

ORGANIZATION: PULLMAN POWER PRODUCTS
WILLIAMSPORT, PENNSYLVANIA

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| REPORT NO.: 99900021/81-01 | INSPECTION DATE(S): 10/6-9/81 | INSPECTION ON-SITE HOURS: 26 |
| CORRESPONDENCE ADDRESS: Pullman Power Products ATTN: Mr. T. Daniels, Director Quality Assurance P. O. Box 3308, Reach Road Williamsport, Pennsylvania 17701 | | |
| ORGANIZATION CONTACT: Mr. T. Daniels, Director, Quality Assurance TELEPHONE: (717) 323 9991 | | |
| PRINCIPAL PRODUCT: Nuclear Piping | | |
| NUCLEAR INDUSTRY ACTIVITY: Approximately 40% of their work is devoted to the commercial nuclear industry, with most of that effort being provided to Georgia Power Company's Alvin W. Vogtle, Jr. Nuclear Power Plant, Units 1 and 2, and Cleveland Electric Illuminating Company's Perry Nuclear Power Plant, Units 1 and 2. | | |
| ASSIGNED INSPECTOR: <i>for</i> <u>Wedin Stapor</u> L. E. Ellershaw, Reactive Inspection Section (RIS) | | <u>11-5-81</u> Date |
| OTHER INSPECTOR(S): | | |
| APPROVED BY: <i>for</i> <u>Wedin Stapor</u> I. Barnes, Chief, RIS | | <u>11-5-81</u> Date |
| INSPECTION BASES AND SCOPE: | | |
| A. BASES: 10 CFR Part 21 and 10 CFR Part 50, Appendix B. | | |
| B. SCOPE: This inspection was made as a result of a 10 CFR Part 21 written notification by Gilbert Associates, Inc., pertaining to mechanical penetration attachment plates provided to Perry, Units 1 and 2, not being impact tested or normalized, and a written request by Office of Inspection and Enforcement, Headquarters, pertaining to questionable impact properties of E7018 and E70S-6 welding materials. Additional areas selected for inspection included: weld material control; welding process control; and manufacturing process control. | | |
| DESIGNATED ORIGINAL Certified By <u>Rheanne Joubert</u> | | |

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REPORT NO.: 99900021/81-01

INSPECTION RESULTS:

PAGE 2 of 4

A. VIOLATIONS:

None

B. NONCONFORMANCES:

1. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 3, a Design Specification and its subsequent revisions were reviewed and accepted, in which the necessary data was not in sufficient detail to form the basis for fabrication to the ASME Code and as a result, certain materials used in the fabrication of containment penetration attachment plates for the Perry Nuclear Power Plant had not been impact tested.
2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and QA Manual Section 8.2; one holding oven contained type 309-16 electrodes in which 1/8" and 5/32" sizes were mixed together, and another oven identified as containing only type 8018 electrodes, also contained type 7018 electrodes of the same size (5/32") mixed together.
3. Contrary to Criterion V of Appendix B to 10 CFR Part 50, ASME Code Section IX, and QA Manual Section 9, changes to nonessential variables (amperage and voltage) were being made during in-process SMAW, without the changes being documented either in an amendment to the welding procedure specification (WPS) or a new WPS. ✓
4. Contrary to Criterion V of Appendix B to 10 CFR Part 50, and QA Manual Section 10, the identification of actual procedures selected for use during fabrication, and their revision dates, has been recorded incorrectly on the process sheets. ✓

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. 10 CFR Part 21 Report - A written notification was made by Gilbert Associates, Inc., (GAI) on April 28, 1981, pertaining to mechanical penetration attachment plates which attach piping to ASME Code Class MC containment penetration sleeves, not being impact tested in accordance with ASME Code, Section III, Subsection NE. Subsequently, Pullman Power Products (PPP) identified the heats of material used in the plate material and had impact tests performed. The material which failed, has been replaced. The GAI design specification did not require impact testing nor did the design drawings specify that impact testing was to be performed.

Revision XI to the GAI design specification (SP-527-4549-00) dated April 8, 1981, now addresses the material requirements for the plate assemblies. However, it also provides specific requirements for the penetration plates which are contrary to ASME Code requirements. As a result, Nonconformance B.1. was identified.

REPORT NO.: 99900021/81-01

INSPECTION RESULTS:

PAGE 3 of 4

2. Questionable Impact Properties of Welding Materials - During an NRC inspection at the Perry Nuclear Power Plant, the suitability of certain heats of E70S-6 bare wire and E7018 electrodes for use in ASME Section III components became suspect, due to reported impact test results on Material Test Reports (MTR).

PPP ordered 450 lbs. of 1/16" E70S-6 wire (SFA 5.18) to chemistry only, with physical tests to be performed later by PPP or a vendor. PPP received an initial 50 lbs. of wire for test purposes on June 14, 1976. This was sent to W. B. Coleman Co., a testing laboratory, on purchase order no. 76-15, for the purpose of conducting physical testing in accordance with SFA 5.18. The acceptance criteria for the impact tests is 20 ft. lbs. energy (minimum) at a test temperature of -20 F, which was exceeded by this material. Lateral expansion is not part of the acceptance criteria. PPP decided to upgrade this material to meet the requirements of ASME Section III, NB-2332. Additional wire was sent to W. B. Coleman on purchase order no. 77-94 dated November 29, 1977, for physical testing to meet the requirements of NB-2332, in which lateral expansion is part of the acceptance criteria. The wire was tested at +30 F (the service temperature as stated in the design specification) and met all requirements in both the as-welded and stress relieved conditions, as shown on the Certified Material Test Reports provided by W. B. Coleman, dated November 29, 30, and December 1, 1977.

Three heats of E7018 electrodes were identified as having questionable impact properties. Each heat was tested for impact properties by having five specimens tested in the as-welded condition and a stress relieved condition. Section II C of the ASME Code allows the low and high results for the energy, ft. lbs., to be discarded. These values were reported on the CMTRs. If they had been discarded, the low lateral expansion results would have been eliminated in two of the three cases. The remaining low value, 30 mils lateral expansion, would not be acceptable if these electrodes had been used on based material with fracture toughness requirements and a nominal wall thickness of over 1½", in that the ASME Code requires a minimum of 40 mils lateral expansion. However, this welding material was used on material with a nominal wall thickness of 1½" or less, and the ASME Code requirements in this case is 25 mils lateral expansion. In addition, a review of all nuclear material sheets from the time this welding material was accepted (August 25, 1976) till the time it was depleted (August 30, 1977) and the associated design specifications, revealed there were no special customer requirements for impact testing in excess of ASME Code requirements.

3. Weld Material Control - This area was inspected by review of PPP's procurement, receipt, inspection, storage and issue of welding materials. Included was a review of 20 Certified Material Test Reports and verification of wire/flux combinations testing. During observation of stored welding materials in holding ovens, nonconformance B.2. was identified.

ORGANIZATION: PULLMAN POWER PRODUCTS
WILLIAMSPORT, PENNSYLVANIA

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| REPORT NO.: 99900021/81-01 | INSPECTION RESULTS: | PAGE 4 of 4 |
| <p>4. Welding Process Control - This area was inspected by review of five welding procedure specifications and their procedure qualification records, and observation of four in-process SMAW and SAW operations. During observation of SMAW, nonconformance B.3. was identified.</p> <p>5. Manufacturing Process Control - This area was inspected by review of eight in-process and completed traveler packages including process sheets, shop drawings, and the referenced specifications. Nonconformance B.4. was identified.</p> | | |

Inspector LEE Ellershaw
Scope/Module Inspection on 10/6-9/81

Scope/Module Inspection on 10/6-9/81

DOCUMENTS EXAMINED

Docket No. 99900021
Report No. 81-01
Page 2 of 2

| 1 | 2 | TITLE/SUBJECT | 3 | 4 |
|----|---|--|---------|----|
| 1 | 4 | Pullman Power Products QA Manual | 8-11-81 | - |
| 2 | 2 | Gilbert Associates, Inc. Design Specification SP-527-4549-00 | 4-8-81 | X1 |
| 3 | 5 | 6 Purchase orders pertaining to welding materials | - | - |
| 4 | 8 | 15 Certified Material Test Reports of welding materials | - | - |
| 5 | 8 | Weld Rod Control Sheet | 10-2-81 | - |
| 6 | 3 | Welding Procedure Specification (WPS) No. 70 | 6-24-69 | - |
| 7 | 3 | WPS No. 25 | 3-1-79 | - |
| 8 | 3 | WPS No. 24 | 3-1-79 | - |
| 9 | 1 | 10 design drawings | - | - |
| 10 | 8 | 6 Traveler packages from Job No. 8087 | - | - |
| 11 | 8 | 4 Heat Treat Charts from Job No 8087 | - | - |

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchase Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Columns:

1. Sequential Item Number
2. Type of Document
3. Date of Document
4. Revision (If applicable)