

APPENDIX C

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-267/88-15

License: DPR-34

Docket: 50-267

Licensee: Public Service Company of Colorado (PSC)  
P.O. Box 840  
Denver, Colorado 80201-0840

Facility Name: Fort St. Vrain Nuclear Generating Station (FSV)

Inspection At: FSV, Platteville, Colorado

Inspection Conducted: July 11 through August 5, 1988

Inspectors:

I. Barnes  
I. Barnes, Chief, Materials and Quality  
Programs Section, Division of Reactor Safety

7-8-88  
Date

*for* I. Barnes  
R. G. Taylor, Reactor Inspector, Materials and  
Quality Programs Section, Division of Reactor  
Safety

7-8-88  
Date

Accompanying Personnel: K. L. Heitner, Project Manager, NRR

Approved:

I. Barnes  
I. Barnes, Chief, Materials and Quality  
Programs Section, Division of Reactor Safety

7-8-88  
Date

Inspection SummaryInspection Conducted July 11 through August 5, 1988 (Report 50-267/88-15)

Areas Inspected: Routine, unannounced inspection of licensee actions on previous inspection findings, licensee event report (LER) followup, control of design changes and modifications, and activities related to the refurbishment of the reactor helium circulators.

Results: Within the four areas inspected, one violation (failure to store records at location required by procedure, paragraph 2.e) was identified in the area of previous inspection findings. Two violations (failure to obtain authorization for helium circulator installation, paragraph 5.c; and failure to appropriately control special processes, paragraphs 5.c and 5.d) and one deviation (failure to comply with commitments made to the NRC relative to procurement of helium circulator fasteners, paragraph 5.c) were identified in the area of refurbishment of reactor helium circulators.

DETAILS1. Persons ContactedPSC

- \* R. O. Williams, Jr., Vice President, Nuclear Operations
- \* #D. Warembourg, Manager, Nuclear Engineering Division (NED)
- #M. E. Niehoff, Nuclear Design Manager
- #F. J. Novachek, Nuclear Support Manager
- #P. F. Tomlinson, Manager, Quality Assurance (QA) Division
- #C. H. Fuller, Manager, Nuclear Production
- \* G. Redmond, Circulator Program Manager
- \* P. F. Moore, Supervisor, QA Technical Services
- \* J. P. Hak, Superintendent, Maintenance
- \* J. K. Jackson, Supervisor, QA/Quality Control (QC)
- \* M. Lehr, Supervisor, QA Engineering
- \* L. R. Sutton, Supervisor, QA Auditing
- \* M. J. Raymond, Program Manager, Simulator-Training
- \* T. E. Schleiger, Superintendent, Chemistry and Radiation Protection
- \* L. D. Scott, QA Services Manager
- \* R. L. Hellner, Supervisor, QA Materials Engineering
- \* M. L. Block, Systems Engineering Manager
- \* M. W. Coppello, Central Planning & Scheduling Manager
- \* H. O. Hagan, Outage Manager
- \* #R. L. Craun, NED Site Manager
- \* J. M. Gramling, Supervisor, Nuclear Licensing-Operations
- \* M. H. Holmes, Nuclear Licensing Manager

The NRC inspectors also interviewed other licensee personnel during the course of the inspection.

# Denotes those persons attending the exit interview on July 14, 1988.

\* Denotes those persons attending the exit interview on August 5, 1988.

2. Licensee Action on Previous Inspection Findings (92702, 92701)

- a. (Closed) Violation (267/8507-05): This finding involved (1) failure to include architect-engineer/nuclear steam system supplier (AE/NSSS) drawing technical notes in a work instruction for the control rod drives, and (2) failure to properly identify and establish material traceability for slack cable bushing caps. Relative to item (1), the licensee documented a detailed review of the specific work instructions involved. While a number of discrepancies were noted, none required rework of the control rod drives. The licensee further committed to rewrite all equipment maintenance procedures by January 1,

1987, and that the rewritten procedures would reference appropriate AE/NSSS information. The NRC inspector reviewed selected maintenance procedures and found that they did reference vendor data and in many instances had attachments extracted from vendor provided information. In regard to item (2), the NRC inspector reviewed Change Notice 1994 dated March 26, 1985, which provided a new bearing bushing retaining cap not included in the original design of the control rod drives. The engineer selected aluminum as the material for the cap since it was similar to that in the housing to which the cap would be bolted and thus would prevent thermal expansion stresses from developing. The engineer prescribed aluminum type 2011-T3 for the application, apparently believing that aluminum rod then in stock was of that type. Subsequent inspection could not establish the grade and type of aluminum as documented in Nonconformance Report (NCR) 85-935. The material was ultimately traced to purchase order documentation that revealed that the material was type 2024-T4. Engineering accepted that material "use-as-is" based on the somewhat superior qualities of 2024-T4 versus 2011-T3 in the area of strength. The NRC inspector determined that the thermal behavior of the two grades are essentially the same and had no further questions. The above identified violation is considered closed.

- b. (Open) Violation (267/8619-03): This item involved a finding that the licensee's corrective action program was flawed in several areas. The NRC inspector reviewed Audit Reports CARP 87-01 (April 1987), CARP 87-02 (October 1987), and CARP 88-01 (March 1988) which present the licensee's audit findings relative to their corrective action program. The audit reports reflect that progress has been made to improve the program but as of CARP 88-01, the program is still less than fully satisfactory. The NRC inspector also reviewed a computerized tracking system report that lists all unresolved deficiency reports, of which there are several types intended for different areas of endeavor. The report indicates that a Corrective Action Request (CAR) issued in January 1986, CAR 86-003, is still unresolved after numerous date extensions. In addition, an NCR issued in 1980 remains open as of this time and there are also 35 open NCRs from 1986 and earlier that are unresolved for a variety of reasons. The NRC inspector concurs with the licensee's audit report conclusion, as indicated above, and recommends that licensee management direct renewed emphasis toward further improvement in the program. This item remains open.
- c. (Closed) Open Item (267/8619-02): This item expressed an observation that the licensee's QA audit group was chronically understaffed and that the personnel generally were lacking in experience. The NRC inspector reviewed the current audit schedule. The schedule appears to require frequent audits in appropriate areas and full compliance with the Technical Specification mandated frequencies in other areas. The audits performed during the first half of 1988 were commensurate with the schedule, indicating a sufficiently sized staff. The qualification records for five of the current eight persons assigned

to the audit group were reviewed and all were found to equal or exceed the recommendations of ANSI N45.2.23 "Auditor Qualifications." Based on the review of the audit reports referenced in the previous item, the audits are considered thorough with adequate coverage of the activity areas under audit. This item is considered closed.

- d. (Closed) Open Item (267/8636-01): This item was an observation that a long-term walkdown of non-EQ safety-related systems and components internally committed to by the licensee in CAR 86-105 had not yet been initiated. This CAR has been closed on the basis that the walkdowns have been proceduralized and a project team has been organized. At the time of this inspection, approximately 25 percent of the overall projected effort has been completed. The NRC inspector reviewed selected records of the walkdown observations and interviewed the project team manager. Based on the review of recently generated records and the interview, the NRC inspector had no further question and this item is closed.
- e. (Closed) Unresolved Item (267/8623-06): This item concerned an observation that no audit had been performed of an offsite commercial records facility utilized by the licensee to store quality records. An audit was performed in early 1987 with a conclusion that the facility met the requirements of ANSI N45.2.9. The audit report also stated that the audit would be the first and last audit of the facility since it was not being used to store quality records based on the licensee's records program. This program requires that all quality records be microfilmed prior to being forwarded to the storage facility. The microfilms are stored in the onsite Records Center and are considered to be the quality records. Administrative Procedures Manual (APM) Procedure Q-17, Issue 11, "Quality Records," while not going into specific detail, does require that all quality records be stored in the onsite Records Center. The records to be stored and the duration of the storage are defined in a Records Retention Schedule. In order to provide some confirmation of the written conclusion of the audit report, the NRC inspector interviewed the supervisor of the personnel working in the Records Center. In response to a statement requesting confirmation that there were no exceptions to all quality records being stored onsite, the supervisor offered that there was one proceduralized exception. The supervisor offered the current Records Retention Schedule which indicated that charts made by control room stripchart recorders were stored onsite for a period up to 2 years and then were sent to the offsite facility for lifetime storage. The supervisor stated that the microfilming equipment could not handle the charts and the records center building was not large enough to permanently house the volume of records involved. It appears that the licensee has violated APM Procedure Q-17 and thereby the requirements of Criterion XVII of Appendix B to 10 CFR Part 50. (267/8815-01)

### 3. LER Followup

(Closed) LER 84-05: This LER was submitted to the NRC on April 26, 1984, and involved a finding made during a surveillance test of the prestressed concrete reactor vessel tendons. The initial finding was that individual wires in some tendons had failed, with the initial apparent cause of failure being a corrosion mechanism. Liftoff tests, which verify presence of adequate preload in the tendon, indicated that the reactor vessel remained within its design basis even though some wires had failed. Supplemental reports were submitted frequently as new information became available with a final (revised) report submitted June 16, 1986. The NRC inspector reviewed several correspondences between NRR and the licensee which indicated that there had been no significant continuing degradation of the tendons based on the results of additional surveillance tests conducted at 6-month intervals since the initial finding. Based on discussions with the NRR Project Manager and on review of the reports of the test, this LER is considered closed from an inspection standpoint.

### 4. Control of Design Changes and Modifications (37700)

The purpose of this area of the inspection was to verify continued adherence by the licensee to NRC requirements and to commitments made to the NRC in the area of design changes and modifications that are not considered to require NRC approval under 10 CFR 50.59. The NRC inspector reviewed the following documents and procedures germane to the control of design changes and modifications:

- o Updated Final Safety Analysis, Revision 5, paragraph B.5.3, "Design Controls"
- o Procedure Q-3, Issue 12, dated June 17, 1988, "Design Control System"
- o Procedure G-2, Issue 22, dated February 10, 1988, "Fort St. Vrain Procedure Systems"
- o Procedure G-3, Issue 8, dated May 27, 1987, "Action Request-Preparation and Processing"
- o Procedure G-9, Issue 9, dated April 6, 1988, "Controlled Work Procedures"
- o Procedure ENG-1, Issue 13, dated February 25, 1988, "Design Change Control"
- o Procedure ED-100, Issue 4, February 25, 1988, "Change Notice Preparation and Document Control"
- o Procedure SEMAP-12, Issue 2, dated June 16, 1988, "CWP Preparer's Instructions"



- o Procedure SEMAP-11, Issue 2, dated February 10, 1987, "Controlled Work Procedure (CWP) NED Instructions"
- o Procedure SEMAP-18, Issue 4, dated November 19, 1987, "Processing of Temporary Configuration Reports"
- o Procedure TASMAL-7, Issue 6, dated September 20, 1987, "Work Review Committee Guidelines"

The procedures essentially describe a program for design change and modification control in which nearly any person in any organization can request consideration of a proposed design change. Once approved, the request generally goes forward to the NED for action. The NED can originate changes as well as persons on the plant staff. Changes take on one of two forms. One form is of an essentially permanent nature and is documented in a Change Notice (CN) and is usually prepared within the NED under their procedural direction. The other form is a temporary change generally having an effect for a relatively short period of time and is documented on a Temporary Configuration Report (TCR). The CN package, when complete, contains a description of the change and an evaluation of the change at the 10 CFR 50.59 level and for environmental considerations. Equipment qualifications are also considered and documented. Changes are design reviewed by a person other than the originating engineer. After completion of review and approval of basic engineering, a Procurement, Installation, and Test Requirements document is prepared which includes a Bill of Materials, installation sequencing, and pertinent information to aid the users. Test requirements are included where required. When the complete package is ready, the package is forwarded to the plant staff which then develops a Controlled Work Package (CWP) that is reviewed and approved by the Work Review Committee and scheduled for implementation.

The TCR packages are subject to plant manager and Plant Operations Review Committee (PORC) approval prior to implementation and are reviewed after the fact by engineering. The same considerations outlined above for the CN are applied to these changes.

To verify implementation of the above program, the NRC inspector selected the following four CNs from a group of approximately four dozen scheduled for partial or complete implementation during the plant outage period of July 5 through October 15, 1988.

- o CN-2559 and CWP 88-157: Approves the use of elastometer "O"-ring seals in the helium circulators in lieu of the present metallic rings. This is a nonmandatory change that can be implemented as necessary.
- o CN-2715 and CWPs 88-0167 through -0174, and 88-0177: This package provides for a substantial number of bolting and antiseize material changes in the helium circulators. In all, approximately 46 detailed changes are documented.

- o CN-1878 and CWPs 88-086 through -094: Moves certain stripchart type recorders from the main control board to an auxiliary panel.
- o CN-2747 and CWPs 88-073 and -074: Replaces two existing valves with different model valves from the same vendor since the original valves are no longer available. Components for the old valves can no longer be obtained.

The NRC inspector reviewed each package in detail and found that all procedural requirements had been satisfied. The level of engineering detail was considered to be excellent as were the work instructions given for installation. The results of additional NRC inspection of design changes and controls implemented on the helium circulators are documented in paragraph 5 of this report.

In regard to implementation of the temporary changes, the NRC inspector obtained the following four TCRs from the Records Center that had been fully completed:

- o TCR 87-10-01: Authorized installation of a temporary electrical cable to replace a cable that had been damaged.
- o TCR 87-10-02: Authorized installation of a temporary electrical cable to replace a cable that had been damaged.
- o TCR 87-09-01: Authorized the removal of one cell from battery N9243 in order to use the cell in another battery bank.
- o TCR 87-09-02: Authorized connecting a temporary line to provide makeup water to the bearing water surge tank when reactor is at low pressure.

The above TCRs were all closed with restoration of normal service in approximately 2 months after initiation. The technical and safety basis for each of the changes was well documented and each had received PORC approval.

No violations or deviations were identified in this area of the inspection.

##### 5. Refurbishment of Reactor Helium Circulators

The purpose of this area of the inspection was to verify that design changes and repair activities addressed in PSC engineering report "Report of Helium Circulator S/N C-2101 and Inlet Piping S/N 2001 Repair and Modification Activities," Attachment 1 of PSC Letter P-88019 to the NRC dated January 22, 1988, were being implemented in accordance with licensee commitments and regulatory requirements.



a. Review of Fastener Installation Criteria (37700)

The NRC inspector reviewed Procedure MP-2229, "Removal and Installation of Pelton Wheel and Turbine Stator/Rotor Assemblies," Issue 2, effective date July 8, 1988, with respect to the commitments contained in the engineering report referenced above. During this review, the NRC inspector noted that the procedure did not address: (1) chamfering of the edge of the C-2101-431 counterbores (paragraph 5.5 of Attachment 1 to P-88019), and (2) cleaning of bolt holes to remove previous thread lubricants (paragraph 5.6 of Attachment 1 to P-88019). The NRC inspector also noted that the procedure torquing criteria for the C-2101-300-52 3/4-inch bolt created higher preload stresses as a result of the bolt being center drilled. In response to observations (1) and (2) above, the licensee furnished CWP No. 880170. The NRC inspector verified by review of this document that the requirements for chamfering of counterbores and cleaning of bolt holes had been specified. The NRC inspector also verified that the question of increased stress levels in the -52 bolts had been evaluated with a conclusion made that the small stress increase from the drilled hole still left the overall stress levels significantly below yield levels.

The NRC inspector additionally reviewed Procedure QCIM-33, "Control of Bolt Elongation Using the Stress-Mike Stress Control Computer," Issue 1, effective date July 8, 1988, which is utilized for measurement of C-2101-300-45 bolt elongation, and hence preload stress. The procedure was found to be satisfactory and consistent with commitments.

During the inspection, the NRC inspector questioned licensee personnel concerning the results of the GA Technologies inspection of the primary side of the S/N C-2101 helium circulator. Licensee personnel stated that they had not yet received the results of this inspection from GA Technologies. This subject is considered to be an open item pending the licensee obtaining the inspection results and NRC review. (267/8815-02)

No violations or deviations were identified in this area of the inspection.

b. Circulator Wobble Monitoring System (37700)

The NRC inspector reviewed the proposed operation of the circulator wobble monitoring system. Circulator shaft wobble is currently monitored by dedicated oscilloscopes and recorded daily per Test T-369. A surveillance procedure, now in draft form, will be implemented for monitoring of this parameter. The circulator shaft wobble data directly reflects sideways (radial) movement of the shaft at the probe location. Based on the limited clearances of the lower bearing (about 2 mils), the licensee has decided that a maximum wobble of 0.5 mils will be allowed. (The plant operations staff will

be alerted at 0.3 mils of wobble.) The NRC inspector had no further questions or comments concerning this system.

No violations or deviations were identified in this area of the inspection.

c. Receipt Inspection of Fasteners (38702)

- (1) Installation of Helium Circulator S/N C-2101: As a result of a prior observation that the S/N C-2101 helium circulator, which had been received from GA Technologies following refurbishment, was in the process of being installed, the NRC inspector decided to commence inspection in this subject area relative to fasteners installed by GA Technologies. At the start of the review, the NRC inspector requested verification that all PSC receipt inspection activities were complete for this circulator. QA/QC personnel informed the NRC inspector that a hold tag had been placed on the circulator on receipt as a result of the physical inability to place the circulator in the receiving area. This hold tag was placed to alert plant personnel that receipt inspection had not been completed and had not been removed as of the time of this discussion. The QA/QC supervisor ascertained that the circulator had been installed and initiated a stop work action.

Paragraph 4.8 of APM Procedure Q-8, "Identification and Control of Materials, Parts, and Components," Issue 7, effective date September 30, 1986, provides for conditional release of materials, which have not been accepted by QA/QC, for the purpose of alleviating delays in performance of construction or plant maintenance. A conditional release requires the approval of the NED Site Engineering Manager/Designee and the QA Services Manager/Designee. The NRC inspector ascertained from the NED Site Engineering Manager that a request had not been made for conditional release of the circulator. The failure to obtain appropriate authorization for installation of the S/N C-2101 helium circulator is an apparent violation of Criterion VIII of Appendix B to 10 CFR Part 50 and the licensee's approved QA program. (267/8815-03)

The NRC inspector additionally ascertained on August 2, 1988, that NCR 88-199 had been initiated on July 19, 1988, relative to materials documentation furnished by GA Technologies. This NCR was not dispositioned until after installation of the S/N C-2101 helium circulator. As a result of this status, the NRC inspector reviewed APM Q-15, "Nonconformance Reports," Issue 7, effective date March 15, 1988, with respect to the nature of work activities permitted on a component affected by an open NCR. Paragraph 3.7 of this procedure was found to prohibit work on the nonconforming part of an item until the NCR has been dispositioned and approved. While this requirement can be

construed as not prohibiting circulator installation, the circumstances bring into potential question the effectiveness of existing controls relative to Criterion XV of Appendix B to 10 CFR Part 50.

- (2) Review of Fastener Certifications: The NRC inspector reviewed materials documentation which was furnished by GA Technologies with replacement circulator fasteners. This review was performed relative to the commitments and criteria contained in Table 3 and paragraphs 5.2 and 6.0 of Attachment 1 to P-88019, with the emphasis placed on fastener part numbers which had exhibited prior stress corrosion cracking. The NRC inspector noted no discrepancies relative to the certified material test report data and heat treat charts furnished for fasteners which had been changed to Inconel X-750 materials.

During this review, it was noted, however, that no vendor certification had been received for 16 spring plungers (Item 37, Purchase Order (PO) N8446 through Supplement 02 dated June 6, 1988) which were changed by Table 3 of Attachment 1 to P-88019 from carbon steel to Inconel X-750. As a result of NRC inspector questions on the absence of documentation, PSC personnel contacted GA Technologies and were informed that a certified material test report was available which would be sent to PSC. This contact also established, however, that the modified Inconel X-750 heat treatment committed to by paragraph 5.2 of Attachment 1 to P-88019 had not been used for the spring plungers. It would appear from the available information that the spring plungers were not considered to be fasteners and thereby falling in the scope of commitments made for fastener procurement by Attachment 1 to P-88019. The items were, however, included in the Table 3 of Attachment 1 to P-88019 list of fasteners and lockwashers, without any modification of commitments subsequently being made. The failure to comply with the commitments made by Attachment 1 of P-88019 relative to procurement of spring plungers is an apparent deviation. (267/8815-04)

No discrepancies were noted by the NRC inspector with respect to the certification applicable to the 3/4-inch C-2101-300-104 and -105 A286 steam ducting to bearing assembly bolts (original part numbers were, respectively, C-2101-300-52 and -45). The NRC inspector did observe that only tensile strength values had been obtained by the vendor by tensile test of a completed fastener, but had no further questions as a result of Table 2 of Attachment 1 to P-88019 showing the minimum yield strength for the material was an estimated value.

The NRC inspector noted from review of PO N8446 that PSC had required only a certificate of conformance from GA Technologies in regard to many of the detailed QA requirements for fastener

procurement committed to by paragraph 6.0 of Attachment 1 to P-88019. The NRC inspector was thus unable to specifically verify implementation of these commitments by GA Technologies in the procurement process. This subject is considered an open item pending completion of a planned NRC inspection at GA Technologies. (267/8815-05)

The NRC inspector additionally reviewed a PSC procurement for steam inlet piping stud material (Part No. FP-91-M-19-4-42), which was indicated by paragraph 5.2 of Attachment 1 to P-88019 to have been changed from SA-193 Grade B5 to SA-193 Grade B7 material because of material availability reasons. It was noted that the stud material was ordered as bar stock from two separate vendors with no heat treat charts obtained, required threads rolled by another vendor, and fluorescent magnetic particle examination of the threads performed by PSC QA/QC personnel.

Paragraph 6.0 of Attachment 1 to P-88019 committed, however, for fastener procurement to require furnace charts for all heat treating. This paragraph additionally committed to fluorescent penetrant examination of completed fasteners per ASME Code Section V, Article 6, with no linear indications permitted in the shanks or threads. In response to a question on why the committed nondestructive examination method was not used, the NRC inspector was shown NCR 88-142. This NCR identified that fluorescent magnetic particle examination had been used and was dispositioned as acceptable based on equal sensitivity of the method and that the method was preferred by QA.

The NRC inspector additionally questioned why the shanks of these long studs (approximately 17 feet) had not been examined as committed. The rationale provided by PSC personnel was that only the threaded portions of the studs were actually loaded after installation. The NRC inspector did not disagree with the technical accuracy of this information after examination of an assembly. No information was provided to the NRC inspector, however, which would indicate that any modifications had been made to commitments contained in Attachment 1 to P-88019. The failure to fully implement these commitments with respect to steam inlet piping studs is an additional example of the apparent deviation described above. (267/8815-04)

While reviewing the PSC fluorescent magnetic particle examination report for the threads on the steam inlet piping studs, the NRC inspector noted that the record indicated only one direction of examination was performed; i.e., only a three turn coil was denoted as being used. The NRC inspector then reviewed the applicable Procedure QCIM-24, "Fluorescent Magnetic Particle Inspection," Issue 4, effective date September 22, 1987. This review confirmed that the procedure was consistent

with ASME Code Section V requirements relative to two directions of examination being required, with the lines of magnetic flux for the second examination being perpendicular to the flux direction in the first examination. The NRC inspector questioned the adequacy of the magnetizing current used for the coil examination with respect to the equation specified by ASME Code Section V and the procedure for determining this parameter. PSC personnel informed the NRC inspector that a magnetic particle field indicator had been used to assure the adequacy of the magnetizing field. Use of this device is permitted as an alternate to the equation for assuring adequacy of magnetizing field. The failure of PSC personnel to perform the required two directions of magnetic particle examination is an apparent violation of Criterion IX of Appendix B to 10 CFR Part 50 and the licensee's approved QA program. (267/8815-06)

d. Repair Welding and Examination of Steam Ducting Struts (55050, 57060)

The NRC inspector requested a repeat liquid penetrant examination of a sample of upper strut to scroll plate weld repairs in the "A" S/N C-2102 helium circulator. The NRC inspector selected Struts 4 and 11 for this examination and examined the results. No relevant indications were noted. The NRC inspector reviewed the applicable Procedure QCIM-20, "Liquid Penetrant Test Procedure," Issue 6, effective date June 20, 1987, and found it to be consistent with the requirements of ASME Code Sections III and V.

The NRC inspector examined the weld data sheets, filler material certified material test reports, and liquid penetrant examination reports which were applicable to PSC repair welding of the upper strut to scroll plate welds in the S/N C-2102 and C-2105 helium circulators. A verification was also performed that the welders documented on the weld data sheets as performing the weld repairs were included in the welders qualification status listing for the applicable Welding Procedure Specification (WPS).

During the review, the NRC inspector noted that different WPSs were indicated by the weld data sheets as being used for the repairs made to the two helium circulators. In following up the reasons why this happened, the NRC inspector ascertained the following information. NCR 88-186 was initiated on July 13, 1988, as a result of the liquid penetrant examination identification of linear indications in all 16 upper strut to scroll plate welds in the S/N C-2105 helium circulator. On the same date, NCR 88-190 was initiated relative to the WPS to be used for repair welding, WPS 5A/B-3, being incorrectly qualified for ASME Code Section IX P-5 to P-5 material rather than the required P-4 to P-4 material qualification. This NCR was dispositioned "use-as-is," with the instruction given to perform welding on the circulator using WPS 5A/B-3 and to perform a P-4 material procedure qualification prior to operation of the circulator. The disposition additionally permitted use of a



different welding process (i.e., shielded metal arc) to the gas tungsten arc welding (GTAW) process specified by WPS 5A/B-3, again on the premise of qualification prior to circulator operation. This approach fails to recognize that special processes are required by Criterion IX of Appendix B to 10 CFR Part 50 and APM Procedure Q-9, "Control of Special Processes," Issue 8, effective date December 1, 1986, to be performed using qualified procedures. The failure to qualify a WPS for P-4 material application prior to use is considered an additional example of the apparent violation described in paragraph 5.c above. (267/8815-06)

The NRC inspector noted that the GTAW WPS for P-4 material, WPS 4-A/B-3, was qualified prior to use for repairs made to the upper strut to scroll plate welds in the "A" helium circulator (S/N C-2102). This WPS reduced the permissible maximum interpass temperature to 400°F from the 600°F permitted by WPS 5A/B-3 and also slightly increased the permissible amperage range, neither of which parameters are ASME Code Section IX essential variables for the application.

The NRC inspector additionally reviewed welding and nondestructive examination records which were applicable to repair welding by GA Technologies of the upper strut to scroll plate welds in the S/N C-2101 helium circulator. During the review, the NRC inspector noted that the record package furnished to him by PSC included a welding procedure qualification record (PQR) but not a WPS. A copy of the GA Technologies WPS used for the repair welding was requested from PSC. The NRC inspector was subsequently informed by PSC personnel that GA Technologies personnel had stated to PSC that the same parameters documented on the PQR were used for the repair welding. In response to a direct question on the existence of a WPS, the NRC inspector was informed that GA Technologies had not prepared a WPS for this activity. This subject is considered unresolved pending performance of a planned NRC inspection at GA Technologies. (267/8815-07)

#### 6. Unresolved Item

Unresolved items are matters about which more information is required in order to ascertain whether or not the items are acceptable, violations, or deviations. The following unresolved item was discussed in this report:

<u>Paragraph</u>	<u>Item</u>	<u>Subject</u>
5.d	267/8815-07	Performance of repair welding without a WPS



7. Exit Interview

Exit interviews were conducted on July 14 and August 5, 1988, with the licensee personnel denoted in paragraph 1. During these interviews, the NRC inspectors reviewed the scope and findings of the inspection.