ORGANIZATION: TARGET ROCK CORPORATION
EAST FARMINGDALE, NEW YORK

REPORT NO.: 99900060/89-01	INSPECTION DATE: July 18-21, 1989	INSPECTION ON-SITE HOURS: 30

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NUCLEAR INDUSTRY ACTIVITY: Manufacturer of solenoid operated valves.

ASSIGNED INSPECTOR: K. R. Naidu
K. R. Naidu, Reactive Inspection Section No. 1, VIB — Date: 9/27/89

OTHER INSPECTOR(S):

APPROVED BY: Edward T Baker
E. T. Baker, Chief, Reactive Inspection Section No. 1, VIB — Date: 9/29/89

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR 50, Appendix B; 10 CFR Part 21.

B. SCOPE: Review implementation of the quality assurance program in selected areas; corrective action taken on nonconformances identified in NRC inspection report No. 99900060/83-02; corrective action taken to resolve Part 21 items; and tests observed on a power operated relief valve.

PLANT SITE APPLICABILITY: All plants with Target Rock Corporation solenoid valves

A. VIOLATIONS:

No violations were identified during this inspection.

B. NONCONFORMANCES:

Contrary to Criterion II of 10 CFR 50, Appendix B, Target Rock Corporation (TRC) inadequately implemented their quality assurance program as evidenced by the following examples:

1. Contrary to Criterion XV of 10 CFR 50, Appendix B, nonconformance reports (NCR) were not initiated to document conditions adverse to quality in the following instances:

   a. An NCR was not initiated when a TRC Model No. 88 RR power operated relief valve (PORV) failed to meet the opening and closing times criteria specified in Consumers Power Company Technical Specification MI-LBA, ESS-Specification SP-MP-8306-002(Q). (89-01-01)

   b. An NCR was not initiated to document that two TRC Model 82-UU-001 valves failed to open on demand during hot functional tests at Watts Bar Unit 1 nuclear power station. This failure was reported to the NRC by Tennessee Valley Authority as a 10 CFR Part 21 item in a letter dated October 25, 1983. (89-01-02)

2. Contrary to Criterion XVI of 10 CFR 50, Appendix B, corrective action was not taken on one of the three nonconformances identified in NRC Inspection Report No. 99900060/83-02. Furthermore, corrective actions taken to redesign and rework nonconforming items, including those reported as 10 CFR Part 21 items, were not documented and preserved in an auditable manner. (89-01-03)

3. Contrary to Criterion V of 10 CFR 50, Appendix B:

   a. A checklist used to document the results of the acceptance tests performed on July 19, 1989, on a PORV intended for the Palisades nuclear power plant, did not contain acceptance criteria to establish opening and closing times as specified in the technical specification. (89-01-04)

   b. Activities related to electrical solder joints were performed on Class 1E wire harnesses without the benefit of a written procedure and inspections were not conducted prior to shipment, resulting in Washington Public Power Supply System (WPPSS) nuclear power plant Unit 2 receiving 17 safety-related

electrical wire harness replacement kits with defective solder joints. WPPSS reported this matter as a Part 21 item in a letter dated May 19, 1989. (89-01-05)

4. Contrary to Criterion VI of 10 CFR 50, Appendix B, General Weld Procedure Specifications (GWPS) and Joint Weld Procedure Specifications (JWPS) were used in production welding without having valid approval signatures, including dates of approval, to indicate the GWPS and JWPS were reviewed and approved by individuals other than those who prepared them. This item was previously identified as a nonconformance in Inspection Report No. 99900060/83-02. TRC responded to the nonconformance in their letter dated October 19, 1983, and stated that the GWPS and JWPS will be signed and dated. In spite of this commitment, those procedures remained without valid signatures of approval and dates of approval until July 21, 1989, and were used in production welding during the period in between. (89-01-06)

C. UNRESOLVED ITEMS:

No unresolved items were identified during this inspection.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

The status of the following nonconformances identified in NRC Inspection Report No. 99900060/83-02 was reviewed and determined to be as follows.

1. (Closed) NONCONFORMANCE 83-02, Item A

This nonconformance identified that contrary to Criterion V of 10 CFR 50, Appendix B and paragraphs 3.3.1 and 3.5.1 of the TRC quality assurance manual (QAM), selected paragraphs describing the number and distribution of the operation history card had been revised and implemented without the approval of the QA manager and acceptance by the Authorized Inspection Specialist. Furthermore, the revision had not been distributed to all holders of controlled copies of the QAM.

A review of the QAM indicates that Revision 3 to Change Notice No. 8, which revised Section 7 of the QAM, was revised on October 15, 1983, in response to the nonconformance. The entire QAM has been subsequently revised and the current status is Revision 4. TRC is currently in the process of revising their QAM in preparation for the renewal of their ASME certification.

2. (Closed) NONCONFORMANCE 83-02 Item B

This nonconformance identified that contrary to Criterion V of 10 CFR 50, Appendix B; Welding Procedures TRP 11.200, Revision B and TRP 11.203, Addendum No. 3 used in production welding, had not been approved.

This was also contrary to paragraph 8.4.1 of the QAM and paragraph 6.1 of TRC procedure QCI 2130.

TRC, in a letter dated October 19, 1983, to the NRC outlining their corrective action to this nonconformance, stated that it has now provided on the document the inhouse approval of the revision and that such approval is considered to be mandatory for document and control purposes. The inspector reviewed the GWPS and JWPS prepared prior to 1988 and determined that TRC failed to implement the above commitments. GWPS, JWPS, and revisions to JWPS prepared and implemented prior to 1988 were incomplete, without signatures and/or dates. Subsequent to 1988, the Welding Engineer responsible for this activity, has prepared and approved several JWPS and revisions to the JWPS as evidenced by his signatures on these documents. TRC, in response to the inspector's observation that the practice of preparation and approval of the JWPS by the same individual lacks the benefit of independent review, stated that in the future an individual other than the preparer will approve such procedures.

This nonconformance is considered closed and TRC's failure to implement the corrective action to update these procedures is identified as a nonconformance to 10 CFR 50, Appendix B, Criterion XVI, related to failure to implement the existing Quality Assurance program. Refer to paragraph 4.b. of this report. (Nonconformance 89-01-03)

3. (Closed) NONCONFORMANCE 83-02 Item C

This nonconformance identified that contrary to Criterion VII of 10 CFR 50, Appendix B, measures were not established to select and assess Q-Tek Corporation, a contractor who was performing vendor audit services for TRC. TRC stated that the practice of using a contractor to perform vendor audits has been discontinued. TRC stated that they now perform vendor audits themselves.

E. OTHER INSPECTION FINDINGS AND COMMENTS:

1. Review of Previously Reported 10 CFR Part 21 Items.

The inspector reviewed the corrective action taken by TRC to resolve the following 10 CFR Part 21 items identified during the 1983 - 1989 period.

a. Combustion Engineering Incorporated (CE) reported to the NRC problems in four TRC valves procured for use at the Palo Verde Nuclear Generating Station (PVNGS). CE identified that two one-inch TRC Model 77L-001 and two two-inch TRC Model 77L-003 valves, which were received for the purpose of performing additional qualifications to the requirements of NUREG-0588, were inspected prior to the tests. The inspection identified incorrect valve assemblies and significant missing parts, which were subsequently corrected. During the seismic testing of the valves, CE identified problems such as valve position indicator failures, failure of the valve to open due to an electrical short in the solenoid leads, failure of the valve to close due to improper seating, and shorted electrical leads due to wear. CE determined that the failures were related to vibratory damage.

TRC evaluated the problem and determined that in the valves identified above, the problem was caused by the axial travel of the solenoid coil inside the solenoid housing because the solenoid assemblies were not potted. TRC issued a Service Bulletin (SB) 8302 dated April 6, 1983, to all their customers. The SB provided instructions to inspect their valves to detect axial travel. The SB stated that TRC had a modification kit available for use containing the necessary parts and instructions to eliminate the problem.

The NRC also evaluated the problem and issued Information Notice (IN) 85-49 attaching TRC SB 8302 informing users of potential problems with certain models of TRC valves. The IN stated that these models of TRC valves failed during environmental qualification testing and that the analysis of the failure suggests that line vibration induced by hydrodynamic forces in the piping and other forms of mechanical vibration may cause loosening of the solenoid hold-down nut of those TRC solenoid valves with design features similar to TRC valve models tested. The action taken by TRC, i.e., potting the assemblies, is considered adequate for this item.

b. Arizona Public Service Company (APS), in a telephone conversation to the NRC Region V office, followed by an interim letter dated December 23, 1982, reported similar problems with other TRC valves. APS in a final report dated July 11, 1984, provided the following additional details on the anomalies:

1) Incorrect valve assembly - An insulating washer was observed to be off-center and wedged in the land between the pressure housing and the lower case of the Reed switch housing. This misalignment prevented pressure from the assembly nut being transmitted to the bottom of the solenoid housing and the lower O-ring seal. The misalignment was corrected.

2) Significant missing parts - Two O-ring seals were observed to be missing on two valves and two O-ring seals were missing on two additional valves. These discrepancies were also discovered prior to testing.

Valves, identified by CE, discussed in the above paragraph were included in the APS report. The APS corrective action included modifying valves according to TRC SB 8302, obtaining missing parts and reassembling the valves. APS also replaced several TRC Model 77L-003 two-inch valves with valves manufactured by VALCOR. Corrective action taken to resolve this deficiency appears to be adequate.

c. On September 28, 1983, APS reported to the NRC that the external factory calibration seals applied to TRC Model 76-Q-XXX valves were observed to be broken. Subsequent testing of the valves by APS personnel determined that the valves failed performance testing due to excessive seat leakage. The tests were repeated by a TRC field representative utilizing a TRC test rig, which was equipped with an accumulator and used pure water. The APS test rig did not have an accumulator and used impure water. The test results indicated that the valves failed because of foreign material contained in the test media used in the APS test rig. The foreign material is postulated to have caused surface indentations on the disc seating areas which prevented the valves from reseating properly, thus causing excess leakage.

Two problems, one related to broken seals and the other related to excess seat leakage, were identified. A review of records related to Purchase Order (PO) 10407-13-JM-691, which were available at TRC, indicated that the valves were shipped to APS after they were tested and a seal was applied at the top of the valve to prevent tampering with the pressure setting. Specifically, an "In-Process Status Sheet" dated November 12, 1981, identifies the serial numbers of the 12 valves (which are mentioned in the 10 CFR Part 21 submitted by APS) and reports that the valves were tested at TRC and determined acceptable in the presence of a Bechtel inspector representing APS. The problem with the broken seals was identified during the construction of the plant and it is presumed that the valves were disassembled prior to welding, at which time the seals were broken.

Regarding the second problem, TRC informed APS that the lack of an accumulator on the APS test rig and utilization of impure water during tests, permitting introduction of foreign particles, were the probable causes of the hammered peening effect on the disc areas which ultimately resulted in excess leakage. APS, in a final report to the NRC dated May 4, 1984, concluded that the observed adverse condition was solely due to improper field testing and therefore was not reportable under the requirements of 10 CFR Part 21 requirements. APS returned the defective valves to TRC. APS proposed to procure a new test rig, equipped with accumulators, to test their valves in the plant. The inspector concurs with APS that this matter is not a 10 CFR Part 21 item.

d. Tennessee Valley Authority (TVA) reported to the NRC in a letter dated October 25, 1983, that during hot functional testing of the Watts Bar Unit 1 nuclear power plant, two TRC Model 82 UU-001 pressurizer PORVs failed to open on demand. Results of tests indicated that the valves would not open when the block valve was also open, which is the normal operating configuration. The PORV's respective pilot valves would open but the main disc remained closed because the piston rings for the main disc compressed and allowed leakage past the rings and into the pilot disc chamber. This leakage prevented the necessary pressure decrease in the pilot chamber when the pilot disc opened, preventing the valve from opening because the valve's solenoid could not lift the main disc against the unbalanced force of a full pressure drop. The valves were returned to TRC for modification and testing. TRC engineers analyzed this problem and determined that the piston ring needed a spring force underneath it to force the piston ring to expand.

To implement this proposal, the piston ring grooves were machined deeper and a backup ring made of inconel X750 was placed behind the piston rings to provide the spring force to expand the 17-7PH piston rings. After modification, the valve was cycled a total of 1500 times at different temperatures and pressures, including 500 times at operating conditions of 2335 psig and 657 degrees Fahrenheit. The valve operated satisfactorily and no anomalies were experienced. TRC stated that this valve was unique to Watts Bar and not applicable to other plants. Action taken by TRC to resolve this item is considered adequate. However, an NCR was not generated to identify the problem and the corrective actions, including the design change, were not documented in an auditable format. TRC's failure to generate an NCR is identified as a nonconformance to 10 CFR 50, Appendix B, Criterion XV. (Nonconformance 89-01-02)

e. On May 10, 1984, Standardized Nuclear Unit Power Plant Systems (SNUPPS), notified the NRC of a generic deficiency relating to improperly-rated field run cables used to connect Valcor supplied solenoid valves in class 1E applications which included TRC valves. SNUPPS reported that cables qualified to withstand high temperature and adverse environment were installed in the field to replace the previously installed cables.

The inspector reviewed this matter and determined that this was a field problem and hence did not require TRC corrective action.

f. On January 29, 1986, TVA notified the NRC that the internal wiring in a solid-state control system (SSCS) cabinet was damaged when a 120 Volt (V) ac potential was applied to at least two different field input points of the cabinet. The SSCS should have received a 48V input instead of the 120V from the TRC valves. The SSCS was designed to control the TRC valves and was intended to receive a 48V dc input from the TRC valves. TVA determined that TRC supplied a solenoid valve with an internal jumper which was not shown on their drawings and that TVA failed to specify the removal of several of the jumpers shown on the TRC valve drawings. TVA stated that this deficiency was applicable only to the Bellefonte nuclear power plant, Unit 2.

Records indicate that TRC supplied 28 Model 77DD-038 valves to TVA in June 1980, in response to PO 77K3 - 820 230-1, dated 1977. In a release dated June 26, 1980, TVA transmitted a wiring diagram for their Bellefonte plant (no drawing number) showing a wiring change for one valve only, identified as 3BW022-NK-81. In this diagram, the jumper between terminal 2 on terminal block (TB) 1 and terminal 1 on TB2 was deleted. The corresponding data sheet for all 28 valves was enclosed. There was no specific indication on this data sheet that the jumper was to be deleted on one valve only. Other changes mentioned included: changes in environmental conditions, time versus temperature graph, and an additional position indicator switch added at the end of travel. The valves were intended for the reactor coolant drains and vents, and miscellaneous piping systems. The TRC standard design does not include jumpers. TVA was the only customer who ordered valves with jumpers. TRC drawing 1 SMH - S-12 Revision 0, dated August 16, 1980, titled "1" Solenoid Operated Globe Valve Assembly Normally Closed," was generated during the procurement process after the TVA letter dated June 26, 1980. TRC informed the inspector that TVA was unable to identify the TRC serial number of the valves that had the jumpers.

Based on the above information and review of the documents, the inspector was unable to conclude that there was a deficiency in the TRC design review process that was generic and applicable to other plants.

g. On June 2, 1986, APS informed the NRC that during a review of the class 1E qualification it was determined that two TRC solenoid valves supplied within the CE work scope had qualification which addressed continuous energization at 135V dc. The review also identified 13 TRC valves, in the balance of plant scope of supply, that had documentation for the solenoid coil in the normally de-energized condition. The review concluded that these valves were all used in fail-safe design applications and their failure would not adversely affect the safety functions of the systems in which they were used.

Based on the above information and discussions with the TRC engineers, the inspector concurs with APS that this matter is not considered a 10 CFR Part 21 item.

h. On October 22, 1987, Stone and Webster Engineering Corporation informed the NRC that during the course of disassembling a TRC modulating valve at the Beaver Valley Unit 2 nuclear power plant, a wooden dowel pin was found in place of the required stainless steel spiral pin. The function of the spiral pin was to prevent the rotation of the disc rod which is threaded into the plunger. Rotation of the rod could result in an increase or decrease to the valve stroke causing either excess leakage or reduced opening. The valve was reassembled using the proper spiral pin. Disassembly and inspection of a duplicate valve, manufactured during the same period of time as the deficient valve, identified no problems.

The inspector reviewed the TRC Field Service Report (TFSR) for project 87ZC30 which documents the service performed during May 14-16, 1987, at the Beaver Valley nuclear power plant. The TFSR states that one modulating Model 83 C019 valve was unable to stroke from the closed position when energized. All other modes of operations were successful. The valve was disassembled and inspected. The TRC service representative observed very heavy sediment deposits and concluded that this may have caused one piston ring to seize in its groove in the main disc. During the cleaning operation, it was observed that a wooden dowel pin had been used to pin the assembly on the disc rod instead of a plunger spiral pin (roll pin). The roll pin is used to lock the plunger to the rod disc assembly to permit the proper lift of the valve. The plunger has four holes diametrically opposite to each other. The rod assembly has a slot above the threaded portion of it. The purpose of the roll pin is to lock the position of the rod disc assembly to a pre-determined length. During the assembly of the valve, a wooden dowel may be used to temporarily lock the plunger to the rod disc assembly (during a trial and error process) to verify the proper lift of the valve, because it is difficult to slide a roll pin in and out. The inspector could not determine from the documents examined and the discussions with the TRC personnel if the dowel pin was left in the valve at TRC or if it was left in place at Beaver Valley after some on-site service.

i. During May 1988, cracks were reported in the wire insulation and terminal blocks of TRC valves installed at the Shearon Harris Unit 1 and Robinson Unit 2 nuclear power plants.

TRC informed the NRC in a letter dated June 28, 1988, that TRC sent an information bulletin (SB 8801 dated May 18, 1988) informing all their customers that the position indication switch wires which bear the marking "Ristance Wire" may be susceptible to cracking when flexed during handling. TRC recommended replacement of the position indication switch if insulation cracking was observed.

This problem relates to cable leads of Reed switches mounted inside a splash-proof cover mounted on top of the valve. The purpose of the Reed switches is to respond to the position of the rod disc assembly and indicate the status of the valve (i.e., open or closed). The Reed switch is a single pole, single throw switch in a sealed enclosure with two silicone rubber insulated 20 American Wire Gauge (AWG) leads rated for 150 degrees Centigrade and 600 V and manufactured by the Belden Company. TRC, which was evaluating the problem, stated that the cracking problem was first observed at the River Bend nuclear power plant in 1983. TRC intensified their evaluation after receiving information on two additional failures at Shearon Harris and Robinson in May 1988. As a result, TRC issued Service Bulletin 8801, dated May 18, 1988, in which they requested customers to inspect their Reed switches and the lead wires by flexing through a 90-degree bend, close to the potting junction point and observe evidence of insulation cracking. TRC recommended their customers return switches with cracked insulation along with specifying the date of purchase, environmental conditions to which the switch was exposed, and any differences from those specified in the original PO. To correct this problem, TRC upgraded the Reed switch. The Reed switch container is spun over at the ends to provide better clamping of the insulation in the can. The silicone wire leads were replaced with 18 AWG Capton insulated wire manufactured by Champlain Cable Company, Winooski, Vermont, to meet Military Specification W 81381 and be capable of withstanding 752 degrees Fahrenheit, activating energy of 1.29mev, and a radiation damage threshold of 1XE9 Rads. The terminal block was also changed. Based on the above, TRC has taken adequate corrective action to resolve this deficiency.

j. On May 19, 1989, Washington Public Power Supply System (WPPSS) informed the NRC that actuator kits manufactured by TRC and supplied to WPPSS Unit 2 nuclear power plant contained defects, such as a cold solder condition, in addition to insufficient and failed solder joints. TRC evaluated the problem and determined

that the 17 assemblies ordered by WPPSS were retrofits and were required to satisfy urgent needs. Due to the nature of the emergency, the actuator kits were soldered and assembled by personnel other than the assembly test personnel, who normally perform this activity. The actuator kit mentioned in the WPPSS 10 CFR Part 21 Report specifically refers to a retrofit relay assembly kit consisting of two double-pole, double-throw relays, each connected to a single-pole, single-throw Reed switch to provide a load carrying capacity of 10 amps for the position indication circuitry. The two additional relays are necessary because the current carrying capacity of the Reed switch is limited to 3 amps. The defective kits were returned to TRC where they were reworked and returned to WPPSS. TRC determined that the WPPSS cold solder joint anomaly was a unique isolated occurrence and therefore notification to other recipients of similar relay assemblies was not warranted. TRC's corrective action included developing a solder procedure and informing field service, assembly and testing personnel that only persons qualified to the procedure were to perform soldering in the future. The inspector informed the TRC staff that soldering was performed in the past without the benefit of an approved soldering procedure and that performing a safety-related activity without a valid procedure was in nonconformance with 10 CFR 50, Appendix B Criterion V. Refer to paragraph 4.c of this report. (Nonconformance 89-01-05)

2. Observation of Activities.

a. Power Operated Relief Valve (PORV) Testing

During the inspection, the inspector observed a four-inch, 2500 pound stainless steel, TRC Model 88 RR PORV, suitable for operation at 700 degrees Fahrenheit and 2500 psig, being tested with saturated steam. The valve is intended for the Consumer Power Company for installation at the Palisades nuclear power plant. The valve was being subjected to engineering tests, including operability with steam at 665 degrees and 2500 psig, and subcooled water tests with water at 300 degrees and approximately 470 psig. The TRC test facility is capable of producing 100,000 pounds of saturated steam per hour at 2500 psi and 663 degrees Fahrenheit. On July 19, 1989, the inspector observed three sets of measurements being taken to determine the time taken to open and close the valve. The valve opened in less than 2.00 seconds and closed in 0.5 seconds. On the following day, the inspector witnessed similar tests being performed

with subcooled water. For this test, the valve opened in less than 2.1 seconds and closed in less than 6.00 seconds. The relevant Specification SP-MP-8394-002 (Q), issued by Consumers Power Corporation (CPC), specifies the opening and closing times to be 0.2 seconds minimum and 2.0 seconds maximum. The inspector observed that the valve met the actuation times for saturated steam conditions but not for subcooled water conditions. TRC informed the inspector the following day that the delay experienced to close the valve under subcooled temperatures was due to a rectifier assembly placed across the push button located at the test stand. The rectifier was to protect the push button from voltage surges resulting from energizing the solenoid coil of the valve. The inspector observed that all instruments used to monitor the test were calibrated.

The inspector also observed two examples demonstrating unacceptable implementation of the TRC quality assurance program. One was that this specific valve had previously failed the performance test for closing and opening times and yet no nonconformance was written by TRC to document this condition. The engineering changes made to the valve before being retested were not documented. Secondly, the checklist used to document the results of the test did not contain the acceptance criteria, such as the maximum opening and closing times, specified in the CPC technical specification. Paragraph 4 of this report identifies these matters as examples of nonconformance to Criteria XV and V of 10 CFR 50, Appendix B. (Nonconformances 89-01-01 and 04)

b. Observation Of Hydrostatic Tests

The inspector observed hydrostatic tests being performed on a segment containing two TRC Model 79 AB-001 solenoid valves welded in series. Two such spool assemblies were ordered by Technipipe Incorporation, Houston, Texas, for use at the A.N. Vandellos (ANV) nuclear power plant located in Spain. Each ASME Section III, Class 1 valve was to be supplied with an N-stamp, in compliance with ANV Specification S-0-220, which describes all the technical data, quality assurance requirements, and tests, which included electrical, hydraulic, and functional tests. TRC Test Procedure 4974, dated March 6, 1989, was utilized and provided information on the valve and fixture preparation, the range and calibration of the pressure test gauges, the quality of the water to be used during the hydrostatic test, a hydrostatic pressure of 6050

psig, an assembly seal weld test, satisfactory actuation of the valve (actuation time should be less than 10 seconds), satisfactory position indication, and satisfactory operation at normal and degraded voltage conditions. Pressure gauges used during the hydostatic test were calibrated prior to the test. The inspector identified no unacceptable findings in this area.

3. Review of Records.

The inspector reviewed the records related to a valve shipped to APS. Item 1 of APS PC 60149664 C/05 required TRC to supply a relief valve, S/N 14, Model 76 Q - 008, with a 0.375 inch orifice, with a one-inch nominal inlet and outlet. The following information was available in the review of this package:

a. NV1 Certificate Holders Data Report for Safety and Safety Relief Valves

b. Test report to indicate that on April 18, 1989, the valve successfully withstood 425 psig hydrostatic test pressure for 10 minutes.

c. Seat leakage test, with Nitrogen medium at 113 psig, was measured to be zero bubbles per minute, which was less than the acceptance criteria of 20.

d. Gagging device test with Nitrogen medium at 231 psig for one minute resulted in no leakage.

e. Operational test with Nitrogen medium, indicated the valve operated at 125 psig, plus or minus 3.8 psig, and reseated at 112.5 psig.

f. Liquid Penetrant inspection report which identified no unacceptable observations.

g. Valve body thickness measurements.

h. Welding reports.

Review of the above records identified no unacceptable findings.

4. Review of the TRC Quality Assurance Program.

The NRC inspector reviewed the implementation of the TRC quality assurance program in selected areas during the inspection and determined that the established program was being inadequately implemented in the following areas:

a. Criterion XV of 10 CFR 50, Appendix B is inadequately addressed in the TRC quality assurance manual (QAM) and consequently inadequately implemented. The requirement to identify and document nonconformances was also inadequately described in the QAM. The inspector observed that nonconformance reports (NCR) were only written when the dimensional tolerances were not met and not written when technical specification requirements were violated. However, corrective action, such as design changes, were initiated to correct the problem. Since an NCR was not generated to document the nonconformance, it was not possible to establish the sequence of corrective actions. Specifically, the records on TRC's review and resolution to the 10 CFR Part 21 items were not auditable due to lack of NCRs. (Nonconformances 89-01-01 and 02)

b. Criterion XVI of 10 CFR 50, Appendix B is also inadequately addressed in the QAM. Since NCRs are seldom written, the corrective action taken to correct the nonconformances cannot be readily established without the benefit of consultations with the cognizant engineers and reconstructing the events which occurred at that time. In the case of the PORV supplied to CPC, design changes were made to the PORV because the valve did not meet the technical specifications. The inspector informed TRC personnel that the implementation of the QAM would have been considered acceptable if TRC had generated an NCR to document that the PORV did not meet the opening and closing times referenced in the CPC specification. The NCR should have referenced the evaluation of the failure, the Engineering Change Notice initiating the design change to modify the disc, the results of the subsequent retesting, and the final closure of the NCR should have indicated that corrective action was verified to be complete and adequate. (Nonconformance 89-01-03)

c. Criterion V of 10 CFR 50, Appendix B, requires activities affecting quality to be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances. Contrary to this criteria, procedures had not been established to solder electrical connections.

Furthermore, a test procedure, which had been established specifically to test a PORV, did not contain the acceptance/rejection criteria prescribed in the relevant technical specification. (Nonconformances 89-01-04 and 05)

d. 10 CFR 50, Appendix B, Criterion VI, requires measures to be established to control documents such as instructions including changes, and requires that these instructions and changes be reviewed for adequacy and approved for release by authorized personnel. Contrary to this requirement, there was no requirement in the QAM to sign and date procedures. Several weld procedure specifications (WPS), prepared prior to 1988, remained without valid signatures and dates. WPSs developed after 1988 were prepared and approved by the same individual without the benefit of an independent review. (Nonconformance 89-01-06)

The inspector informed the TRC personnel that the above are examples of inadequate implementation of the TRC quality assurance program and identified all these matters as examples of a nonconformance contrary to the requirements of Criterion II of 10 CFR 50, Appendix B.

F. TRC PERSONS CONTACTED:

Name	Title
*R. Langseder	Director of Engineering
*J. Bocchi	Manager of Sales and Service
*T. D. Crowley	Product Support Manager
*V. Liantonio	Manager, Applications Engineering
*E. Bajada	Manager, Quality Assurance
K. Wenzel	Manager, Parts and Service
E. Reichelt	Welding Engineer
R. Rudden	QA Supervisor

* Attended exit meeting

G. EXIT MEETING:

The inspector met with individuals identified in Section F, and discussed the scope and findings of the inspection.