.

The termination identified in the Notice of Violation, has been inspected and was found to be acceptable. The quality control inspection was documented in accordance with WPP/QCI 255.0. To the best of our knowledge, there has been no substantiated allegation that either a Termination Engineer or a Quality Control Engineer has improperly stamped, initialed or signed any termination card. (See April 22, 1983, Inspection Report.) Further, as the April 22, 1983, Inspection Report shows, each of the terminations for which a replacement card was prepared was inspected by a Quality Control Engineer after the craftsman had signed the replacement card.

It is apparent from the April 22, 1983, Inspection Report that there was no intent on the part of any craftsman or his foreman or other supervisor to violate any NRC regulation since his signature and crimp tool serial number are not required by any such regulation. Nor could there be any intent to violate the required quality control inspection, because he did not and could not perform that function. The most adverse effect that could have flowed from an improper signature and the improper recording of a crimp tool serial number would be the need to recheck an excessive number of terminations if there was evidence that during the period when the termination was actually performed, crimping tools which were out of calibration were in use.

Investigation of the calibration records for crimping tools used at Palo Verde has not revealed any case where any crimping tool was out of calibration by a margin wide enough to affect the acceptability of crimps made with the tool. In fact, tests conducted to determine the effectiveness of the crimping tools has shown that none of the total of 27 crimping tools which have been rejected for project use were damaged or out of calibration severely enough to produce an unsatisfactory termination.

Accordingly, in the absence of any information to the contrary as may be contained in the report of the Office of Investigation (which has not been disclosed), APS is of the opinion and belief that there is no evidence that any termination card was improperly completed by any craftsman, either on his own initiative or as a result of any direction of his foreman or other supervisor, with the intent to violate, defect or circumvent any Regulatory Requirement.

APS has also found no evidence, nor has any evidence been made available, to indicate that any inspection record completed by a quality control inspection was not completed in accordance with Regulatory Requirements. Additionally, APS has found no evidence, nor has any evidence been made available, that there are any terminations at PVNGS which are defective as a result of the alleged violation in Section I.B. of the Notice.

RECEIVED

1984 JAN 13 AM 11 37

REGION V

Arizona Public Service Company
P O BOX 21666 • PHOENIX, ARIZONA 85036

January 11, 1984
ANPP-28597-JAR/BSK

U. S. Nuclear Regulatory Commission
Region V
Creekside Oaks Office Park
1450 Maria Lane - Suite 210
Walnut Creek, CA 94596-5368

Attention: Mr. John B. Martin
Regional Administrator

Subject: Notice of Deviation
NRC's Special Construction Appraisal Inspection
File: 84-019-026; D.4.33.2

Reference: NRC's letter to Mr. T. G. Woods, Jr. from Mr. J. B. Martin,
dated December 12, 1983

Dear Sir:

This letter refers to the Construction Appraisal Inspection referenced above. Our response to the Notice of Deviation is enclosed in Attachment A.

Very truly yours,

E. E. Van Brunt

E. E. Van Brunt, Jr.
APS Vice President, Nuclear
ANPP Project Director

EEVB/BSK:ru

Attachment

cc: See Page Two

~~8401300225 PDR~~

5

cc: K. L. Turley
T. G. Woods, Jr.
J. A. Roedel
D. B. Fasnacht
A. C. Rogers
B. S. Kaplan
W. E. Ide
J. Vorees
J. R. Bynum
D. D. Green
P. P. Klute
A. C. Gehr
W. J. Stubblefield
W. G. Bingham
R. L. Patterson
R. W. Welcher
H. Foster
D. R. Hawkinson
L. E. Vorderbrueggen
G. A. Fiorelli
S. R. Frost
J. Self
D. Canady

ATTACHMENT A

NOTICE OF DEVEIATION

Arizona Public Service Company
Palo Verde Nuclear Generating Station
Unit No. 1

Docket No. 50-528
Construction Permit No. CPPR-141
EA 83-30
EA 83-130

As a result of the inspection conducted between September 6-16, 26-30, October 31, and November 1, 1983, and in accordance with the NRC Enforcement Policy, 10 CFR 2, Appendix C, the following deviation was identified:

> FSAR Section 3.8.1.6.6, Structural and Miscellaneous Steel, states:
>
> "Welding is done is accordance with AWS D1.1-72, Revision 1, 1973, Structural Welding Code. The acceptance criteria for visual inspection of welding is done in accordance with AWS D1.72, Revision 1, 1973."
>
> Contrary to this commitment, Appendix A, Visual Inspection Criteria, for Structural Steel and Miscellaneous' Metal Welding to Meet Design Requirements, to Specification 13-CM-320, Erection of Structural and Miscellaneous Steel, permits acceptance of undercut, incomplete fusion (rollover or overlap), and underfilled weld craters in amounts or circumstances not allowed by AWS Code as described in NRC Inspection Report No. 50-528/83-34, pages VII-5 and 6.

RESPONSE TO NOTICE OF DEVIATION

Corrective Steps Taken And Corrective Steps That Are Planned

The structural and miscellaneous steel welding requirements as contained in Specification 13-CM-320 are being revised for clarification and ease of interpretation by Field Change Requests (FCR) 72,146-C,71-023-C, and Specification Change Notice (SCN) 3568. Areas specifically addressed were weld undersize, oversize, and undercut; additionally, the changes covered both welding requirements and inspection accept/reject criteria. An additional review is being performed to assure that all deviations to AWS D1.1 meet project design requirements.

The FSAR will be revised by SAR Change Notice 1123 which will incorporate the specific welding requirements currently contained in Specification 13-CM-320. The exceptions taken to AWS D1.1-72, Revision 1, 1973, and the justification for the exceptions, will be incorporated into the FSAR. This change clarifies the licensing document to incorporate the flexibility permitted by the Code. The change also provides consistency between the implemented practice reflected in the construction specification, as allowed by the Code, and the licensing document.

A re-review by Bechtel Engineering to provide additional assurance of consistency between the licensing documents and the other currently implemented construction specificatons is currently being conducted and will be documented by the final report issued for Deficiency Evaluation Report 83-72, scheduled for January 27, 1984.

Completion Of Corrective Steps:

A draft revision to FSAR Sections 3.8.1.6.6 and 3A.10 will be submitted for NRC review by March 31, 1984 and incorporated into amendment 13 to the FSAR.

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President, Nuclear Projects of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Edwin E. Van Brunt Jr.
Edwin E. Van Brunt, Jr.

Sworn to before me this 11 day of January, 1984.

Nora E. [illegible]
Notary Public

My Commission Expires:

My Commission Expires April 6, 1987

file

JAN 25 1984

Docket No. 50-528/83-34

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

Attention: Mr. E. E. Van Brunt, Jr.
Vice President

Gentlemen:

Thank you for your letter dated January 11, 1984 informing us of the steps you have taken to correct one of the items which we brought to your attention in our letter dated December 12, 1983. Your corrective actions will be verified during a future inspection.

Your cooperation with us is appreciated.

Sincerely,

Thomas W. Bishop, Director
Division of Reactor Projects
and Safety

Sent to DCS w/cy ltr dtd 1/11/84 for Dist.
Dist. by RV w/cy ltr dtd 1/11/84 - A. C. Gehr, Resident

~~8401300222 PDR~~

FILE

84-035

OFFICE ▶	RV	for					
SURNAME ▶	Young/dz	Bishop					
DATE ▶	1/20/84	1/20/84					

OFFICIAL RECORD COPY

USGPO: 1981—33

Docket No. 50-528 MAR 22 1984

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

Attention: Mr. T. G. Woods
Executive Vice President

Gentlemen:

Subject: NRC Meeting with APS on March 5, 1984

This refers to the meeting held with you and members of your staff at your corporate office in Phoenix, Arizona, on March 5, 1984.

The meeting was in regard to your corrective actions taken in response to the NRC team inspection conducted in September 1983 and reported in Inspection Report 50-528/83-34.

The enclosed report lists the remaining questions which were not resolved at the meeting. A response to these open questions is requested.

If you have any questions concerning this report, do not hesitate to contact us.

Sincerely,

Original signed by
D. F. Kirsch

T. W. Bishop, Director
Division of Reactor Safety
and Projects

Enclosure:
Inspection Report
No. 50-528/84-11

bcc: RSB/Document Control File (RIDS)

Distributed by RV:
Martin
State of Arizona
Resident Inspector
Ms. Jill Morrison

~~8403270135 PDR~~

RV/jk

DDN	PPN for	PPN for	DPN for	JJB	
NARBUT	YOUNG	FIORELLI	VORDERBRUEGGEN	BURDOIN	BISHOP
3/20/84	3/20/84	3/20/84	3/20/84	3/20/84	3/22/84

14

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Division of Resident, Reactor Projects and Engineering Programs

Report No. 50-528/84-11

Docket No. 50-528 License No. CPPR-141

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

Facility Name: Palo Verde Nuclear Generating Station - Unit 1

Location at: APS Corporate Offices, Phoenix, Arizona

Conference conducted: March 5, 1984

Participants:

PPNarbut for T. Young Jr., Chief, Reactor Projects Section 2	3/20/84 Date Signed
PPNarbut for P. P. Narbut, Reactor Inspector	3/20/84 Date Signed
PPNarbut for G. Fiorelli, Resident Inspector	3/20/84 Date Signed
PPNarbut for L. Vorderbrueggen, Senior Resident Inspector	3/20/84 Date Signed
Jol F. Burdoin J. Burdoin, Reactor Inspector	3/20/84 Date Signed

Approved by: D F Kirsch
for T. W. Bishop, Director, Division of Reactor Safety and Projects — 3/22/84 Date Signed

Summary:

A meeting, open to the public, was held on March 5, 1984. The following was discussed:

1. A presentation by APS of the details of the corrective actions taken by APS in response to the September 1983 CAT Inspection Findings.
2. A clarifying question and answer period between the NRC and APS.

~~8403270139 PDR~~

DETAILS

1. Meeting Participants

Arizona Public Service

Mr. T. G. Woods, Executive Vice President
Mr. E. E. Van Brunt, Vice President, Nuclear Projects
Mr. W. E. Ide, Corporate Quality Assurance Manager
Mr. A. C. Gehr, Esq., Snell and Wilmer
Mr. P. P. Klute, Manager of Public & Employee Information
Mr. A. C. Rogers, Nuclear Engineering Manager
Mr. D. B. Karner, Assistant Vice President, Nuclear Projects
Mr. J. Kirby, Startup Manager

Bechtel Power Corporation

W. G. Bingham, Project Engineering Manager

U. S. Nuclear Regulatory Commission

Mr. T. W. Bishop, Division Director
Mr. T. Young, Jr., Section Chief
Mr. P. P. Narbut, Project Inspector
Mr. L. E. Vorderbrueggen, Resident Inspector
Mr. G. Fiorelli, Resident Inspector
Mr. J. Burdoin, Reactor Inspector

In addition 5 other members of the APS staff, 9 members of the public including the PVIF, and 18 press and media members were in attendance.

2. Meeting Summary

The meeting was held at the APS Corporate Offices at 411 N. Central Avenue, Phoenix, Arizona at 11:30 a.m., March 5, 1984. The meeting was held between APS and the NRC and was open to members of the public and the press.

The purpose of the meeting was to clarify the corrective actions described by APS in their January 31, 1984 response to the NRC findings presented in the team inspection report number 50-528/83-34 and the NRC enforcement letter dated December 12, 1983. The focus of the meeting was a technical understanding of the APS actions. The violation severity levels and the APS request for mitigation of civil penalties were not discussed.

After brief introductory remarks by Mr. Bishop and Mr. Van Brunt, Mr. Ide presented the corrective actions being taken in response to each of the violations.

After Mr. Ide's presentation, the NRC participants asked clarifying questions. The questions were satisfactorily answered with the exception of the following questions which required further information to be obtained:

a. In regards to cable tray overfill, why was QC retraining not specified in Attachment D, Section II.A.1? Was a QC oversight involved in this problem?

b. In regards to loose structural bolts, what were the results of the walkdown specified in Attachment D, Section II.B.1.

c. In regards to concrete expansion anchors, did the walkdown specified in Attachment D, Section II.B.2 confirm the results of the initial small sample of 226 anchor bolts, and why was no craft or QC training specified?

d. How were the accuracies of the various walkdowns assessed by APS?

e. Regarding missing bolts in the motor control centers, what are the results of the reinspection of other equipment? What percentage of such bolts are you examining?

f. Regarding your new procedure to stroke manual valves, you stated that you've included major flow valves. Does this include all valves?

g. Regarding your reinspection findings in the area of pipe supports, some of the more significant findings involved missing snubbers. Was this limited to snubbers or was structure involved?

h. What is you~~r~~ current schedule for the transfer of systems to operations?

i. Why were the results of the Torrey Pines Technology Inc. walkdown of installed systems different than the NRC's?

j. Has anything been identified in the additional reinspections and walkdowns performed to date which is significant or disturbing?

At the conclusion of the meeting, questions were entertained from the attending members of the public. No questions were put forth. Subsequent to the meeting press interviews were held.

The meeting concluded at approximately 1:30 p.m.

Arizona Public Service Company

April 13, 1984
ANPP-29302-WEI/BSK

U.S. Nuclear Regulatory Commission
Region V
Creekside Oaks Office Park
1450 Maria Lane - Suite 210
Walnut Creek, CA 94596-5368

Attention: Mr. John B. Martin
Regional Administrator

Subject: Notice of Deviation
NRC's Special Construction Appraisal Inspection
File: 84-019-026; D.4.33.2

RECEIVED
1984 APR 18 PM 2:16

Reference: (1) NRC's letter to Mr. T. G. Woods, Jr. from Mr. J. B. Martin, dated December 12, 1983
(2) Letter ANPP-28597-JAR/BSK dated January 11, 1984

Dear Sir:

This letter refers to the Construction Assesment Team Inspection referenced above. Our response to the notice of deviation was transmitted by reference (2).

The committed date, for submittal of the draft revision of the applicable FSAR sections, has been revised. A revision to FSAR Sections 3.8.1.6.6 and 3A.10 will be submitted for NRC's information by June 1, 1984 and will be incorporated in a future amendment to the FSAR. This is due to a complete re-write, and associated lengthy review process, of SAR change notice 1123. However the committed corrective action has not changed and the final report for the Deficiency Evaluation Report was submitted on March 14, 1984.

If there are any questions, please let us know.

Very truly yours,

E. E. Van Brunt

~~8405010301 PDR~~

E. E. Van Brunt, Jr.
APS Vice President, Nuclear
ANPP Project Director

FILE

EEVB/BSK:db
Attachment

84-181

cc: See Page Two

IE-28

19.

cc: K. L. Turley
T. G. Woods, Jr.
W. E. Ide
D. B. Fasnacht
A. C. Rogers
B. S. Kaplan
J. Vorees
J. R. Bynum
P. P. Klute
A. C. Gehr
W. J. Stubblefield
W. G. Bingham
R. L. Patterson
R. W. Welcher
H. Foster
D. R. Hawkinson
L. E Vorderbrueggen
G. A. Fiorelli
S. R. Frost
J. Self
D. Canady

File w/
IR84/11

Arizona Public Service Company

April 30, 1984
ANPP-29386 BSK/JEC

U. S. Nuclear Regulatory Commission
Region V
Creekside Oaks Office Park
1450 Maria Lane - Suite 210
Walnut Creek, CA 94596-5368

Attention: Mr. T. W. Bishop, Director
Division of Resident
Reactor Projects and Engineering Programs

Subject: NRC Meeting with APS on March 5, 1984
File: 84-019-026; D.4.33.2

Reference: NRC's letter to Mr. T. G. Woods, Jr. from Mr. T. W. Bishop, dated March 22, 1984

This letter refers to the meeting held at APS' Corporate Office in Phoenix, Arizona, on March 5, 1984. Our response to the open questions which were not resolved at the meeting is enclosed in Attachment A.

Very truly yours,

E E Van Brunt

E. E. Van Brunt, Jr.
APS Vice President, Nuclear
ANPP Project Director

EEVB/JEC:ru

Attachment ~~8405100026 PDR~~

cc: See Page Two

FILE

84-198
IE-28 JD

cc: Richard DeYoung, Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

T. G. Woods, Jr.
W. E. Ide
D. B. Fasnacht
A. C. Rogers
B. S. Kaplan
L. A. Souza
D. E. Fowler
J. Vorees
J. R. Bynum
P. P. Klute
A. C. Gehr
W. J. Stubblefield
W. G. Bingham
R. L. Patterson
R. W. Welcher
H. D. Foster
D. R. Hawkinson
L. E. Vorderbrueggen
G. A. Fiorelli
S. R. Frost
J. Self
D. Canady

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, GA 30339

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President, Nuclear of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.

Edwin E. Van Brunt Jr

Edwin E. Van Brunt, Jr.

Sworn to before me this 30th day of April, 1984.

Nora E. Meador

Notary Public

My Commission Expires:

My Commission Expires April 6, 1987

ATTACHMENT A

The following responses are provided to the questions included in Inspection Report No. 50-528/84-11:

A. Question: In regards to cable tray overfill, why was Quality Control (QC) retraining not specified in Attachment (D), Section II.A.1? Was a QC oversight involved in this problem?

Response: QC involvement and retraining concerning generic tray separation requirements was included in the response to Section II.A.2. This training included the condition identified by Section II.A.1.

The condition identified by the NRC was overlooked during QC inspection because the applicable Bechtel Construction Work Plan Procedure 31.0 did not require an inspection for tray fill to the requirements of the specification. As indicated by the corrective action response to this section, Bechtel Engineering clarified specification requirements to permit cables to extend above the tray rails where there is not tray cover, provided that proper separation has been maintained. In addition, WPP/QCI 31.0 has been revised to require inspection for tray fill.

B. Question: In regards to loose structural bolts, what were the results of the walkdown specified in Attachment (D), Section II.B.1.?

Response: The walkdown program is in progress at the jobsite. It is being conducted by Engineering, QC, and the necessary crafts under a construction inspection plan (CIP No. 551.0) developed exclusively for this task. The walkdown involves 259 connections per unit which represents 100% of the critical connections in the Containment Building which require friction type connectors in order to transmit lateral loads. Partial data accumulated for over 1000 bolts indicates that 4% of the connectors experience greater than 1/12 relative rotation when subjected to the job inspection torque. A summary and evaluation are scheduled to be completed by April 20, 1984.

C. Question: In regards to concrete expansion anchors, did the walkdown specified in Attachment (D), Section II.B.2 confirm the results of the initial small sample of 226 anchor bolts, and why was no craft or QC training specified?

Response: The walkdown has been completed for 1178 randomly sampled wedge type concrete expansion anchors, representative of all buildings and all three units. The walkdown results provide a 95% confidence level that less than 5.7% of the installed anchors in Quality Class Q systems do not conform to all specification requirements. This has been calculated using standard statistical techniques. USNRC IE Bulleting Number 79-02, Revision 2, dated November 8, 1979, for "Pipe Support Baseplate Designs Using Concrete Expansion Anchor Bolts" describes the acceptable sampling method which was employed for evaluation of the walkdown data.

The walkdown results indicate that no gross or widespread violations in craft practice and QC procedures have been evidenced. An evaluation, considering the applications for which wedge type expansion anchors were used and the nature of defects identified, concluded that the number of defects identified is acceptable.

In regards to training, the normal method used to inform Field Engineers, and QC personnel of changes to the Work Plan Procedures/QC Instructions, is to route the changes with training sheets attached. The training sheet requires signature and date of each individual. This was done in this instance. A formal training session is used when there are "significant" or "important" changes. Subsequently, a formal QC training session was completed. Craft training is not required.

D. Question: How were the accuracies of the various walkdowns assessed by APS?

Response: For the most extensive walkdown, that of pipe supports, APS QA reviewed the inspection plan and sample criteria before the walkdown commenced. Additionally, as detailed in our response, QA provided an overview of the QC reinspection program by performing sample review of inspections performed by QC to assess inspection effectiveness. For the other walkdowns the sample size was reviewed and evaluated by APS as part of the review of the proposed Corrective Action. Increased samples were taken in some areas where the review found the sampling criteria to be deficient. Additionally, the summary of results of each walkdown were reviewed and evaluated by APS as part of the review of the proposed response to the Notice of Violation and associated Deficiency Evalutation Reports. Where deemed necessary, the response was modified to fully address APS' concerns and to ensure the evaluation of the results was adequate.

E. Question: Regarding missing bolts in the motor control centers, what are the results of the reinspection of other equipment? What percentage of such bolts are you examining?

Response: The reinspection of safety-related equipment installations for Units 1, 2 and 3 consisted of (1) auditing the field installation of 83 pieces of equipment in each unit and (2) reviewing the engineering documents of 247 pieces of equipment.

All base channel assembly bolts associated with the installation of the motor control centers have been reviewed. No bolts were found missing, at the interface of the equipment to the structure, other than the conditions described in the original response.

The results of the field audit indicated that all other equipment was properly installed. With ninety-percent of the engineering review complete, minor design improvements to DC motor control centers in Units 1 and 2 (1-E-PKC-M43C, 1-E-PKD-M44D, 2-E-PKC-M43C and 2-E-PKD-M44D) are being initiated solely based on good engineering practice.

F. Question: Regarding your new procedure to stroke manual valves, you stated that you have included major flow valves. Does this include all valves?

Response: In Unit 1, only safety related locked open/closed valves will be operated and Roto-hammer and similar valves will be inspected as described below:

> Locked open/closed safety related major flow path valves (not including such valves as instrument root, vent and drain valves) in Unit 1 without remote position indication will be operated to verify operabilty and position indication, prior to fuel loading.
>
> In addition to the response provided in Attachment C, Part III, Section 4.3 and 4.4, Unit 1 safety-related Roto-hammer and other valves with remote manual operators with position indication (where a rising stem could cause interference or mechanical binding preventing full travel of the valve) will be inspected. Discrepancies and deficiencies found will be documented and resolved through approved design control/work control programs. This inspection will exclude instrument root, vent and drain valves.

For Units 2 and 3, a generic test procedure will be developed and implemented during the normal flushing and test evolutions to verify that safety related, manually operated, main flow path valves (2 inches and larger) are fully operable and position indication is correct. This procedure will not be performed on instrument root, vent, and drain valves.

Full compliance to the paragraphs above will be achieved prior to Fuel Load for each respective unit.

G. Question: Regarding your reinspection findings in the area of pipe supports, some of the more significant findings involved missing snubbers. Was this limited to snubbers or was structure involved?

Response: This condition was limited to snubbers, no structure was involved.

H. Question: What is your current schedule for the transfer of systems to operations?

Response: Appendix A is a system acceptance schedule in histogram form. Please note the schedule can be modified as time progresses. The histogram is identified by package number which may include more than one subsystem/system.

I. Question: Why were the results of the Torrey Pines Technology Inc. Walkdown of installed systems different than the NRC's?

Response: There are considerable differences between the TPT and the NRC walkdowns. The TPT review occurred at a different time, with different emphasis on specific areas, and it differed in the degree of detail applied to the inspected items. However, both walkdowns indicated that basic construction of the portions examined was generally in compliance with applicable requirements. Both walkdowns also revealed some weakness in construction inspection activities,* and in both evaluations some of the discrepancies were judged to have potential safety impact.** Where TPT and NRC made a comparable examination the results of the examination were substantially similar, with two possible exceptions (pipe supports and procedures/records for tansmitter installations, see below).

* Refer to Section 4.4 of Volume 2 of the TPT Independent QA Evaluation of Palo Verde NGS Units 1, 2,and 3.

** Refer to Section 6.3 of Volume 2 of the TPT Independent QA Evaluation of Palo Verde NGS Units 1, 2, and 3.

The major differences between the NRC and TPT walkdowns are as follows:

1. The NRC examined a significant portion of the HPSI system in detail. TPT looked at selected portions of the shutdown cooling water and auxiliary feedwater systems primarily from an overall systems installation viewpoint, and only selected a limited number of items for detailed inspection.

2. The TPT walkdown objective was to assess the conformance of the portions of the safety systems selected to requirements of design documents for Units 1, 2, and 3. Approximately one-third of the TPT effort was devoted to Units 2 and 3. The NRC walkdown objective was to provide an overall assessment of the actual as-built conditions to design requirements, and was substantially limited to Unit 1. It is estimated that the total NRC inspection effort on Unit 1 was approximately twice that of TPT.

3. The TPT walkdown occurred during construction prior to turnover to APS. Accordingly, if evidence existed that either APS or BPC was aware of a discrepancy, and a procedure existed which, if followed, could be reasonably expected to result in correction of the discrepancy, TPT did not identify the discrepancy as a valid potential finding. The NRC walkdown occurred approximately one year later, after construction of the HPSI system was essentially completed. Any observed discrepancy was considered to represent the completed installation of the item inspected, and judged to be valid.

The two possible areas of difference in conclusions where TPT and NRC made comparable examinations are:

1. Pipe Supports - The NRC walkdown revealed that approximately 20% of the 68 pipe supports inspected had deficiencies. TPT examined 3 supports in Unit 1 in detail (not inspected later by NRC) and TPT did not find such discrepancies. These two results are not surprising. Even if one assumes that 20% of all pipe supports in Unit 1 were in fact defective, there is approximately a 50% chance that TPT would not have discovered this based on a sample of 3 supports.

2. Transmitter installation records - the TPT walkdown revealed several discrepancies in the area of transmitter installation procedures and inspection records. The NRC walkdown did not reveal such discrepancies in that area. This is not surprising considering the effort subsequently put in by APS to correct the deficiencies detected by TPT.

The detailed differences between the number of items inspected by NRC and TPT for Unit 1, the areas of examination for each item, and the number of valid observed discrepancies is described in Appendix B.

Considering these differences, it is not surprising that detailed results of the two walkdowns do not totally coincide. However, it is significant that both walkdowns revealed similar trends and conclusions concerning the portion inspected.

J. Question: Has anything been identified in the additional reinspections and walkdowns performed to date which is significant or disturbing?

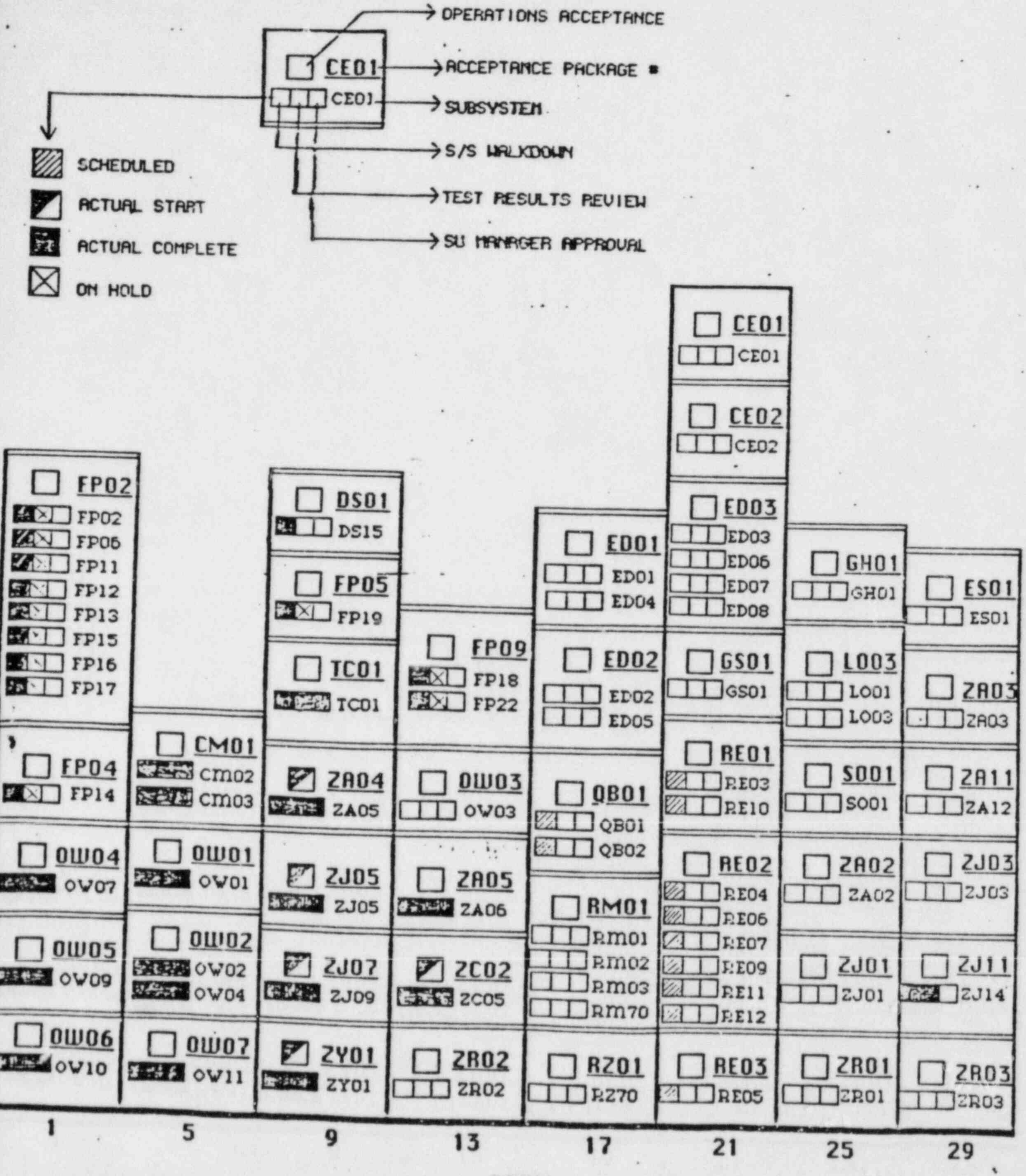
Response: No significant concerns were identified in areas other than structural steel joints (Item B), where the connections fall into three main categories:

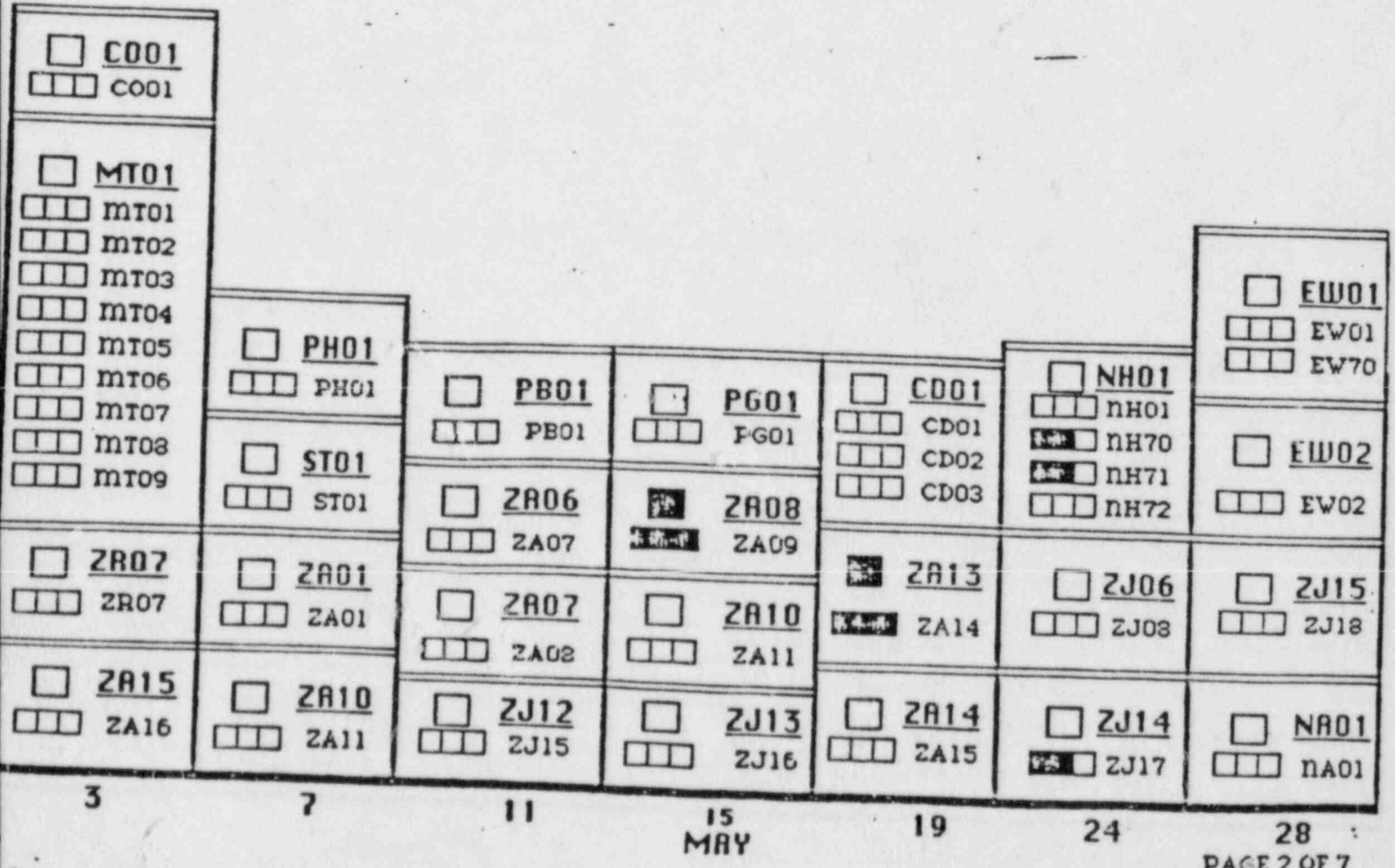
- Structural steel framing
- Safety injection (SI) tank keyway lateral restraint brackets
- Main steamline structural steel supports

No significant results have been obtained for the first and third categories. However, the first few Unit 1 SI tank keyway bolts (1-3/8"0 -A490) which have been checked underwent significant rotation under the job inspection torque. Some of the plate washers covering long slotted holes have experienced measurable deformation under the bolt preload. Although these bolts do not sustain externally applied loads during normal operating conditions, Engineering is paying particular attention to the nonconforming bolts. This will be evaluated upon completion of the walkdown.

APPENDIX A

OPERATIONS ACCEPTANCE SCHEDULE

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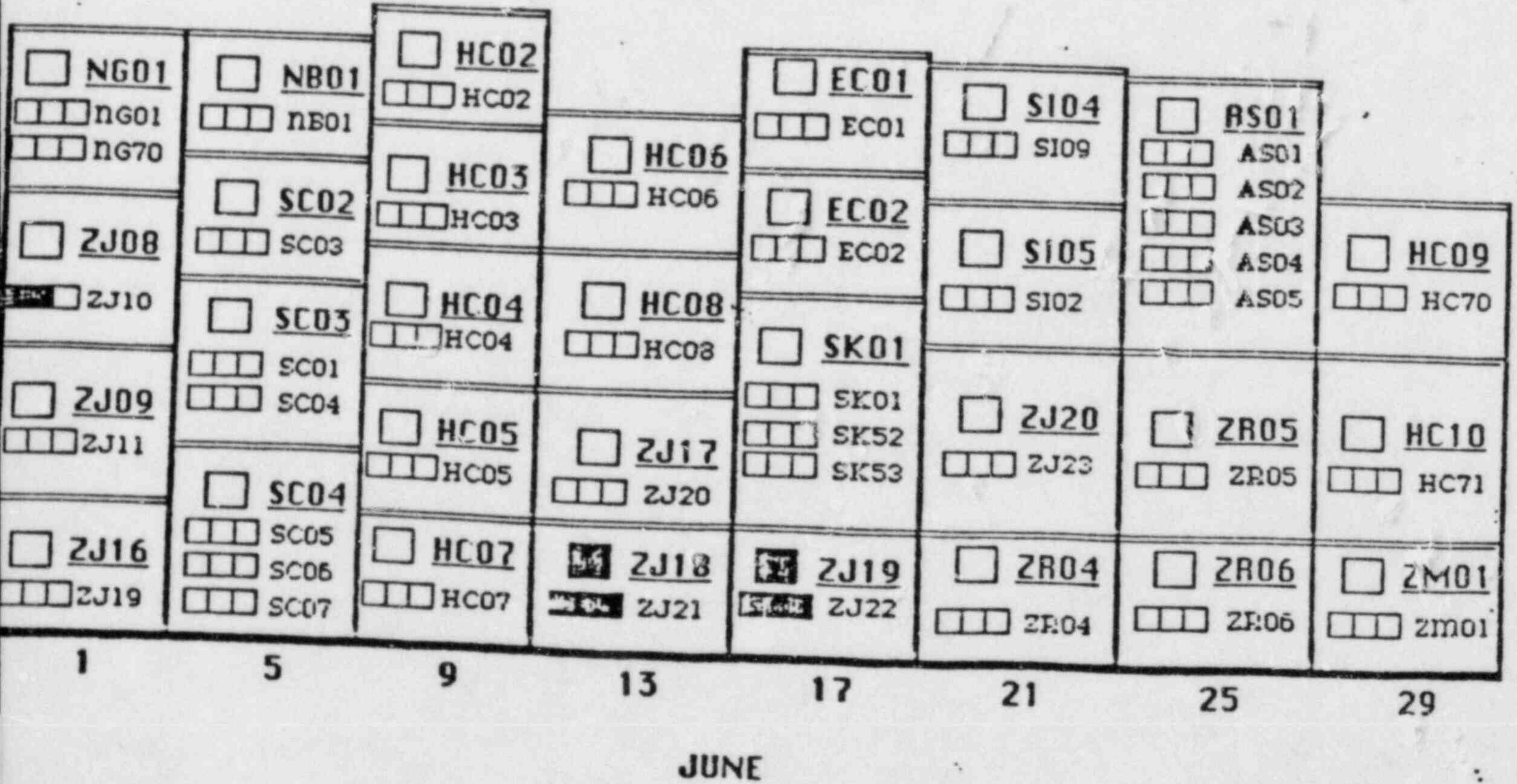
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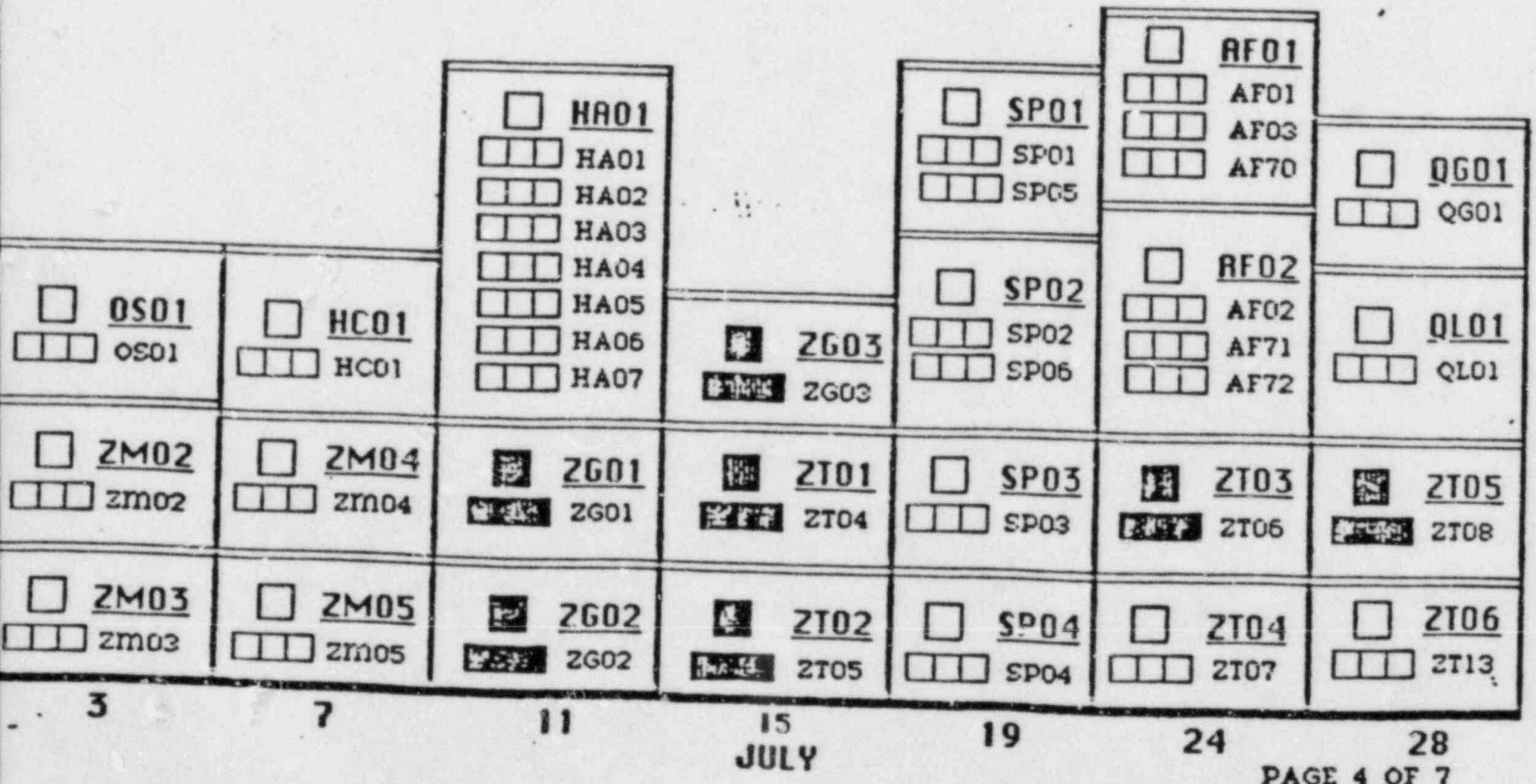
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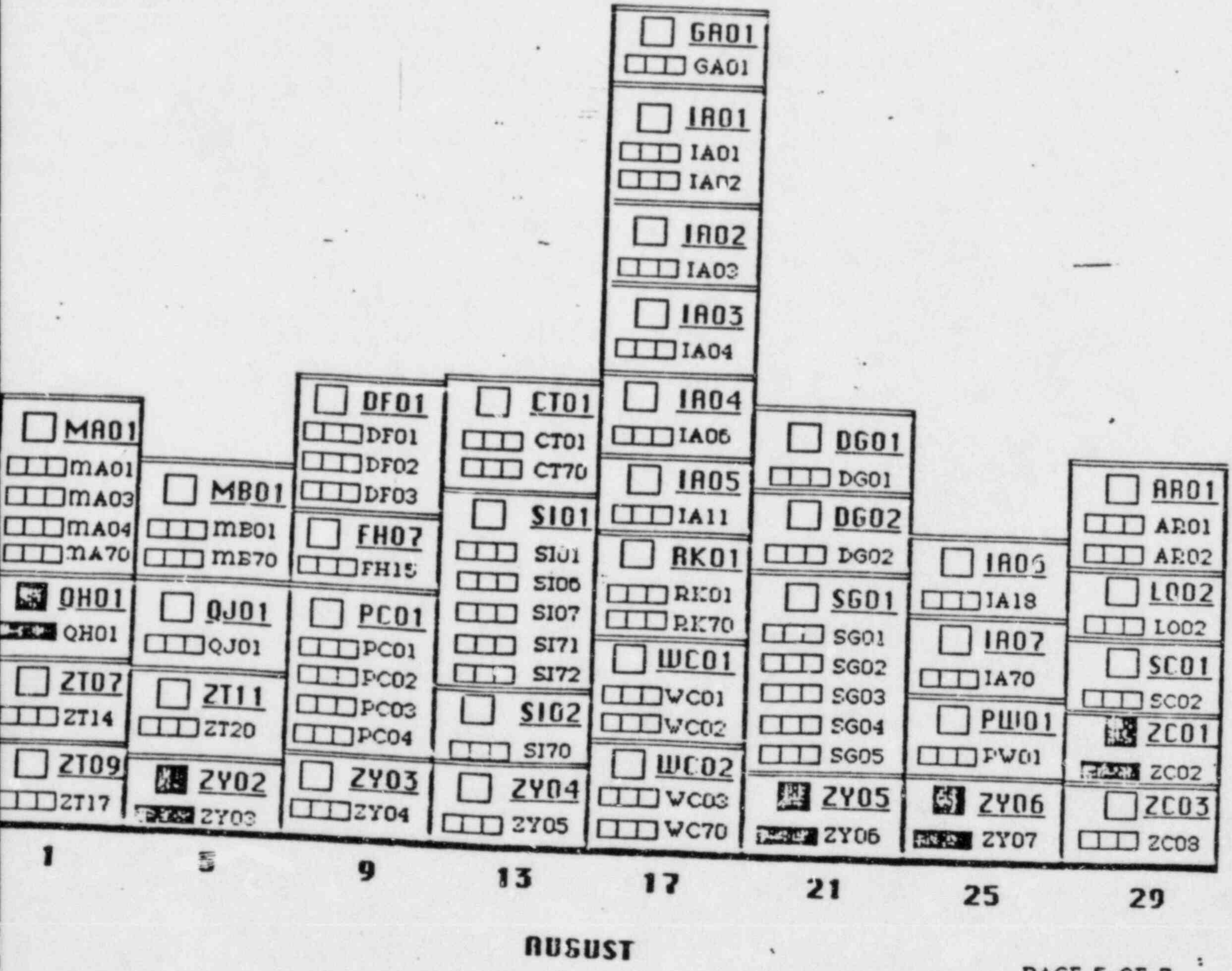
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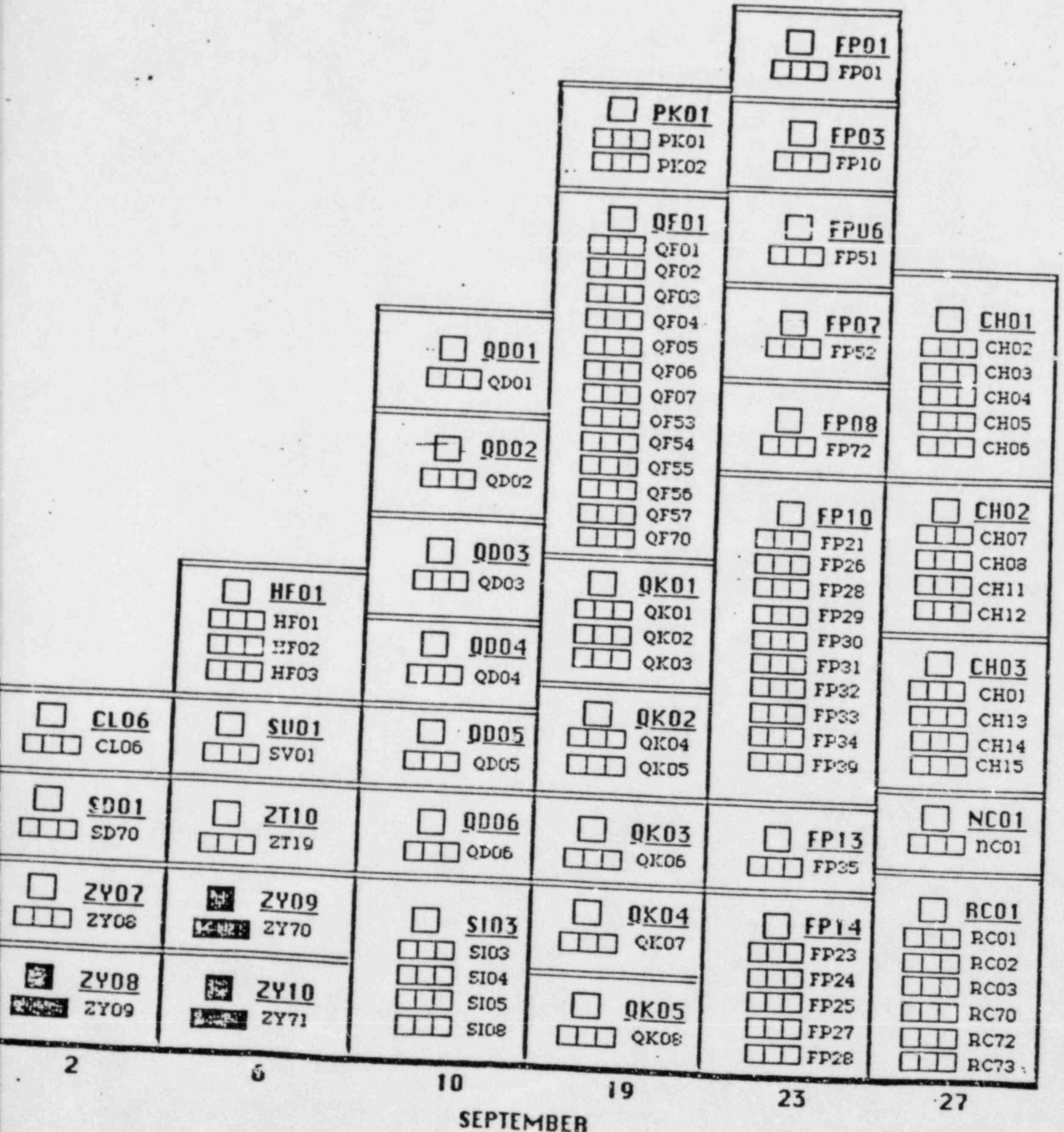CL06
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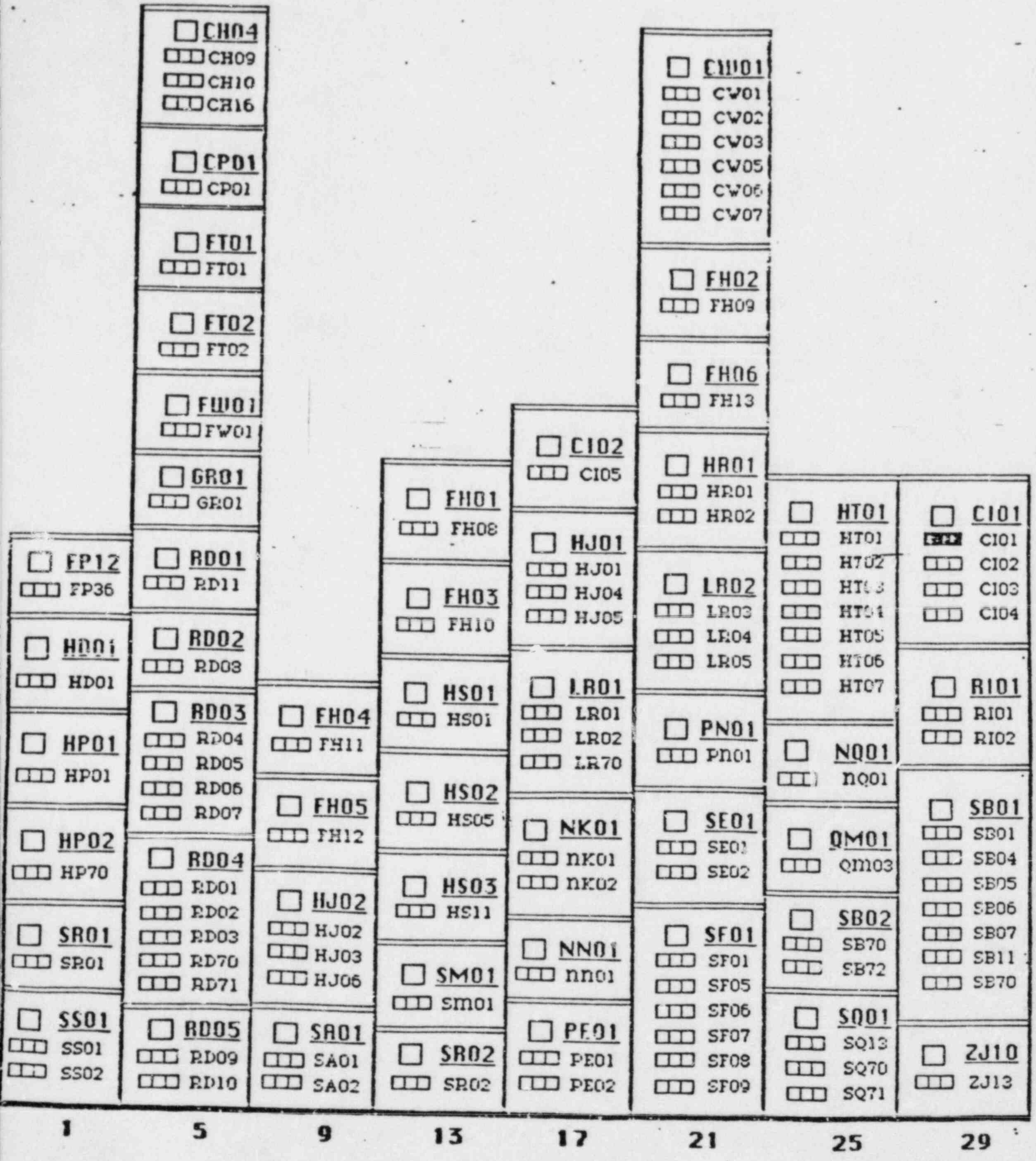
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OCTOBER

APPENDIX B

COMPARISON OF NRC AND TPT WALKDOWNS
PALO VERDE NUCLEAR GENERATING STATION UNIT 1

TYPE OF EQUIPMENT EXAMINED	NUMBER OF ITEMS EXAMINED		INSPECTIONS AND OBSERVED DISCREPANCIES				
			AREA OF EXAMINATION	EXAMINED BY		NUMBER OF VALID OBSERVED DISCREPANCIES	
	NRC	TPT		NRC	TPT	NRC	TPT
Piping	530' for Instal. Adequacy	800' total 400' for Instal. Adequacy	Identification	Yes	Yes	0	0
			Location & Length	Yes	Yes	0	2
			Straightness	Yes	400'	0	0
			Finish & Defects	Yes	400'	1	0
Pipe Welds	234 visual	0	Location	200			
			Appearance	234			
			Defects	Yes			
	218 NDE		Reinforcement	234	N/A	0	N/A
			Welder Qualif.	Yes			
			NDE Verification	218			
			Documentation	Yes			
Pipe Supports Snubbers and Restraints	68 all in detail	45 total 3 in detail	Identification	Yes	Yes	0	0
			Location	Yes	Yes	1	1
			Procedure & Records	Yes	Yes	0	0
			All installed	Yes	Yes	0	0
			None Additional	Yes	Yes	0	0
			Configuration	Yes	Yes	1	0
			Dimensions	Yes	3	0	0
			Fit	Yes	3	2	0
			Adequacy of Design	Yes	Yes	2	0
			Documentation	Yes	Yes	7	0
			Welds	Yes	3	7	0
			Cold Set of Snubbers	Yes	No	0	N/A
Raceway Supports	60 all in detail	6 Total 2 in detail	Identification	Yes	Yes	0	0
			Location	Yes	Yes	0	0
			Procedures & Records	Yes	Yes	0	0
			Mounting	Yes	2	0	0
			Configuration	Yes	Yes	0	0
			Member Size	Yes	2	0	0
			Connection Details	Yes	2	6	1
			Dimensional Details	Yes	2	1	0
			Painting	Yes	No	1	N/A
Valves	17	52	Identification	Yes	Yes	0	6
			Location & Orient.	Yes	Yes	0	1
			Procedures & Records	Yes	Yes	1	1
			Size, Type, & Mfg.	Yes	Yes	0	2
			Installation Details	Yes	No	4	N/A

COMPARISON OF NRC AND TPT WALKDOWNS
PALO VERDE NUCLEAR GENERATING STATION UNIT 1

TYPE OF EQUIPMENT EXAMINED	NUMBER OF ITEMS EXAMINED		INSPECTIONS AND OBSERVED DISCREPANCIES				
			AREA OF EXAMINATION	EXAMINED BY		NUMBER OF VALID OBSERVED DISCREPANCIES	
	NRC	TPT		NRC	TPT	NRC	TPT
Pump Motors	2	2	Identification	Yes	Yes	0	0
			Location	Yes	Yes	0	0
			Location Identif,	Yes	No	1	N/A
Motor Operated Valve Motors	17	5	Procedures & Records	Yes	Yes	2	1
			Mounting & Install.	Yes	No	1	N/A
			Bolting	Yes	No	0	N/A
			Nameplate Data	Yes	Yes	2	3
			Grounding	Yes	No	1	N/A
			Protection	Yes	No	0	N/A
Cable Raceways	1590' Tray 26 Conduit Runs	50' Tray 11 Cond. Runs	Identification	Yes	Yes	3	See Note A
			Location	Yes	Yes	0	0
			Procedures & Records	Yes	Yes	0	0
			Separation	Yes	No	3	N/A
			Color Coding	Yes	Yes	0	0
			Mech. Details	Yes	No	1	N/A
			Connection Details	Yes	No	0	N/A
Cable Installations	31	35	Identification	Yes	Yes	1	See Note A
			Procedures & Records	Yes	Yes	1	0
			Separation	Yes	Yes	0	0
			Routing to last Raceway	Yes	Yes	0	0
			Routing along Raceway	Yes	No	2	N/A
			Supports	Yes	No	0	N/A
			Size and Type	Yes	No	0	N/A
Cable Terminations	31	15	Identification	Yes	Yes	0	0
			Location	Yes	Yes	0	0
			Procedures & Records	Yes	Yes	0	0
			Size of Conductors and Lugs	Yes	No	0	N/A
			Installation Details	Yes	No	1	N/A

NOTE A: TPT noted a similar identification discrepancy to that observed by NRC. However, there was a procedure which required replacement of damaged identification markers prior to completion of construction.

COMPARISON OF NRC AND TPT WALKDOWNS
PALO VERDE NUCLEAR GENERATING STATION UNIT 1

TYPE OF EQUIPMENT EXAMINED	NUMBER OF ITEMS EXAMINED		INSPECTIONS AND OBSERVED DISCREPANCIES				
			AREA OF EXAMINATION	EXAMINED BY		NUMBER OF VALID OBSERVED DISCREPANCIES	
	NRC	TPT		NRC	TPT	NRC	TPT
Emergency Diesel Generators	1	0	Identification	Yes	N/A	0	N/A
			Location	Yes		0	
			Procedures & Records	Yes		0	
			Mounting	Yes		0	
			Separation	Yes		0	
			Controls	Yes		0	
DC Batteries and Racks	4	0	Fluid Levels	Yes	N/A	0	N/A
			Mounting	Yes		0	
			Panel Display	Yes		0	
DC Battery Chargers	4	0	Conduit Configuration	Yes		0	
			Spacing and Alignment	Yes		0	
			Conductor Terminations	Yes		0	
			Bolting	Yes		0	
Vital AC Bus Converters	4	0	Procedures & Records	Yes		5	
			Identification	Yes		0	
DC Panels	14	0					

COMPARISON OF NRC AND TPT WALKDOWNS
PALO VERDE NUCLEAR GENERATING STATION UNIT 1

TYPE OF EQUIPMENT EXAMINED	NUMBER OF ITEMS EXAMINED		INSPECTIONS AND OBSERVED DISCREPANCIES				
			AREA OF EXAMINATION	EXAMINED BY		NUMBER OF VALID OBSERVED DISCREPANCIES	
	NRC	TPT		NRC	TPT	NRC	TPT
Instruments	On Panels/ Cabinets	19	Identification	Yes	Yes	0	1
			Location	Yes	Yes	0	0
			Procedures & Records	Yes	Yes	1	0
			Separation	Yes	No	1	N/A
Instrument Panels	34	0	Cleanliness & Workmanship	Yes	No	0	N/A
			Mounting	Yes	No	0	N/A
Instrument Cabinets	14	0	Connections	Yes	No	0	N/A
			Internal Wiring	Yes	Yes	0	0
			Functional Req'ts	Yes	Yes	0	0
Electrical Penetrations	5	0	Identification	Yes		0	
			Location	Yes	N/A	0	N/A
			Mounting Details	Yes		0	
			Type	Yes		0	
4160 V Switchgear	2	1	Identification	Yes	Yes	1	1
			Location	Yes	Yes	0	0
480 V Switchgear	2	0	Mounting Details	Yes	No	2	N/A
			Protection	Yes	No	0	N/A
			Separation	Yes	No	2	N/A
			Records & Documentation	Yes	Yes	0	0
480 V MCC	6	3	Nameplate Data	Yes	Yes	0	0
Pressure Transmitters	8	2	Identification	Yes	Yes	0	4
			Location	Yes	Yes	0	0
Flow Transmitters	0	2	Procedures & Records	Yes	Yes	0	16
			Mounting	Yes	Yes	0	3
			Functional Req's	Yes	Yes	0	0
Level Transmitters	0	2	Calibration	Yes	Yes	0	0
			Tubing & Supports	Yes	Yes	2	0
			Separation	Yes	No	0	N/A
Position Transmitters	0	4					

COMPARISON OF NRC AND TPT WALKDOWNS
PALO VERDE NUCLEAR GENERATING STATION UNIT 1

TYPE OF EQUIPMENT EXAMINED	NUMBER OF ITEMS EXAMINED		INSPECTIONS AND OBSERVED DISCREPANCIES				
	NRC	TPT	AREA OF EXAMINATION	EXAMINED BY		NUMBER OF VALID OBSERVED DISCREPANCIES	
				NRC	TPT	NRC	TPT
Concrete Tests	11 tests areas	0	Concrete strength	Yes	-	0	
			Steel material	Yes		0	
			Procedures & Records	Yes		0	
			Steel-Steel Bolting	Yes	N/A	6	N/A
Steel Framing	3		Welding	Yes		16	
			Weld Specifications	Yes		5	
			Material Size	Yes		0	
Cont. Pene.	6	0	Configuration	Yes		0	
Embed. Plates	68	0	Expansion Anchor Details	Yes		13	
Concrete Exp. Anchors	88	0					
Cont. Spray Pump Support Structure	0	1	Material Size		Yes		0
			Configuration	N/A	Yes	N/A	0
			Procedures & Records		Yes		0
			Connection Details		Yes		0

REGISTERED: RETURN RECEIPT REQUESTED

TY DPJ for
PPN DPJ

FILE

Report
83-34

Arizona Public Service Company

ANPP-29406-EEVBJr
May 2, 1984

Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. DeYoung:

The check of Arizona Public Service Company, holder of Construction Permit CPPR-141, in the amount of $20,000 payable to the Treasurer of the United States is submitted herewith pursuant to paragraph IV of the Order Imposing A Civil Monetary Penalty, issued by you on April 3, 1984, in Docket 50-52B.

Respectfully yours,

E. E. Van Brunt

E. E. Van Brunt, Jr.
APS Vice President, Nuclear
ANPP Project Director

lb

Encl.

cc: J. Martin, Region V NRC
R. Zimmerman, NRC
L. Vorderbrueggen, NRC
G. Fiorelli, NRC
K. Turley
T. Woods

File: 84-056-026

~~8405090025~~ PDR

FILE

16

89-215

21.

cc: D. B. Karner, 4060
W. E. Ide, 4074
D. B. Fasnacht, 6330
A. C. Rogers, 4056
B. S. Kaplan, 4074
L. A. Souza, 6330
D. E. Fowler, 6330
J. Vorees, 4082
J. R. Bynum, 6125
J. M. Allen, 6130
P. P. Klute, 1380
A. C. Gehr, 4141
W. J. Stubblefield, 6330
W. G. Bingham, 6330
R. L. Patterson , B/N
R. W. Welcher , B/N
H. D. Foster , B/PV, 6330
D. R. Hawkinson , B/PV, 6330
S. R. Frost, 4080
J. Self, 6075
D. Canady, 1390

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, GA 30339

~~10 PAGES~~

~~E. E. Van Brunt, Jr.~~

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 0 3 1984

Docket No. 50-528
EA 83-30
EA 83-130

Arizona Public Service Company
ATTN: Mr. T. G. Woods Jr.
Executive Vice President
P. O. Box 21666
Phoenix, Arizona 85036

Gentlemen:

This refers to your letter of January 31, 1984, which responded to the NRC letter and Notice of Violation and Proposed Imposition of Civil Penalties of December 12, 1983. This action was based on significant violations of NRC requirements involving your failure to adequately control activities affecting the quality of safety-related work. The circumstances are contained in our letter of December 12, 1983, and in NRC Inspection Report 50-528/83-34.

Based on careful consideration of your reply, and for the reasons given in the Appendix to the enclosed Order, we have concluded that the violation occurred as set forth in paragraph I.A, Notice of Violation and Proposed Imposition of Civil Penalties. In accordance with your request, the item in paragraph I.B. of the Notice of Violation and of Proposed Imposition of Civil Penalties will be addressed later in separate correspondence.

After careful consideration of your response to item I.A, we have concluded for the reasons given in the enclosed Order and Appendix that your prompt and extensive corrective action provides sufficient basis for 50% mitigation of the proposed penalty. Accordingly, we hereby serve the enclosed Order on Arizona Public Service Company imposing a civil penalty in the amount of Twenty Thousand Dollars ($20,000) for this item.

We also acknowledge receipt of your response to those items contained in the Notice of Violation for which no civil penalty was proposed. As you requested, we have reexamined the severity levels assigned each of those items. With exception of items II.A.3 and II.A.4, we disagree with your contention that the violations have been inappropriately assigned as Severity Level IV. Items II.A.3 and II.A.4., are hereby reclassified as Severity Level V.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

FILE

verified 4:28 p.m 4/3/84
nh 84-163

~~8404160280 PDR~~

18.

We will review the effectiveness of your corrective actions taken, and those proposed, during subsequent inspections.

In accordance with 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room.

Sincerely,

R C DeYoung

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Enclosures:
1. Order Imposing a Civil Monetary Penalty
2. Appendix - Evaluation and Conclusion

cc w/enclosures:
J. Bynum, APS
E. E. Van Brunt, Jr., APS
K. Turley, APS

UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the Matter of

ARIZONA PUBLIC SERVICE COMPANY
Palo Verde Nuclear Generating Station
Unit No. 1

Docket No. 50-328
Construction Permit No. CPPR-141
EA 83-30
EA 83-130

ORDER IMPOSING A CIVIL MONETARY PENALTY

I

Arizona Public Service Company, P. O. Box 21666, Phoenix, Arizona, 85036 (the "Licensee") is the holder of Construction Permit CPPR-141 issued by the Nuclear Regulatory Commission ("NRC" or the "Commission"). The Construction Permit authorizes construction of the Palo Verde Nuclear Generating Station facility in Maricopa County, Arizona. The Construction Permit was issued on May 25, 1976, and is due to expire on December 31, 1984.

II

A special inspection of the licensee's activities under the Construction Permit was conducted at the Palo Verde plant by an NRC special inspection team during the period of September 6 - November 1, 1983. As a result of the inspection, the NRC staff determined that the licensee had not conducted its activities in full compliance with NRC requirements. A written Notice of Violation and Proposed Imposition of Civil Penalties was served upon the

~~8404160283~~ PDR

licensee by letter dated December 12, 1983. The Notice stated the nature of the violations, the provision of the NRC regulations violated, and the amount of the civil penalties proposed for each of the violations. The licensee responded to the Notice of Violation and Proposed Imposition of Civil Penalties in a letter dated January 31, 1984.

III

Upon consideration of the licensee's reply to the Notice of Violation and arguments for mitigation of the proposed civil penalty, the Director of the Office of Inspection and Enforcement, for the reasons set forth in the Appendix to this Order, has determined that the penalty proposed for the violation identified in paragraph I.A. in the Notice of Violation and Proposed Imposition of Civil Penalties should be mitigated by 50% based upon the licensee's prompt and extensive corrective action. The violation identified in Paragraph I.B of said Notice shall be the subject of future action as requested by the licensee.

IV

In view of the foregoing and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2282, PL 96-295), and 10 CFR 2.205, IT IS HEREBY ORDERED THAT:

The licensee pay a civil penalty in the amount of Twenty Thousand Dollars ($20,000) within 30 days of the date of this Order, by check, draft, or money order, payable to the Treasurer of the United States and mailed to the Director of the Office of Inspection and Enforcement, USNRC, Washington, DC 20555.

V

The licensee may, within 30 days of the date of this Order, request a hearing. A request for a hearing shall be addressed to the Director, Office of Inspection and Enforcement. A copy of the hearing request shall also be sent to the Executive Legal Director, USNRC, Washington, D.C. 20555. If a hearing is requested, the Commission will issue an Order designating the time and place of hearing. Upon failure of the licensee to request a hearing within 30 days of the date of this Order, the provisions of this Order shall be effective without further proceedings; if payment has not been made by that time, the matter may be referred to the Attorney General for collection.

VI

In the event the licensee requests a hearing as provided above, the issues to be considered at such hearing shall be:

(a) whether the licensee violated Appendix B requirements as set forth in paragraph I.A. of the Notice of Violation and Proposed Imposition of Civil Penalties; and

(b) whether, on the basis of such violation, this Order should be sustained.

FOR THE NUCLEAR REGULATORY COMMISSION

R C DeYoung

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this 3rd day of April 1984

APPENDIX

EVALUATION AND CONCLUSION

In the licensee's January 31, 1984 response to NRC's Notice of Violation and Proposed Imposition of Civil Penalties dated December 12, 1984, the licensee admits that (1) the discrepant conditions identified in the four examples cited in Section I.A did exist in September 1983, (2) there was no documentation or records of such discrepant conditions, and (3) such conditions were identified by the NRC Construction Assessment Team. Nevertheless, the licensee denies that the discrepant conditions constitute a violation of NRC requirements and protests the imposition of civil penalties, and if such is disallowed, requests remission or mitigation of the civil penalty proposed by the notice. A statement of the violation, a summary of the licensee's response, and NRC's evaluation and conclusions are presented as follows:

Statement of Violation

I.A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires in part that: "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety."

Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality as evidenced by the following examples:

1. On September 10, 1983, it was determined that the containment pressure instrumentation was incapable of performing its intended safety function in that caps had been installed on the sensing lines. Construction of the containment and pressure sensing systems had been completed, turned over from the constructor to the licensee, and tested. Subsequently, the quality assurance organization directed that the caps be installed without following established QA procedures for correcting potential deficiencies. No administrative requirement existed to assure that the caps would have been discovered until the next scheduled containment leak rate test, pursuant to the operating license requirements. This containment pressure instrumentation is required to automatically initiate the HPSI and other safety systems on high containment pressure.

2. On September 7, 1983, the manual operator for valve SI V470 on the suction of the HPSI "A" pump was disconnected and resting on the sprinkler system piping. Construction of the subsystem had been completed, turned over to the licensee, and was undergoing pre-operational testing. There was no record of the defective and/or nonconforming condition which included a missing stud nut and leaking flange.

3. On September 28, 1983, the position indicator for valve SI V402 on the suction of the HPSI "B" pump was positioned so that the valve could only be opened 30 to 35 percent of its full open position.

Construction of this subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition.

4. On September 14, 1983, 87 3/8-inch bolts were missing from the base frames for six motor control centers (MCC) of the vital AC onsite power distribution system. These bolts are necessary to ensure the structural integrity of the MCCs.

This is a Severity Level III Violation, (Supplement II).
(Civil Penalty - $40,000)

Summary of Licensee Response

I.A.1 Containment Pressure Sensing Line Caps

The licensee admits to the conditions of the sensing line caps, states some preoperational tests had been done, and states that the caps were installed by direction of QA but not documentated. The licensee also states that the system had not been turned over to operations. The licensee further states there was no regulatory requirement to document the installation of the caps and that the required action in response to IE Notice 84-23 would have assured cap removal.

I.A.2 Manual Operator Disconnected, and Missing Stud Nut with Leaking Flange

The licensee admits to the conditions found, but states preoperational testing was not complete, the valve had not been accepted by operations and that further preoperational testing would have discovered the problems. The licensee further states, that the as found condition of the valve would have had no impact on the safe operation of the system. The licensee further states the valve was improperly reassembled after turnover to the startup organization.

I.A.3 Improper Installation of a Position Indicator Limited Valve Travel

The licensee admits to the conditions found but states the valve had not been accepted by operations, preoperational testing was not complete, and no uncontrolled work had been performed on the valve. The licensee also states the as-found condition would have had no impact on the safe operation of the system. The licensee further stated the valve had been stroked by APS operators and the valve was assumed to be full open.

I.A.4 Missing Bolts

The licensee denies that any bolts necessary for structural integrity are missing from the MCC's. However, the licensee states that the vendor installation drawings indicate that a portion of the eighty-seven identified missing bolts should have been installed but subsequent analysis showed that they were not essential for the structural integrity of the MCCs.

NRC Evaluation

As stated in the introduction of 10 CFR 50, Appendix B, the NRC quality assurance requirements apply to all activities affecting the safety-related functions of structures, systems and components in nuclear power plants that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public; these activities include designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling and modifying.

In addition, as stated in Criterion I of 10 CFR 50, Appendix B, safety-related activities include both the performing functions of attaining quality objectives and the quality assurance functions. The quality assurance functions are those of (a) assuring that an appropriate quality assurance program is established and effectively executed and (b) verifying, such as by checking, auditing, and inspection, that activities affecting safety-related functions have been correctly performed.

Although strictly speaking, failure to properly perform a work function is a violation of the NRC quality assurance criteria (Criterion V), the NRC's Enforcement Policy (10 CFR Part 2, Appendix C) provides that Notices of Violation will not be issued for a particular violation when the defective condition is identified; is of a Severity Level IV or V; is reported, if required; is corrected within a reasonable time; and is not a violation that could reasonably be expected to have been prevented by a previous corrective action.

In essence the NRC quality assurance criteria require that all safety-related work be performed pursuant to approved instructions, procedures or drawings and verified, as appropriate, by inspection, checking, testing or auditing.

As admitted in the licensee's response, summarized above, the identified discrepant conditions occurred as a result of individuals performing work or otherwise doing an act or not doing an act that should have been done that affects safety-related structures, systems and components without the use of and contrary to approved instructions, procedures and drawings. As discussed above, all work on safety-related items must be controlled subsequent to initial installations and inspection to assure that the original quality of the items are not degraded and that any modifications are appropriately reviewed and approved as provided for in the NRC quality assurance criteria.

The licensee's contention that each of the items when viewed singularly should not represent a significant safety concern on the part of the NRC and, therefore, its inference that the cumulative aspects of the items are also insignificant does not have merit. Discrepant conditions were found by the NRC inspection staff in three vital safety-related systems (containment, emergency core cooling, and electrical) that should have been prevented and/or identified by the licensee had the licensee's quality assurance program been functioning as required by the NRC requirements. A malfunctioning quality assurance program is significant to safety and must be corrected. In view of the foregoing the NRC viewed the conditions as cause for significant concern in that the circumstances surrounding the conditons evidenced a breakdown in the quality assurance program amounting to more than isolated instances. Therefore, the cited violation was properly categorized a Severity Level III.

Request for Remission or Mitigation

In Attachment E of the licensee's response, the licensee protests the imposition of a civil penalty, and if disallowed, requests remission or mitigation of the civil penalty proposed by the Notice. The licensee has not provided adequate reasons for disallowing or remitting the civil penalty; however, mitigation of the civil penalty for actions taken by the licensee was reviewed and considered appropriate. The corrective action taken which includes, among other actions, initiation of an independent assessment immediately following the special team inspection, suspension of startup work taken on the licensee's own initiative, reorganization of the management structure, and the direct involvement of the most senior corporate management was found to be unusually prompt and extensive. Therefore, mitigation of the penalty in the amount of 50% is allowed.

Conclusion

The violation identified in Section I.A. of the Notice of Violation and proposed Imposition of Civil Penalties did occur as orginally stated. However, as discussed above, the civil penalty has been mitigated 50% based upon the licensee's prompt and extensive corrective action.

Docket No. 50-528
EA 83-30
EA 83-130

This document, undated, [redacted] Region V's recommendation to Mr. DeYoung was transmitted during the month of March 1984 by computer. The record on the computer has since been erased!
Talbert Young Jr. 6/29/84

Arizona Public Service Company
ATTN: Mr. T. G. Woods Jr.
Executive Vice President
P. O. Box 21666
Phoenix, Arizona 85036

Gentlemen:

This refers to your letter of January 31, 1984, which responded to the NRC letter and Notice of Violation and Proposed Imposition of Civil Penalties of December 12, 1983. This action was based on significant violations of NRC requirements involving your failure to adequately control activities affecting the quality of safety-related work. The circumstances are contained in our letter of December 12, 1983, and in NRC Inspection Report 50-528/83-34.

Based on careful consideration of your reply, and for the reasons given in the Appendix to the enclosed Order, we have concluded that the violation occurred as set forth in paragraph I.A, Notice of Violation and Proposed Imposition of Civil Penalties. In accordance with your request, the item in paragraph I.B. of the Notice of Violation and of Proposed Imposition of Civil Penalties will be addressed later in seperate correspondence.

After careful consideration of your response, we have concluded for the reasons given in the enclosed Order and Appendix that a sufficient basis for 50% mitigation of the proposed penalty based upon your prompt and extensive corrective action is warranted. Accordingly, we hereby serve the enclosed Order on Arizona Public Service Company imposing a civil penalty in the amount of Twenty Thousand Dollars ($20,000).

We also acknowledge receipt of your response to those items contained in the Notice of Violation for which no civil penalty was proposed. Your corrective action for those items will be examined during our future inspections. Per your request we have reexamined the severity levels assigned each of those items. With exception of items II.A.3 and II.A.4, we disagree with your contention that the violation have been inappropriately assigned as Severity Level IV. For items II.A.3 and II.A.4., we hereby reclassify those as Severity Level V.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

~~8404160280 PDR~~

11.

We will review the effectiveness of your corrective actions taken, and those proposed, during subsequent inspections.

In accordance with 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room.

Sincerely,

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Enclosures:
1. Order Imposing a Civil Monetary Penalty
2. Appendix - Evaluation and Conclusion

cc w/enclosures:
J. Bynum, APS
E. E. Van Brunt, Jr., APS
K. Turley, APS

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Richard C. DeYoung, Director
Office of Inspection and Enforcement

Enclosures:
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J. Bynum, APS
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UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the Matter of

ARIZONA PUBLIC SERVICE COMPANY
Palo Verde Nuclear Generating Station
Unit No. 1

Docket No. 50-328
Construction Permit No. CPPR-141
EA 83-30
EA 83-130

ORDER IMPOSING A CIVIL MONETARY PENALTY

I

Arizona Public Service Company, P. O. Box 21666, Phoenix, Arizona, 85036 (the "Licensee") is the holder of Construction Permit CPPR-141 issued by the Nuclear Regulatory Commission ("NRC" or the "Commission"). The Construction Permit authorizes construction of the Palo Verde Nuclear Generating Station facility in Maricopa County, Arizona. The Construction Permit was issued on May 25, 1976, and is due to expire on December 31, 1984.

II

A special inspection of the licensee's activities under the Construction Permit was conducted at the Palo Verde plant by an NRC special inspection team during the period of September 6 - November 1, 1983. As a result of the inspection, the NRC staff determined that the licensee had not conducted its activities in full compliance with NRC regulations. A written Notice of Violation and Proposed Imposition of Civil Penalties was served upon the

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licensee by letter dated December 12, 1983. The Notice stated the nature of the violations, the provision of the NRC regulations violated, and the amount of the civil penalties proposed for each of the violations. The licensee responded to the Notice of Violation and Proposed Imposition of Civil Penalties in a letter dated January 31, 1984.

III

Upon consideration of the licensee's reply to the Notice of Violation and arguments for mitigation of the proposed civil penalty, the Director of the Office of Inspection and Enforcement, for reasons set forth in the Appendix to this Order, has determined that the penalty proposed for the violation identified in paragraph I.A. designated in the Notice of Violation and Proposed Imposition of Civil Penalty should be mitigated by 50% based upon the licensee's prompt and extensive corrective action. The violation identified in Paragraph I.B of said Notice shall be the subject of future action as requested by the licensee.

IV

In view of the foregoing and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2282, PL 96-295), and 10 CFR 2.205, IT IS HEREBY ORDERED THAT:

The licensee pay a civil penalty in the amount of Twenty Thousand Dollars ($20,000) within 30 days of the date of this Order, by check, draft, or money order, payable to the Treasurer of the United States and mailed to the Director of the Office of Inspection and Enforcement, USNRC, Washington, DC 20555.

V

The licensee may, within 30 days of the date of this Order, request a hearing. A request for a hearing shall be addressed to the Director, Office of Inspection and Enforcement. A copy of the hearing request shall also be sent to the Executive Legal Director, USNRC, Washington, D.C. 20555. If a hearing is requested, the Commission will issue an Order designating the time and place of hearing. Upon failure of the licensee to request a hearing within 30 days of the date of this Order, the provisions of this Order shall be effective without further proceedings; if payment has not been made by that time, the matter may be referred to the Attorney General for collection.

VI

In the event the licensee requests a hearing as provided above, the issues to be considered at such hearing shall be:

(a) whether the licensee violated Appendix B requirements as set forth in paragraph I.A of the Notice of Violation and Proposed Imposition of Civil Penalties; and

(b) whether, on the basis of such violation, this Order should be sustained.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this day of March 1984

APPENDIX

EVALUATION AND CONCLUSION

In the licensee's January 31, 1984 response to NRC's Notice of Violation and Proposed Imposition of Civil Penalties dated December 12, 1984, the licensee admits that (1) the discrepant conditions identified in the four examples cited in Section I.A did exist in September 1983, (2) there was no documentation or records of such discrepant conditions, and (3) such conditions were identified by the NRC Construction Assessment Team. Nevertheless, the licensee denies that the discrepant conditions constitute a violation of NRC requirements and protests the imposition of civil penalties, and if such is disallowed, requests remission or mitigation of the civil penalty proposed by the notice. A statement of the violation, a summary of the licensee's response, and NRC's evaluation and conclusions are presented as follows:

Statement of Violation

I.A. 10 CFR 50, Appendix B, Criterion II, as implemented by Chapter 17 of the licensee's PSAR and FSAR, requires in part that: "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety."

Contrary to the above requirements, the licensee's quality assurance program did not maintain adequate control over activities affecting quality as evidenced by the following examples:

1. On September 10, 1983, it was determined that the containment pressure instrumentation was incapable of performing its intended safety function in that caps had been installed on the sensing lines. Construction of the containment and pressure sensing systems had been completed, turned over from the constructor to the licensee, and tested. Subsequently, the quality assurance organization directed that the caps be installed without following established QA procedures for correcting potential deficiencies. No administrative requirement existed to assure that the caps would have been discovered until the next scheduled containment leak rate test, pursuant to the operating licensee requirements. This containment pressure instrumentation is required to automatically initiate the HPSI and other safety systems in high containment pressure.

2. On September 7, 1983, the manual operator for valve SI V470 on the suction of the HPSI "A" pump was disconnected and resting on the sprinkler system piping. Construction of the subsystem had been completed, turned over to the licensee, and was undergoing pre-operational testing. There was no record of the defective and/or nonconforming condition which included a missing stud nut and leaking flange.

3. On September 28, 1983, the position indicator for valve SI V402 on the suction of the HPSI "B" pump was positioned so that the valve could only by opened 30 to 35 percent of its full open position.

Construction of this subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition.

4. On September 14, 1983, 87 3/8-inch bolts were missing from the base frames for six motor control centers (MCC) of the vital AC onsite power distribution system. These bolts are necessary to ensure the structural integrity of the MCCs.

This is a Severity Level III Violation, (Supplement II).
(Civil Penalty - $40,000)

Summary of Licensee Response

I.A.1 Containment Pressure Sensing Line Caps

The licensee admits to the conditions of the sensing line caps, states some preoperational test had been done, and states that the caps were installed by QA direction (verbal). The licensee also states that the system had not been turned over to operations. The licensee further states there was no regulatory requirement to document the installation of the caps and that the required action in response to IE Notice 84-23 would have assured cap removal.

I.A.2 Manual Operator Disconnected, and Missing Stud Nut with Leaking Flange

The licensee admits to the conditions found, but states preoperational testing was not complete, the valve had not been accepted by operations and that further preoperational testing would have discovered the problems. The licensee further states, that the as found condition of the valve would have had no impact on the safe operation of the system. The licensee further states the valve was improperly reassembled after turnover to the startup organization.

I.A.3 Improper Installation of a Position Indicator Limited Valve Travel

The licensee admits to the conditions found but states the valve had not been accepted by operations, preoperational testing was not complete, and no uncontrolled work had been performed on the valve. The licensee also states the as-found condition would have had no impact on the safe operation of the system. The licensee further stated the valve had been stroked by APS operators and the valve was assumed to be full open.

I.A.4 Missing Bolts

The licensee denies that any bolts necessary for structural integrity are missing from the MCC's. However, the licensee states that a portion of the eighty-seven identified missing bolts were structural in nature but that subsequent analysis showed them to be unnecessary.

NRC Evaluation

As stated in the introduction of 10 CFR 50, Appendix B, the NRC quality assurance requirements applies to all activities affecting the safety-related functions of structures, systems and components in nuclear power plants that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public; these activities include designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling and modifying.

In addition, as stated in Criterion I of 10 CFR 50, Appendix B, safety-related activities include both the performing functions of attaining quality objectives and the quality assurance functions. The quality assurance functions are those of (a) assuring that an appropriate quality assurance program is established and effectively executed and (b) verifying, such as by checking, auditing, and inspection, that activities affecting the safety related functions have been correctly performed.

Although strictly speaking, failure to properly perform a work function is a violation of the NRC quality assurance criteria (criterion V), the NRC's enforcement policy (10 CFR Part 2, Appendix C) provides that Notices of Violation will not be issued for a particular violation when the defective condition is identified; is of a Severity Level IV or V; is reported, if required; is corrected within a reasonable time, and is not a violation that could reasonably be expected to have been prevented by a previous corrective action.

In essence the NRC quality assurance criteria requires that all safety related work be performed pursuant to approved instructions, procedures or drawing and verified, as appropriate, by inspection, checking, testing or auditing.

As admitted in the licensee's response, summarized above, the identified discrepant conditions occurred as a result of individuals performing work or otherwise doing an act or not doing an act that should have been done that affects safety related structures, systems and component without the use of and contrary to approved instructions procedures and drawings. As discussed above, all work on safety-related items must be controlled subsequent to initial installations and inspection to assure that the orginal quality of the items are not degraded unless appropriately reviewed and approved as provided for in the NRC quality assurance criteria.

The licensee's contention that each of the items when viewed singularly should not represent a significant safety concern on the part of the NRC and, therefore, infer that the cumulative aspects of the items are also insignificant does not have merit. Discrepant conditions were found by the NRC inspection staff in three vital safety-related systems (containment, emergency core cooling, and electrical) that should have been prevented and/or identified by the licensee had the licensee's quality assurance program been functioning as required by the NRC requirements. A malfunctioning quality assurance program is significant to safety and must be corrected. In view of the foregoing the NRC viewed the conditions as cause for significant concern in that the circumstances surrounding the conditons evidenced a breakdown in the quality assurance program amounting to more than isolated instances. Therefore, the cited violation was properly categorized a Severity Level III.

Request for Remission or Mitigation

In Attachment E of the licensee's response, the licensee protests the imposition of a civil penalty, and if disallowed, requests remission or mitigation of the civil penalty proposed by the Notice. The licensee has not provided adequate reasons for disallowing or remitting the civil penalty; however, mitigation of the civil penalty for actions taken by the licensee was reviewed and considered appropriate. The corrective action taken which includes, among other actions, initiation of an independent assessment immediately following the CAT inspection, suspension of startup work taken on the licensee's own initiative, reorganization of the management structure, and the direct involvement of the most senior corporate management was found to be unusally prompt and extensive. Therefore, mitigation of the penalty in the maximum amount of 50% is allowed.

Conclusion

The violation identified in Section I.A. of the Notice of Violation and proposed Imposition of Civil Penalties did occur as orginally stated. However, as discussed above, the civil penalty has been mitigated 50% based upon the licensee's prompt and extensive corrective action.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

NOV 11 1983

Docket No. 50-528

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

Attention: Mr. T. G. Woods Jr.
Executive Vice President

Gentlemen:

Subject: Construction Appraisal Inspection 50-528/83-34

This refers to the construction appraisal inspection conducted by Region V on September 6-16, 26-30, October 31 and November 1, 1983 at Palo Verde Unit 1. The Construction Appraisal Team was composed of members of Region I, Region V and a number of consultants. This inspection covered construction activities authorized by NRC Construction Permit CPPR-141.

The enclosed report identifies the areas examined during the inspection. Within these areas, the effort consisted of detailed inspection of selected hardware subsequent to APS Quality Control inspections, examination of procedures and records, observation of work activities and interviews with management and other personnel.

The inspection concentrated on hardware and was intended to assess whether the construction of Unit 1 was performed in accordance with quality requirements by comparing the as-built condition to the design requirements.

The method used in this inspection was to select a meaningful sample of completed safety-related construction for rigorous examination. The method further required the sample to be of high safety significance and to be generally representative of the work controls, procedures, methodology and documentation of the other safety-related work performed at the Palo Verde Nuclear Generating Station.

The team's approach was to direct 70 percent of its effort on system installation verification of the High Pressure Safety Injection (HPSI) System, "A" train. This included an in-depth examination of a large number of elements related to that system (on the order of 25 percent) including: piping; supports; pumps; valves; welding; nondestructive examination; electrical supplies; (including redundancy/separation); electrical motors; cables; terminations; supporting structural steel elements; related concrete structures; and other systems. Within the sample special emphasis was directed to the area of welding and electrical activities because of the multiple allegations received in these areas in the past. The other 30 percent of the team's effort was focused on inspection of other important areas (including the Reactor Coolant System).

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The HPSI "A" train was selected because of its high safety significance, its representativeness in terms of construction practices, and the fact that the system had not previously been independently examined by a third party.

OVERALL CONCLUSIONS

The team found that basic construction appeared to be generally satisfactory, however large numbers of deficiencies were not being identified during final QC inspections. The majority of these deficiencies appeared to be minor in nature but some were significant and reflected a weakness in quality assurance and/or a lack of management control by the APS Operations and Startup Groups. Although the team's focus was construction, a number of problems identified indicated that some of the deficiencies may have resulted from activities performed after the system or component had been turned over to operations and startup. General findings are discussed below:

AREAS INSPECTED AND RESULTS

A. Electrical and Instrumentation Construction

The inspections in this area revealed deficiencies in the thoroughness of the final inspections and/or in control of maintenance following testing. Of major significance was the finding of pipe caps left in place on the containment pressure sensing lines with no administrative requirement in place to insure their removal prior to operation of the plant. The existence of these caps was therefore lost. Had these caps remained in place during operation the response capability of the HPSI system would have been defeated. The inspectors were unable to reconstruct the circumstances of the caps being installed: whether the caps were installed and left on by the construction personnel or whether they were later installed by the preoperational testing personnel.

Missing bolts were identified in the base frames of the six separation groups 1 and 2 motor control centers. These bolts appear to be required for the seismic qualifications of these cabinets.

Some problems with cable separation were identified. These problems did not appear to be pervasive or indicate a lack of control in the area of cable separation.

Additionally, discrepancies associated with concrete expansion anchor bolts and supporting electrical raceways were found.

B. Mechanical Construction

Again the inspections in this area revealed deficiencies in the thoroughness of the final inspections and/or in maintenance following testing.

The manual operating mechanism of a 10 inch suction line valve was completely disconnected from the valve and flange bolts on the same valve had not been adequately torqued. As a result, the valve couldn't be operated and the valve bonnet was leaking. It appeared that the valve disassembly had been performed after construction personnel had completed their work on the valve. There was no indication that the preoperational testing or startup personnel had control measures in effect to recognize and repair the unsatisfactory valve condition. The same valve in train B was found in a condition which would not allow it to open fully.

An examination of 68 pipe hangers or supports of a total of 116 (60 percent) in the HPSI system showed that fourteen such structures have deficiencies such as undersize fillet welds.

C. Welding and Nondestructive Examination

The NRC examined 18 circumferential and 10 socket welds in the HPSI system by independent radiography. Also, 34 welds were visually examined in the field, and the radiographs on file for 192 welds were read by NRC. This resulted in looking at 28 percent of the welds in the HPSI systems. No deficiencies were found. In addition to the HPSI examination, system radiographs and weld records for twelve welds in the primary loop were examined. Three primary loop welds in PVNGS Unit 3 was examined radiographically for comparison of radiographic techniques with similar Licensee radiographs. One unresolved item was identified dealing with weld ripple images which could possibly mask weld defects.

D. Structures

Examinations in this area included concrete in situ testing, penetrations, structural bolting and welding. Some problems with bolting and welding of gallery steel were noted as described in the enclosed inspection report.

Most deficiencies appear to result from inadequate inspections prior to or inadequate control of systems after turnover to operations and startup.

WORKER INTERVIEWS

In order to determine if there were intimidation or undue pressure felt by workers to cut corners, 115 craftsmen and first line quality control inspectors were interviewed. The team considered that if such pressure and intimidation were widespread, the problem would surface in these interviews.

These interviews were face to face, and were made in private between one or two workers and a NRC inspector.

The tabulated results of these contacts, the crafts represented by the contacts are contained in the enclosed inspection report. None of the workers interviewed indicated that he or she felt intimidated or felt any pressure to cut corners for the sake of production.

NOV 1 1 1983

Enforcement action related to this inspection will be the subject of separate correspondence.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,

JBMartin

J. B. Martin
Regional Administrator

Enclosure:
1. Inspection Report 50-528/83-34

NOV 11 1983

Docket No. 50-528

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

Attention: Mr. T. G. Woods Jr.
Executive Vice President

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The inspection concentrated on hardware and was intended to assess whether the construction of Unit 1 was performed in accordance with quality requirements by comparing the as-built condition to the design requirements.

The method used in this inspection was to select a meaningful sample of completed safety-related construction for rigorous examination. The method further required the sample to be of high safety significance and to be generally representative of the work controls, procedures, methodology and documentation of the other safety-related work performed at the Palo Verde Nuclear Generating Station.

The team's approach was to direct 70 percent of its effort on system installation verification of the High Pressure Safety Injection (HPSI) System, "A" train. This included an in-depth examination of a large number of elements related to that system (on the order of 25 percent) including: piping; supports; pumps; valves; welding; nondestructive examination; electrical supplies; (including redundancy/separation); electrical motors; cables; terminations; supporting structural steel elements; related concrete structures; and other systems. Within the sample special emphasis was directed to the area of welding and electrical activities because of the multiple allegations received in these areas in the past. The other 30 percent of the team's effort was focused on inspection of other important areas (including the Reactor Coolant System).

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The HPSI "A" train was selected because of its high safety significance, its representativeness in terms of construction practices, and the fact that the system had not previously been independently examined by a third party.

OVERALL CONCLUSIONS

The team found that basic construction appeared to be generally satisfactory, however large numbers of deficiencies were not being identified during final QC inspections. The majority of these deficiencies appeared to be minor in nature but some were significant and reflected a weakness in quality assurance and/or a lack of management control by the APS Operations and Startup Groups. Although the team's focus was construction, a number of problems identified indicated that some of the deficiencies may have resulted from activities performed after the system or component had been turned over to operations and startup. General findings are discussed below:

AREAS INSPECTED AND RESULTS

A. Electrical and Instrumentation Construction

The inspections in this area revealed deficiencies in the thoroughness of the final inspections and/or in control of maintenance following testing. Of major significance was the finding of pipe caps left in place on the containment pressure sensing lines with no administrative requirement in place to insure their removal prior to operation of the plant. The existence of these caps was therefore lost. Had these caps remained in place during operation the response capability of the HPSI system would have been defeated. The inspectors were unable to reconstruct the circumstances of the caps being installed: whether the caps were installed and left on by the construction personnel or whether they were later installed by the preoperational testing personnel.

Missing bolts were identified in the base frames of the six separation groups 1 and 2 motor control centers. These bolts appear to be required for the seismic qualifications of these cabinets.

Some problems with cable separation were identified. These problems did not appear to be pervasive or indicate a lack of control in the area of cable separation.

Additionally, discrepancies associated with concrete expansion anchor bolts and supporting electrical raceways were found.

B. Mechanical Construction

Again the inspections in this area revealed deficiencies in the thoroughness of the final inspections and/or in maintenance following testing.

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The manual operating mechanism of a 10 inch suction line valve was completely disconnected from the valve and flange bolts on the same valve had not been adequately torqued. As a result, the valve couldn't be operated and the valve bonnet was leaking. It appeared that the valve disassembly had been performed after construction personnel had completed their work on the valve. There was no indication that the preoperational testing or startup personnel had control measures in effect to recognize and repair the unsatisfactory valve condition. The same valve in train B was found in a condition which would not allow it to open fully.

An examination of 68 pipe hangers or supports of a total of 116 (60 percent) in the HPSI system showed that fourteen such structures have deficiencies such as undersize fillet welds.

C. Welding and Nondestructive Examination

The NRC examined 18 circumferential and 10 socket welds in the HPSI system by independent radiography. Also, 34 welds were visually examined in the field, and the radiographs on file for 192 welds were read by NRC. This resulted in looking at 28 percent of the welds in the HPSI systems. No deficiencies were found. In addition to the HPSI examination, system radiographs and weld records for twelve welds in the primary loop were examined. Three primary loop welds in PVNGS Unit 3 was examined radiographically for comparison of radiographic techniques with similar Licensee radiographs. One unresolved item was identified dealing with weld ripple images which could possibly mask weld defects.

D. Structures

Examinations in this area included concrete in situ testing, penetrations, structural bolting and welding. Some problems with bolting and welding of gallery steel were noted as described in the enclosed inspection report.

Most deficiencies appear to result from inadequate inspections prior to or inadequate control of systems after turnover to operations and startup.

WORKER INTERVIEWS

In order to determine if there were intimidation or undue pressure felt by workers to cut corners, 115 craftsmen and first line quality control inspectors were interviewed. The team considered that if such pressure and intimidation were widespread, the problem would surface in these interviews.

These interviews were face to face, and were made in private between one or two workers and a NRC inspector.

The tabulated results of these contacts, the crafts represented by the contacts are contained in the enclosed inspection report. None of the workers interviewed indicated that he or she felt intimidated or felt any pressure to cut corners for the sake of production.

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Enforcement action related to this inspection will be the subject of separate correspondence.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1)

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,

/s/

J. B. Martin
Regional Administrator

Enclosure:
1. Inspection Report 50-528/83-34

cc w/enclosures:
G. C. Andognini, APS
E. E. Van Brunt Jr., APS
J. Bynum, APS

bcc:
RSB/Document Control Desk (RIDS)
Ms. Jill Morrison
Arthur C. Gehr, Esq.
pink/green copies
docket file copy
Resident Inspector
Mr. Martin, RV

RV

YOUNG/dot	BISHOP	MARTIN
11/10/83	11/10/83	11/ /83

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Division of Resident, Reactor Projects and Engineering Programs

Report No. 50-528/83-34

Docket No. 50-528 License No. CPPR-141

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

Facility Name: Palo Verde Nuclear Generating Station - Unit 1

Inspection at: Construction Site

Inspection conducted: September 6-16, 26-30 October 31 and November 1, 1983

Inspectors:

Talbert Young Jr. for 11-10-83
W. G. Albert, Senior Resident Inspector WNP-3 (Team Leader) Date Signed

J F Burdoin 11-10-83
J. F. Burdoin, Reactor Inspector Date Signed

Talbert Young Jr. for 11-10-83
R. H. Campbell, Engineering Technician Date Signed

Talbert Young Jr. for 11-10-83
R. H. Harris, Engineering Technician Date Signed

Talbert Young Jr. for 11-10-83
H. W. Kerch, Lead Reactor Engineer Date Signed

PPNarbut 11-10-83
P. P. Narbut, Project Inspector Date Signed

Talbert Young Jr. for 11-10-83
L. E. Vorderbrueggen, Senior Resident Inspector PVNGS Date Signed

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Talbert Young Jr. for
W. J. Wagner, Reactor Inspector

11-10-83
Date Signed

Talbert Young Jr. for
G. E. Walton, Senior Resident Inspector
BVPS-2

11-10-83
Date Signed

Talbert Young Jr. for
J. L. Crews, Technical Assistant to the
Regional Administrator

11-10-83
Date Signed

Talbert Young Jr.
T. Young, Jr., Chief
Reactor Projects Section 2

11-10-83
Date Signed

Consultants: W. Marini, C. Crane, and L. Stanley

Contract Technicians: K. Grevenow and J. Ludiwissi

Approved By: T.W. Bishop
T. W. Bishop, Director, Division of Residents,
Reactor Projects and Engineering Programs

11/10/83
Date Signed

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I. INSPECTION SCOPE AND OBJECTIVES

The scope of this inspection was the evaluation of on-site construction for Palo Verde Nuclear Generating Station Unit 1.

The objective was to provide an overall assessment of the actual as-built condition of the Palo Verde Nuclear Generating Station Unit 1 (PVNGS-1) by comparing the as-built condition to design requirements of a representative sample. Therefore, the inspection concentrated on hardware and assessed whether the construction of PVNGS-1 was performed in accordance with quality requirements applicable to the plant.

In the areas inspected, the following was determined:

- The construction observed was in conformance to the drawings and specifications.
- Necessary quality verifications were performed during the construction process with appropriete hold points and other controls.
- Nonconforming conditions were properly addressed in accordance with approved procedures.
- Equipment was turned over to the startup organization in operable condition and it was being maintained properly as evidenced by the as-found condition.

II. TEAM ORGANIZATION AND METHODS

The NRC inspection team consisted of ten NRC employees, three consultants, and two technicians from Wisconsin Testing, Inc., as follows:

William G. Albert - Team Leader

Registered Professional Engineer (Mechanical) with 33 years experience in reactor construction, engineering and operation. Currently the NRC's Senior Resident Inspector for the WNP-3 plant in Washington State.

Paul P. Narbut - Lead Inspector, Mechanical Area

Nuclear Engineer (Nuclear) with 20 years experience in the design, construction and testing of nuclear power plants. Currently a Project Inspector for the NRC's Region V office.

John F. Burdoin - Lead Inspector, Electrical Area

Registered Professional Engineer (Electrical, Mechanical and Nuclear), with 36 years experience in the field of electrical engineering. Currently a Reactor Inspector with the NRC's Region V office, specializing in electrical inspection.

Tolbert Young, Jr. - Interview and Report Coordination

Registered Professional Engineer (Nuclear) with 22 years experience in nuclear power plant operation. Currently a Section Chief with the NRC's Region V office.

Glen A. Walton - Welding and NDE Specialist

Twenty-seven years experience in regulation and management of NDE and QA/QC. Currently the NRC's Senior Resident Inspector for the Beaver Valley plant in Pennsylvania.

William J. Wagner - Welding Inspection

Registered Professional Engineer (Quality) and AWS-Certified Welding Inspector with 24 years of experience in the field of metallurgy, quality assurance and NDE. Currently a Reactor Inspector with NRC's Region V office, specializing in welding.

Harry W. Kerch - NDE Van Supervisor

Registered Professional Engineer (Quality) and Certified ASNT Level III Examiner with 35 years of NDE experience. Currently a Lead Reactor Engineer with the NRC's Region I office.

L. E. Vorderbrueggen - Team Support and Civil/Structural Coordinator

Electrical engineer with 36 years experience in the design and construction of industrial plants. Currently the NRC's Senior Resident Inspector at Palo Verde.

Richard H. Harris - NDE Inspection

Certified ASNT Level II Examiner and AWS Welding Inspector with 22 years experience in NDE and QC. Currently an Engineering Technician with the NRC's Region I office.

R. M. Campbell - NDE Inspection

Certified ASNT Level II Examiner and AWS Welding Inspector with nine years experience in NDE and QC. Currently an Engineering Technician with the NRC's Region I office.

Loren Stanley - Electrical Consultant

Registered Professional Engineer (Electrical) with 27 years electrical engineering experience. Currently in private consulting.

William Marini - Electrical Consultant

Electrical Inspection Specialist with 13 years experience in the field of electrical and welding inspection. Currently with Resource Technical Services.

Cyril J. Crane - Electrical Consultant

Registered Professional Engineer (Electrical) with 27 years experience in reactor operation and electrical engineering. Currently with Westec Services, Inc.

Jesse L. Crews - Registered Proffessional Engineer (Nuclear) with 22 years experience in reactor construction, engineering and operations. Currently Technical Assistant to the Regional Administrator.

K. Grevenow - NDE Technician

Wisconsin Testing

J. Ludiwissi - NDE Technician

Wisconsin Testing

The methods used for this inspection were to select a meaningful sample of Palo Verde safety-related construction for rigorous examination. The sample was of high safety significance and was deemed to be representative of the work controls, procedures, methodology, and documentation of safety-related work performed at Palo Verde Nuclear Generating Station. Selection and in-depth examination of a representative sample of this nature allowed extrapolation of the Team's findings to the adequacy of other safety-related construction at Palo Verde.

Accordingly, the team's approach was to direct 70 percent of its effort to the verification of system installation for the High Pressure Safety Injection System (HPSI) A train. This included in-depth examination of a large number of elements related to this system, including piping, pipe supports, pumps, valves, welding, nondestructive examination, electrical power supplies, electrical cables (including redundancy and separation), instrumentation, control, electrical motors, supporting structural steel elements, and related concrete structures. Within this sample, special emphasis was directed to the areas of welding and electrical construction since both of these areas had been the subject of allegations. The other 30 percent of the team's effort was focused on inspection in other important areas such as the Reactor Coolant System.

The examinations discussed above were conducted by:

(a) Physical inspection of systems, components, and structures.

(b) Independent NDE of welds and structures.

(c) Examination of documentation, where necessary, to support physical inspections.

(d) Private interviews and discussions with over 100 craft and inspection personnel.

(e) Examination of radiographs and other direct evidence of the quality of work such as postweld heat treatment charts.

(f) Testing of components by ultrasonic thickness measurements, hardness, radio signal cable tracing, and concrete probes.

III. CONTACTS AND LICENSEE/NRC MEETINGS

The inspection was unannounced until the morning of September 6, 1983. On that day all team members and the NRC Nondestructive Examination (NDE) Van arrived on site. The teams primary point of contact during the course of this inspection was the Arizora Public Service (APS) Construction Quality Assurance organization at the site. This organization is managed by Mr. W. E. Ide.

An entrance meeting was held at the start of the inspection to acquaint the licensee with what the NRC inspection team intended to accomplish, arrange for needed drawings and documentation, arrange for off shift radiography, define organizational points of contact, and arrange necessary Saturday coverage since September 10, 1983, was a day of work for the inspection team. This meeting was attended by Mr. E. E. Van Brunt, APS Vice President for Nuclear Projects Management, Mr. J. A. Roedel, APS Corporate Quality Assurance Manager, Mr. W. J. Stubblefield, Bechtel Field Construction Manager and 20 other staff members of the APS and Bechtel Site Organizations.

On September 14, 1983, a brief meeting was held between the NRC team leader Mr. W. G. Albert, Mr. E. E. Van Brunt, APS Vice President of Nuclear Projects and Mr. D. B. Fasnacht, APS Nuclear Construction Manager. The purpose of this meeting was to provide highlights of tentative findings up to that time since Mr. Van Brunt could not attend the meeting on September 16th.

On September 16, 1983, a meeting was held between the team leader and the team lead inspectors with Mr. J. A. Roedel, APS Corporate Quality Assurance Manager, Mr. D. B. Fasnacht, APS Nuclear Construction Manager, Mr. W. G. Bingham, Bechtel Project Engineering Manager and approximately ten other APS and Bechtel Staff. The purpose of this meeting was to provide APS with a progress report on the type and nature of NRC findings at that point in the inspection.

This was a status meeting and, therefore, no attempt was made to categorize the findings as to their seriousness or to define which would be items of noncompliance. The NRC stated at that time that they perceived a weakness at the interface between construction and operations and while the basic construction appeared satisfactory, a significant number of findings indicated that either final inspections were not properly performed and/or there was a lack of control of work after completion of construction by the startup organization.

The principal exit interview for this inspection was held in the APS corporate offices on September 30, 1983. This meeting was attended by Mr. J. B. Martin, NRC Regional Administrator, Mr. T. W. Bishop, NRC Division Director and three NRC observers from headquarters organizations. The APS attendees included Mr. K. L. Turley, Chairman of the Board, Mr. O. M. DeMichele, President, Mr. T. G. Woods, Jr., Executive Vice President, Mr. E. E. Van Brunt, Vice President Nuclear

Projects, Mr. G. C. Andognini, Vice President Nuclear Operations, and eight other APS staff members. Bechtel attendance consisted of Mr. W. J. Stubblefield, Site Construction Manager and Mr. D. R. Hawkinson, Projects Quality Assurance Manager. In addition to the above, the meeting was also attended by representatives of the five other owner organizations for the Palo Verde Nuclear Generating Station which are: Southern California Edison Company, Salt River Project, Los Angeles Department of Water and Power, El Paso Electric and Public Service of New Mexico. At this meeting, the individual team members reported upon the areas examined and the significant findings in each area as detailed in this report.

The NRC management again reiterated their concern with regard to the quality controls exercised at the time of system turnover from construction to the APS startup organization and the apparent need for more definitive quality control by maintenance organizations. However, the NRC expressed general satisfaction with basic construction, particularly pipe welding, and the results of over 100 private but informal contacts with craftsmen and first-line inspectors.

The applicant expressed their intent to immediately and thoroughly followup on the NRC findings. Except for disagreement with the NRC finding regarding the readability of certain primary loop pipe radiographs, the applicant did not comment on the NRC findings at the time of this meeting and questions were generally oriented toward the clarification of issues.

On November 1, 1983, a meeting was held between the Section Chief, the Technical Assistant to the Regional Administrator, Mr. E. E. Van Brunt, APS Vice President of Nuclear Projects, Mr. J. A. Roedel, APS Corporate Quality Assurance Manager, Mr. D. B. Fasnacht, APS Nuclear Construction Manager and other members of the APS staff. The purpose this meeting was to discuss the additional facts obtained (during the last two days of the inspection) surrounding the more significant violations.

IV. Electrical and Instrumentation Construction

Objective

The primary objective of the appraisal of electrical and instrumentation construction was to determine whether safety-related components and systems were installed in accordance with regulatory requirements, SAR commitments, and approved construction specifications and drawings. Additional objectives were to determine whether procedures, instructions and drawings used to accomplish construction activities were adequate and whether quality-related records accurately reflect the completed work.

Particular attention was concentrated on the "A" train of the high pressure safety injection (HPSI) system to demonstrate specific areas within the broad categories of electrical and instrumentation construction. These areas include electrical raceway (cable tray and conduit) and raceway supports; electrical motors; electrical cable and cable terminations; electrical penetrations; instrumentation (sensors and logic); diesel generator; and onsite AC power distribution system and DC power system. Portions of the HPSI B train were also examined.

A. Electrical Raceways and Raceway Supports
Areas Examined

1. Electrical Raceways

The NRC Team Inspectors examined approximately 1,690 feet of cable trays and 26 conduit runs. These raceways were inspected for: separation, proper identification and color coding, tray/conduit size and routing in accordance with design drawings, raceway bend radii conformance to criteria, bolted connection are tightness, weld conformance to applicable requirements, raceways free of debris and sharp edges, and installation and inspection documentation completeness and accuracy.

Findings

The inspection found that the raceways were in conformance with requirements regarding size, bend radii, bolting, welding, debris, sharp edges, general installation and inspection. However, deficiencies were identified in the areas of identification and separation, as indicated below. One instance of a damaged flexible conduit jacket repair is an open item and will be examined during a subsequent inspection.

a. Temporary alphanumeric identification on cable tray 1EZAIDBTXF had not been replaced with permanent identification (OII 50-528/83-34-11). E

b. Nonsafety-related conduit 1EZADCNRQ506 for thermostat 1EQFNT1243C in HPSI A pump room was separated from safety-related group 1 junction box 1EZACCAKKJ03 by less than one inch (OII 50-528/83-34-12). Ⓔ

c. At diesel generator E-PEA-G01 nonsafety-related flexible conduit 1EZG1ANRX11 at junction box 4 is in contact with safety-related flexible conduit 1EZG1AARR20 at junction box 6 (OII 50-528/83-34-13). Ⓔ

d. Separation group 1 cable tray located in HPSI pump room A was not marked with red color identification (round emblems) between points 1EZACEATCBA and 1EZACCARC03 (OII 50-528/83-34-14). E

e. The following separation group I conduits were not identified by alphanumeric markings (OII 50-528/83-34-15): E

   1) Conduits 1EZJ1AARC12,-14 and -16, on both sides of the wall between group 1, 4.16 KV switchgear area and channel A remote shutdown panel area, at the 100 foot elevation.

   2) Conduit sleeves 1EZJ1BARC13, 14 and 15 on control building wall in channel B remote shutdown area, at the 100 foot elevation.

f. Round blue identification emblems were missing from channel D conduit (PT-351) for a distance of approximately 40/50 ft at elevation 120' (OII 50-528/83-34-16).

g. At diesel generator E-PEA-G01, vendor supplied nonsafety-related ALS flexible cable at junction box 14 could potentially move and come in contact with safety related flexible conduit 1EZG1AARX27 at junction box 7.

h. The vinyl jacket on safety related flexible (anaconda metal hose type NWC), conduit ER1EZC1CARK13 inside containment was damaged and subsequently repaired in accordance with established procedures (Procedure for Raceway Installation, WPP/QCI 251.0, Revision 18, Section 5.10) by taping over the damaged vinyl with Scotch 33 tape (Unresolved Item 50-528/83-34-02).

2. Raceway Supports

The NRC Team examined 60 raceway supports. These supports were inspected for conformance to design drawings including: support spacing, configuration, location, mounting, material, support member size, and weld joints.

Findings

The raceway supports were found to be in general conformance with design drawings and regulatory requirements. The following deficiencies were identified:

a. The bolted connections attaching tray 1E[illegible]1BBTXCV to hanger H7 (drawing 13-E-ZAC-016 Rev. 20) were disconnected (OII 50-528/83-34-17).

b. The as-installed configuration of the welds attaching the longitudinal bracing for hangers H212, H10, H11 and H12 on drawing 13-E-ZJC-044 Rev. 9 to embedded plates is not as specified by detail 21, alternate, on drawing 13-E-ZAC-043 rev. 18. In addition, slag remains on the referenced welds for hanger H12. The raceway installation cards for trays 1EZJ4AATXHA and 1EZJ4AATXHB indicate that these welds have been inspected and accepted by QC (OII 50-528/83-34-18).

c. The fifth support from instrument rack 1JSBAA01 for conduit 1EZC1AARX-10 was found to contain welds which exhibited overlap, which is prohibited by AWS D1.1-72 (OII 50-528/83-34-19).

d. The priming and painting of welds on raceway supports in channel c (green) riser room adjacent to cable spreading room at the 120 foot elevation was incomplete.

e. The fourth support from junction box J-RCA-PT-190A for conduit 1EZCAAARX08 contains a damaged P1001A3 unistrut member which prohibits the full engagement of a unistrut spring nut within the unistrut channel.

B. Electric Motor Installation

Areas Examined

The NRC Team Inspectors examined a sample of installed electric motors within the HPSI system. The motors selected were two HPSI pump motors, IMSIAP02 (Train A) and IMSIBP02 (Train B); and 17 motor-operated valve motors included in the HPSI System (Trains A and B);

UV-617
UV-667
HV-699
HV-609
HV-530
HV-604
UV-627
HV-698
UV-673
UV-674
UV-616
UV-637
HV-531
UV-626
UV-636
UV-646
UV-647

For the motors, the inspectors reviewed associated vendor drawings and documents, and plant maintenance, test, and installation records which define the design and installation methods for the equipment. A physical inspection of the installed equipment was performed to determine compliance to design requirements and vendor installation criteria, mounting, bolting, identification, nameplate date, location, grounding, and protection. The following documents and areas were reviewed: equipment specifications; purchase order documentation; vendor drawings and instruction manuals, including maintenance and installation requirements; seismic analysis or test and equipment qualification documentation, including special mounting and maintenance requirements; equipment maintenance records for warehouse, construction, and startup phases; warehouse records including receipt, storage, and release documentation; material receiving reports, including equipment certifications from vendors; electrical testing records for pre-operational phase; and associated quality control and installation records.

The power cables for the motors were inspected in the field and the terminations were examined at the motors. The routing of the cables for the HPSI motors and approximately one-third of the MOVs were traced back to their respective 4160 volt or 480 volt power sources to verify physical separation of trains, cable tray/conduit arrangement, and cable tray fill. Specific cable numbers are identified below in Section C, electrical cable installation.

Findings

The following deficiencies were identified:

1. It was found that the installation of the dowel pins in the motor mounting (following alignment), as required by the manufacturer, had not been installed. Doweling of the motor mounts could not be identified on the master list of items to be completed prior to fuel load. However, it was established that the maintenance division, charged with the installation of these dowel pins, was aware of this remaining requirement in the mounting of the HPSI pump motors and tools were ordered in August 1983 to perform the job.

2. HPSI pump 1MSIAP02 motor, ground cable hold-down clamp was missing.

3. Motor heater (M-SIA-P02H) nameplate missing at MCC 1EPHAM37.

4. There are no permanent identification signs at entrances to HPSI pump rooms, Train A and Train B.

5. Revision 3 of Specification SYS.80-PE-410 for the HPSI pumps is not contained in Purchase Order 9500088, as required. Revision 2 of the specification is included in the purchase order.

5. MOV nameplate error at MCC 1EPHAM33. The nameplate reads JSIA-UH-604, but should read 1J-SIA-HV-604.

7. Material Receiving Report 42220 is missing from Purchase Order 960-1231 for MOV 1JSIA-HV 604.

No items of noncompliane or deviations were identified.

C. Electrical Cable Installation

Electrical Cable Installation
Areas Examined

The NRC Team inspectors selected a sample as listed below of installed electrical high and low voltage power, and control cables within the HPSI systems Trains A (and some in Train B) and the Class IE power systems. For each selected cable, the NRC inspectors reviewed associated drawings and documents which define the location, design route, and installation methods for cable installation within tray and conduit. A physical inspection of the as-built cable installation was performed by inspecting the entire length of cable run between the associated equipment and its respective load center/control cabinet. The objective of the inspection was to ascertain compliance with design, installation, and quality assurance documents. During the course of the inspection, the following documents and areas were reviewed: elementary and cable block diagrams; cable code and cable scheme numbers; single line diagrams, cable type and identification, including separation color and cable markers; E580 computer program sorts for routing, identification of cables at tray points, actual and allowable tray fill at tray points, and size and type of cable; physical separation criteria, including raceway and tray designations; conduit and tray arrangement drawing; raceway installation cards; cable installation cards; and cable installation specifications. The physical inspection of the cable runs included a determination of size, type, routing, protection, separation, identification, loading, cable supports and cable spacing. The actual cable installation and routing was compared to the design as determined from the E580 computer program and the cable installation cards.

The installation was examined for the following power, control and instrument cables, totaling approximately 8680 feet for the HPSI system, Trains A and B and Instrument Channels A, B, C, and D.

CABLES	EQUIPMENT	TO LOCATION
1ESI01BC1CA	HPSI Pump/Motor B	1EPBBS04E
1ESI01AC1CA	HPSI Pump/Motor A	1EPBAS03E
1ERC65CC1XA	PT-102C	1ESACZ28I
1ERC65CC1XB	Penetration Z28	1JSBCC02A
1ERC65DC1XA	PT-102D	1ESFDZ77I
1ERC65DC1XB	Penetration Z77	1JSBDC02A
1EHC62CC1XA	PT-351C	1JSBCC02A
1EHC62DC1XA	PT-351D	1JSBDC02A
1ESI40BC1KA	V-609	1EPHBM3410
1ESI1BBC1KA	V-667	1EPHBM3608
1ESI39BC1KA	V-699	1EPHBM3807
1ERC64AC1XB	PT-102A	1ESAAZ47I
1ERC64BC1XA	PT-102B	1ESFBZ38I
1ERC64BC1XB	Penetration Z38	1JZJBE02
1EHC61AC1XA	PT-351A	1JSBAC02A
1EHC61BC1XA	PT-351B	1JSBBC02A
1EPE01AC1CA	Diesel Generator	1JDGAB03
1EPE01AC1CB	1EPEAG01	1JDGAB03
1EPE01AC1CC	1EPEAG01	1JDGAB03
1ESI40AC1KA	MOV HV-604	1EPHAM3305
1ESI39AC1KA	MOV HV-698	1EPHAM3708
1ESI40AC1RA	MOV HV-604	1EPHAM3305
1ESI39AC1RA	MOV HV-698	1EPHAM3708

CABLES	EQUIPMENT	TO LOCATION
1ESI21AC1RC	Penetration Z46	1EPHAM3512
1ESI21AC1RB	MOV UV-673	1EPHAZ46I
1ESI21AC1KA	Penetration Z46	1EPHAM3512
1ESI21AC1KB	MOV UV-673	1EPHAZ46I
1EBC64BC1XD	Remote Shutdown Pnl.	1JSBBC02A
1ESB01AC1RM	Distrib. Pnl. (1EPNA-D25)	1JSBAC02B
1ESB01AC1RS	Distrib. Pnl. (1EPNA-D25)	1JRMAB02B
1EPN02AC1RB	Isolat'n.Pnl. (1JSAA-C04)	1EPNAN11

Findings

Cable installation activities were found to be in conformance with requirements. Two apparent violations were identified in this area.

1. Scaffolding lumber was found stored in channel C electrical raceway/cable chase located in the lower cable spreading room at the 120 foot elevation (OII 50-528/83-34-20).

2. In tray 1EZJ4AATSCE, cables are projecting above the level of the tray siderails, and are in physical contact with fire protection piping and two HVAC ducts (OII 50-528/83-34-21).

In addition to the violations, the following two concerns were identified:

1. While inspecting the traceability of Anaconda 5 KV cable, it was found that the identification, required to be permanently marked on the outer jacket of the cable at three-foot intervals, could easily be rubbed off. This resulted in the cable jacket markings becoming illegible following handling during installation.

2. Traceability of 5KV cable was found to lack clarity. The cable is received on site from the vendor under a material receiving record (MRR) which identifies the cable, vendor and receiving cable reels. Following receipt, the vendors cable reels are assigned Bechtel cable reel numbers for storage and future processing. The Bulk Material Inventory (computer readout), the principle cable record, correlates Bechtel cable reel numbers to vendor reel numbers, but does not list the MRR numbers under which the vendor cable reels were delivered. Therefore, it is difficult to trace cable directly from the Bechtel storage reels to the material receipt records.

D. Cable Terminations

The NRC Team inspectors examined the terminations of 31 cables identified above under cable installation. The terminations at both ends of the cables were inspected for: cable terminations as shown on engineering documents, identification with enclosure, separation, size of conductor, tie-down, bend radius, grounding of cable shield, disposition of spare wires, proper size terminal lugs, neatness and workmanship, and installation and inspection documentation.

Findings

Except as noted below, cable terminations were found to be in conformance with requirements. The following deficiency was identified:

1. Electrical installation, Specification EM-306, Section 7.2R, requires spare wires in a cable to be coiled and insulated with tape or a shrink sleeve. The end of green/black tracer, spare wire cable ESI21AC1RC at EPHAM3512 was bare and not insulated. The quality of insulating the ends of other spare wires was inconsistent and insecure in some instances. No items of noncompliance or deviations were identified.

E. Electrical Penetrations

Areas Examined

The following installed containment electrical penetration assemblies were inspected:

Number	Elevation
Z28	100-foot
Z38	100-foot
Z46	120-foot
Z47	120-foot
Z77	120-foot

The location, type, mounting, and identification were compared with the installation drawings. The cable terminations at the penetrations were examined both inside and outside of containment. The QC records associated with receiving, storage and installation of these penetrations were also reviewed.

Finding

Activities observed and documentation reviewed indicated work performed in this area was in accordance with requirements. No items of noncompliance or deviations were identified.

F. Electrical Instrumentation

Areas Examined

The actuation of HPSI is initiated from either of two parameters (four channels); low-pressurized pressure and high containment pressure. The four pressurizer low-pressure transmitters, PT-102A, 102B, 102C and 102D; and the four containment high pressure transmitters, PT-351A, 351B, 351C, and 351D were inspected in the field.

These pressure transmitters were inspected for proper mounting, physical separation, identification of correct instruments and safety channel (color code), instrument calibration, etc. The stainless steel tubing runs were traced from the transmitters back to the containment isolation/root valves to verify; proper grade (slope) and tubing support.

The instrument cabinets and panels were inspected for technical requirements as contained in the Procurement Specifications 13-JM-200 (COMSIP, Inc) and 13-EM-022 (HARLO Corp.), and Installation Specification for Instrumentation and Control Equipment, 13-JM-702, Revision 8. The physical inspection also included inspection of internal wire routing and separation, cable marking (identification), termination connections, module mountings, overall workmanship, and cleanliness. Operator controls and displays for the HPSI system were examined at the B02 and B05 main control room benchboards. The interface between the HPSI system and remote shutdown panel was also examined.

The following engineered safety features (HPSI) systems cabinets and instrument panels were inspected:

1. NSSS Analog Instrument Cabinets A, B, C, and D:

   1-J-SBA-C02A 1-J-SBB-C02A 1-J-SBC-C02A 1-J-SBD-C02A
   1-J-SBA-C02B 1-J-SBB-C02B

2. Plant Protection System Cabinets A, B, C, and D:

   1-J-SBA-C01 1-J-SBB-C01 1-J-SBC-C01 1-J-SBD-C01

3. Main Control Room Panels:

   1-J-RMA-B02 1-J-RMB-B02 1-J-RMC-B02 1-J-RMD-B02
   1-J-RMA-B05 1-J-RMB-B05 1-J-RMC-B05 1-J-RMD-B05

4. ESFAS Auxiliary Relay Cabinets A and B:

   1-J-SAA-C01 1-J-SAB-C01

5. BOP ESFAS Cabinets A and B:

   1-J-SAA-C02A 1-J-SAB-C02A 1-J-SAA-C02B 1-J-SAB-C02A

6. Isolation Cabinets A, B, C, and D:

   1-J-SAA-C04 1-J-SAB-C04 1-J-SAC-C04 1-J-SAD-C04

7. Status Display Panel Inserts A and B:

   1-J-ESA-C01 1-J-ESB-C01

8. Remote Shut Down Panel Sections (HPSI Valve Controls):
1-J-ZJA-E01 1-J-ZJB-E01 1-J-ZJC-E01 1-J-ZJD-E01

The following quality control records for the HPSI instrument systems were examined: purchasing/receiving records, storage/maintenance records, installation records, cable installation, and termination records.

Findings

Inspection of instrumentation revealed a significant violation which reflects a weakness in the preoperational/startup test program:

1. The sensing lines for the four channels of containment pressure (PT-351A, 351B, 351C and 351D) were found to be capped immediately inside containment. The sensing lines were capped with threaded pipe caps and could only be removed with the aid of a pipe wrench. The presence of these pipe caps made this system inoperative. There were no records to indicate when the caps were installed. The inspectors were unable to determine whether the caps were installed by construction or preoperational personnel. It was not apparent that any preoperational or startup program action would have assured the removal of the caps prior to plant operations. This is an apparent violation (OII 50-528/83-34-22).

In addition to the apparent violation identified above, three items of concern were identified:

1. The instrument sensing line support shown in Detail 1 on Drawing 13-J-01D-105, Revision 4 has a weld which contains undercut measuring approximately 1/32-inch in depth. The 1/32-inch value does not satisfy the requirements of the .01-inch criteria for undercut transverse to the primary tensile stress of the member in question as stated in AWS D1.1-72, Revision 1973 as defined in specification 13 CM 320.
2. An internal separation barrier cover was missing from remote shutdown panel 1JZJBE01, and no status tag noting its removal was observed.
3. It was found that temporary nonconformance report hold tags for level transmitters LT 1123A and LT 1124A at the 100 foot elevation inside containment were reversed.

G. Emergency Diesel Generator

Areas Examined

The electrical aspects of the Emergency Diesel Generator 1, 1EPEAG01, including control cabinet wiring, were inspected for location, mounting, separation, protection, and identification.

Findings

These reviewed aspects indicated work was performed in accordance with installation requirements. Some minor deficiencies that were found in raceways (flexible conduit) separation were address under raceway and support section of this report Paragraph IV.A-1. No other violations or deviations were identified.

H. Onsite AC Power Distribution System

Areas Examined

The NRC inspector examined the following components of the Class I 4160-volt and 480-volt power distribution system:

1E-PBB-S04	4.16 KV switchgear, separation group 2
1E-PBA-S03	4.16 KV switchgear, separation group 1
1E-PGA-L35	480 V switchgear, separation group 1
1E-PGA-L33	480 V switchgear, separation group 1
1E-PHA-M33	480 V MCC, separation group 1
1E-PHA-M35	480 V MCC, separation group 1
1E-PHA-M37	480 V MCC, separation group 1
1E-PHB-M34	480 V MCC, separation group 2
1E-PHB-M36	480 V MCC, separation group 2
1E-PHB-M38	480 V MCC, separation group 2

The 4160-volt switchgear, 480-volt switchgear and 480-volt motor control centers (MCC) were inspected and compared to installation drawings relative to configuration, location, mounting, identification, installation documentation, and protection.

Findings

Inspection of this area revealed three apparent violations related to cabinet installation and electrical separation:

1. It was found that 87 3/8-inch bolts were missing from the base frames for the six separation groups 1 and 2 motor control centers identified. The failure to identify this condition, adverse to quality, is an apparent violation (OII 50-528/83-34-23).
2. In 4160-volt switchgear cubicle E-PBA-503L nonsafety-related flexible conduit 1EZJ1ANRR52 is separated from safety-related wiring by less than 1 inch which does not satisfy the separation requirements (OII 50-528/83-34-24).
3. In 4160-volt switchgear cubicle E-PBA-503K nonsafety-related flexible conduit 1EZJ1ANRR51 is separated from safety-related wiring by less than one inch, contrary to separation criteria (OII 50-528/83-34-25).

In addition to the violations noted above, two items of concern were identified:

1. An error was found in the identification of compartment 05 of MCCEPMAM33 on drawing 13-E-PHA-003. Long term cooling valve JSIAHV604 was identified as JSIAUV604.
2. It was found that three cubicle tie-down bolts in MCC 1E-PHA-M35 were not fully engaged. The licensee had in progress design change package (DCP) 1SE-PH-035 requiring certain modifications to the tie-down method for the above identified MCCs. These modifications were required to assure the MCCs comply with the seismic analysis requirements.

I. DC Power System

Areas Examined

The four main DC batteries, battery chargers, and Vital AC bus inverters were inspected for electrical separation aspects, fluid levels, termination connections, bolting materials, spacers, mounting arrangements, and general workmanship and cleanliness. Equipment that was inspected is identified in the following list:

DC Batteries and Mounting Racks A, B, C, and D:
1-E-PKA-F11 1-E-PKB-F12 1-E-PKC-F13 1-E-PKD-F14

DC Battery Chargers A, B, C, and D:
1-E-PKA-H11 1-E-PKB-H12 1-E-PKC-H13 1-E-PKD-H14
1-E-PKA-H15 1-E-PKB-H16

Vital AC Bus Inverters A, B, C, and D:
1-E-PNA-N11 1-E-PNB-N12 1-E-PNC-N13 1-E-PND-N14

Technical requirements for the batteries, battery chargers, and inverters contained in Procurement Specifications 13-EM-050 for Exide, 13-EM-051 for Power Conversion Products, Inc., and 13-EM-054, respectively, were reviewed.

Each battery was physically inspected for adequate fluid levels, conductor termination connections, bolting materials used, and absence of battery case cracks. Each battery rack was inspected for battery-to-end plate spacing, battery-to-battery spacers, alignment of frame spring-nuts, and frame welding to the battery room floor imbeds. The location, floor mounting, panel displays, and electrical conduit configuration for each battery charger and Vital AC inverter were inspected.

Revisions 0 and 1 of the PM-410 Startup Generic Maintenance Procedure for Station Batteries were reviewed for technical requirements and test acceptance criteria. Records were inspected for each of the four safety-related batteries, such as on-site receiving records, mid-1981 test results during warehouse storage, and periodic maintenance test result records during construction for the period from February 1982 through September 1983.

Installation, in-site modification, and periodic maintenance records for each battery charger, and Vital AC inverter (prior to turnover to Startup) were also inspected.

Findings

The following deficiencies were identified:

1. The batteries were received on site during the summer of 1981. It was found that no procedure existed for performing the required periodic tests (IEEE Std. 308) to maintain the batteries. The required procedure came into effect in the spring of 1982. This item was the subject of a violation during the team inspection of 1981.

2. The earliest maintenance records are for August 1981, and proceed monthly through November. However, no records can be found for December 1981 and January 1982.

3. The storage of periodic maintenance records did not satisfy the storage requirements of Section 1.8 of the FSAR. These records, required to be stored in a manner which minimizes the risk of destruction from fire, were found stored in a paperboard box. A licensee representative stated that this was temporary for field use.

4. No records exist to indicate that baseline annual cell-to-cell and terminal detail connection resistance data was ever recorded during factory acceptance tests for these batteries. However, the licensee startup generic test procedure addresses the requirement to record intercell resistance checks, during preoperational testing.

5. It was found that the vendor testing (at the factory) of battery C did not completely fulfill the discharge rate requirements. However, the licensee identified this, at the time, by issuing supplier deviation disposition request (SDDR) 2763 which requires the capacity discharge test to be run on the job site. This test is scheduled to be accomplished by the startup group during preoperational testing.

V. Hangers and Supports, Snubbers and Restraints

A. Areas examined

1. Hardware: The inspector examined all pipe hangers, supports, snubbers, and restraints on the HPSI A piping system from the start of suction line SIA-008-GCBC-10-inch through discharge lines SI-A-100-CCBA-4 inch were and SI-A-106 CCBA-3-inch, throughout the 40-foot elevation, up through the vertical pipe chase to the 89-foot elevation pipe chase. At this juncture, one of the five injection branch lines, SI-E-176-CCBA-3", was followed to the injection point and all pipe supports, hangers, snubbers, and restraints were examined. Additionally, miscellaneous branch lines from the HPSI discharge path were examined for supports (to the first isolation valve on the branch). Additionally, a few supports not involved in the line description above were examined if a condition was noted which warranted follow up. All supports examined are listed in Table V-1.

   In most cases, pipe insulation was removed for inspection. In those cases where a support was only partially examined, Table 1 so notes. These cases generally fall into the following conditions:

   - Insulation not removed. This condition precluded examining pipe lug welds only. The hanger members and welds are not covered by insulation and can be throughly inspected.
   - Lug welds only. In these cases, the inspector examined only the lug welds to increase the sample of lug welds by inspecting supports which were not on the selected branch line, but were part of HPSI-A.
   - One aspect only (e.g., "base plate only"). In these cases, the support was not included in the lines selected but was partially examined because a condition warranting follow up was noted.
   - Location and configuration only. These cases involved a series of replicate supports in a horizontal run. The location of the support and the configuration were checked against drawing requirements, and support member sizes and weld sizes were checked by visual examination rather than by measurement.

All other supports were examined fully.

The inspector examined the supports to determine that:

- All supports shown on the piping isometric drawings were installed.
- No additional supports were installed.
- The support configuration was as shown on the support drawing.
- The support member material was per the drawing.
- The welds on the support were the correct size and met the applicable code and standard requirements.
- The welded attachments to piping were per drawing.
- The attachment welds to pipe were per drawing and met code and standard requirements.
- Mechanical snubbers and restraints were installed where required by drawing.
- The snubber and restraints were the proper size (load rating).
- The snubbers and restraints had the proper cold setting shown on the drawing.
- The supports were properly located per the drawing relative to the piping and the structure.

There are a total of 116 pipe supports involved in all of the HPSI-A system. The inspector examined 68 supports or about 60 percent. Of the 68 supports examined 14 supports had one or more problems. This is about a 20 percent reject rate. The problems identified are discussed in the "Findings" section below.

2. <u>Drawings, Specifications, and Procedures</u>

The inspector gathered and reviewed the applicable piping drawings, hanger drawings, specifications, work and inspection procedures, and pertinent vendor information.

Other safety-related documentation, including documents, authorizing deviations from the drawings, records of hanger inspection by QC, non-destructive examination records, welding inspection records, noncomformance reports, vendor certification records, code reports, and piping spool fabrication records were reviewed as they were identifed in the pursuit of questions raised on a particular support's apparent anomolies.

The inspector also reviewed the FSAR and ASME codes for applicable requirements.

The documents discussed above will be listed and specifically addressed only as they apply to findings, discussed in the "Findings" section below.

3. Tools

The inspection was conducted utilizing unaided visual examination, tape measure, weld gages, angle finder, and adequate lighting. Safety equipment was utilized as required. No NRC independent non-destructive examination was performed on the pipe supports due to other priorities. In the one case where the visual inspection indicated a possible weld defect, the inspector requested the licensee reexamine the weld using liquid penetrant examination. The inspector observed the entire performance of the examination.

B. Findings

Table V-1 lists all supports inspected and shows which supports were found unsatisfactory and provides a brief description of the problem(s) found.

The problems found group into four areas which are considered apparent violations of NRC regulations. Each problem identified in Table V-1 is explained more fully below.

(1) Failure of the pipe support QC personnel to identify support conditions which are not in accordance with drawing or specification requirements (five examples).

10 CFR 50, Appendix B, Criterion 5, requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings, and shall be accomplished in accordance with these instructions.

The licensee's procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, "Nuclear Pipe Hangers and Supports Installation," Appendix I, requires the Piping QC Engineer to verify each completed task on the "CIP for Nuclear Pipe Supports." The inspection requirement for Task 1 is to verify the support assembly correct per approved engineering drawings and specifications.

- Support SI-100-H003 was found with a loose pipe clamp and installed at an angle of 4 1/2° from vertical. Procedure WPP/QCI 201.1, paragraph 8.9, requires the clamp to be snug on the pipe. Procedure WPP/QCI, paragraph 9.2.7.1, requires the angle to be no greater than 2 degrees. The support was accepted by QC on November 20, 1983.

- Support SI-100-H005 was found with the drawing specified dimension of 3 3/4 inches between the centerline of the pipe stanchion and the centerline of the insert plate to be actually 7 1/2 inches. This difference exceeds the tolerances of ± 2 inches paragraph 9.3.12 of the WPP/QCI. The support was accepted by QC on November 13, 1981.

- Support SI-100-H036 was found in a condition which did not match the hanger drawing and modifying Field Change Request (FCR) 15, 123P. Item D of the FCR was not installed. The support was accepted by QC on October 22, 1983 to the drawing and FCR.

- Support SI-101-H00A was found with a loose jam nut on Item 61, the sway strut assembly. The support was accepted by QC on October 2, 1981.

- Support SI-106 H001 was found with the 2" long pipe lugs, Item 38, bearing on the supporting steel for only 3/16 inch and 7/16 inch, respectively. Paragraph 9.4.1 of the WPP/QCI indicates full bearing surface should be provided as indicated on the support drawing. The support was accepted by QC on May 23, 1980.

The failure of pipe support QC personnel to identify pipe support conditions which were not in accordance with drawing or specification requirements is an apparent violation of NRC regulations (OII50-528/83-34-01).

(2) Failure of the welding QC personnel to identify weld conditions which are not in accordance with the drawing or the welding code requirements (eight examples).

10 CFR 50, Appendix B, Criterion 5, requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings, and shall be accomplished in accordance with these instructions.

Licensee's procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, "Nuclear Pipe Hangers and Supports Installation," Appendix I, requires the Piping QC Engineer to verify each completed task on the "CIP for Nuclear Pipe Supports."

The inspection requirements for Task 8 require the welding QCE to verify that field welding is complete. For Task 9, he is to verify the vendor welding was checked for size and length. The instructions to the QCE in Appendix I instruct the QCE to verify welding acceptability.

- Support SI-100-H005 was found with an underfill condition in the stanchion, Item 30, to pipe weld. The weld is required to be a 5/16-inch fillet weld. The actual fill was measured to be 1/4 inch. The weld was accepted on the field weld check list on November 9, 1981.

- Support SI-100-H010 was observed to have an apparent lap in the weld of Item 38 to the pipe. This was a vendor weld. Minor slag was also present in the toe of the weld. These conditions would have precluded a satisfactory liquid penetrant examination by the vendor. The vendor records show the weld was liquid penetrant examined and accepted on December 4, 1977 (Job 2810, Piece 1-SI-100-S-009, "F" No. 261). The NRC inspector had the visual indication on the weld reexamined by licensee personnel by liquid penetrant examination in his presence. The liquid penetrant examination resulted in an unacceptable linear indication.

  The vendor weld had been last inspected by site QC personnel per Task 8 on June 17, 1981, and was accepted.

- Support SI-100-H015 has the lug, item 38A, field welded to the pipe. The weld was 1/32-inch undersize. The welds were originally accepted on January 22, 1979, and were accepted again during the support inspection on October 28, 1981.

- Support SI-100-H034 was found with one undersized vendor lug weld (Item 38 to the pipe). The weld was required to be a 1/4-inch fillet and measured to be 3/16 inch. The vendor welds were checked by site QC for size and accepted on September 11, 1982.

- Support SI-102-H00B was found with several weld problems. The vendor weld of Item E to Item B was required to be a 3/16-inch fillet, but was 1/8 inch on three sides. Additionally, there was rollover (or laps) at the corners. The field weld of Item C to existing structure was required to have one-inch end returns on the welds, but did not. The vendor weld was accepted by site QC on August 18, 1981. The field weld was originally accepted on October 14, 1980, and was accepted again on August 18, 1981.

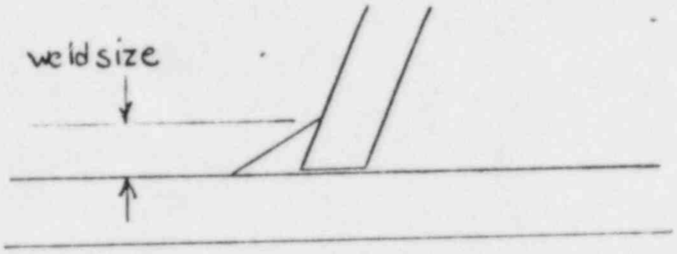
- Support SI-106-H011 was found with the pipe lug welds (Items 38 and 38A to pipe) closer than 1 inch to the adjacent pipe-to-pipe circumferential weld. The actual distance was 3/4 inch. Specification 13-PM-204, "Field Fabrication and Installation of Nuclear Piping Systems," paragraph 12.2.9, states that welded attachments shall not be installed within 1.0 inch of existing circumferential welds. The field lug welds were originally accepted on February 12, 1979, and again during final support acceptance on October 2, 1980.

- Support SI-176 H001 was found with an undimensioned weld on the drawing, therefore, the proper size of the weld could not be properly verified by the QC inspector. The 3-inch long fillet field welds of Item 84 to Item B are not dimensioned on the support drawing 13-SI-176-H001, Revision 1. The welds were originally accepted on December 18, 1980, and were accepted again on September 15, 1982.

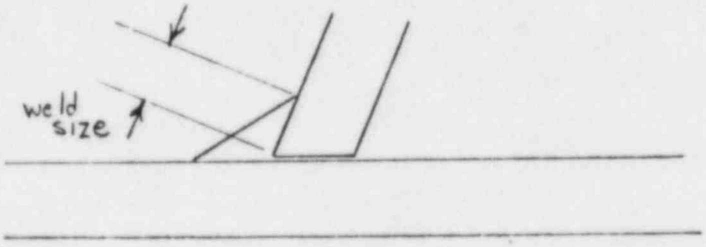
- Support SI-176-H003 was found to have an undersize weld. The skewed (120-degree) fillet weld of Item A to the containment insert plate measured 1/4 inch rather than the required 5/16 inch. The support weld was accepted on July 14, 1980.

Further discussions with the Lead QC Engineer for Pipe Supports and the Lead Welding Engineer disclosed that the Welding Engineer had given verbal instructions to the QC Engineer that were contrary to the AWS D.1.1 code requirements for measuring the size of skewed fillet welds. Hence, this undersize weld may be considered caused by improper engineering information. It follows that all skewed fillet welds may require reinspection to the proper criteria.

The AWS D.1.1 Code 1974 shows, in Figure 2.7.1, that skewed fillet welds are measured thus:



At Palo Verde the QC Engineer states weld are "measured" as shown below (it is not clear how this is "mesured" since there is no access to one of the measurement points):



To "measure" by the Palo Verde method to a given size (e.g., 5/16 inch on a 120-degree weld) will result in an undersize weld by the Code definition (in this case by 3/64 inch). Nonetheless, QC inspectors are required by WPP/QCI 201.1 to inspect to AWS D.1.1 criteria for this weld. The AWS D.1.1 criteria are clear and are not superceded by verbal instructions from engineering.

The failure of welding QC to identify pipe support weld conditions which are not in accordance with the drawing or welding code requirements is an apparent violation of NRC regulations(OII 50-528/83-34-02).

(3) Failure of engineering to include a non-safety loads in a safe related pipe support calculation (one example).

10 CFR 50, Appendix B, Criterion 5, requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures and drawings and shall be accomplished in accordance with these instructions.

Specification 13-PM-204, Revision 12, Paragraph 12.1.2 dated April 7, 1983, states the design and location of all pipe supports shall be the responsibility of project engineering. Paragraph 12.1.4 states pipe supports designed by engineering will be shown on drawings and all design details will be shown including miscellaneous steel.

Support SI-100-H-012 was found with a miscellaneous steel member installed which was used as a support for an Instrument Air Line. The miscellaneous steel was not shown on the pipe support drawing, 13 SI-100-H-012, Revision 1. The drawing does show the engineering design loads used in the analysis of the pipe support and the applicable calculation number (Problem No. 513-E, point number 293).

Engineering was contacted by telephone, and the responsible engineer stated that the loads from the miscellaneous steel member used as an instrument air support (IA-116-H00A) were not included in the design load for the pipe support, SI-100-H-012.

The engineer stated that loads were inconsequential (29 pounds) and the instrument air calculation had been annotated to state that the attachment to the Safety Injection Support was satisfactory. Nonetheless, he stated the procedure requires the safety injection support calculation be amended to include such loads. The failure of engineering to include a nonsafety design load in a safety-related pipe support calculation is considered an apparent violation of NRC regulations.

(4) Failure to maintain an accepted pipe support in an acceptable condition

Appendix B, of 10 CFR 50, Criterion II, as implemented by Chapter 17 of the PSAR and FSAR requires in part that "The quality assurance program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety".

Support SI-089-H008 was found with rubber seal material injected in the space by the Flourogold slides plates, Items 54 and 55 on the drawing. The drawing does not show rubber sealant material. It is probable that the material was inadvertently injected after the support inspection on November 29, 1979, but the material had been neatly trimmed away and the edges painted in the area painting.

The failure to provide control over activities affecting quality, resulting in a challenge to the sliding function of support SI-089 H008 is considered a violation (OII 50-528/83-34-03).

TABLE V-1

	SUPPORT	TYPE	FINDING	PROBLEM DESCRIPTION	DEGREE OF INSPECTION
1.	SI 008 H001	S	Sat		Full
2.	SI 008 H002	SS	Sat		Full
3.	SI 008 H003	S	Sat		Full
4.	SI 008 H004	SNB	Sat		Full
5.	SI 008 H005	S	Sat		Full
6.	SI 089 H008	S	Unsat	Penetration Seal Material on Slide Plate	Slide Plate only
7.	SI 099 H001	SNB	Sat		Full
8.	SI 099 H002	S	Sat		Full
9.	SI 100 H001	S	Sat		Presence only - seal boot on
10.	SI 100 H002	S	Sat		Full
11.	SI 100 H003	S	Unsat	(1) Loose clamp (2) Excessive Angle	Full
12.	SI 100 H004	S	Sat		Full
13.	SI 100 H005	S	Unsat	(1) Location dimension varies more than allowed (2) Lack of fill on stanchion to pipe field weld	Full
14.	SI 100 H006	S	Sat		All but lug welds
15.	SI 100 H007	SNB	Sat		Full
16.	SI 100 H008	S	Sat		Full
17.	SI 100 H009	S	Sat		All but lug welds
18.	SI 100 H010	S	Unsat	PT accepted (by Vendor) w. lap and slag	Full
19.	SI 100 H011	S	Sat		Full
20.	SI 100 H012	S	Unsat	Nonsafety hanger loads not included	Full
21.	SI 100 H013	S	Sat		Full
22.	SI 100 H015	S	Unsat	Lug weld size	Full
23.	SI 100 H016	S	Sat		Full
24.	SI 100 H017	S	Sat		Full
25.	SI 100 H018	S	Sat		Full
26.	SI 100 H019	S	Sat		Full
27.	SI 100 H020	SNB	Sat		Full
28.	SI 100 H021	S	Sat		Full
29.	SI 100 H022	S	Sat		Location/ Configuration/ Clearances only
30.	SI 100 H023	S	Sat		"
31.	SI 100 H024	S	Sat		"
32.	SI 100 H025	S	Sat		"
33.	SI 100 H026	S	Sat		"
34.	SI 100 H027	S	Sat		"
35.	SI 100 H028	S	Sat		Full

36.	SI 100 H029	S	Sat		All but pipe lugs
37.	SI 100 H031	S	Sat		Lug welds only
38.	SI 100 H032	S	Sat		Lug welds only
39.	SI 100 H034	S	Unsat	Undersize lug weld	Full
40.	SI 100 H035	S	Sat		Lug welds only
41.	SI 100 H036	S	Unsat	Configuration differs from drawing	Full
42.	SI 101 H00A	SS	Unsat	Loose Locknut	Lock nut only
43.	SI 102 H00A	S	Sat		Full
44.	SI 102 H00B	S	Unsat	Welds deficient (Undersize weld, rollover, no end returns)	Full
45.	SI 105 H00B	S	Sat		Full
46.	SI 105 H00C	S	Sat		Full
47.	SI 105 H00D	S	Sat		Full
48.	SI 105 H00E	S	Sat		Full
49.	SI 106 H001	S	Unsat	Lack of Lug Contact area with support members	Full
50.	SI 106 H002	S	Sat		Full
51.	SI 106 H003	S	Sat		Full
52.	SI 106 H004	S	Sat		Full
53.	SI 106 H005	S	Sat		Full
54.	SI 106 H006	S	Sat		Full
55.	SI 106 H007	S	Sat		Full
56.	SI 106 H008	SNB	Sat		Full
56.	SI 106 H009	S	Sat		Full
57.	SI 106 H010	S	Sat		Full
58.	SI 106 H011	S	Unsat	Pipe lug weld w/in 1" of circumferential weld	Full
59.	SI 106 H012	S	Sat		All but pipe lugs
60.	SI 106 H013	S	Sat		All but pipe lugs
61.	SI 106 H014	S	Sat		Full
62.	SI 106 H015	S	Sat		Full
63.	SI 106 H016	S	Sat		Full
64.	SI 106 H023	S	Sat		Full
65.	SI 176 H001	S	Unsat	Undimensioned weld on drawing	Full
66.	SI 176 H002	S	Sat		Full
67.	SI 176 H003	S	Unsat	Undersize fillet weld	Full
68.	SI 176 H004	SS	Sat		Full

LEGEND

S = Support
SS = Restraint (Sway Strut)
SNB = Snubber

VI. PIPING SYSTEMS INSPECTION

Approximately 826 feet of HPSI-Train A piping was selected for inspection. Inspection was performed on 64 percent, which represents 530 feet of the HPSI piping, to verify compliance with the isometric drawings and ASME Section III requirements. This included 64 feet of piping on the suction line of HPSI pump A; the balance of piping inspected was on the discharge lines located in the auxiliary and containment buildings respectively. Piping system inspection includes visual inspection of pipe welds, welder qualifications, piping size and quality, and valve installation.

A. Piping System Welds

1. Areas Examined

Visual inspection of 200 pipe welds, out of a total of approximately 900 weld joints (pipe and socket) in the entire HPSI systems was made for quality and compliance with ASME Section III requirements. Characteristics examined included weld surface appearance, location, weld reinforcement, and absence of surface defects including cracks, lack of fusion, porosity, slag and undercut exceeding prescribed limits.

The records associated with one percent of the total welds were reviewed in detail and compared with the information obtained at the weld joint. Records examined included certified material test reports, piping class sheets, Bechtel's Form 84 which specifies the welding and nondestructive examination requirements for field erected piping, welder qualifications, field welding check list, and filler material certifications.

2. Findings

The type of pipe weld joints examined included pipe-to-pipe, pipe-to-fittings and pipe-to-valves. The visual inspection of these weld joints and the associated records reviewed indicated that the components were welded together by qualified welders using qualified filler materials and qualified welding procedures, the components being joined were certified, that the base material and the filler material were compatible for welding, and the required nondestructive examinations and weld inspections were performed. No items of noncompliance or deviations were identified.

B. Piping

1. Areas Examined

Field inspection activities included visual examination of the 530 feet of piping. This was to assure that the installed piping was as specified on the design drawing, and that the piping was reasonably straight, had a workmanlike finish and was free from injurious defects such as mechanical marks, abrasions and pits.

2. Findings

Inspection of piping quality revealed one section of pipe to have mechanical marks. This was identified on pipe spool 28 line number A106-CCBA, adjacent to pipe-to-valve weld number W025. The quality control instruction, WPP/QCI No. 204, Revision 3, "Piping Systems Release for Insulation," Appendix I, requires that piping systems, prior to insulation, be checked for surface damage by the quality control engineer. Any unacceptable surface damage is then required to be documented on the construction inspection plan (CIP), and then evaulated in accordance with procedure ED-1, entitled "Elimination of Defects". The CIP for the pipe spool in question did not identify any unacceptable surface damage on this system. The main concern was whether the pipe minimum wall thickness requirements were violated. The Licensee initiated NCR No. SM 2976; the pipe was re-inspected and dispositioned "accept-as-is" in accordance with the acceptance standards specified in ED-1. In this case minimum wall had not been violated.

Also during this examination of pipe quality the inspector observed an apparently unacceptable pit-like defect on the outer-surface of pipe spool SI-008-S002 adjacent to pipe support SI-008-H002. The pit was unusual in that it did not appear to be typical mechanical damage or a typical welding arc strike. It appeared to be a minor blow hole from the original pipe manufacturer. The pit appeared to violate minimum wall requirements. The inspector requested the Licensee to have the pipe hanger removed for access to the pipe pit; measurements were taken by the piping QC engineer in the presence of the NRC inspector with a calibrated pit gage. The pit was measured to be 0.059 inches deep. The allowable minimum wall for pipe spool SI-009-S 002 is 0.219 inches and the remaining wall (calculated from nominal wall) is 0.191 inches. Therefore the pit represents an underwall condition requiring an engineering evaluation.

Procedure WPP/QCI 204, Revision 2 "Piping Systems Release for Insulation", requires the final inspection of piping to be performed by a piping QC engineer prior to covering the pipe with insulation. Paragraph 3.1 of Appendix 1 requires an inspection for surface damage per specification (ED-1). The specification "Welding Standard ED-1 Elimination of Defects" states in paragraph 4.1 that defects may be removed provided wall thickness is not reduced below the minimum specified.

The pipe spool was inspected in accordance with the above and improperly accepted on November 14, 1982, as certified on the Piping Release No. 301-398. The failure of the piping QC engineer to identify an unacceptable defect during the piping inspection prior to insulation is considered an apparent item of noncompliance. (OII 50-528/83-34-04)

C. Valves

1. Areas Examined

All valves in the HPSI A train were examined during the walkdown inspection for compliance with the isometric drawing; specifically to assure proper valve size, location, type, orientation and installation. In addition, torque verifications were performed on a few selected valves to assure that the torque values were within the valve manufacturer's acceptable range.

2. Findings

Inspection of this area revealed three instances which are apparent violations, indicating a weakness with the preoperational test/startup program.

(a) During the inspection of valve No. 470 on the suction side of the HPSI pump "A", it was observed that the manual operator assembly was totally disconnected from the valve and resting on the sprinkler system piping. There was no documentary evidence to indicate that maintenance was being performed on the operator assembly. It does not appear that the preoperational testing program organization was fully cognizant of the valve's unsatisfactory status nor were procedures being applied which would assure control of this activity. Neither the valve or the operator had been recorded as deficient or nonconforming. The failure to control activities affecting quality is an apparent violation. (OII 50-528/83-34-05)

(b) Three additional adverse conditions were identified on valve No. 470. First, visual examination revealed that the bonnet was leaking; second, that one stud nut was missing from one of the studs connecting the bonnet to the valve body. These two conditions resulted in the inspector's request for torque verification on the stud nuts. The torque verification revealed a number of loose stud nuts which connect the bonnet to the valve. This third item, failure of the stud nuts to meet the torque requirements specified on the design drawings, represents a condition adverse to quality, and is an apparent violation. (OII 50-528/83-34-06)

(c) Valve No. 402 was found with the position indicator positioned so that the valve could only be opened about 30-35 percent. There was no documentary evidence to indicate that maintenance was being performed or that the licensee was aware of the condition of the valve. Preoperational testing was being conducted on this subsystem. The failure to identify this condition adverse to quality, is an apparent violation. (OII 50-528/83-34-07)

D. Welder Qualifications

1. Areas Examined

Bechtel specification WQ-1, Revision 17, of March 10, 1983, "Welding Standard Performance Specification," was examined. This specification describes the requirements for determining the ability of welders to make acceptable welds. The Welding Test Lab where welder performance qualifications are performed was examined for compliance with WQ-1 and ASME Section IX requirements. Also examined was the ability of the Welding Test Lab to detect "stand-ins" for welder qualification tests. The qualification records of 22 percent of the welders who field-welded on the 530 feet of pipe selected for the inspection were examined for compliance with WQ-1 and the latest issue of ASME Section IX.

2. Findings

The welders records examined revealed that the welders were qualified, on the date the weld was made, to the requirements of Bechtel specification WQ-1. WQ-1 meets the requirements of the latest issue of ASME Section IX. The welder performance qualification records were being properly maintained and were up-to-date.

Although no new welders were being qualified during this inspection, the Welding Test Lab was examined and found to be well organized and controlled. The weld rod is properly controlled, rod ovens are calibrated and kept at the correct temperature, and testing booths and welders' records are properly maintained.

Bechtel welder qualification procedures do not specifically address the subject of welder identity during qualification testing. However, Bechtel's current system requiring the welder's signature, social security number, and a photo badge appears to be satisfactory in preventing any practices of using stand-ins for welder qualifications. No items of noncompliance or deviations were identified.

VII. Inspection Results - Civil/Structural

A. Concrete Tests

1. Areas Examined

Eleven test areas were selected for examination using the "Windsor Probe Test" (WPT). These areas are identified in Table VII-1. They were selected as representative of concrete in the HPSI A pump room and in the vicinity of selected portions of the connected piping. The WPT measures the resistance of concrete to penetration by an explosively driven probe. Correlation to actual concrete strength is by reference to the Windsor Probe manufacturer's charts which relate probe penetration distance to strength for different aggregate hardness values.

2. Inspection Findings

Maximum aggregate size in the concrete tested was 1 1/2-inches. The Moh number for the aggregate selected from the probe manufacturer chart was number 6 (Far Southwestern United States). The indicated concrete strengths ranged from 5,800 to 7,600 psi, indicating adequate concrete strength exists in all areas measured. Detailed data are given in Table VII-1. No items of noncompliance or deviations were identified.

B. Structural Steel Framing

1. Areas Examined

Building and platform structural steel was examined to verify that the sizes, types and materials were in accordance with design requirements. The areas examined were in the HPSI A pump room, the auxiliary building northwest pipeway at the 40' elevation, and the 100 feet elevation on the south side of the containment building. The governing documents were as follows:

- Specification 13-CM-320 - Erection of Structural and Miscellaneous Steel.
- Drawing 13-C-00A-001 - Civil/Structural General Notes.

- Drawing 13-C-ZADS-500 - Auxiliary Building - Framing Plan for Elevation 51'-6".
- Drawing 13-C-ZCS-529 - Containment Internals - Structural Steel Platforms below Elevation 100.
- Drawing 13-C-ZAS-570 - Auxiliary Building - Structural Steel Sections and Details - Sheet 1.
- Drawing 13-C-ZAS-571 - Auxiliary Building - Structural Steel Sections and Details - Sheet 2.
- Drawing 13-C-ZAS-572 - Auxiliary Building - Structural Steel Sections and Details - Sheet 3
- WPP/QCI 58.0 - Erection of Structural and Miscellaneous Steel.

2. Inspection Findings

The steel that was examined was installed as specified and was of the required type and size. Certified Mill Test Reports were on file which verified that the proper material had been furnished. These were spot checked and were found to be in order. No items of noncompliance or deviations were identified.

Bolting and welding of the steel is addressed in Sections VII.3 and VII.4 of this report.

3. Structural Steel-Bolted Connections

a. Areas Examined

Bolted connections in selected portions of the building and platform structural steel in areas associated with HPSI A train system were examined for compliance with design requirements. Particular attention was given to bolt size and type, presence of washers where required, adequacy of thread engagement. Tightness of a representative sample of bolts was tested using a calibrated torque wrench. The joints were located in the HPSI A pump room, the northwest pipeway at the 40-foot elevation and the 88-foot elevation pipeway in the auxiliary building, the 82 to 95-foot elevations of both "wrap-around" portions of the auxiliary building, and at various elevations in the containment building. Additional structural steel joints not associated with the HPSI A train system were also examined. They were in the containment building and in the HPSI B pump room. Detials are provided in Table VII-2. In addition to the documents listed in paragraph VII.B.1, the governing documents also include the following:

- Drawing 13-C-ZAS-510 - Auxiliary Building Framing Plan for Elevation 88' - Area AAA.
- Drawing 13-C-ZAS-511 - Auxiliary Building Framing Plan for Elevation 88' - Area AAB.
- Drawing 13-S-ZAS-535 - Auxiliary Building Miscellaneous Steel Plan @ Elevation 88'.
- Drawing 13-S-ZAS-536 - Auxiliary Building Miscellaneous Steel Sections and Details - Sheet 1.
- Drawing 13-C-ZAS-581 - Auxiliary Building Miscellaneous Steel Platforms and Details - Sheet 2.
- American Institute of Steel Construction (AISC) - Specification for Structural Joints Using ASTM A325 or A490 Bolts.

2. Findings

Detailed inspection findings are given in Table VII-2. Except as described below, all bolted joints examined satisfied the specified requirements.

Table 3 of the AISC specification requires that 7/8-inch diameter A325 bolts be tightened to a minimum tension of 39 kips. The following departures from that requirement were found:

(a) Four bolts in one joint in the AC-6 platform at the 51'6" elevation of the HPSI A pump room were only "finger tight."

(b) One bolt in a 4-bolt I-beam to I-beam connection at the 125 degree azimuth, 10 feet from the liner, elevation 88-feet in the containment building, required a nut rotation of 45 degrees before achieving the tightness equivalent to the required 39 kips.

(c) One bolt in a 4-bolt floor beam connection in the auxiliary building northwest pipeway, 6 feet east of column line AD, 51'-6" elevation, required a nut rotation of 60 degrees to achieve the 39 kip requirement.

In all three cases, the connections had been inspected and accepted by Bechtel Quality Control personnel. The unsatisfactory bolting accepted by QC is an apparent violation. (OII 50-528/83-34-08)

D. Structural Steel Welded Connections

1. Areas Examined

Welded connections in selected segments of the building and platform structural steel in areas associated with HPSI A train system were examined for compliance with design requirements. Attributes examined were fillet leg size and length, weld contour, and absence of overlap and undercut. The joints examined were located in the auxiliary building (pipeways at the southwest 40 foot elevation and at the 88 foot elevation), and in the containment building (80-87 foot elevation and the 125 foot elevation). Details are provided in Table VII-3. In addition to the documents listed in paragraphs VII.B.1. and VII.C.1., the governing documents also include the following:

- Drawing 13-C-00A-050 - Welding and Nondestructive Examination Requirements for Civil Structural - "Form 84C".
- Structural Welding Code AWS D1.1 1972, with Revision 1, 1973.

2. Findings

Detailed inspection findings are given in Table VII-3. The welded connections in the containment building that were examined were found acceptable. In the auxiliary building pipeway, elevation 88 foot, the inspector found six fillet welds with undersize leg length and four welds with unacceptable undercut. The welds are portions of a W8X31 pipe support rack, number B-79, fabricated by Marathon Steel Company.

In the auxiliary building northwest pipeway, elevation 51'6", the inspector found six fillet welds with undersize leg lengths. The welds are portions of a W16X36 floor beam clip connection. The inspector measured fillet weld sizes down to 5/32 inch, whereas 5/16 inch size was specified for these welds. The undercut criteria specified in AWS D1.1 requires that it be no more than .01 inch deep when its direction is transverse to primary tensile stress in the part that is undercut, and no more than 1/32 inch for all other situations. Contrary to this requirement, the inspector found undercut of approximately 1/16 inch deep.

The undersize and undercut welds had been inspected and accepted by Bechtel Quality Control personnel. The acceptance of welds which are not in conformance with specification requirements is an apparent violation.

FSAR Section 3.8.1.6.6 states: "The acceptance criteria for visual acceptance for welding is done in accordance with AWS D1.1-72, Revision 1, 1973." During the inspection, the following items were noted which appear to be deviations from this commitment:

- AWS D1.1-72, Revision 1973, paragraph 3.6.6 states "welds shall be free from overlap." Specification 13-CM-320, Appendix A, paragraphs 3.1.4, 3.2, and 3.3.4 allow a maximum of 1/8" of overlap.

- AWS D1.1-72, Revision 1973, paragraph 8.15.1.3 requires that "all craters are filled to the full cross section of the welds." Specification 13-CM-320, Appendix A, paragraphs 3.1.5, 3.2, and 3.3.8 allow underfilled weld craters.

- AWS D1.1-72, Revision 73, paragraph 3.6.4 states that "...undercut shall not be more than 0.01" deep when its direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32" for all other situations." Specification 13-CM-320, Appendix A, paragrph 3.3.7 allows up to a maximum of 1/16" of undercut under certain circumstances and does not address undercutting transverse to primary tensile stress.

- AWS D1.1-72 does not permit incomplete fusion. Specification 13-CM-320, Appendix A, paragraphs 3.1.8, 3.2 and 3.3.6 allow an exception to the requirement for complete fusion between weld metal and base metal.

- Paragraph 9.2 of Specification 13-EM-302, Cable Tray Hangers, states that..." all quality Class Q cable tray hanger welds shall be inspected in accordance with AWS D1.1-79." (emphasis added)

These discrepancies are considered to constitute a deviation from the FSAR commitment. (OII 50-528-83-34-09)

E. Containment Structure Penetrations

1. Areas Examined

Five piping penetrations (nos. 13, 14, 15, 16, and 77) and one electrical penetration (no. 47), all associated with the HPSI train A system were visually examined and their records reviewed to ascertain compliance with the requirements of the ASME Boiler and Pressure Vessel Code, Section III-1974 Edition. In addition, piping penetration No. 62, monitoring contaiment internal pressure, and spare penetration No. 69 were examined. The visual examination was related to weld reinforcement height and surface finish. The records review addressed the presence and validity of the supplier's material test report, and the adequacy of the Field Welding check list (Form WR-5) and the Filler Metal Withdrawal Record (Form WR-6). Other factors examined were the qualification of the specified welding procedure, control of preheat and interpass temperatures, and nondestructive examination of the completed welds.

2. Findings

All work in this area was found to be in conformance with requirements. No items of noncompliance or deviations were identified.

F. Steel Embed Plates In Concrete

1. Areas Examined

Except for 3 or 4 plates in the vertical pipe chase in the northwest corner of the auxiliary building, all embedded plates carrying pipe hangers/supports for the HPSI A system lines in the auxiliary building were examined. These were 3 plates on the suction line and 35 plates on the discharge lines. In addition, approximately 30 plates were randomly selected in various walls in the auxiliary and containment buildings, of which approximately 20 were not loaded. The examination included measurement of plate thickness and anchor bolt length using an ultrasonic transducer and CRT videoscope (only 2 or 3 bolts in each embed plate were measured), and a graduated depth gauge measurement of bolt thread engagement. The governing documents were as follows:

- Specification 13-CM-308 - Installation and Testing of Concrete Embeds and Insert Plates.
- Drawing 13-C-00A-001 - Civil Structural - General Notes.
- Drawing 13-C-00A-010 - Typical Insert Plate Schedules and Details.
- Drawing 13-C-00A-011 - Anchor Bolt Schedule and Details.
- Drawing 13-C-ZAS-110 - Auxiliary Building - Plan at Elevation 40'.
- Drawing 13-C-ZAS-112 - Auxiliary Building - Insert Plan at Elevation 40'.
- Drawing 13-C-ZAS-146 - Auxiliary Building - Plan at Elevation 120'.
- Drawing 13-C-ZAS-200 - Auxiliary Building - Wall Elevations - Sheet 1.
- Drawing 13-C-ZAS-224 - Auxiliary Building - Wall Elevations - Sheet 25.
- Drawing 13-C-ZCS-413 - Containment Internals - Wall Inserts and Penetrations - Sheet 1.
- Drawing 13-C-ZCS-406 - Containment Internals - Wall Inserts and Penetrations - South Secondary Shield Wall.

2. Findings

All embedded plates examined were found to be installed in the specified locations and were the specified thickness. All anchor bolt lengths were as specified. One plate was found with three of eight bolts apparently missing; search with the UT transducer, however, found that all three had been relocated (by welding) as permitted by the specification when interference with reinforcing steel was encountered. Two other plates were found with documented relocation of anchor bolts. For one case of suspected insufficient bolt thread engagement, documentation was on file which showed that the bolt had been circumferentially welded to the back of the plate, also as permitted by the specification. No items of noncompliance or deviations were identified.

G. Concrete Expansion Anchors

1. Areas Examined

A representative sample of concrete expansion anchors was examined to ascertain conformance with the installation requirements. At Palo Verde, the design intent is to avoid the use of expansion anchors to the maximum possible extend. A generous quantity of embedded steel plates and unistrut channels were provided for fastening equipment generally and, except for specifically identified lightly loaded applications, expansion anchors were to be used only after all other methods had been evaluated and determined unfeasable or unacceptable by Engineering. For these situations, documented licensee approval is required on a case-by-case basis. The previously mentioned lightly loaded applications include electrical raceway (except cable tray) instruments, instrument sensing lines, and local panels.

A total of 88 anchor bolts were examined for depth of embed and proper torquing of the tensioning nut. These were comprised of the following:

- 20 Hilti Kwik-Bolts associated with 1 electrical panel box and all Class IE raceway supports (9) in the HPSI A pump room.
- 29 Hilti Kwik-Bolts fastening raceway supports in the east "wrap-around" section (100' elevation) of the auxiliary building.
- 8 Hilti-Kwik-Bolts anchoring 2 instrument sensing line support plates in the east "wrap around" section (80' elev.) of the auxiliary building.
- 8 Hilti Kwik-Bolts anchoring 2 switchbox panels in Battery Rooms C and D in the Control Building (100' elevation).
- 17 Drillco Maxi-Bolts anchoring control center panels to the floor (100' elevation) in Battery Rooms A, C and D in the Control Building. (Only 8 of these bolts were torque tested).

- 6 Drillco Maxi-Bolts anchoring 6" fire-line support plates (2) to the MSSS wall (108' elevation) in the corridor adjacent to the turbine building.

All torque testing was performed by a Quality Control Inspector or a journeyman electrician using a calibrated torque wrench in the presense of the NRC inspector. The governing documents were:

- Specification 13-CM-307 - Design, Installation and Testing of Concrete Anchors.

- WPP/QCI 24.1 - Installation and Testing of Concrete Expansion Anchors.

2. Findings

Of the 23 Drillco Maxi-Bolts examined, all were found to be embedded and torqued to the required values. For the bolts anchoring the equipment panels in the battery rooms, there was no documentary evidence that Bechtel had obtained the required licensee approval prior to their installation. Similarly, no approval documentation was available for 4 Hilti Kwik-Bolts used for a strut supporting a cable tray hanger in the auxiliary building east "wrap-around" at the 100' elevation (east wall).

In the HPSI A pump room, 6 miscellaneous Hilti Kwik-Bolts (1 raceway support) could not be properly torqued due to the absence of washers under the tensioning nut (support holes too large). Due to the proximity of adjacent supports, this one probably could have been eliminated and the raceway would have been adequately anchored. Also in the HPSI A pump room, one anchor bolt was insufficiently embedded (3") because it was located too close (1 1/2") to an ungrouted, unusued hole. Embed depth should have been 6 1/4". Two unused holes were found ungrouted, contrary to the specified requirements. Additionally, there were two bolts that violated the specified minimum distance from other anchor bolts.

In the auxiliary building "wrap-around" section (100' elevation), 9 bolts, randomly located, were found undertorqued (all four in one 4-bolt plate), one bolt was too close (2 1/8") to the edge of a wall opening, one bolt was insufficiently embedded (2 1/4" instead of 5" required), and two bolts had nuts with insufficient thread engagement.

All bolts examined in this sample had been given the requisite inspection by Bechtel Quality Control inspection and had been judged acceptable. The failure of QC to identify nonconforming conditions to specification requirements is considered an apparent violation. (50-528/83-34-10)

TABLE VII - 1

CONCRETE STRENGTH MEASUREMENT

Test No.	LOCATION/DESCRIPTION	PLACEMENT				Meas.(1) Probe Exten-in.	STRENGHT (psi)		
		No.	Date	Age	Max. Agg. Size		Probe Meas	Cylind.(2) Break	Design
1	HPSI A Pump Room-Aux.Bldg. Floor (El. 40') Adjacent to Pump	1A05-1	11/24/76	6 Yrs.-11 Mo.	1 1/2	2.25	7400	5870	4000 @ 28 Da.
2	HPSI A Pump Room-Aux. Bldg. East Wall (Elev. 44') Adjacent to Pump	1A12-1	1/21/77	6 Yrs.-9 Mo.	3/4	2.20	7000	5185	"
3	HPSI A Pump Room-Aux.Bldg. South Wall (Elev 43') Adjacent to Pump Motor	1A12-1	1/21/77	6 Yrs.-9 Mo.	3/4	2.25	7400	5155	"
4	North Pipeway-Aux. Bldg-South Wall (elev.44') Between Col Lines AE & AF	1A08-1	12/23/76	6 Yrs.-11 Mo.	3/4	2.275	7600	5960	"
5	HPSI A Pump Room-Aux.Bldg. Floor (Elev.40') Adjacent to West Wall & Floor Embed under Suction Line to Contain. Sump	1A04-1	11/24/76	6 Yrs.-11 Mo.	1 1/2	2.125	6400	5870	"
6	Control Bldg. Floor (Elev.100') 125 V Battery A Charging Equipment Room	1J016	3/10/78	5 Yrs.-6 Mo.	1 1/2	2.050	5800	5875	4000 @ 91 Da.
7	Control Bldg. Floor (Elev.100') 125V Battery A Room	"	"	"	"	2.075	6000	5875	"
8.	Control Bldg. Floor (Elev.200') 125V Battery C Room	"	"	"	"	2.100	6200	5230	"

TABLE VII - 1

CONCRETE STRENGTH MEASUREMENT

		PLACEMENT				Meas.(1)	STRENGHT (Psi)		
Test					Max.	Probe		Cylind.(2)	
No.	LOCATION/DESCRIPTION	No.	Date	Age	Agg. Size	Exten-in	Probe Meas	Break	Design
9	Control Bldg. Floor (Elev. 100') In front of HPSI A 4160V Motor Breaker Cubicle	"	"	"	"	2.150	6600	5875	"
10	Containment Bldg. Base Mat Floor (Elev. 80') Adjacent to South stairway	1C013-1	7/8/77	6 Yrs. -2 Mo.	1 1/2	2.200	7000	5350	5000 @ 91 Da.
11.	Containment Bldg. Base Mat Floor (Elev. 80') West Side Under Safety Injection Piping Runs	"	"	"	1 1/2	2.100	6200	6040	"

Notes

(1) Windsor Probe Test-Average of 3 driven probes

(2) Average of compression test of 2 cylinders

TABLE VII-2

STRUCTURAL STEEL BOLTED CONNECTIONS

Inspection Location	Elevation	Amount of Inspection Versus Total Available	Type of Inspection	Inspection Findings
Auxiliary Bldg. HPSI A Pump Room	51'6"	15 joints of approx. 30	Visual	Four Loose bolts in a 4-bolt Joint - Platform AC-6
Northwest Pipeway Auxiliary Bldg.	51'6"	13 joints of approx. 15	Visual	Acceptable
Wrap-Around Areas Auxiliary Bldg.	82'-95'	94 joints of approx. 200	Visual	Acceptable
Pipeway Area Auxiliary Bldg.	88'	40 joints of approx. 300	Visual	Acceptable
Containment Bldg.	80'-87'	110 joints of approx. 500	Visual	Acceptable
Auxiliary Bldg. HPSI A Pump Room	51'6"	10 bolts of approx. 120	Torque Test	Acceptable
Northwest Pipeway Auxiliary Bldg.	51'6"	28 bolts of approx. 52	Torque Test	One bolt rotated 60 degrees before mihimum tightness was achieved. was achieved.
Containment Bldg.	87'	24 bolts of approx. 2500	Torque Test	One bolt rotated 45 degrees before minimum tightness tightness was achieved.
Containment Bldg.	98'	34 joints of approx. 100	Visual	Acceptable
*Containment Bidg.	125'	12 joints	Visual	Acceptable
*Containment Bldg.	140'	15 joints	Visual	Acceptable
*Containment Bldg. Pressurizer Compartment	-	20 joints	Visual	Acceptable
*Auxiliary Bldg. HPSI B Pump Room	51'6"	15 joints	Visual	Acceptable

*Items inspected which are not associated with the HPSI train A system.

TABLE VII-3

STRUCTURAL STEEL WELDED CONNECTIONS

Inspection Location	Elevation	Amount of Inspection Versus Total Available	Type Of Inspection	Inspection Findings
Northwest Pipeway Auxiliary Bldg.	51'6"	13 joints of approx. 15	Weld gauge Visual	Six undersize fillet welds
Pipeway Area Auxiliary Bldg.	88'	50 joints of approx. 200	Weld gauge Visual	Six undersize fillet welds, Four welds with undercut.
Containment Bldg.	80'-87'	110 joints of approx. 250	Weld gauge Visual	Acceptable
*Containment Bldg.	125'	4 joints	Weld gauge Visual	Acceptable

*Items inspected which are not associated with the HPSI Train A system.

VIII. NRC Nondestructive Examination and Quality Review of Safety Related Systems

A. Purpose

The purpose of the independent, NRC nondestructive examination (NDE) was to verify the adequacy of the licensee's welding quality control program. This was accomplished by duplicating those examinations required of the licensee by regulations and evaluating the results. In addition to the required examinations, several additional confirmatory examinations designed to verify conformance with material specifications were performed and compared to quality assurance records. The NRC inspection team selected the HPSI A system to inspect at the Palo Verde Unit 1. There are approximately 900 piping welds in the HPSI A system. This system was undergoing preoperational testing and was full of water under pressure. A selection of welds from this system that could be drained and inspected was made. Due to preoperational testing of Unit 1, a selection of welds from Unit 3 was also made. The selection of these welds was intended to provide a representative sample of piping components, sizes, materials, of shop and field welds. All the welds selected were previously accepted by the licensee based on vendor, shop, or field NDE records.

B. Document Reviews

The following quality assurance documents were reviewed to verify compliance with regulatory and code requirements:

1. Twelve weld document packages were reviewed for:

    - Material Certifications
    - NDE results
    - Fabrication records shop and field
    - Drawings (Isometric)
    - PWHT Charts

    (Note: The twelve welds reviewed are listed at the end of Table VIII-2. See those listed for drawing 13-P-ZCG-103)

2. Two quality procedures were reviewed.

    - 13PM-201 Shop Fabrication of Nuclear Piping Systems
    - 13PM-204 Field Fabrication and Installation of Nuclear Piping Systems

3. A review of GEO's (site NDE subcontractor) internal audit, dated June 10, 1983, was performed. This audit reviewed all of GEO's NDE site personnel qualification at Palo Verde.

4. Verification of NDE Personnel Qualifications to SNT-TC-1A

   The NRC inspector reviewed all of Bechtel's individual film interpreter qualification and certification records. He also reviewed 6 out of 39 of GEO's NDE records for personnel qualifications.

All the above documents were verified to satisfy NRC requirements and licensee commitments to industry codes and standards.

C. NRC Independent Examinations
(Note: Refer to Table VIII-1 for specific listings of independent inspection items)

1. Radiography

   Twenty-one welds were re-examined by the NRC using an Iridium 192 source. Welds that were radiographed were ASME Code Class 1 and 2, carbon and stainless steel.

   Results: All re-radiographed welds were found acceptable to ASME Section III acceptance criteria.

2. Pipe Wall Thickness Measurement - Eleven pipe welds and adjacent pipe material were examined per NRC procedure NDE-11, Revision 0, using a NORTEC NDT thickness gauge. Minimum wall thickness was determined by using an ASTM standard pipe sizes and nominal thickness chart.

   Results: All areas examined were within tolerance requirements.

3. Ferrite Measurements - Thirteen pipe welds were checked for delta ferrite content using a Type II Ferrite Indicator (Severn Gauge).

   Results: All measurements were within acceptable limits of material test results.

4. Hardness Measurements - Fourteen welds were checked for hardness (base material adjacent to welds) using the Equo-tip hardness tester per NRC Procedure NDE-12, Revision 0. Hardness numbers were converted to Brinnell values and the approximate tensile strengths were determined by use of conversion tables.

Results: All areas examined were within acceptable limits of material test reports.

5. Alloy Analyzer - Four pipe welds and adjacent base metals were examined using a Texas Nuclear Alloy Analyzer. A quantitative chemical analysis was made on two stainless steel, type 304, and two stainless steel, type 316 materials.

   Results: Areas examined were within ± 2% of chemical analysis indicated on corresponding certified mill test reports and were within acceptable limits.

6. Liquid Penetrant Examination - Eight safety related pipe weldments were liquid penetrant examined per NRC procedure NDE-9, Revision 0. All weldments examined were ASME Class 2 welds.

   Results: All areas inspected were acceptable.

7. Visual Examination - Thirty-four weldments and adjacent base material were visually inspected for weld reinforcement, overall workmanship and surface condition per NRC procedure NDE 14, Revision 0.

   Results: All areas inspected were acceptable.

8. Radiography of Socket Welds - Ten socket welds were radiographed to verify pipe engagement.

   Results: All radiographs show at least a minimum of 1/16 inch gap per ASME Section III, paragraph NC4427 requirements.

9. Radiographic Review of Licensee Field Welds and Vendor Welds - A review of licensee's pipe weld radiographs was made during this inspection of ASME Class 1 and 2 weldments. Out of 746 sets of radiographs, 204 were reviewed as listed below, with results as listed in Table VIII-2.

   The radiographic film review disclosed 6 welds which are in the "as-welded" condition and present weld ripple images in the film. The ASME V Code, paragraph T-221-2, requires that weld irregularities be removed to the extent that they cannot mask or be confused with actual discontinuities. The weld ripple images for ISO 01-P-SIF 105 Line 1RC-051-S-001-16, welds A and B; 1RC-051-S-002; weld A; and ISO-13-P-ZCG-103, 1RC-079, 030 and 073 are considered excessive and capable of masking or being confused with discontinuities in the opinion of the NRC Level III examiner.

On October 12, 1983 licensee representatives and the Bechtel Corporation Level III examiner telephoned the Regional office to express a difference of professional opinion. The Bechtel examiner did not consider that the weld ripple images could mask discontinuities. This item is considered unresolved. (Unresolved item 50-528/83-34-01)

No items of noncompliance or deviations were identified.

Table VIII-1

INDEPENDENT MEASUREMENTS PALO VERDE

INDEPENDENT MEASUREMENTS PROGRAM USNRC R MOBILE NDE VAN Page 1

Line/ISO	Weld No.	Class	Date	RT	MT	PT	UT	Hardness	Thick Wall	Ferrite	Alloy Anal	Visual	Comments
HPSI F-375 Elev 45'	VW-D	2	X	X		X		X	X	X		X	10" S/S 5.0 to 7.5 FN Results
	VW-B	2	X	X		X		X	X	X		X	10" S/S 5.0 to 7.5 FN
F-375 Aux Bldg	VW-A	2	X	X		X		X	X	X		X	10" S/S 5.0 to 7.5 FN
Elev 45'											X		Spool SF-008-006
"A" Pump Lino											X		Spool SF-008-005
HPSI F-422	SW-5	2	X	X		X		X	X	X		X	10" S/S 5.0 to 7.5 FN
Elev 45' "A" Pump Line	VW-A	2	X	X		X		X	X	X		X	10" S/S 5.0 to 7.5 FN
HPSI "A" Line	VW-B	2	X	X		X		X	X	X		X	10" S/S 5.0 to 7.5 FN
F-423 Elev 45	VW-A	2	X	—		X		X	X	X		X	10" S/S 5.0 to 7.5 FN
F-423 Elev 45' Aux Bldg	VW-E	2	X			X		X	X	X		X	10" S/S 5.0 to 7.5 FN
SI-099-4 Aux Bldg	VW-E	2	X	X								X	4" S/S
"A" Line F-149	VW-B	2	X	X					X			X	4" S/S
SI-099-4 HPSI	F149 VW-A	2	X	X					X			X	4" S/S
"A" Line Elev 45'	Not Req'd	2	X										4" S/S
SI-099-4 HPSI "A" Line	FW-1	2	X	X						X	X	X	4" S/S
SI-106-3 HPSI Line A	FW-1	2	X					X					
	FW-2	2	X					X					
SI-106-3 HPSI Line A	FW-3	2	X	X				X			X	X	3" S/S
	FW-4	2	X	X				X				X	
SI-100-004 F156	VW-A	2	X	X				X		X		X	4" S/S
	VW-B	2	X	X				X		X		X	4" S/S

Table VIII-1 (continued)

INDEPENDENT MEASUREMENTS PROGRAM USNRC RI MOBILE NDE VAN Page 2

Line/ISO	Weld No.	Class	Data	RT	MT	PT	UT	Hardness	Thick Wall	Ferrite	Alloy Anal	Visual	Comments
SI-100-4 F156	VW-3	2	X	X					X	X		X	4" S/S
	FW-2	2	X	X						X		X	
SI-106-3	FW 301	2	X	X								X	3" S/S Weld
SI-105-2	SW 00L	2		X								X	HPSI Socket Welds Elev 45
	SW 00M	2		X								X	HPSI Line A Socket Welds
SI-105-2" HPSI "A" Line	SW 00R	2		X								X	Socket Welds S/S
	SW 00S	2		X								X	Socket Welds S/S
SI-105-1" HPSI "A" Line	W 00C	2		X								X	S/S Socket Welds
	W 00D	2		X								X	S/S Socket Welds
SI-105-1" HPSI "A" Line	W 00Y	2		X								X	S/S Socket Welds
	W Y023	2		X								X	Socket Welds
SI-106-3 "A" Line Elev 92	W 018	2		X								X	3" S/S Weld
	Not Rec'd											X	3" S/S Weld
SI-106-1½ MK 7833	VW A	2		X								X	3" S/S Weld Socket Weld
	VW B	2		X								X	3" S/S Socket Welds
Reactor Coolant Containment Bldg. Steam Gen. #1	FW-1	1		X								X	Loop #1 Steam Generator Unit 3 30" Dia
RC-030 073 #2	FW-1	1		X								X	Loop #2 Steam Generator #2 30" Dia
Reactor Coolant Containment Bldg. Loop Pump 1B RC-031	FW-1	1		X								X	Loop #1 Steam Generator to Pump Unit #3 30" Dia

Table VIII-2
Review of Licensee RT Films and Records

Line	ISO	WELD	RESULTS
SI-008-CCBC-10"	13-P-SIF-201	FW 5	Acceptable
"	"	FW 1	Acceptable
"	"	FW 2	Acceptable
"	"	FW 3	Acceptable
"	"	FW 4	Acceptable
"	"	FW 6	Acceptable
"	"	*FW 7	Acceptable
SI-008-GCBC-10"	13-P-SIF-201	VW-D-F375	Acceptable
"	"	VW-B-F375	Acceptable
"	"	VW-A-F375	Acceptable
"	"	VW-A-422	Acceptable
"	"	VW-B-423	Acceptable
"	"	VW-A-423	Acceptable
SI-A-009-CCBC-4"	13-P-SIF-203	FW 1	Acceptable
"	"	FW 2	Acceptable
SI-099-CCBB-4"	13-P-SIF-203	VW-E-F149	Acceptable
"	"	VW-B-F149	Acceptable
"	"	VW-A-F149	Acceptable
SI-099-S-001-4"	13-P-SIF-203	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
SI-A-100-CCBA-4"	"	FW 1	Acceptable
"	"	FW 2	Acceptable
"	"	FW 3	Acceptable
SI-100-CCBB-4"	13-P-SIF-203	VW-A-156	Acceptable
"	"	VW-B-156	Acceptable
"	"	VW-3-156	Acceptable
SI-A-101-CCBA-1"	13-P-SIF-204	FW 00L	Acceptable
2"	"	FW 00A	Acceptable
2"	"	FW 00B	Acceptable
2"	"	FW 00C	Acceptable
2"	"	FW 00H	Acceptable
2"	"	FW 00J	Acceptable
2"	"	FW 00K	Acceptable

*Visually verified RT root indication (concavity) between RT station numbers 12 and 15 by using a fiberscope. All areas of concern are acceptable.

Line	ISO	WELD	RESULTS
2"	"	FW 00L	Acceptable
2"	"	FW 00N	Acceptable
2"	"	FW 00P	Acceptable
2"	"	FW 00R(C)	Acceptable
2"	"	FW 00S(C)	Acceptable
2"	"	FW 00T	Acceptable
2"	"	FW 000	Acceptable
SI-A-102-CCBA-2"	13-P-SIP-204	FW 00A	Acceptable
"	"	FW 00B	Acceptable
"	"	FW 00C	Acceptable
"	"	FW 00D	Acceptable
"	"	FW 00E	Acceptable
"	"	FW 00F	Acceptable
"	"	FW 00G	Acceptable
"	"	FW 00H	Acceptable
"	"	FW 00J	Acceptable
"	"	FW 00K	Acceptable
"	"	FW 00L	Acceptable
"	"	FW 00M(C)	Acceptable
SI-103-CCBA-2"	13-P-SIF-203	FW 300	Acceptable
"	"	FW 00A	Acceptable
"	"	FW 00B	Acceptable
"	"	FW 00C	Acceptable
"	"	FW 00D	Acceptable
"	"	FW 00E	Acceptable
SI-103-CCBA-2"	13-P-SIF-203	FW 00G	Acceptable
"	"	FW 00I	Acceptable
"	"	FW 00J	Acceptable
"	"	FW 00K(C)	Acceptable
"	"	FW 00P	Acceptable
"	"	FW 00R	Acceptable
SI-105-S-003-4"	13-P-SIF-203	A	Acceptable
"	"	B	Acceptable
SI-105-S-004-4"	13-P-SIF-203	A	Acceptable
SI-105-S-005-4"	13-P-SIF-203	A	Acceptable
"	"	B	Acceptable
SI-105-S-002-4"	13-P-SIF-202	A	Acceptable
SI-105-S-001-4"	13-P-SIF-202	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
SI-157-CCBA-4"	13-P-SIF-204	FW 300	Acceptable
4"	"	FW 301	Acceptable
1"	"	FW 00C(C1)	Acceptable
2"	"	FW 00A	Acceptable
2"	"	FW 00B(C)	Acceptable
2"	"	FW 00C(C1)	Acceptable
2"	"	FW 00D(C)	Acceptable
1"	"	FW 00E	Acceptable
SI-157-CCBA-1"	13-P-SIF-204	FW 00E	Acceptable
2"	"	FW 00H	Acceptable

Line	ISO	WELD	RESULTS
1"	"	FW OOI	Acceptable
4"	"	FW 001	Acceptable
4"	"	FW 002	Acceptable
4"	"	FW 003	Acceptable
3"	"	FW 004	Acceptable
3"	"	FW 006	Acceptable
3"	"	FW 007	Acceptable
3"	"	FW 008	Acceptable
SI-157-S-001-4"	13-P-SIF-136	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
"	"	F	Acceptable
SI-157-S-002-4"	13-P-SIF-136	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
SI-157-S-003-4"	13-P-SIF-136	A	Acceptable
SI-157-S-004-4"	13-P-SIF-136	A	Acceptable
SI-157-S-005-4"	13-P-SIF-136	A	Acceptable
"	"	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	13-P-ZG108	U-77(c-1)	Acceptable
SI-157-S-006-3"	13-P-SIF-136	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
SI-157-S-007-3"	13-P-SIF-136	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
RC-051-S-001-16"	01-P-SIF-105	A	Rejected Beads
"	"	B	Rejected Beads
RC-051-S-002-16"	01-P-SIF-105	A	Rejected Beads
RC-051-S-003-16"	01-P-SIF-105	G	Acceptable
"	"	H	Acceptable
"	"	A	Acceptable
"	"	B	Acceptable
"	"	D	Acceptable
SI-176-S-001-4"	13-P-SIF-204	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
SI-176-S-002-3"	13-P-SIF-204	A	Acceptable
SI-176-S-003-3"	13-P-SIF-204	A	Acceptable
SI-176-S-004-3"	13-P-SIF-204	A	Acceptable

Line	ISO	WELD	RESULTS
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
SI-176-S-006-3"	13-P-SIF-204	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
"	"	F	Acceptable
SI-218-S-001-4"	13-P-SIF-203	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
"	"	F	Acceptable
SI-218-S-002-4"	13-P-SIF-203	A	Acceptable
SI-236-S-003-4"	13-P-SIF-203	A	Acceptable
SI-236-S-005-4"	13-P-SIF-203	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	D	Acceptable
SI-236-S-006-3"	13-P-SIF-203	B	Acceptable
"	"	E	Acceptable
"	"	F	Acceptable
"	"	H	Acceptable
"	"	J	Acceptable
"	"	K	Acceptable
"	"	L	Acceptable
"	"	M	Acceptable
"	"	N	Acceptable
SI-248-S-003-3"	01-P-SIF-105	A	Acceptable
"	"	B	Acceptable
"	"	D	Acceptable
SI-248-S-007-3"	01-P-SIF-105	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable
"	"	G	Acceptable
"	"	H	Acceptable
"	"	J	Acceptable
"	"	K	Acceptable
"	"	D	Acceptable
"	"	E	Acceptable
"	"	F	Acceptable
SI-248-S-008-3"	01-P-SIF-105	H	Acceptable
"	"	J	Acceptable
"	"	K	Acceptable
SI-248-S-009-3"	01-P-SIF-105	A	Acceptable
"	"	B	Acceptable
"	"	C	Acceptable

"	"	D	Acceptable
SI-248-S-011-3"	01-P-SIF-105	G	Acceptable
"	"	H	Acceptable
"	"	J	Acceptable
SI-248-S-012-3"	01-P-SIF-105	F	Acceptable
"	"	G	Acceptable
"	"	H	Acceptable

O.D. Size	Line	Document Review	ISO	Weld S/N	Results
30"	1-RC079	"	13-P-ZCG-103	W001	Rejected Beads
30"	1-RC030	"	"	"	Rejected Beads
30"	1-RC073	"	"	"	Rejected Beads
30"	1-RC031	"	"	"	Acceptable
Unit 2					
30"	2-RC079	"	13-P-ZCG-103	W001	Acceptable
30"	2-RC030	"	"	"	Acceptable
30"	2-RC073	"	"	"	Acceptable
30"	2-RC031	"	"	"	Acceptable
Unit 3					
30"	3-RC079	"	13-P-ZCG-103	W001	Acceptable
30"	3-RC030	"	"	"	Acceptable
30"	3-RC073	"	"	"	Acceptable
30"	3-RC031	"	"	"	Acceptable

IX. CRAFT AND QC INSPECTOR INTERVIEWS

During the course of the inspection interviews were conducted by the team members with various craft persons and QC inspectors. These interviews were conducted on a one on one basis at random in the field, predominantly at Unit 1, but some were conducted at Units 2/3 and in the senior resident inspector's office. There were 115 of these interviews conducted with the idea of finding whether there was pressure by management to "cut corners," and to give the interviewee an opportunity to discuss any problems he/she may know of with a NRC inspector.

None of the workers indicated that he/she felt intimidated or that there was any pressure to cut corners, all thought that the quality on this project was above average to excellent and none knew of major problems on this project that NRC did not know about.

Table IX-1
Workers Interviewed

Craft		No. Interviewed
1.	Electrician	23
2.	Millwright	2
3.	Ironworker	7
4.	Boilermaker	1
5.	Pipefitter	21
6.	Carpenter	4
7.	Janitor	1
8.	QC Welder	7
9.	QC Elect	16
10.	QC Mech/Piping/NSSS	12
11.	Laborer	3
12.	Insulator	2
13.	Welder	7
14.	NDE Tech	4
15.	Sprinkler	2
16.	Operating Engineer	1
17.	QC CSC	2

Attachment A

A. Persons Contacted

1. Arizona Public Service Company

E. Van Brunt Jr., V.P. Nuclear Projects
J. Roedel, Corporation QA Manager
D. Fasnacht, Nuclear Construction Manager
J. Keiley, Startup Manager
J. Bynum, Nuclear Operations Manager
W. Ide, Construction (QA/QC) Manager
P. Moore, QA Engineer
B. Love, QA Engineer
R. J. Kimmel, Field Engineering Supervisor
G. Pankonin, Startup QA/QC Manager
F. Godwin, Nuclear Projects Records Manager
K. Gross, Compliance/Operations Supervisor
C. Rogers, Nuclear Engineer
L. Souza, Construction QA Supervisor
J. Hayes, Startup Manager, Unit 1

2. Bechtel Power Corporation

W. Stubblefield, Field Construction Manager
D. Hawkinson, Project QA Manager
J. White, Lead Pipe Support QCE
G. Stam, Weld Engineering Supervisor
J. Sabol, Lead Pipe Support Engineer
D. Keitch, Bechtel, Downey
H. Miller, Lead Field Welding Engineer
M. Rosen, QC Supervisor
T. Mack, Assistant Project Manager
A. Priest, Construction Engineer
C. Berg, Construction Engineer

Other persons contacted during the inspection included construction craftsmen, QC inspectors, startup personnel, QA personnel and Supervisory Personnel.

NRC FORM 766 A
(11-81)
IE MC 0535

INSPECTOR'S REPORT
(Continuation)
Office of Inspection and Enforcement

DOCKET NO. (8 digits) OR LICENSE NO. (BY PRODUCT) (13 digits)	REPORT NO.	SEQ.	MODULE NUMBER
05000528	8334	A	92706
		B	
		C	
		D	

VIOLATION SEVERITY OR DEVIATION: 1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☐ 6 ☐ D ☐

SITE RELATED: ☒ A ☐ B ☐ C ☐ D

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

1. Contrary to the 10CFR50, Appendix B, Criterion II ~~above requirement,~~ on September 10, 1983, the containment pressure instrumentation was incapable of performing its intended safety function in that caps had been installed on the sensing lines. Construction of the containment and pressure sensing systems had been completed, turned over from the constructor to the licensee, and tested. No administrative requirement existed to assure that the caps would have been discovered until the next scheduled containment leak rate test, pursuant to the operating license requirements. This containment pressure instrumentation is required to automatically initiate the HPSI and other safety systems on high containment pressure.

2. Contrary to the above requirement, on September 7, 1983, the manual operator for valve SI V470 on the suction of the HPSI "A" pump was disconnected and resting on the sprinkler system piping. Construction of the subsystem had been completed, turned over to the licensee, and was under going preoperational testing. There was no record of the defective and/or nonconforming condition.

3. Contrary to the above requirement, on September 28, 1983, the position indicator for valve SI V402 on the suction of the HPSI "B" pump was positioned so that the valve could only be opened 30 to 35 percent of its full open position. Construction of this subsystem had been completed, turned over to the licensee, and was undergoing preoperational testing. There was no record of the defective and/or nonconforming condition.

4. Contrary to the above requirement, on September 14, 1983, 87 3/8-inch bolts were missing from the base frames for six motor control centers (MCC) of the vital AC onsite power distribution system. These bolts are necessary to insure the structural integrity of the MCCs.

This is a Severity Level III Violation, Supplement II

U.S. NUCLEAR REGULATORY COMMISSION

NRC FORM 766 A
(11-81)
IE MC 0535

INSPECTOR'S REPORT
(Continuation)
Office of Inspection and Enforcement

DOCKET NO. (8 digits) OR LICENSE NO. (BY PRODUCT) (13 digits): 5 0 0 0 5 2 8 8 3 3 4

REPORT NO. / SEQ: A ☐ B ☐ C ☐ D ☐

MODULE NUMBER: 1 9 2 7 0 1 6

VIOLATION SEVERITY OR DEVIATION: 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ D ☐

SITE RELATED: ☒ A C ☐ B D ☐

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

Contrary to ~~the above requirement~~ 10CFR50 Appendix B, Criterion V and the specifications listed below, the following conditions existed at the time of the inspection:

1. The separation and identification criteria as identified in the FSAR Section 8.3.1 are described, in part, by the following Bechtel Documents: a. "Cable and Raceway Physical Separation Guide," Drawing 13-E-ZAC-077, Revision 2, and b. "Installation Specification for Cable Splicing, Termination and Supports," Specification No. 13-EM-306.

   The separation requirement as described in the above specifications identifies one foot as the minimum separation distance between raceways of different separation groups located in the cable spreading rooms.

   Contrary to the above requirement, in tray 1EZJ4AATSCE, cables projecting above the level of the tray siderails and which were in physical contact with fire protection piping and two HVAC ducts.

   This is a Severity Level IV Violation, Supplement II.

2. The separation requirement, as described in the above specifications, identifies the minimum separation distance between safety-related and nonsafety-related trays or raceways as one inch.

   Contrary to the above requirements:

   a. Nonsafety-related conduit 1EZADCNRQ506 for thermostat 1EQFNT1243C in HPSI A pump room was separated from safety-related group 1 junction box 1EZACCAKKJ03 by less than one inch.

   b. At diesel generator E-PEA-G01, nonsafety-related flexible conduit 1EZG1ANRX11 at junction box 4 was in contact with safety-related flexible conduit 1EZG1AARR20 at junction box 6.

   c. In 4160-volt switchgear cubicle E-PBA-503L, nonsafety-related flexible conduit 1EZJ1ANRR52 was separated from safety-related wiring by less than one inch.

   d. In 4160-volt switchgear cubicle E-PBA-503K, nonsafety- related flexible conduit 1EZJ1ANRR51 was separated from safety-related wiring by less than one inch.

   This is a Severity Level IV Violation, Supplement II.

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50000528	8334	A
		B
		C
		D

MODULE NUMBER 92706

VIOLATION SEVERITY OR DEVIATION 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ "D" ☐

SITE RELATED ☒ A C ☐ B D ☐

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

3. The separation requirement as described in the above specifications requires each circuit and raceway be given a unique permanent alphanumeric identification and colored dots (round emblems) along their lengths at intervals not greater than 15 feet.

   Contrary to the above requirements, the NRC inspectors identified:

   a. Separation group 1 cable tray located in HPSI pump room A was not marked with red color identification (round emblems) between points 1EZACEATCBA and 1EZACCARC03.

   b. Round blue identification emblems were missing from channel D conduit (PT-351) for a distance of approximately 40/50 feet. at the 120-foot elevation.

   c. Temporary alphanumeric identification on cable tray 1EZAIDBTXF had not been replaced with permanent identification.

   This is a Severity Level IV Violation, Supplement II.

4. IEEE Standard 384-1974, "Criteria for Separation of Class IE Equipment and Circuit Breakers," endorsed by the Licensee in Section 8.3.1 of the FSAR in Section 5.1.2, states, in part, "Exposed Class IE Raceways shall be marked in a permanent manner at points of Entry and Exit from an Enclosed Area," as incorporated in the abaove specifications.

   Contrary to the above requirements, at the time of the inspection the following separation group I conduits were not identified by alphanumeric markings:

   a. Conduits 1EZJ1AARC12, 14, and 16 on both sides of the wall between group I, 4.16 KV switchgear area and channel A remote shutdown panel area at the 100 foot elevation.

   b. Conduit sleeves 1EZJ1BARC13, 14 and 15 on control building wall in channel B remote shutdown area at the 100 foot elevation.

   This is a Severity Level IV Violation, Supplement II.

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VIOLATION SEVERITY OR DEVIATION 1 2 3 4 5 6 D 27

SITE RELATED A C B D 28

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

B. 10 CFR 50, APPENDIX B, CRITERION V Contrary to ~~the above requirement~~ and the specifications listed below, the following conditions existed at the time of the inspection.

1. Section 11.0 of Bechtel Specification 13-CM-320, "Erection of Structural and Miscellaneous Steel," states, in part, "Installation shall be in accordance with AISC Specification for Structural Joints using ASTM A325 or A490 bolts." Paragraph 5(a) of the AISC specification requires that A325 bolts, 7/8-inch diameter be tightened to at least a minimum tension of 39 Kips. An acceptable method of obtaining this tension is described in paragraph 5(e), "Turn-of-Nut Tightening," which requires that bolts be brought to a "snug tight" condition plus an additional 1/3 to 2/3 turn, depending on the bolt length.

   Contrary to these requirements, on September 7 and 13, 1983, four A325 bolts were finger loose. Using a calibrated torque wrench two A325 bolts showed a tighteness of less than 39 Kips. These bolts were located in the structural steel beams as itemized in NRC Inspection Report No. 50-528/83-34, pages VII-3&4.

   This is a Severity Level IV Violation, Supplement II.

2. Bechtel Specification 13-CM-307, "Design, Installation and Testing of Concrete Anchors," establishes requirements for bolt embedment depth, spacing, torquing, and case-by-case Licensee approval for use.

Contrary to these requirements, concrete expansion anchors were deficient in that 15 bolts were under-torqued, washers were missing under two nuts, three bolts were insuficiently spaced from other bolts or unused holes, three unused holes were ungrouted, and two cases existed where prior Licensee approval was required and not obtained. These anchors were located in various safety-related raceway supports, and are itemized in NRC Inspection Report No. 50-528/83-34, pages VII-8&9.

This is a Severity Level IV Violation, Supplement II.

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REPORT NO. SEQ. A B C D

MODULE NUMBER

VIOLATION SEVERITY OR DEVIATION 1 2 3 4 5 6 D

SITE RELATED A C B D

27 28

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

3. Procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, "Nuclear Pipe Hangers and Supports Installation," Appendix I, requires the QC Engineer to verify each completed task on the "CIP for Nuclear Pipe Supports."

   The inspection requirement on the CIP for "Task 1" is to verify that the support assembly is correct per approved engineering drawings and specifications.

   Contrary to the above, in September 1983, Unit 1 pipe supports were found to be incorrectly installed per approved drawings and specifications but had been verified correct by the Piping QC Engineer. Specifically, supports SI-100-H003, H005, and H036; SI-101-H00A; and SI-106-H001 were found with items which did not meet drawing requirements as described in Inspection Report 50-528/83-34, pages V-3, 4, and 5. The supports had been accepted by Piping QC Engineers during the period November 29, 1979, to November 20, 1981.

   This is a Severity Level IV Violation, Supplement II.

4. Procedure WPP/QCI 201.1, Revision 18, dated May 25, 1983, "Nuclear Pipe Hangers and Supports Installation," Appendix I, requires the QC Engineer to verify each completed task on the "CIP for Nuclear Pipe Supports." The "CIP" inspection requirements for Task 8 require the Welding QC Engineer to verify that field welding is complete. For Task 9, he is to check the vendor welding for size and length. Additional instructions to the Welding QC Engineer in Appendix I instruct him to verify welding acceptability.

   Contrary to the above, in September 1983, Unit 1 pipe supports were found with unacceptable weld conditions which had been reported as acceptable by the Welding QC Engineers. Specifically, pipe supports SI-100-H005, H010, H015, and H034; SI-102-H00B; SI-106-H011; and SI-176-H001, and H003 were found with unacceptable weld conditions. The supports had been verified acceptable during the period July 14, 1980 to September 15, 1982. The welds and deficiencies are described in NRC Inspection Report No. 50-528/83-34, pages V-5, 6 and 7.

   This is a Severity Level IV Violation, Supplement II.

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50005288	334	A	192706	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ "D" ☐	A ☒ C ☐ B ☐ D ☐
		B			
		C			
		D			

VIOLATION OR DEVIATION (*Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.*)

5. Specification 13-PM-204, Revision 12, dated April 7, 1983, paragraph 12.1.2, states the design and location of all pipe supports shall be the responsibility of project engineering. Paragraph 12.1.4 states pipe supports designed by engineering will be shown on drawings and all design details will be shown including miscellaneous steel.

   Contrary to the above, in September 1983, Unit 1 pipe support SI-100-H012 contained a miscellaneous steel member. The member was not shown on the pipe support drawing, 13 SI-100-H012, Revision 1, and was used to provide support to an instrument air line.

   This is a Severity Level IV Violation, Supplement II.

6. Procedure WPP/QCI No. 204, Revision 3, "Piping Systems Release for Insulation", Appendix I requires that piping systems be checked for unacceptable surface damage prior to insulation of the piping.

   Contrary to the above, pipe spool 1SI-009 S-002 was certified acceptable for insulation on November 14, 1982, with an unacceptable pit in the pipe which violated minimum wall requirements.

   This is a Severity Level IV Violation, Supplement II.

C. Contrary to ~~the above requirements,~~ 10 CFR 50, APPENDIX B, CRITERION IX, AND THE FSAR SECTION 3.8.1.6.6 at the time of the inspection, the size of structural steel fillet welds were less than required by ~~the~~ BECHTEL DRAWINGS 13-S-ZAS-536 REVISION 3 AND 13-C-ZAS-570 REVISION B ~~drawings~~ and undercut in welds exceeded the requirements of AWS D1.1. These welds were located in various safety-related structural steel and are itemized in NRC Inspection Report No. 50-528/83-34, pages VII-4, 5, and 6.

This is a Severity Level IV Violation, Supplement II.

D. Contrary to ~~the above,~~ 10 CFR 50 APPENDIX B, CRITERION XVI AND BORG WARNER VALVE ASSMBLY DRAWING NUMBER 77770-1 on September 15, 1983, the inspector observed torque verification performed on valve number V-470 which resulted in the identification of loose stud nuts connecting the bonnet to the valve body.

This is a Severity Level IV Violation, Supplement II.

GPO 887-881

U.S. NUCLEAR REGULATORY COMMISSION

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50000528	8334	A
		B
		C
		D

MODULE NUMBER: 92706

VIOLATION SEVERITY OR DEVIATION: 1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐ 6 ☐ D ☐

SITE RELATED: A ☐ B ☐ C ☐ D ☐

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

10 CFR 50 APPENDIX B, CRITERION II

E. 1. Contrary to ~~the above requirement,~~ on September 10, 1983, scaffolding lumber was in the channel "C" electrical raceway chase located at elevation 120 feet in the lower cable spreading room. These areas are required to be free of combustible materials.

This is a Severity Level IV Violation, Supplement II.

2. Contrary to the above requirement, pipe support SI-089-H008 was found during the September 1983 inspection with rubber seal material in between the Flourogold slide plates, Items 54 and 55 on the drawing. The applicable support drawing does not permit the use of rubber material. The rubber material may impair the sliding function. The support had been accepted by QC on November 29, 1979.

This is a Severity Level IV Violation, Supplement II.

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D

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VIOLATION SEVERITY OR DEVIATION
1 2 3 4 5 6 D
27

SITE RELATED
A C
B D
28

VIOLATION OR DEVIATION (*Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.*)

See next page for a Deviation

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REPORT NO. / SEQ.: A

MODULE NUMBER: 92706

VIOLATION SEVERITY OR DEVIATION: 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ "D" ☒

SITE RELATED: ☒ A ☐ B ☐ C ☐ D

VIOLATION OR DEVIATION (*Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.*)

APPENDIX B

NOTICE OF DEVIATION

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

Docket No. 50-528
Construction Permit No. CPPR-141

As a result of the inspection conducted between September 6-16, 26-30, October 31, and November 1, 1983, and in accordance with the NRC Enforcement Policy, 10 CFR 2, Appendix C, the following deviation was identified:

FSAR Section 3.8.1.6.6, Structural and Miscellaneous Steel, states:

"Welding is done in accordance with AWS D1.1-72, Revision 1, 1973, Structural Welding Code. The acceptance criteria for visual inspection of welding is done in accordance with AWS D1.72, Revision 1, 1973."

Contrary to this commitment, Appendix A, Visual Inspection Criteria, for Structural Steel and Miscellaneous' Metal Welding to Meet Design Requirements, to Specification 13-CM-320, Erection of Structural and Miscellaneous Steel, permits acceptance of undercut, incomplete fusion (rollover or overlap), and underfilled weld craters in amounts or circumstances not allowed by the AWS Code as described in NRC Inspection Report No. 50-528/83-34, pages VII-5 and 6.

You are hereby requested to submit to this office within thirty days of the date of this notice, a written statement or explanation regarding the above deviation describing corrective steps taken, the results achieved (or corrective steps that are planned), and the date when corrective action will be completed.

Date

T. Young, Jr., Chief
Reactor Projects Section No. 2