APPENDIX B

Cardinal Industrial Products Corporation
Docket No. 99900840/83-01

NOTICE OF NONCONFORMANCE

Based on the results of an NRC inspection conducted on October 11-14 and November 14-18, 1983, it appears that certain of your activities were not conducted in accordance with NRC requirements. Nonconformances with these requirements are as follows.

A. Criterion IX of Appendix B to 10 CFR Part 50 states, "Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

Contrary to the above, the Quality Assurance Manual (QAM) did not establish measures to assure that welding was controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes. Cardinal Industrial Products Corporation (CIPC) supplied 52 Locking Cup Assemblies to Arkansas Power & Light Co. (AP&L) Arkansas Nuclear One, Unit 1, in which fabrication, including welding, was required to be in accordance with Subsection NG in Section III of the ASME Code. In addition to the CIPC QAM not establishing the required measures, a welding procedure specification, procedure qualification record, and welder qualifications could not be located during this inspection.

B. Criterion V of Appendix B to 10 CFR Part 50 states, "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. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

Paragraph 8-3 of Section 8 in the CIPC QAM states, in part, "Materials shall be purchased from a vendor whose Quality System Program has been surveyed, qualified, and approved by Cardinal Industrial Products Corporation (and appropriate records maintained in the files of the Quality Assurance Department)."

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Paragraph NCA-3862 in Section III of the ASME Code requires that the vendor Quality System Program be documented in a Quality System Manual or an Identification and Verification Manual, and that these manuals shall be the major basis for demonstration of Code compliance.

Contrary to the above, survey/audit records did not provide objective evidence of either performance of satisfactory surveys and audits, or that vendor manuals were the major basis for demonstration of ASME Code compliance, as evidenced by the following categories of examples:

1. Acceptance of vendors' Quality Assurance Programs written in

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2. Vendor survey/audits performed by CIPC were not documented in survey/audit checklists -

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3. Vendor survey/audit checklists with all questions checked off as being acceptable, but with no supporting evidence -

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4. Erroneous supporting evidence statement added to a vendor survey/audit checklist -

Note: Survey Report No. J-1, dated September 22 and 28, 1983, has

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the following question in Section V, Part B.4: "Are there established measures to show the status and results of any required examination or test for the material at any time." The answer was "Yes", with this note: "Charpy is the only required test per Cardinal PO per material specification." However, all reviewed Certified Material Test Reports (CMTR) indicated Izod impact tests were performed instead of Charpy V-Notch (CVN) impact tests.

5. Placement of vendors on approved vendor list without required survey/audit being performed -

6. Approval of a vendor whose quality program was not in complete compliance as evidenced by the survey/audit checklist -

7. Survey/audit checklists apparently filled out by vendor (Self-Audit) -

Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph 5-3 in Section 5 of the QAM states, in part, "Purchase orders for all nuclear . . . materials shall be initiated by the Purchasing Department. The purchase order shall have the codes, standards and specification requirements sufficiently detailed so that the supplier has the necessary information to provide the material required."

Paragraph 5-4 states, "The purchase order shall be forwarded to the Quality Assurance Department for review and approval."

Paragraph 5-5 states, "The purchase order shall then be forwarded to an approved vendor on Cardinal's AVL (Approved Vendor List)."

Paragraph 3.4 in CIPC Standard Practice No. CSF 5.003 states, "All Purchase Orders shall carry the following statement: 'The above material was manufactured and supplied in accordance with (name of Vendor) Quality Assurance Program Revision No. _____ and Date _____, surveyed and approved by Cardinal Industrial Products Corporation on Date '."

Contrary to the above, a review of numerous CIPC purchase orders (POs) and the associated vendor CMTRs for materials which were subsequently sold for ASME Code Section III applications revealed the following conditions:

1. CIPC did not invoke ASME Code requirements on POs to their vendors.

2. Numerous POs were not approved by the QA Department.

3. Certain POs were placed with vendors not on CIPC's AVL.

4. Numerous CIPC POs did not contain a statement that the material was to be manufactured in accordance with a QA Program meeting the requirements of NCA-3800, and approved by CIPC.

D. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph NCA-3867.4(e) in Section III of the ASME Code states, in part, "The Material Manufacturer who certifies material made from stock produced by a manufacturer whose Quality System Program has not been qualified under NCA-3800 may accept the certification of the requirements of the material specification which must be performed during the melting and of the heat analysis from the manufacturer of the stock provided . . . (1) . . . The Material Manufacturer performs or subcontracts all other requirements of the material specification on each piece of stock material. Alternatively, the Material Manufacturer may perform or subcontract all other requirements of the material specification on each heat and lot of material, provided traceability has been established by his Program or the Program of the Certificate Holder who uses the material . . . . (2) The Material Manufacturer performs or subcontracts a product analysis to verify the chemical composition of each piece of stock material furnished by the stock material manufacturer . . . ."

Contrary to the above, CIPC improperly certified stock materials (i.e., materials procured from manufacturers without specification that the material be produced using a Quality System Program that had been verified by survey to be in accordance with the requirements of Subarticle NCA-3800 in Section III of the ASME Code) as being in compliance with Section III of the ASME Code. Material specification requirements other than those applicable during melting had, however, not been performed on either a piece or heat basis and product analysis was not performed on each piece of stock material.

Identified customers receiving these materials include: HUB, Inc.; Commonwealth Edison Company; AP&L; Carolina Power & Light Company; Arizona Public Service Company (APS); Northern States Power Company, and Consumers Power Company. It was further identified that Transamerica Delaval, Inc. indirectly received some of these materials from CIPC through POs placed with Sargent Nut & Bolt Company and Liberty Equipment & Supply Co.

E. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph 3.1 in CIPC Standard Practice No. CSP 7.002 states, "On receipt of a shipment of material and/or fastener(s), the Cardinal Quality Assurance Department Representative will verify the Certification and Documentation for completeness in accordance with Invoked Codes, Standards, and/or Specification, i.e.: ASTM, ASME, SAE, ANSI, and the Cardinal Purchase Order."

Contrary to the above, a review of approximately 50 CIPC accepted vendor certification/documentation packages revealed that they were not in accordance with invoked codes, standards and/or specifications as evidenced by the following:

1. The CMTRs for material received from reported Izod impact test results rather than the material specification and ASME Code required CVN impact tests.

2. CIPC accepted CMTRs from in which the reported stress relief temperatures were as much as 120°F below the allowable minimum temperature.

3. CIPC accepted a CMTR from dated May 6, 1981, in which the stated proof load value of 245,900 lbs was less than the material specification required value of 261,100 lbs. Subsequently on November 9, 1982, CIPC altered the CMTR to reflect the correct value, with the notation. "per A corrected CMTR was not obtained from

4. CIPC accepted CMTRs from which contained the required QA statement pertaining to the material being manufactured and supplied in accordance with the QA Program as approved by CIPC. However, the name identified in the statement as being the manufacturer and supplier was not but

5. CIPC accepted a CMTR from in which the reported stress rupture time was 57.1 hours which did not meet the material specification requirement of 100 hours minimum that was imposed in AP&L's Specification No. APL-M-402 for material used in thermal shield special bolts.

6. CIPC accepted a CMTR from in which only single mechanical test results were reported rather than the results of multiple tests required by the material specification for the quantity ordered. The CMTR additionally did not contain any heat treatment information to show compliance with the minimum tempering temperature requirements of the material specification.

F. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph 15-3 of Section 15 in the QAM states, in part, ". . . The test requirements shall be in accordance with the customer requirements, invoked codes, standards and specifications."

Paragraphs NB and NC-2343 in Section III of the ASME Code state, in part, "One test (Cv) shall be made from each lot of bars . . . where a lot is defined as one heat of material treated in one charge or as one continuous operation, not to exceed 6000 lbs."

Paragraph NX-2321 states, in part, with respect to CVN impact tests, ". . . The results, orientation and location of all tests performed . . . shall be reported in the Certified Material Test Report."

Paragraph NB-2581 states, in part, "Bolts, studs, and nuts shall . . . be examined in accordance with the requirements of paragraphs RU (visual examination), RZ (ultrasonic examination - for sizes greater than 2" nominal bolt size), and either RW (magnetic particle examination) or RX (liquid penetrant examination - greater than 1" nominal bolt size) of SA-614."

Contrary to the above, test and examination requirements have not been performed in accordance with customer requirements, invoked codes, standards and specifications as evidenced by the following:

1. CIPC failed to comply with AP&L imposed Combustion Engineering Specification No. N-POH16(h) for primary manway studs with respect to:

   a. Removal of test coupons after heat treatment of production material.

   b. Testing of both ends of one bar from each heat in each tempering charge.

   c. Performance of CVN impact testing after all heat treatments had been given to the production material.

   d. Removal of CVN impact specimens with mid-length of specimens at least one diameter or thickness from a heat treated end.

   e. Performance of sufficient CVN impact tests to establish upper and lower energy shelves of the CVN transition curve.

2. CIPC failed to comply with AP&L Specification No. APL-M-402 with respect to reporting the cobalt content of the material used for the thermal shield special bolts.

3. CIPC failed to have performed the required number of CVN impact tests on material received which was in excess of the 6000 lbs. heat treatment lot limitation.

4. When CIPC did have CVN impact tests performed, they failed to report the orientation and location of the test specimens on their CMTRs.

5. The following was identified with respect to nondestructive examination (NDE):

   a. There were no records to show that required magnetic particle examination (MT) had been performed on 28, 1-½ inch bolts supplied to APS on January 11, 1982.

   b. CIPC CMTR No. 34265 attested that MT had been performed on 20, 1-½ inch nuts supplied to APS; however, there were no MT reports to substantiate that MT had been performed.

      CIPC's Customer Production Record (CPR), a route sheet, listed an MT operation referencing a test report (NO. 6708); however, review of Test Report No. 6708 showed that it was a report of CVN impact test results.

   c. CIPC CMTR No. 31690 dated June 16, 1983, did not report the required MT as being performed on a bolt supplied to Northern States Power Co., nor was there an MT report available.

   d. CIPC CMTR No. 30162 dated April 26, 1983, stated that 40, 2-½ inch studs supplied to Consumers Power Co. had been ultrasonic examined (UT'd). However, review of the applicable UT reports for this material failed to show that 31 pieces had been UT'd.

6. AP&L imposed Combustion Engineering, Inc., Specification No. N-POH19(b) in procurement of primary manway stud nuts. This specification required that a tensile test be performed on the material used to manufacture the nuts. CIPC furnished, however, inventory nuts from for which the required starting material tesile test had not either been required or performed.

G. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph 20-3 in Section 20 of the QAM states, "Training for Non-Destructive Examination (Testing) personnel shall be in accordance with the applicable sections of recommended practice No. SNT-TC-1A (June 1975 Edition)." SNT-TC-1A requires that certification records be maintained on file.

Paragraph NB-5521 in Section III of the ASME Code (Summer 1982 Addenda) states, in part, "(a) Personnel performing nondestructive examinations shall be qualified in accordance with the recommended guidelines of SNT-TC-1A. . . . The recommended guidelines of SNT-TC-1A shall be considered minimum requirements . . . (1) Qualification of Level III nondestructive examination personnel shall be by examination."

Footnote 4, which is referenced by (a) above, states, "Personnel qualified by examination and recertified to the 1975 edition are considered qualified to the 1980 edition where the recertification is based on continuing satisfactory performance. All reexaminations and new examinations shall be in accordance with the 1980 edition."

Contrary to the above, the current Level III Examiner in liquid penetrant examination (PT), MT and UT at
was employed in February 1983 and was certified on March 1, 1983, by examinations which were not in accordance with the 1980 edition of SNT-TC-1A.

Paragraph 8.3.3 in SNT-TC-1A specifies the following with respect to the types of tests and numbers of questions:

Basic Examination - 50
Method Examination - 65 (for each method)
Specific Examination - 20 (for each method)

A review of the Level III Examiner's qualifications records revealed the following with respect to types of tests and numbers of questions:

General Test - 30
Specific - 15 (for each method)
Practical - 10 (for each method)

In addition, there were no valid qualification records available for the Level II radiographer who performed radiography on December 20, 1982, of the thermal shield special bolt heads which were subsequently supplied to AP&L.

H. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph T-110 in Article 1, Section V of the ASME Code states, in part, "(a) This Section of the Code contains requirements and methods for nondestructive examination which are Code requirements to the extent they are specifically referenced and required by other Code Sections . . . . They include . . . visual examination . . . ."

Paragraph T-291 in Article 9, "Visual Examination," Section V of the ASME Code states, in part, "Visual examinations to this Article, when required by the referencing Code Sections, shall be done to a written procedure . . . ."

Paragraph NB-5521 states, in part, ". . . For nondestructive examination methods not covered by SNT-TC-1A documents, personnel shall be qualified to comparable levels of competency by subjection to comparable examinations on the particular method involved."

SNT-TC-1A and the ASME Code require that NDE personnel be given eye examinations on an annual basis to assure natural or corrected near distance acuity.

Contrary to the above, CIPC has treated required visual examination as an inspection function and not an NDE discipline. As a result, personnel performing this activity have neither been qualified nor have they been given eye examinations. Further, written procedures did not exist to provide for the performance of visual examination.

I. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Subparagraph NCA-3867.4(b) in Section III of the ASME Code states, in part, "The Material Manufacturer . . . shall provide a Certified Material Test Report when required in the appropriate Subsection . . . ." Paragraph NCA-3867.5 states, in part, ". . . The Material Supplier shall transmit all Material Manufacturer's Certified Material Test Reports . . . to the purchaser at the time of shipment."

Contrary to the above, CIPC, when acting as a material supplier, does not transmit all material manufacturer CMTRs to the purchaser. CIPC's practice is to transcribe data from their vendor CMTRs onto their own master certification, which is subsequently provided to the purchaser. With respect to transcription, it was noted during review of vendor CMTRs and CIPC's applicable master certifications that certain conditions existed in which the purchaser may not have received the correct data.

1. Numerous CMTRs from provided the following heat treatment data for A-193 Grade B7 material: Quench 1530° - 1560°F 40-70 minutes, tempering 1080° - 1150°F 2 hours, and stress relieve 930° - 1040°F 4 hours. CIPC optimized this data without benefit of objective evidence (i.e., temperature recording charts) to produce a master certification which showed: Harden 1560°F 1:10 hours, temper 1150°F 2 hours, and stress relieve 1040°F 4 hours.

2. CMTRs provided to Consumers Power Co. (Nos. 28961 and 28963) showed the tempering temperature to be 1100°F minimum. However, there was no supporting documentation as to the source of this data.

3. CMTR No. 25517, provided to Northern States Power, showed a proof load value of 133,700 lbs., but there was no supporting documentation as to the source of this data.

J. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . . ."

Paragraph 2.10 in CIPC Standard Practice No. CSP 7.001 states, "As additional certification input is received (heat treating, destructive, nondestructive testing, plating, etc.) such Certified information shall be added to the Cardinal Certification as required by the Customer Purchase Order."

Paragraph NCA-3867.4 in Section III of the ASME Code states, in part, with respect to CMTR reporting requirements, ". . . When specific times and temperatures (or temperature ranges) are not required by the material specification, a statement of the type of heat treated condition shall be reported . . . ."

Contrary to the above, a statement reflecting performance of normalizing and hardening heat treatments was not reported on certain of the CIPC CMTRs for ASME Code Section III, Class 1 primary manway studs supplied to AP&L on PO No. 73555.