Licensee Contractor and Vendor Inspection Status Report

Quarterly Report
October – December 1997

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

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October – December 1997

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**Division of Reactor Controls and Human Factors
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001**

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ABSTRACT

This periodical covers the results of inspections performed between October 1997 and December 1997 by the NRC's Quality Assurance, Vendor Inspection and Maintenance Branch that have been distributed to the inspected organizations.

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INTRODUCTION

A fundamental premise of the U. S. Nuclear Regulatory Commission (NRC) licensing and inspection program is that licensees are responsible for the proper construction and safe and efficient operation of their nuclear power plants. The Federal government and nuclear industry have established a system for the inspection of commercial nuclear facilities to provide for multiple levels of inspection and verification. Each licensee, contractor, and vendor participates in a quality verification process in compliance with requirements prescribed by the NRC's rules and regulations (Title 10 of the *Code of Federal Regulations*). The NRC does inspections to oversee the commercial nuclear industry to determine whether its requirements are being met by licensees and their contractors, while the major inspection effort is performed by the industry within the framework of quality verification programs.

The licensee is responsible for developing and maintaining a detailed quality assurance (QA) plan with implementing procedures pursuant to 10 CFR Part 50. Through a system of planned and periodic audits and inspections, the licensee is responsible for ensuring that suppliers, contractors and vendors also have suitable and appropriate quality programs that meet NRC requirements, guides, codes, and standards.

The NRC reviews and inspects nuclear steam system suppliers (NSSSs), architect engineering (AE) firms, suppliers of products and services, independent testing laboratories performing equipment qualification tests, and holders of NRC construction permits and operating licenses in vendor-related areas. These inspections are done to ensure that the root causes of reported vendor-related problems are determined and appropriate corrective actions are developed. The inspections also review vendors to verify conformance with applicable NRC and industry quality requirements, to verify oversight of their vendors, and coordination between licensees and vendors.

The NRC does inspections to verify the quality and suitability of vendor products, licensee-vendor interface, environmental qualification of equipment, and review of equipment problems found during operation and their corrective action. When nonconformances with NRC requirements and regulations are found, the inspected organization is required to take appropriate corrective action and to institute preventive measures to preclude recurrence. When generic implications are found, NRC ensures that affected licensees are informed through vendor reporting or by NRC generic correspondence such as information notices and bulletins.

This quarterly report contains copies of all vendor inspection reports issued during the calendar quarter for which it is published. Each vendor inspection report lists the nuclear facilities inspected. This information will also alert affected regional offices to any significant problem areas that may require special attention. This report lists selected bulletins, generic letters, and information notices, and include copies of other pertinent correspondence involving vendor issues.

INSPECTION REPORTS

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 19, 1997

Mr. Paul Heffernan
Astro Nuclear Dynamics Inc.
2901 Industrial Blvd.
Bethel Park, PA 15102

SUBJECT: NRC INSPECTION REPORT 99901324/97-01 AND NOTICE OF
NONCONFORMANCE

Dear Mr. Heffernan:

On August 26-29 and October 30, 1997, the U.S. Nuclear Regulatory Commission (NRC) performed an inspection at the Astro Nuclear Dynamics Inc. (ANDI) facility. The enclosed report presents the findings of that inspection.

The inspection was conducted to assess specific attributes and implementation of the ANDI quality assurance (QA) program to ascertain whether it met NRC requirements. The inspector assessed ANDI's conformance to customer procurement requirements, commercial grade dedication activities and compliance with Part 21 of Title 10 of the Code of Federal Regulations. The inspector also assessed licensee monitoring of the quality of items purchased from ANDI.

During the inspection, the inspectors determined that ANDI did not adequately implement its quality assurance (QA) program to comply with NRC requirements imposed upon ANDI by its customers. Specifically, ANDI did not (1) assure that personnel designated to approve quality assurance documents were properly trained and certified, and (2) assure that products designated as safety-related were stored in an appropriate environment.

These issues are cited in the enclosed Notice of Nonconformance (NON), and the circumstances surrounding them are described in detail in the enclosed report. You are requested to respond to the nonconformance 97-01-02 and should follow the instructions specified in the enclosed NON when preparing your response. You are not requested to respond to nonconformance 97-01-01 because your corrective actions were found acceptable during the October 30, 1997, part of inspection.

In a September 2, 1997, letter to the NRC, ANDI stated that it was taking corrective actions to improve its QA program to enhance interface and coordination with its customers, and evaluate the adequacy of the ANDI storage facility for protecting safety-related items. ANDI further stated that it plans to hire an auditing service to perform an independent annual audit of ANDI's QA program and its implementation.

In addition, the inspector observed that licensee monitoring of ANDI's control of quality did not identify the nonconformances described above.

Mr. P. Heffernan

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC's Public Document Room.

Sincerely,

A handwritten signature in cursive script that reads "Suzanne C. Black".

Suzanne C. Black, Chief
Quality Assurance, Vendor Inspection,
and Maintenance Branch
Division of Reactor Controls and Human Factors
Office of Nuclear Reactor Regulation

Docket No. 99901324

Enclosures: 1. Notice of Nonconformance
2. Inspection Report 99901324/97-01

Mr. P. Heffernan

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cc:

Mr. James Johns
Supervisor, Quality Services
Duquesne Light Company
P.O. Box 4
Shippingport, PA 15077

Mr. Danny Leigh
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Washington, D.C. 20004

NOTICE OF NONCONFORMANCE

Astro Nuclear Dynamics Inc.
Bethel Park, PA

Docket No.: 99901324

Based on the results of an NRC inspection conducted on August 26-29 and October 30, 1997, it appears that certain of your activities were not conducted in accordance with NRC requirements:

1. Criterion II of Appendix B to 10 CFR Part 50, "Quality Assurance Program," requires, in part, that the program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained.

Paragraph 4.1 of Section 1-2, "Personnel Qualifications-Inspection and Test," Astro Nuclear Dynamics Inc. (ANDI) Quality Assurance Procedures (QAP), dated June 4, 1995, requires, in part, that qualification of personnel shall be established on the basis of achieved technical training.

Contrary to these requirements, the president of ANDI was responsible to assure that the quality of items sold through ANDI's brokerage program conformed to procurement documents, but was not trained for the task.

During the October 30, 1997, inspection, the inspector noted that ANDI had discontinued the use of procedure CP-110, "Control and Administration of Brokered Items Purchased for Resale." Therefore, all certificates of compliance must now be signed by the Quality Assurance Manager. Therefore, no response is required for this Noncompliance.

(Nonconformance 99901324/97-01-01)

2. Criterion XIII of Appendix B to 10 CFR Part 50, "Handling, Storage, and Shipping," requires, in part, that measures shall be established to prevent the use of incorrect or defective materials, parts, or components. For particular products, special protective environments, such as moisture and temperature levels, shall be provided to prevent damage or deterioration.

Paragraph 8.0 of Section 13-1, "Handling, Storage, and Shipping," ANDI QAP, dated June 14, 1995, requires that storage requirements be evaluated and appropriate controls and facilities provided to protect the material or equipment against damage, minimize deterioration, and prevent contamination during storage.

Contrary to these requirements, ANDI's storage facility did not have uniform heating and temperature control to protect applicable safety-related items from condensation and corrosion.

(Nonconformance 99901324/97-01-02)

Please send a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with a copy to the Chief, Quality Assurance, Vendor Inspection and Maintenance Branch, Division of Reactor Controls and Human Factors, Office of Nuclear Reactor Regulation, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each Nonconformance: (1) the reason for the Nonconformance, or if contested, the basis for disputing the Nonconformance, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further noncompliance, and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to extending the response time.

Dated at Rockville, Maryland
this 19th day of November 1997

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Report No: 99901324/97-01

Organization: Astro Nuclear Dynamics Inc.
Bethel Park, Pennsylvania

Contact: Paul Heffernan, President
412/851-5500

Nuclear Industry
Activity: Resale of components, machining of mechanical components,
and seismic testing

Dates: August 26-29, 1997, and
October 30, 1997

Inspectors: Gregory C. Cwalina, Senior Operations Engineer
Anil S. Gautam, Senior Reactor Engineer

Approved by: Robert A. Gramm, Chief
Quality Assurance and Safety Assessment Section
Quality Assurance, Vendor Inspection
and Maintenance Branch
Division of Reactor Controls and Human Factors

Enclosure 2

1 INSPECTION SUMMARY

Astro Nuclear Dynamics, Inc. (ANDI) holds ASME N and NPT certificates to provide components to the nuclear industry. ANDI's Engineering Laboratories provide safety-related engineering and test services to the nuclear and other industries. In addition, ANDI supplies surplus parts, purchased by ANDI and resold (brokered), to the nuclear industry. Brokered items can be sold as nonsafety-related, bought and resold as safety-related, or bought as commercial grade, dedicated and sold as safety-related.

During this inspection, the inspectors assessed specific attributes and implementation of the ANDI quality assurance (QA) program, specifically as it applies to the supply of safety-related brokered and commercial grade dedication items to ascertain whether it conformed to NRC requirements. The inspector also assessed licensee monitoring of ANDI's control of quality.

The inspection bases were as follows:

- Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50),
- 10 CFR Part 21, "Reporting of Defects and Noncompliance," and
- ANDI's Nuclear Quality Assurance Procedures Manual, Revision 6, dated July 1, 1996.

During this inspection, the inspectors noted that ANDI's Part 21 procedure did not contain the reporting and timeliness requirements specified in Part 21.21. This has been identified as a non-cited violation and is discussed in Section 3.1 of this report. In addition, ANDI did not conform to certain NRC requirements imposed upon it by NRC licensees. These nonconformances are discussed in Section 3.2.

The inspectors observed that licensees did not identify the nonconformances noted in this report. Licensees' monitoring of ANDI's control of quality is discussed in Section 3.3.

2 STATUS OF PREVIOUS INSPECTION FINDINGS

This was the first NRC inspection of ANDI.

3 INSPECTION FINDINGS AND OTHER COMMENTS

3.1 10 CFR Part 21 Program

a. Inspection Scope

The inspector reviewed ANDI procedure CP-906, "Identification and Reporting of Conditions Potentially Adverse to Nuclear Safety." The requirements of the procedure apply to "the identification, review and reporting of nuclear safety-related noncompliances, deficiencies and defects" as defined in 10 CFR. The ANDI procedure

specifies 10 CFR Part 21.3 and other regulations, including Parts 50.55, and 50.59 as included in the scope.

b. Observations and Findings

The inspector noted that the procedure did not contain the evaluation and reporting requirements specified in Part 21.21, nor did it contain the timeliness requirements. The inspector noted other concerns to ANDI, such as the responsibility of Procurement to (1) forward vendor notifications to the president, (2) discuss reported conditions with the employee, (3) assess the condition's significance, and (4) document action and inform the employee, responsibilities typically associated with engineering or QA. Further, the procedure requires employees to report conditions "adverse, or potentially adverse." The inspector pointed out that if that requirement relates to conditions adverse to nuclear safety, typical employees would not be able to make that determination and, thus, some conditions may go unreported. ANDI agreed to revise the procedure to address the requirements of Part 21 and the inspector's other concerns.

c. Conclusions

The inspectors concluded that ANDI failed to include the evaluation and reporting timeliness requirements of Part 21 in procedure CP-906. In accordance with the NRC Enforcement Policy as promulgated in NUREG-1600, this was considered a minor violation of NRC requirements and no Notice of Violation is being issued.

3.2 Quality Assurance Program

a. Inspection Scope

The inspector examined the adequacy and implementation of ANDI's QA program and 10 CFR Part 21 applicability, and assessed ANDI's conformance to customer procurement requirements.

b. Observations and Findings

The inspector observed that ANDI's QA program was based on the requirements and criteria of 10 CFR Part 50, Appendix B. At the time of the October 30, 1997, inspection, the QA program staff consisted of the Quality Assurance Manager and two other staff. The QA manager reported directly to the president of ANDI, and was authorized to stop production of a nonconforming item until the nonconforming conditions were corrected. Specific items examined and findings are provided in the following sections.

b.1 Training of Personnel

During the August 26-29, 1997, part of the inspection, the inspector noted that the president of ANDI was responsible for the control and administration of the sale of brokerage items. The president's responsibility included assuring that the brokerage items met applicable QA, technical, maintenance, and storage requirements.

At that time, the sale of brokered items was accomplished according to ANDI Procedure CP-110, "Control and Administration of Brokered Items Purchased for Resale." The procedure states that a "commercial" certificate of conformance (CoC) is issued for brokered items. It was ANDI's contention that only commercial grade items were processed under CP-110, and that all safety-related items were provided under ANDI's Appendix B QA program.

The inspectors review of CP-110 indicated that the procedure was intended for the resale of commercial grade items. However, the procedure does allow for additional procedures and controls if required by customer contract. The inspectors were concerned that ANDI may inadvertently allow safety-related items to be processed under CP-110. For example, the inspectors reviewed several brokerage packages (see Section 3.4) and their associated documentation. The inspectors observed that, in at least two instances, a CoC was provided, signed by the president, which stated that Appendix B was applicable. ANDI was able to provide evidence that the CoCs in question related to commercial grade purchases (ANDI processed the orders in accordance with their Appendix B program merely to assure an adequate control of quality). Although the inspectors did not identify any CoCs for safety-related items processed in accordance with CP-110, the inspectors concluded that the potential existed for the use of CP-110 to process safety-related orders. Therefore, the potential existed for the president to sign CoCs for safety-related orders.

Although the president was responsible for assuring that the quality of brokerage items sold conformed to procurement documents in accordance with CP-110, he was not trained for the task if those orders were to be safety-related. The inspector concluded that ANDI's failure to establish the qualification of personnel, as required by Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50, constitutes Nonconformance 99900824/97-01-01.

In his September 2, 1997, letter to the NRC, the president stated that he planned to remove himself and any other untrained personnel from performing activities related to implementing the ANDI QA program. During the October 30, 1997, inspection, the inspector observed that ANDI had abolished CP-110. All purchase orders are now processed through the same ANDI QA program. All CoCs, whether commercial grade or safety-related are signed by the QA manager. Therefore, since corrective action has been completed, no response to the nonconformance is necessary.

b.2 Equipment Handling and Storage

The inspector observed that ANDI certified items to be protected in Class B storage (e.g., items for ANDI job number M-1051). During the August 26-29, 1997, inspection, the inspector determined that ANDI's storage facility did not have uniform heating and temperature control to protect applicable safety-related items from condensation and corrosion, as defined in ANSI/ASME N45.2.2-1978, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Plants." The inspector concluded that ANDI's failure to establish special protective environments, such as moisture and temperature

levels, as required by Criterion XIII, "Handling, Storage, and Shipping," of Appendix B to 10 CFR Part 50 constitutes Nonconformance 99900824/97-01-02.

In a letter dated September 2, 1997, to the NRC ANDI stated that it plans to "conduct a Storage Evaluation Program to determine temperature and environmental conditions of the ANDI storage facility in order to comply with the requirements of ANSI/ASME N45.2.2-1978 for Level B storage. This evaluation would be performed for a period of 60 days and will generate data which will be utilized for any corrective actions to be taken, if necessary." On October 6, 1997, the president confirmed by telephone that ANDI will also evaluate the impact on potentially inadequately controlled components, if necessary, that had been certified and shipped as protected in Class B storage.

During the October 30, 1997, inspection, the inspector noted that the evaluation program was ongoing.

b.3 Control of Materials, Parts, and Equipment

The inspector observed that ANDI maintained both safety-related and non-safety-related raw materials, parts, and equipment in its QA-controlled storage area. Although the storage area is locked and controlled by QA, the inspectors were concerned regarding the possibility of integrating safety and nonsafety components. In its letter dated September 2, 1997, to the NRC, ANDI stated that "in the future, ANDI will ensure proper separation and segregation of raw materials, parts and equipment based on its safety-related and non-safety status." In addition, ANDI plans to revise procedure CP-112, "Identification and Control of Materials and Items," dated September 9, 1997, to require physical segregation. No further concerns were identified.

b.4 Receipt Inspections

The inspector observed that on the basis of Paragraph 5.5 of Section 7-1, "Procurement Control," ANDI QAP, dated July 1, 1996, receipt inspections to assure materials met the procurement documents were performed by QA personnel. The inspector was concerned that an independent assessment was not being conducted by personnel other than those who perform the receipt inspection. ANDI's QA manager stated that receipt inspections were audited annually by individuals independent of the QA group to fulfill the QA requirements. No further concerns were identified.

c. Conclusions

In general, ANDI's QA program was in compliance with the requirements of Appendix B to 10 CFR Part 50. However, the inspectors identified deficiencies in ANDI's implementation of its program. ANDI's program for processing brokerage items had the potential for including safety-related items which could be certified by a unqualified individual. Further, the storage of potentially environmentally sensitive materials had not been adequately evaluated.

3.3 Commercial Grade Dedication Program

a. Inspection Scope

The inspectors reviewed ANDI Manufacturing/Inspection Procedure (MIP) No. 95A021, "Utilization of Commercial Grade Items Through Commercial Dedication," Revision 2, March 26, 1996. MIP 95A021 specifies the process for developing instructions to dedicate commercial grade items, performing dedication activities, and accepting the items for use in safety-related applications.

b. Observations and Findings

The inspectors noted that ANDI requires technically knowledgeable individuals to establish the technical and quality requirements for the commercial grade dedication. Among those duties are the technical evaluation, parts classification, identification of safety function and critical characteristics, developing the commercial dedication instruction (CDI), including inspection and test guidance and acceptance criteria. QA is responsible for independently verifying information and actions used to dedicate items. ANDI's procedure is intended to provide reasonable assurance that the commercial grade dedication activities assure that the item received is the item specified and that the item is suitable for its intended safety related application.

The inspectors reviewed ANDI's procedure and found the procedure will provide for a properly dedicated commercial grade item if implemented correctly.

In order to assess ANDI's implementation of the procedure, the inspector reviewed two examples of dedicated items, one completed and one currently in process. ANDI job number M-1277-1, is for the supply of a 3/4" orifice to the Carolina Power and Light Company (CP&L). In a letter of October 24, 1997, ANDI informed CP&L that they were unable to purchase a safety-related component and would therefore, dedicate a commercial grade orifice. ANDI provided the CDI, a typical CoC (stating the methodology ANDI would be using), and a CoC attachment (specifying the part name, and drawing number, including part number and revision). The CDI includes a description of the part's safety-related function and a list of critical characteristics to be verified. The critical characteristics are identified as being related to either the product identification or the items' physical performance. It also contains a description of the verification method. The CDI is sent to the customer for their review and approval before the dedication activity begins. CP&L had not yet responded to ANDI's letter.

The inspector also reviewed ANDI job M-1314, for the dedication of a customer supplied needle valve supplied for the Duquesne Light Company. ANDI completed the dedication and provided a CoC to the licensee certifying compliance with the PO with the exception of one nonconformance. The nonconformance report was included in the package sent to the licensee, as was all other documentation, including the CDI. The shipping package also included a note identifying that the item was provided as a commercial grade dedication item.

c. Conclusions

The inspectors were satisfied that ANDI properly implemented their commercial grade dedication activity. In addition, the requirement to supply the customer the CDI for review and approval was regarded as a strength.

3.4 Sale of Brokered Items

a. Inspection Scope

During the August 26-29, 1997, inspection, the inspectors reviewed ANDI's process for providing brokered items. The process was described in ANDI procedure CP-110, "Control and Administration of Brokered Items Purchased for Resale." During the October 30, 1997, inspection, the inspector noted that CP-110 was no longer in effect.

b. Observations and Findings

The inspectors reviewed approximately 30 files relating to the resale of brokered items. In most case, the inspector noted that the item was supplied as a commercial grade item in accordance with the customer PO. Procedure CP-110 provides for the resale of commercial grade items and notes that a commercial CoC will be issued. ANDI stated that all resale items sold as safety-related would be processed in accordance with ANDI's Appendix B program and not according to CP-110. The inspectors review, in general, supported ANDI's contention, however, the inspectors noted some anomalies and discussed those items further with ANDI representatives.

The inspector observed that on August 19, 1996, American Nutech Company (ANC) placed purchase order (PO) #OH962YA65610 with ANDI for various instrumentation items, including Westinghouse 7300 instrumentation cards, O-rings, and lock wire. Although the PO did not invoke 10 CFR Part 50 Appendix B or 10 CFR Part 21, certain line items included a parenthetical statement that the items were "Class Q" or "Class R."

The inspector noted that ANDI purchased the W 7300 cards from a subvendor, SERTEC, Inc., who had purchased them from Texas Utilities Electric Company (TUEC) as surplus material. ANDI shipped the items as commercial-grade (non-safety-related) to ANC along with a certificate of compliance (COC) dated August 30, 1996, certifying that "the items are in compliance with the procurement documents and all required tests and inspections have been performed." The inspector asked ANDI for documentation that described Class Q and Class R requirements. The president stated that he contacted ANC several times but could not get an adequate response regarding Class Q and Class R requirements. He certified the items met Class Q and Class R requirements because the customer "desired" its COC to match the associated purchase order. He informed ANC that the items were not safety-related by indicating on the COC that 10 CFR Part 21 was not applicable.

The inspector observed that ANDI could not provide documentary evidence of any communication between ANDI and ANC regarding whether the Class Q and Class R

items were safety-related or non-safety-related. During the inspection, the inspector asked the president to contact ANC to confirm whether Class Q items were safety-related. The president contacted ANC and was told by Mr. Peter Choo (president of ANC), that he had "always told ANDI that the items were being purchased as nuclear-grade." On September 8, 1997, the inspector contacted Mr. Choo to confirm his understanding regarding ANDI's supply of the material. The inspector informed Mr. Choo that the instrumentation cards and other items supplied to him by ANDI for PO #OH962YA65610 were commercial-grade and not qualified to Class Q and Class R requirements. Mr. Choo indicated that he thought ANDI had supplied him with "nuclear-grade items" which he believed were equivalent to safety-related items.

The inspector determined that in July 1996, an ANDI staff member contacted Texas Utilities Electric Company (TUEC) for documentation that would certify that the cards were safety-related. TUEC refused to provide any documentation because the cards were no longer qualified to safety-related requirements. During the inspection, the inspector asked the president of ANDI why his staff contacted TUEC for safety-related documents if he had believed the items were purchased by ANC as commercial-grade. The president was not aware that an ANDI staff member had contacted TUEC. He stated that ANDI had not authorized any staff member to contact TUEC and that the staff member in question no longer worked at ANDI.

The inspector noted that on October 7, 1996, ANC informed ANDI that ANC's customer was considering not accepting the instrument cards because "the goods were damaged and broken on joint parts and still had tags from their use in a nuclear plant." ANDI responded to ANC by letter dated October 7, 1996, informing ANC that, according to SERTEC, the items were safety-related, were functional, and had been stored in an environment that met Class B storage requirements.

The inspector's review of this issue determined that ANC had purchased commercial grade items from ANDI, based upon the following. The PO sent to ANDI did not specify Appendix B, Part 21, or any other nuclear unique requirements. Further, ANC had not done any audits or surveys of ANDI and did not indicate by any method that ANDI was an approved supplier. Further, the items in question were being provided to a foreign nuclear plant, not subject to NRC regulation.

However, the inspector also concluded that ANDI had no basis for certifying that the items shipped to ANC met the PO requirements since ANDI was unaware of Class Q and Class R procurement requirements. Since the items purchased were commercial grade, no notice of nonconformance will be issued. However, because the inspectors were concerned that this issue had the potential to affect safety-related orders, it was identified as a weakness.

On the basis of ANDI's September 2 and September 15, 1997, letters to the NRC, and a September 24, 1997, telephone conversation between ANDI and an inspector regarding the NRC concerns described above, ANDI stated that it plans to revise its procedure CP-106, "Quality Assurance Program," Revision D, dated September 4, 1997, to require identifying the safety designation of items sold. ANDI stated that it plans to improve its

QA program to enhance communication and coordination with its customers. During the October 30, 1997, inspection, ANDI stated that it would review previous POs and CoCs to determine if other instances existed whereby ANDI may have certified meeting PO requirements without fully understanding what they were. ANDI further committed to inform customers (including ANC) by letter if any further instances are identified. The president plans to hire an outside auditing service to perform an independent annual audit of ANDI's QA program and its implementation.

The inspector observed that certain CoCs issued by ANDI for customer purchase orders (e.g., CoCs for ANDI job numbers S-1219 and M-0984) identified 10 CFR Part 50 Appendix B requirements as applicable but 10 CFR Part 21 requirements as not applicable. It was not clear from the CoCs whether 10 CFR Part 21 was or was not being applied to the sale of safety-related items. ANDI reviewed its documents and reported that 10 CFR Part 21 applied to all items it sold as safety-related, and that job numbers S-1219 and M-0894 were sold as non-safety-related items. ANDI also indicated that it applied 10 CFR 50 Appendix B on certain items even though these items were sold as non-safety-related items. ANDI reportedly did this to assure that the items received an adequate quality review.

During the October 30, 1997, inspection, ANDI informed the inspectors that CP-110 had been abolished. All brokerage items were to be processed using the current QA program. Those items sold as commercial grade will be noted on the CoC. ANDI provided the inspector with a recent example which stated:

10CFR21 - This is a non-safety related order.

Further, the CoCs will no longer state that Appendix B applies for nonsafety-related items. The inspector agreed this change would result in a clearer CoC. No further concerns were identified.

c. Conclusions

CP-110 was designed and utilized for providing commercial grade brokerage items. Although no instances were found whereby safety-related materials were supplied under CP-110, the inspectors felt the existence of the procedure, as written, could lead to its use for safety related items. CoCs provided under CP-110 were not always clear in that some stated Appendix B was applicable, despite the order not being safety-related. The procedure has been abolished. ANDI certified that customer PO requirements had been met, despite not knowing what the PO requirement entailed. That practice was identified as a weakness.

3.5 Review of Licensee Monitoring of ANDI

a. Inspection Scope

The inspector evaluated licensee monitoring of ANDI's control of quality for safety-related items purchased by licensees.

b. Observations and Findings

In February 1996, TUEC audited ANDI's QA program with representatives from Houston Lighting & Power Company and Virginia Power Company. Part of the scope of the audit was to verify whether ANDI had established and effectively implemented a QA program in compliance with the requirements of 10 CFR Part 50, Appendix B and other industry standards. Among program attributes audited were ANDI's training/certification, design control, material control/handling, storage, and shipping. The audit team identified two ANDI deficiencies regarding (1) failure to submit a commercial-grade item dedication plan to TUEC for approval in accordance with TUEC's procurement requirements, and (2) failure to identify the safety function and critical characteristics of several items requiring commercial-grade item dedication. The audit team also observed that ANDI had no provisions for the classification of parts for safety-related components or equipment. The audit team did not consider its findings to have an adverse impact on the quality of ANDI's completed products. TUEC accepted ANDI's corrective actions for the findings described above and closed the findings on May 10, 1996, concluding that ANDI's QA program was adequate and that implementation was satisfactory.

In April 1997, Duquesne Light Company (DLC) inspected the equipment they purchased from ANDI. The scope of the inspection included verifying certain attributes of the implementation of ANDI's QA program. No deficiencies were found.

The inspector observed that the licensees did not identify ANDI's inadequate storage protection for applicable safety-related items.

c. Conclusions

In general, licensees' monitoring of ANDI's quality was in accordance with proper criteria, procedures, and checklists. Licensees' monitoring of ANDI's control of quality was not satisfactory because it did not identify deficiencies in ANDI's storage of equipment.

3.6 Entrance and Exit Meetings

At the entrance meeting on August 26, 1997, the NRC inspector discussed the scope of the inspection, outlined the areas to be inspected, and established interactions with ANDI management. In the exit meetings on August 29 and October 30, 1997, the inspectors discussed their findings and observations.

4 PARTIAL LIST OF PERSONNEL CONTACTED

ANDI

Paul Heffernan, President
Dennis R. Swalin, QA Manager
Donald Gray, QA Engineer
Sheryl Damico, QA Inspector (Former Employee)
Tarun Basu, Manager of Testing Laboratory
John Antenucci, Supervisor of Testing Laboratory

Licensees (contacted by telephone)

Danny Leigh, Plant Overview Supervisor, TUEC
James Johns, Supervisor Quality Services, DLC
Fred Stobaugh, Procurement Engineer, TUEC
Dan Poneman, Counsel, Hogan and Hartson

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

99901324/97-01-01	Para. 3.1b	NON	inadequate training of personnel
99901324/97-01-02	Para. 3.1b	NON	inadequate storage

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 10, 1997

Mr. Stephen Sakofsky, Director
Quality Assurance
Industrial Products Group
Gould's Pumps, Incorporated
240 Fall Street
Seneca Falls, New York 13148

SUBJECT: NRC INSPECTION REPORT NO. 99900732/97-01

Dear Mr. Sakofsky:

On October 2-3, 1997, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Gould's Pumps, Incorporated, Industrial Products Group, Engineered Products Division (EPD) facility in Seneca Falls, New York. The enclosed report presents the results of that inspection.

During this inspection, the NRC inspector found that the implementation of your quality assurance program failed to meet certain NRC requirements imposed on you by your customers. Specifically, EPD has issued certificates of compliance for replacement parts without ensuring that all the material critical characteristics have been verified. The inspector determined that EPD is not verifying that the chemical composition of castings are in compliance with the applicable American Society for Testing and Materials (ASTM) standards. Instead, it was found that for approximately 10 years, EPD has been verifying only selected chemical elements in corrosion resistant castings. Additionally, EPD did not verify that ASTM required heat treatment of certain alloys had been performed.

This nonconformance is cited in the enclosed Notice of Nonconformance (NON), and the circumstances surrounding it are described in detail in the enclosed report. You are requested to respond to the nonconformance and should follow the instructions specified in the enclosed NON when preparing your response.

This nonconformance is significant because it represents a deviation from the procurement specifications that were imposed upon EPD by its customers. Consequently, those deviations for each licensee application of the EPD supplied components must be evaluated in accordance with §21.21, "Notification of failure to comply or existence of a defect and its evaluation," of 10 CFR Part 21.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC's Public Document Room (PDR).

Sincerely,

Original signed by: Suzanne C. Black

Suzanne C. Black, Chief
Quality Assurance, Vendor Inspection
and Maintenance Branch
Division of Reactor Controls and Human Factors
Office of Nuclear Reactor Regulation

Docket 99900732/97-01

Enclosure: 1. Notice of Nonconformance
2. Inspection Report 99900732/97-01

NOTICE OF NONCONFORMANCE

Gould's Pumps, Incorporated
240 Fall Street
Seneca Falls, New York 13148

Docket No.: 99900732

Based on the results of an inspection conducted on October 2 and October 3, 1997, it appears that certain of your activities were not conducted in accordance with NRC requirements.

Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," of 10 CFR Part 50 requires in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions, to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components.

Commonwealth Edison purchase order (PO) 47D744, dated June 17, 1997, requested one 7 3/8 inch pump impeller, Part Number R76793-1203, Material - American Society for Testing and Materials (ASTM) type ASTM A-296, Grade CF8M. Purchase Order 47D744 stated that the PO was safety-related and the requirements of 10 CFR Part 21 and 10 CFR Part 50, Appendix B were applicable.

ASTM A 296-1977, "Standard Specification for Corrosion-Resistant Iron-Chromium, Iron-Chromium-Nickel, and Nickel-Base Alloy Castings for General Application," requires that alloys conform to the chemical composition prescribed in Table 2.

Item (C), page 4 of EPD's QCP-187, states: "Critical Characteristics Chart - All critical characteristics will be inspected after the parts are selected from stock for use on a Non Code Safety Related order... Information shown on the chart will be verified to be complete and accurate. The Inspection/Test Record will be signed and dated by the person performing the verification, when complete and acceptable. The Inspection test record will be certified by a QA Engineer...."

Contrary to the above requirements, the inspector determined:

- a) EPD did not include appropriate quality standards in its QCP-187 critical characteristic requirement charts regarding the material verification category.

- b) Although Gould's Pumps, Incorporated, July 24, 1997, Certificate of Compliance to Commonwealth Edison, PO 47D744, certified that the replacement part was in compliance with the original part supplied and the customer's PO requirements, EPD did not verify all of the ASTM chemical composition elements, and did not verify ASTM heat treatment. (Nonconformance 99900732/97-01-01)

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, with a copy to the Chief, Special Inspection Branch, Division of Inspection and Support Programs, Office of Nuclear Reactor Regulation, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each nonconformance: (1) a description of steps that have been or will be taken to correct these items; (2) a description of steps that have been or will be taken to prevent recurrence; and (3) the dates your corrective actions and preventive measures were or will be completed.

Dated at Rockville, Maryland
this 10th day of December 1997.

Enclosure 1

INSPECTION REPORT

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF REACTOR CONTROLS AND HUMAN FACTORS

ORGANIZATION: Gould's Pumps, Incorporated
Industrial Products Group
Engineered Products Division
240 Fall Street
Seneca Falls, New York 13148

REPORT NO.: 99900732/97-01

ORGANIZATIONAL CONTACT: Mr. James F. Heid,
Quality Systems Manager
Engineered Products Division
Industrial Products Group
Gould's Pumps, Incorporated
(315) 568-2811

NUCLEAR INDUSTRY ACTIVITY: Provides Gould's pumps, pump replacement parts, pump refurbishment, and field service.

INSPECTION CONDUCTED: October 2-3, 1997

INSPECTOR: Joseph J. Petrosino, NRR

APPROVED BY: Robert A. Gramm, Chief
Quality Assurance and Safety Assessment Section
Quality Assurance, Vendor Inspection
and Maintenance Branch
Division of Reactor Controls and Human Factors
Office of Nuclear Reactor Regulation

Enclosure 2

1 INSPECTION SUMMARY

During this inspection, the NRC inspector reviewed the implementation of selected portions of the Gould's Pumps, Incorporated, Industrial Products Group, Engineered Products Division (EPD) facility Quality Assurance (QA) Program, and reviewed activities associated with "commercial grade items" and "dedication," as defined in §21.3 of 10 CFR Part 21."

The inspection bases were:

- Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50)
- 10 CFR Part 21, "Reporting of Defects and Noncompliance"

During this inspection, one instance where EPD failed to comply with NRC requirements imposed upon them by NRC licensees was identified. This nonconformance represents a long standing practice that EPD has been performing for its safety-related dedication process and is discussed in Sections 3.2 and 3.3 of this report.

2 STATUS OF PREVIOUS INSPECTION FINDINGS

There were no open findings from the last NRC inspection at Gould's Pumps, Incorporated, NRC Report 99900732/80-01.

3 INSPECTION FINDINGS AND OTHER COMMENTS

3.1 10 CFR Part 21 Program

a. Scope

The inspector reviewed EPD's Quality Assurance Instruction (QAI)-231, "Procedure For 10 CFR Part 21," Revision 10, dated September 24, 1997, for reporting in accordance with 10 CFR Part 21, and observed the required posting of the requirements.

b. Observations and Findings

The inspector determined that both QAI-231 and the posting complied with the Part 21 requirements. However, the inspector noted that QAI-231 did not define terms used in QAI-231 that have specific meaning as defined in §21.3 of 10 CFR Part 21 such as, deviation, discovery, defect, evaluation and substantial safety hazard. The inspector also noted in the narrative of QAI-231 that the term "defect" was used incorrectly in a few sections of the procedure. That is, circumstances and conditions that should have been characterized as being deviations or potential defects were referred to as being defects; therefore, the procedure would not be consistent with 10 CFR Part 21.

The inspector also noted that the point at which "discovery" occurs was not clearly specified in the narrative body of QAI-231. The inspector discussed the above aspects with EPD QA Management and EPD committed to reviewing and revising QAI-231 within 120 days of the exit meeting of this inspection.

c. Conclusions

The inspector concluded that although some portions of the QA instruction adopted by EPD would benefit from additional clarification, QAI-231 adequately implemented the relevant provisions of 10 CFR Part 21.

3.2 Licensee Purchase Order Packages and Certified Material Test Reports

a. Inspection Scope

The inspector selected several licensee purchase order (PO) files and Certified Material Test Reports (CMTR's) for review. The POs that were chosen were for replacement parts used at licensee facilities, and the CMTRs were selected from foundries that supplied commercial castings that could be selected for dedication as safety-related components.

b. Observations and Findings

The EPD personnel stated that very few pump assemblies are currently sold to licensee facilities because the Gould's Pumps are designed for long term application with internal part replacements as components wear out. The inspector noted that each PO file included a copy of the customer's PO that showed the imposed requirements, EPD's certificate's of compliance/conformance (CoCs), inspection and test records such as, "metallographic inspection results-alloy analyzer," dimensional verification records, and associated records such as, manufacturer's certified material test reports (CMTRs)¹ and CoCs for the pump components. The licensee PO's typically imposed the requirements of 10 CFR Part 50, Appendix B, 10 CFR Part 21 and EPD's Quality Control Procedure (QCP)-187, "Inspection/Test Plan for Dedication of Commercial Grade Replacement Parts," Revision 9, dated September 19, 1997, for the components ordered.

One PO package that was reviewed by the inspector was for a 316 series stainless steel impeller replacement. The customer PO, Commonwealth Edison PO 47D744, dated June 17, 1997, requested one 7 3/8 inch pump impeller, Part Number R76793-1203, material: American Society for Testing and Materials (ASTM) type ASTM A-296, Grade CF8M. The ASTM A-296 standard requires the manufacturer to heat treat each casting in accordance with the requirements in Table 1 and to conform with the specific chemical composition prescribed in Table 2 of the standard.

¹ Manufacturer's CMTRs are obtained by EPD only when the EPD customer specifically requires a manufacturer's CMTR to be provided.

The inspector noted that the "Gould's Pumps, Incorporated," Certificate of Compliance (CoC) for Commonwealth Edison PO 47D744, dated July 24, 1997, stated that the replacement parts supplied were in compliance with the original parts supplied on the original pump and the customer's purchase order requirements and applicable specifications.

A review of the PO package records and subsequent discussion with EPD staff identified that it used its portable metal analyzer (Texas Nuclear Analyzer, Model 9277-XL Metallurgist) to verify the applicable elements of the ASTM chemical composition. The alloy analyzer inspection results sheet in the PO package indicated that only four chemical elements had been verified. EPD staff stated that the four elements verified with EPD's portable metal analyzer were Molybdenum (Mo), Nickel (Ni), Chromium (Cr), and Manganese (Mn) for the CF8M alloy. EPD did not verify the chemical composition levels for Carbon (C), Silicon (Si), Sulfur (S) or Phosphorus (P). The EPD staff stated that its portable metal analyzer is not capable of verifying Carbon, Silicon, Phosphorus, or Sulfur for the CF8M material. The inspector was told by EPD that the portable metal analyzer is used for all chemical composition analyses for the dedication of commercial castings. The inspector also determined that EPD did not verify that the appropriate heat treatment was performed.

Discussions with EPD staff indicated that this EPD practice of certifying even though all elements are not verified has been performed for approximately 10 years without a documented engineering justification for not verifying all the chemical composition elements.

The inspector determined that EPD's practice of verifying only a limited amount of the elements in alloys such as CF8M can render the EPD supplied components indeterminate. For example, with CF8M or CF3, the potential of stress corrosion cracking increases proportionate to the level of Carbon. Additionally, the solution annealing temperatures for certain corrosion resistant alloys are important for optimum tensile strength, ductility and corrosion resistance. Therefore, the determination of the maximum level of Carbon and the adequacy and performance of heat treatment is very important. The failure to adequately verify the material characteristics is identified as Nonconformance 99900732/97-01-01, and is discussed further in Section 3.3.

The inspector also noted several CMTRs from one particular foundry that did not appear to have an actual "signature" of the QA Manager. Instead, it was noted that each of QA Manager's signatures on the reviewed CMTR's had been stamped. Consequently, the identity of the person who affixed the stamped signature was indeterminate after the fact.

Subsequent discussions with the Quality Systems manager identified that EPD does not typically perform audits or surveillance of commercial suppliers, unless certain components have specific critical characteristics that can not be verified at EPD's facility. EPD staff stated that all critical characteristics can be verified on castings such as

impellers after manufacturing and receipt at EPD. Therefore, the inspector determined that the use of a signature stamp on the foundry CMTR was not a significant issue.

c. Conclusions

The inspector concluded that the metallurgical quality of the supplied component regarding Commonwealth Edison PO 47D744 is indeterminate because EPD did not verify important chemical composition levels, did not have an engineering justification for not verifying all the chemical composition elements, and did not assess whether the castings manufacturer is adequately performing special processes, such as heat treatment.

The inspector also concluded that the Commonwealth Edison PO package is not an isolated occurrence. The inspector was informed that EPD has made it a practice to certify compliance with purchase order requirements, without verifying requirements such as chemical composition are, in fact, met.

3.3 Quality Assurance and Dedication Program

a. Inspection Scope

The inspector selectively reviewed the EPD QA Manual (QAM) 1002, Fifth Issue, Revision 3, Dated April 11, 1996, and associated procedures and work instructions related to "dedication" activities, as defined in §21.3 of 10 CFR Part 21. EPD's QAM-1002 program was established to meet the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Code, Section III - "Nuclear Power Plant Components," Division 1; ANSI/ASME N45.2-1977, "Quality Assurance Program for Nuclear Facilities," and 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." The QA Manager stated that QAM-1002 program requirements were applied to all work performed in accordance with EPD's Quality Control Procedure (QCP)-187, "Inspection/Test Plan for Dedication of Commercial Grade Replacement Parts," Revision 9, dated September 19, 1997.

b. Observations and Findings

The definition of "dedication" in 10 CFR 21.3 specifies that dedication must provide reasonable assurance that a commercial grade item (CGI) to be used as a basic component will perform its intended safety function, and is deemed equivalent to an item designed and manufactured under a 10 CFR Part 50, Appendix B, QA program. This assurance must be achieved by identifying the critical characteristics of the item and verifying their acceptability. A review of EPD's dedication procedure identified that QCP-187 specifies critical characteristics for the approximately 40 CGI's that are not procured as safety-related components by EPD.

Section 5, "Procurement Process, of QCP-187 requires that the managers of Engineering Systems & Standards and Quality Assurance select the critical characteristics to be verified. The QA manager establishes

tests and inspections to be performed in accordance with established procedures and issues certificates of conformance with the test records. Section 6, "Acceptance Criteria," of QCP-187 requires that parts which are in compliance with the critical characteristics shall be accepted. A discussion with the Manager of Engineering Systems and Standards identified that the critical characteristics have been developed based upon the engineering drawings, specifications, and operating design parameters of the particular pump. The engineering manager stated that this delineation of characteristics was to ensure that all important operating performance aspects as well as relevant design and material considerations were addressed. The EPD Quality Systems Manager stated that the critical characteristics were chosen several years ago using industry guidance and engineering judgement. The adequacy of those critical characteristics was not assessed by the inspector.

The inspector reviewed Chart 17, "Impeller Critical Characteristics Chart," of QCP-187 which requires material verification and CMTR, (if ordered from the manufacturer), verification using the "portable metal analyzer." The inspector noted that Chart 17, instead of specifying the actual material to be verified in accordance with the type and grade of steel, merely stated under the heading "material verification" two items: "CMTR" [see footnote 1] and "portable metal analyzer." The inspector determined that EPD did not include appropriate quantitative or qualitative acceptance criteria in Chart 17, QCP-187 for the critical characteristics necessary to verify compliance with the different ASTM Standards.

The inspector noted that EPD's "metallographic inspection results-alloy analyzer," form (page 45 of QCP-187 has the following chemical elements listed for analysis/verification: Molybdenum, Nickel, Chromium, Manganese, Titanium (Ti), Copper (Cu), Vanadium (V), Iron (Fe), Zinc (Zn), Tin (Sn), Lead (Pb), Aluminum (Al), and Wolfram (W)². The ASTM A 296 elements that are listed under Table 2, "Chemical Requirements," for CF8M are: Carbon, Manganese, Silicon, Phosphorus, Sulfur, Chromium, Nickel, and Molybdenum. It was noted by the inspector that although Carbon, Silicon, Phosphorus, and Sulfur are important for reliability and acceptable performance of stainless steel material, EPD did not identify those elements for material verification on its material analysis "metallographic inspection results - alloy analyzer" form. As discussed in section 3.2 above, EPD's portable metal analyzer does not identify all of those chemical elements found in Table 2 of ASTM A 296.

As a result of a lack of specificity in chart 17, EPD did not verify the ASTM A 296, Table 2 chemical composition elements of Carbon, Silicon, Phosphorus, and Sulfur for the CF8M impeller casting during its dedication process for Commonwealth Edison PO 47D744 (see Section 3.2).

² Although the symbol W was used by EPD to represent Wolfram, W is the symbol for Tungsten. Tungsten (W) is extracted from Wolframite, Scheelite and other minerals.

c. Conclusions

The inspector concluded that EPD does not have an adequate basis to dedicate commercial castings because of the identified practices and methodology employed at its Seneca Falls facility. Since EPD does not survey/audit its commercial casting manufacturers and does not verify all of the chemical composition elements (even on a sample basis), its level of assurance would be questionable.

Additionally, the inspector concluded that Nonconformance 99900732/97-01-01 appears to represent a departure from the technical requirements included in a procurement document and needs to be evaluated in accordance with the provisions of 10 CFR Part 21 by EPD.

3.4 Entrance and Exit Meetings

In the entrance meeting on October 2, 1997, the NRC inspector discussed the scope of the inspection, outlined the areas to be inspected, and established interfaces with the Engineered Products Division and Industrial Products Group management. In the exit meeting on October 3, 1997, the inspector discussed his findings and concerns. Additional discussions were also conducted subsequent to the exit meeting in December 1997.

3.5 Personnel Contacted

S. Sakofsky	Director, Quality Assurance - IPG
R. Schussler	Manager, Engineering Systems and Standards - IPG
J. Heid	Quality Systems Manager - EPD
P. Soscia	Quality Assurance Engineer - EPD
S. Mahalik	Quality Assurance Auditor - EPD

4 ITEMS OPENED, CLOSED, AND DISCUSSED

Nonconformance

99900732/97-01-01 Nonconformance	Dedication Process Questionable Certifications
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 28, 1997

Mr. James Fitzwilliam, Manager
Quality Assurance
Nova Machine Products Corporation
P.O. Box 30879
Middleburg Heights, OH 44130

Subject: NRC INSPECTION REPORT 99901052/97-01 AND NOTICE OF
NONCONFORMANCE

Dear Mr. Fitzwilliam:

On June 2 through 5, 1997, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection of Nova Machine Products Corporation (Nova). An inspection report was issued on July 22, 1997. Subsequently, Nova indicated to the NRC that certain statements made in the report may be misleading. Therefore, by letter of September 5, 1997, the NRC informed Nova that it was withdrawing the inspection report until the issue of potentially misleading information could be resolved. On October 2, 1997, the NRC returned to Nova to complete the inspection and to review Nova's corrective actions to the Notice of Nonconformance, issued with the original report, as described in Nova's letter of August 18, 1997.

During the June 1997 inspection, the NRC inspectors found that the implementation of your quality assurance program failed to meet certain NRC requirements imposed on Nova by customers. Specifically, the inspection identified instances where Nova supplied material under its ASME Quality Systems Certificate (QSC) without providing all documentation required by the applicable ASME Code, NCA 3800 quality assurance program. Additionally, the inspection identified one instance where Nova failed to perform all testing required by Paragraph NCA-3855.5 of the ASME Code, when upgrading unqualified source material. This material was subsequently supplied and certified under Nova's QSC.

This nonconformance is cited in the enclosed Notice of Nonconformance (NON), and the circumstances surrounding it are described in detail in the enclosed report. You responded to the nonconformance by letter of August 18, 1997. During the October 1997 inspection, the NRC determined that your corrective actions were appropriate and complete. Therefore, no further response is required.

James Fitzwilliam

- 2 -

October 28, 1997

In accordance with 10 CFR Part 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in NRC's Public Document Room.

Sincerely,

Original signed by: Richard P. Correia

for Suzanne C. Black, Chief
Quality Assurance, Vendor Inspection
and Maintenance Branch
Division of Reactor Controls and Human Factors
Office of Nuclear Reactor Regulation

Docket No.: 99901052

Enclosures: 1. Notice of Nonconformance
2. Inspection Report 999010521/97-01

NOTICE OF NONCONFORMANCE

Nova Machine Products Corporation
Middleburg Heights, OH

Docket No.: 99901052

Based on the results of an inspection conducted on June 2 through 5, 1997, it appears that certain of your activities were not conducted in accordance with NRC requirements.

- A. Criterion V, "Instructions, Procedures and Drawings," of Appendix B to 10 CFR Part 50 requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings and shall be accomplished in accordance with these instructions, procedures, or drawings.

Paragraph NCA-3862.1(b) of Section III of the ASME Code states that "When required chemical analyses (including mill heat analysis), heat treatment, tests, examinations, or repairs are subcontracted, the approved supplier's certification for the operation's performed shall be furnished as an identified attachment to the Certified Material Test Report."

Paragraph NCA-3855.5, "Utilization of Unqualified Source Material" states, in part, that a Material Organization (MO) may use or furnish unqualified source material, provided the MO performs or subcontracts a product analysis and all other requirements of the material specification on each piece of the material.

The following examples demonstrate failure to comply with the above requirements and constitute Nonconformance 99901052/97-01-01:

1. Contrary to the above, Nova Certified Material Test Report (CMTR) for material supplied to Centerior Energy (Davis-Besse), under Purchase Order (PO) S 078945 D97, certified that this material was supplied in accordance with Nova's ASME Quality Systems Certificate (QSC), but did not include a complete heat treatment certification, or certification of material internal quality (macroetch test) as identified attachments.
2. Contrary to the above, Nova CMTR for material supplied to Northeast Utilities (Millstone) under PO 00951296, Release 023, certified that this material was supplied in accordance with Nova's QSC, but did not include certification of material internal quality in accordance with the test specification referenced in the procurement documents.

3. Contrary to the above, Nova certified that upgraded unqualified source material supplied to PECO Energy Co. (Limerick Generating Station) under PO LS 608180, line item 03, was processed in accordance with their QSC, but did not perform the macroetch test, required by the material specification, on each piece of the material. Only one of the four coils of material, procured from an unqualified supplier, was macroetched, and the certification for this test was not included as an identified attachment to the Nova CMTR.

Since corrective actions were reviewed and found acceptable, no response is required.

Dated at Rockville, Maryland
this 28 day of October 1997

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Report no: 99901052/97-01

Organization: Nova Machine Products Corporation

Contact: James Fitzwilliam, Quality Assurance Manager
(216) 267 3200

Nuclear Industry Activity: Manufacturer of threaded fasteners and supplier of ferrous and nonferrous bars, threaded fasteners, fittings, flanges, and other products used primarily in nuclear applications.

Dates: June 2 through 5, 1997, and October 2, 1997

Inspectors: Uldis Potapovs, Senior Reactor Engineer
Larry L. Campbell, Reactor Engineer
Gregory C. Cwalina, Senior Operations Engineer
Donald Naujock, Materials Engineer

Approved by: Robert A. Gramm, Chief
Quality Assurance Section
Quality Assurance, Vendor Inspection and
Maintenance Branch
Division of Reactor Controls and Human Factors

Enclosure 2

1 INSPECTION SUMMARY

During the June 2-5, 1997, part of the inspection, the NRC inspectors reviewed the implementation of selected portions of Nova Machine Products Corporation's (Nova) quality assurance (QA) program for supplying material under the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) requirements and for providing dedicated commercial grade material in compliance with the requirements of 10 CFR 50, Appendix B. The inspectors also reviewed the implementation of Nova's program for reporting of defects under the requirements of 10 CFR Part 21. This inspection was a part of an NRC pilot program to develop inspection procedures for assessing licensee oversight of supplier quality.

An inspection report was issued to Nova on July 22, 1997. However, by letter of August 18, 1997, Nova raised concerns over potentially misleading statements in the report. Therefore, the NRC withdrew the initial inspection report pending a review of Nova's concerns. That review was completed on October 2, 1997. During the October 1997 inspection, the inspectors further reviewed Nova's commercial grade dedication procedures and their adherence to customer and material specification requirements, particularly as related to small parts. In addition, the inspectors reviewed Nova's implementation of corrective actions provided in their August 18, 1997, letter to the NRC.

The inspection bases were:

- 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."
- 10 CFR Part 21, "Reporting of Defects and Noncompliance."
- ASME Code, Section III, Subarticle NCA 3800.

During this inspection, one nonconformance was identified and is discussed in Sections 3.3.b and 3.3.c of this report.

2 STATUS OF PREVIOUS INSPECTION FINDINGS

The last NRC inspection of Nova was performed on July 14 through 18, 1986. The status of findings from that inspection was not reviewed.

3 INSPECTION FINDINGS AND OTHER COMMENTS

3.1 Description of Facilities and Activities

Nova has been accredited by the ASME as a Material Organization (MO), manufacturing threaded fasteners and supplying ferrous and nonferrous bars, threaded fasteners, fittings, flanges, and other products. According to Nova management, approximately 60-70% of their sales volume consists of safety related material supplied to nuclear utilities. Of that amount, approximately 50% is sold under their ASME Quality Systems Certificate (QSC) as complying with the requirements of Subarticle NCA 3800 of Section III of the ASME Code. Manufacturing capability includes cold and hot forming and machining. Inspection and test capability includes complete dimensional and visual inspection, tensile and hardness testing, and chemical analysis capability for carbon and low alloy steels. Nondestructive examination and heat treating are subcontracted to approved suppliers.

3.2 Review of Nova's 10 CFR Part 21 Program and its Implementation

The inspectors reviewed 10 CFR Part 21 postings at the manufacturing facility and found them to be consistent with the current requirements. The practices for identifying and reporting defects and the time frames for evaluation and notification are described in Nova procedure NP-09, Revision 7, dated March 3, 1997. This procedure assigns the responsibility for documenting the results of deviation evaluations to the QA manager and identifies the nonconformance report (NCR) as the record of evaluation.

The inspectors examined Nova's nonconformance file and did not identify any instances where an evaluation resulted in a reportable condition. The inspectors noted that the evaluation typically consisted of a check mark in the appropriate Yes/No box on the NCR form with no documented bases for this determination. While it can be argued that, in most cases, the bases are readily apparent from other information contained in the NCR, this did not always appear to be the case. For example, NCR 97-29 documented a situation where parts had been rejected and returned to Nova by a customer because Nova had failed to perform liquid penetrant testing as required by the customer's purchase order (PO). The NCR identified the cause of the deviation as failure to include the liquid penetrant testing requirement in Nova's PO to their vendor. The "Not Reportable" Part 21 box was checked with a notation "LP passed" indicating successful testing of the returned parts. The inspectors noted that the evaluation did not fully address the root cause of this deviation to determine why the test requirement was not included in the PO nor the generic potential of such omissions which could require the notification of other customers.

Evaluation of deviations was identified as a weakness in Nova's 10 CFR Part 21 program implementation. Nova management indicated that this issue would be addressed by appropriate changes to the implementing procedure.

3.3 Review of Recent Sales of ASME Code Material to NRC Licensees

a. Scope

The NRC inspectors reviewed the procedural controls and document files for a sample of recently filled orders for safety related material supplied under Nova's ASME QSC to evaluate the implementation of the applicable QA program and ASME Code requirements.

b. Observations and Findings

Nova operates under one quality program. The Quality Assurance Manual (Edition 4, Revision 1) has been written to comply with the applicable requirements of the ASME Code, ISO-9001; Canadian Standard Z-299; 10 CFR Part 50, Appendix B; ANSI N45.2 and other related quality standards. The QA manual is supported by a controlled set of implementing procedures.

Approximately 10 document files supporting the certification of recent material sales under Nova's ASME QSC were reviewed to evaluate the effectiveness of their QA program implementation. Significant observations and findings are summarized below:

- Centerior Energy (Davis-Besse) Purchase Order (PO) S 078945 D97, dated March 13, 1997, for eight 3/4 inch threaded studs, 13 inches long, in accordance with ASME SA-193, Grade B7.

This material was certified as supplied under Nova's QSC in full compliance with the applicable PO requirements. Attached to the Nova certification was a material test report issued by Chaparral Steel Co. of Midlothian, TX, for 20 tons of hot-rolled AISI type 4140 steel bars sold to Cardinal Fasteners, Bedford Heights, OH. Also attached was a heat treatment certification issued to Nova by J.W. Rex Co., Lansdale, PA, (a qualified vendor). The Chaparral certification referenced their QSC number, indicating that, although the material was not provided as ASME Code material, it was processed in accordance with Chaparral's QSC.

The inspector noted that: 1) there was no indication of Cardinal Fasteners role in supplying this material or how Nova acquired the material, 2) the heat treatment certification was incomplete, since only a tempering cycle was described, and 3) there was no indication that the material internal quality had been verified by macroetch as required by ASME SA-193.

During the course of the inspection, Nova staff produced records indicating that, although the material had been purchased by Cardinal, it had been drop-shipped to Nova, and that three samples of the material had been macroetched by an approved laboratory and found acceptable. The records also indicated that the heat treatment certification that was provided to the customer represented only a

re-temper cycle and did not describe the complete heat treatment that was performed on this material. The re-temper cycle was necessary because the initial temper was conducted at a temperature below the specified minimum. Records for the original quench and temper cycle were available.

The inspector noted that, since Nova certified this material as provided in accordance with their QSC, supplier certifications for the complete heat treatment and macroetch examination should have been provided to their customer as required by ASME Code, Section III, NCA-3862.1

- Northeast Utilities (Millstone) PO 00951296, Release 023, dated March 11, 1997 for 40 feet of 3/4 inch threaded rod in 10 foot lengths, in accordance with ASME SA-193, Grade B6X

This material was certified as supplied under Nova's QSC in full compliance with the applicable PO and specification requirements. Attached to the Nova certification was a Carpenter Technology (qualified vendor) certificate of test for Type 410 annealed ground bar. The certificate also referenced ASTM A-182, Grade F6A (chemistry only). The certificate did not reference or indicate compliance with requirements of SA-193, but contained a statement " Discs Macroetched and Approved." There was no reference to the macroetch test method or acceptance criteria. Also attached was a certificate from J.W. Rex Co. (approved vendor) stating that 18 pieces and one test piece of this material were hardened and tempered per SA-193, Grade B6X to a hardness level of 24-26 Rc. Also attached was a certificate from Herron Test Lab. (approved vendor) with tensile and hardness test results for this material.

The inspector noted that the mill certification did not contain complete information to verify compliance with the internal quality requirements specified in SA-193 which requires the macroetch to be performed in accordance with ASTM E-381 (or other suitable method as agreed upon between purchaser and producer), and provides specific acceptance criteria. In accordance with the material certification requirements of NCA-3862, the basis for compliance with SA-193 requirements should have been included in the original mill certification or supplementary test report and provided to the purchaser of this material.

- PECO Energy Co. (Limerick Generating Station) PO LS 608180, line item 03, for Twelve 5/8 inch by 3 1/2 inches long threaded rods, in accordance with ASME SA-193, Grade B7

This material was certified as supplied under Nova's QSC in full compliance with the applicable PO and material specification requirements. The certificate also noted that the material was upgraded per NCA-3855.5. Attached to the Nova certification was a Certification of Inspection and Test, issued to Nova by Walker Wire and Steel Corp. (not on Nova's approved vendor list) which identified the material as .640 inch diameter 4140 cold heading quality hot rolled rod. Also attached to the Nova certification were heat treatment certification from J. W.

Rex Company (approved vendor) indicating that the material had been processed per customer requirements to surface hardness of 27-28 Rc, a test report from Herron Testing Laboratories, Inc. (approved vendor) containing the results of product analyses performed on four samples of this material, and a test report from Herron Testing Laboratories containing the results of tensile tests on this material.

The inspector noted that the information provided with Nova's certification did not provide an adequate basis for establishing compliance to the requirements of SA-193, since there was no record of verification of the material internal quality (macroetch). Furthermore, it could not be determined if the upgrading was properly performed, since the supplier's certification did not indicate how many separate pieces of material were provided to fill this order.

During the course of the inspection, Nova staff produced additional records indicating that Walker Wire purchased the starting material in four coils from Charter Steel. The mill certification was on file at Nova. Nova also produced a test report from Herron Laboratories (approved vendor) indicating that one sample of this heat of material had been macroetched in accordance with ASTM E-381 and met the acceptance criteria specified in SA-193.

The inspector noted that, in accordance with NCA 3862.1, the macroetch test results should have been provided to the purchaser of the material. The inspector also noted that, since the coils were purchased as unqualified source material and upgraded in accordance with NCA-3855.5, each of the four coils should have been tested.

c. Conclusions

The document review described above identified three examples where certification packages provided to Nova customers were incomplete in that they did not include the results or certifications of all tests and heat treatments performed by approved suppliers as required by paragraph NCA-3862.1 of Section III of the ASME Code. Failure to include certifications from approved suppliers as identified attachments to Nova certifications to Centerior Energy (PO S 078945 D97), Northeast Utilities (PO 00951296), and PECO Energy (PO LS 608180) were identified as Nonconformance 99901052/97-01-01.

During the October 1997 inspection, the inspectors reviewed Nova's corrective actions. The inspectors determined that Nova provided the applicable certifications to PECO Energy by letter of August 13, 1997, and to Centerior Energy and Northeast Utilities by letters of August 28, 1997. In addition, Nova revised the certification checklist referenced in Procedure NP-15 to address the Code requirement to provide all heat treat data required by the material specification and to include the macroetch test results, as applicable. The inspectors confirmed the revision had been made and reviewed records indicating that appropriate personnel had been trained in the revision.

3.4 Qualification of Material Vendors

The Nova QA manual has established several categories of vendors, based on their scope of supply. The methods of vendor qualification or approval for each of these categories are described in Section 6.5 of the manual. Non-accredited vendors of ASME Code material are qualified by Nova survey, performed on a three year frequency. The surveys are performed by auditors qualified in accordance with Section 14 of the Nova QA manual and procedure NP-10, "Qualification of Auditors," using approved checklists.

A sampling review of audits of ASME Code material suppliers qualified by Nova, including the completed checklists, showed that these documents did not address the upgrading of unqualified source material. According to the Nova QA manager, material purchased from Nova-qualified manufacturers is generally limited to basic mill products which are not upgraded, therefore, upgrading of stock material was not included in the scope of the audit checklists. The inspectors, however, identified at least one vendor (Flowline Division of Markowitz Enterprises) that Nova had qualified to a scope that included the upgrading of unqualified source material. A review of the vendor's QA manual, on file at Nova, indicated that the manual contained adequate controls for the upgrading process.

Failure to include controls for upgrading of unqualified source material in the vendor survey checklist was identified as a program weakness.

3.5 Commercial Grade Item Dedication Program

a. Inspection Scope

The NRC inspectors reviewed the program and procedural controls applicable to Nova's Commercial grade item (CGI) dedication activities including the selection of critical characteristics and the use of sampling plans for nondestructive and destructive examinations and tests. The inspectors also observed in-process dedication activities and reviewed document files for a sample of recently filled and in-process material orders to evaluate the implementation of the applicable QA program requirements.

b. Observations and findings

b.1 Dedication Methodology

The requirements for CGI dedication are prescribed in Nova's Quality Assurance Manual, Edition 4, Revision 1, and Procedure No. NP-12, "Supplemental Testing," Revision 10, dated March 3, 1997.

Nova selects critical characteristics for CGIs based on the requirements specified by the applicable American Society for Testing and Materials (ASTM) material specification and any other testing requirements specified by the customer. Critical characteristics, in

general, include dimensions, workmanship, and when required by the applicable material specification, chemistry and mechanical properties and other specified tests.

Subsequent to the June 1997 inspection, Nova provided clarification to the NRC on the verification of mechanical and chemical critical characteristics as provided for in Section 1 of Attachments 5.0(A), 5.0(B), and 5.0(C) of Procedure NP-12. Section 1 states, "Mechanical and chemical attributes: When size allows (as defined by the applicable material specification), test and correlate to the requirements dictated by the customer or applicable material specification." Nova informed the inspectors that Section 1 of the attachments to Procedure NP-12 requires that all testing and analyses required by the applicable ASTM material specification be performed, however, Nova further explained that some material specifications exempt products from certain tests and analyses based on the product size.

b.2 Use of Sampling Plans for CGI Dedication

Sampling plans used by Nova for CGI dedication are based, in part, on a combination of the provisions contained in: a) EPRI NP-7218, "Guideline for the Utilization of Sampling Plans for Commercial-Grade Item Acceptance (N.G.-19)," dated June 1992, b) ASTM A-490 (93), "Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength," and c) the degree of confidence that the lot being sampled contains homogenous items.

Nova informed the NRC inspectors that they chose the sample size provided in the shipping lot sampling plan contained in ASTM A-490 (93) because this plan is one of the most severe sampling plans for chemical and mechanical destructive testing in the ASTM standards. The NRC inspectors expressed a concern to Nova that the Shipping Lot Size sample plan provided in ASTM A-490 is for the manufacturer of a commercial product line. Also, the NRC inspectors identified that the quality controls identified in ASTM A-490 do not appear to meet the quality requirements of Appendix B to 10 CFR Part 50 and that such a sample size could include more than one production lot or heat of material. Nova informed the inspectors that it selected this sampling plan based upon the quantity provided in the "Shipping Lot Size" table.

The NRC inspectors also expressed a concern that the qualitative methods for determining when a homogenous lot exists and that the basis for such decisions, as described in Procedure No. NP-12, were not very prescriptive and placed much reliance on judgement. Other concerns expressed by the NRC inspectors are addressed in Section 3.5.c.1 of this inspection report.

Procedure NP-12 lists a number of sampling plan selection factors and provides four categories of sampling plans based on these factors. These sampling categories are included in Attachment 5.0 to Procedure NP-12 and are discussed below:

b.2(a) Sampling Plan Attachment 5.0 (A) of Procedure No. NP-12

Nova uses the following sampling plan for its dedication of CGIs purchased from a commercial vendor where there is no vendor history, the vendor has not been audited, the part is not identified to a standard, and the part is not marked (Reference is made to the applicable sampling tables contained in EPRI NP-7218).

Inspection Characteristic	Sampling Plan
Configuration	Tightened (Table 2-1 of EPRI NP-7218)
Dimensions	Tightened (Table 2-1 of EPRI NP-7218)
Appearance	Tightened (Table 2-1 of EPRI NP-7218)
Hardness*	Tightened (Table 2-1 of EPRI NP-7218)
Chemical*	See Section 3.5.b.2(e) of this Report
Mechanical*	See Section 3.5.b.2(e) of this Report

* When required by the material specification

b.2(b) Sampling Plan Attachment 5.0 (B) of Procedure No. NP-12

Nova uses the following sampling plan for its dedication of CGIs purchased from a commercial grade vendor that has been used before (but not qualified) and where parts are identified and can be traced to a known standard based on the vendor's nonqualified and unaudited markings and documentation:

Inspection Characteristic	Sampling Plan
Configuration	Normal (Table 2-1 of EPRI NP-7218)
Dimensions	Normal (Table 2-1 of EPRI NP-7218)
Appearance	Normal (Table 2-1 of EPRI NP-7218)
Hardness*	Normal (Table 2-1 of EPRI NP-7218)
Chemical*	See Section 3.5.b.2(e) of this Report
Mechanical*	See Section 3.5.b.2(e) of this Report

* When required by the material specification

b.2(c) Sampling Plan Attachment 5.0 (C) Procedure No. NP-12 (Condition A)

Nova uses the following sampling plan for its dedication of CGIs purchased from a commercial grade vendor when a commercial audit of the vendor has been conducted to verify the items are produced from a single heat/lot of material and traceability has been maintained throughout all processing.

Inspection Characteristic

Sampling Plan

Configuration	Normal (Table 2-1 of EPRI NP-7218)
Dimensions	Normal (Table 2-1 of EPRI NP-7218)
Appearance	Normal (Table 2-1 of EPRI NP-7218)
Hardness*	Normal (Table 2-1 of EPRI NP-7218)
Chemical*	See Section 3.5.b.2(e) of this Report
Mechanical*	See Section 3.5.b.2(e) of this Report

* When required by the material specification

b.2(d) Sampling Plan Attachment 5.0 (C) Procedure No. NP-12 (Condition B)

Nova uses the following sampling plan for purchases from a commercial grade vendor when a commercial audit of the vendor has been conducted to verify that the items are produced from a single heat/lot of material, traceability has been maintained throughout all processing and other attributes have been reviewed during the audit and found acceptable.

Inspection Characteristic

Sampling Plan

Configuration	Reduced (Table 2-1 of EPRI NP-7218)
Dimensions	Reduced (Table 2-1 of EPRI NP-7218)
Appearance	Reduced (Table 2-1 of EPRI NP-7218)
Hardness*	Reduced (Table 2-1 of EPRI NP-7218)
Chemical*	See Section 3.5.b.2(e) of this Report
Mechanical*	See Section 3.5.b.2(e) of this Report

* When required by the material specification

b.2(e) Mechanical and Chemical Testing Per Procedure No. NP-12

Regardless of Nova's activities associated with the vendor supplying CGIs or the review of the vendor's quality program implementation, Nova uses the same sampling plan for verifying the CGI's chemical and mechanical properties. This amount of testing is based on the Shipping Lot Size sampling plan provided in ASTM A-490 (93).

Lot Size	Sample Size	Acceptance
1 (1 to sell, 1 to test)	1	(Note 1)
2 to 25	2	(Note 2)
26 to 50	3	(Note 2)
51 to 150	5	(Note 2)
151 to 1200	8	(Note 2)
1201 to 10,000	13	(Note 2)
10,000 to 35,000	20	(Note 2)
35,001 to 150,000	32	(Note 2)

Note 1: Acceptance Number is 0, test piece must pass.

Note 2: Acceptance Number is 0, all test pieces must pass.

The NRC inspectors and Nova discussed the need for a 95 percent confidence that there are only 5 percent defective items in a lot (95/5) as discussed in documents referenced in NRC Information Notice No. 96-40, "Deficiencies in Material Dedication and Procurement Practices and in Audits of Vendors," dated July 25, 1996. The NRC inspectors informed Nova that the 95/5 confidence level is applicable for dedicated CGIs used in high-safety-significant applications, as determined by NRC licensees using probabilistic and deterministic methods similar to those described in NRC draft regulatory guides DG-1061, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis," dated March 28, 1997, and DG-1064, "An Approach for Plant-Specific, Risk-Informed Decision Making: Graded Quality Assurance," dated March 24, 1997. A 95/5 confidence level may also apply to items dedicated for unrestricted safety application (end use or safety classification not identified) and certified as complying with all requirements of 10 CFR Part 50, Appendix B.

Nova questioned the NRC regarding the need for all customer orders to be processed in accordance with a sampling plan that provides a 95/5 confidence level. The inspectors informed Nova that, as discussed above, the 95/5 confidence level was applicable only to those items dedicated to high safety significant (or unrestricted) applications and that it was the NRC licensee's responsibility to evaluate and accept the sampling plans used by Nova for dedicating CGIs supplied for its purchase orders. It was further discussed that for dedicated CGIs used in low-safety-significant applications, the use of a graded approach, as discussed in DG-1064, to determine the necessary sampling plan would be acceptable. For such applications, a sampling plan having a confidence level less than 95/5 confidence level may be appropriate.

The NRC inspectors informed Nova that, in general, a reduced (less than 95/5) sampling plan should be used only after review and acceptance by the customer. Nova informed the NRC inspectors that its sampling plans were generally reviewed by its customers during their audits and that recently a joint utility audit had been performed and there were no findings in the area of Nova sampling plans used for dedicating CGIs. The NRC inspectors' review of the joint utility audit is summarized in Section 3.6 of this report.

b.3 Review of Recent Sales of Dedicated Material

The NRC inspectors reviewed several in process and completed CGI dedication packages to determine if the critical characteristics for the items had been properly identified and verified. In addition to the identified quality and technical requirements, the following POs invoked the requirements of Appendix B to 10 CFR Part 50 and 10 CFR Part 21.

- Item 2 on Nova Sales Order No. 49818, was for the supply of 100, ASTM B 21, Alloy 464, slotted flathead No. 4-40 x 3/16 brass screws, in accordance with Nebraska Public Power District PO 97-1872, dated May 6, 1997. This sales order was being processed during the NRC inspection.

To supply these fasteners, Nova issued a commercial PO and purchased a 1/4 inch diameter X 6 feet long, ASTM B21, Alloy 464, round bar, from Copper & Brass Sales in Cleveland, Ohio. Prior to machining each machine screw, Nova cut two pieces of material from the round bar and sent them to an approved supplier, Herron Testing Laboratories, Inc., located in Cleveland, Ohio, for chemical and mechanical testing (tensile, yield, elongation, and reduction in area). Because this sales order was being processed during the inspection, the results of the configuration, dimensional, and final visual inspection were not available to the NRC inspectors.

The NRC inspectors found the dedication activities specified by Nova for dedicating the screws on Sales Order No. 49818 to be satisfactory.

- Item 2 on Nova Sales Order No. 39933 was for the supply of 10, SAE J429 (August 83), Grade 8, 5/16-18 UNC 2A X 4 inch, fully threaded hex head capscrews, in accordance with PECO Energy Company Blanket PO No. 159325, Release No. 348002, dated May 13, 1997.

This sales order was being processed during the NRC inspection. To supply these fasteners, Nova obtained 5/16-18 UNC 2A X 6 inch fasteners of the specified material from its stock. These stock fasteners were purchased safety-related in 1988, with Appendix B to 10 CFR Part 50 and 10 CFR Part 21 invoked, from Lake Erie Screw Corporation in Cleveland, Ohio. Although Lake Erie Screw Corporation is not presently an approved supplier, at the time of purchase in 1988, it was on Nova's approved supplier list. Nova informed the NRC that, even though the fasteners purchased from Lake Erie Screw Corporation were considered basic components, they were being processed as though they were not fully dedicated CGIs because they were being altered from 6 inches to 4 inches long and the PECO Energy Company's PO had invoked several unique certification requirements.

To process the sales order, Nova performed hardness testing on two capscrews, proof load tests on two capscrews, and wedge tests on two capscrews. Nova did not perform chemical overchecks on the capscrews and justified not

performing chemical tests on the capscrews because they were purchased from an approved supplier. Eight capscrews were subjected to full dimensional and configuration checks and all completed capscrews were subjected to a final visual examination.

The NRC inspectors found the procurement, inspection, and testing activities performed by Nova for the supply of the capscrews on Sales Order No. 39933 to be satisfactory.

- Item 5 on Sales Order No. 39089 was for the supply of 100 ANSI B18.21.1(83), 1/4 inch, type 304 stainless steel lock washers (regular helical) in accordance with PECO Energy PO 159622, dated April 7, 1997.

To supply these fasteners, Nova obtained the lockwashers of the specified size and material from its stock. The lockwashers in stock were purchased commercially from the Mellowes Company in Milwaukee, Wisconsin in 1987. Nova dedicated the lockwashers by obtaining 172 from stock and performing the following dedication activities:

- a. A total of 72 pieces were sent to an approved supplier, Herron Testing Laboratories, Inc., located in Cleveland, Ohio. A total of 18 chemical tests and 18 hardness tests were performed.
- b. The remaining 100 lockwashers were subjected to dimensional and visual inspections (inside and outside diameters and thickness).

The NRC inspectors found the procurement, inspection, and testing activities performed by Nova for the supply of the lockwashers on Sales Order No. 39089 to be satisfactory.

- On October 2, 1997, the NRC inspectors reviewed an additional nine Nova CGI dedication packages, processed during the period March through September 1997, for the supply of small metallic products selected from the following POs: five for Northeast Utilities (POs 02015122, 02018733, 02039272, and 00951296, Blanket Releases No. 34, and No. 58), two for the Tennessee Valley Authority (PO P95N2G108252, Releases 1183024 and 1184926), one for Nebraska Public Power District (PO 971872), and one for PECO Energy (PO159325, Release No. 387049).

The inspectors found that all required chemistry analysis, mechanical testing, and hardness testing was performed when required by the applicable PO and material specification.

The inspectors noted that several of the above orders specified ANSI B18.6.3, "Slotted and Recessed Head Machine Screws". The inspectors and Nova discussed the intent of the provisions contained in Section 2.7, "Material," of ANSI B18.6.3 which states the following:

2.7.1 *Material Screws.* Unless otherwise specified, machine screws shall be fabricated from carbon steel and shall have a minimum tensile strength of 60,000 psi.

2.7.2 *Machine Screws,* where so specified, may also be made from higher strength steels, corrosion resistant steel, brass, monel, aluminum alloys or other materials, as agreed upon between the manufacturer and the purchaser.

Nova informed the inspectors that it interprets the above as meaning that only carbon steel must satisfy the 60,000 psi minimum tensile strength. Nova considers that screws manufactured from stainless steel, brass, or other non-carbon materials are exempt from tensile requirements unless specified by the purchaser. Nova considers stainless steel as corrosion resistant steel. Nova further informed the inspectors that customer POs for non-carbon screws manufactured in accordance with ANSI B18.6.3 typically do not specify tensile test requirements.

c. Conclusions

The NRC inspectors concluded that Nova's CGI dedication program addresses the essential elements of the dedication process and that sufficient guidance for performing activities such as inspection and testing are provided. However, the NRC inspectors identified the following weaknesses:

- The NRC inspectors questioned Nova's practice of stamping all CMTRs, including those received from unqualified suppliers, with a "Nova QA Approved" stamp, based only on a comparison of the CMTR reported values to the material specification requirements. The inspectors noted that this practice may be misleading to the recipients of such CMTRs, since Nova QA approval may be reasonably assumed to also include other supplier activities such as material melting practice or heat treatment, which may not be directly verifiable for unqualified source material. This practice is of concern also because Nova's CGI dedication program does not specifically require that the results of their verification tests (chemical and mechanical) be compared to the values reported on the original CMTR to validate this document. Significant composition variances, even within the product analysis tolerance limits, between the Nova overchecks and CMTR reported values could be an indicator of mixed heats of material or incorrect CMTR for the material being dedicated. Significantly diverging results could, therefore, also invalidate other pertinent information included on the suspect CMTR.
- All of the nondestructive sampling plans in the attachments to NP-12 use the same destructive testing sampling plan regardless of whether the products were purchased as a lot from multiple or a single nonqualified supplier or whether the products were obtained from a supplier that had or had not been subjected to a commercial grade survey.

The NRC inspectors observed Nova personnel performing the following activities: a) receiving, in process, and final inspections, b) chemical analyses, c) tensile, proof load, wedge, and hardness testing, d) order review, and e) shop order processing. Personnel performing these activities demonstrated proficiency in accomplishing these activities and a high degree of knowledge of the applicable industry codes and standards and Nova procedure requirements for the activities. There were no abnormalities observed.

As a result of their observations and reviews, the NRC inspectors considered the following to be additional strengths:

- Nova's attitude to perform work activities correctly was evident during the conduct of the inspection, especially during the discussions between the NRC and Nova concerning the selection of appropriate sampling plans used for CGI dedication.
- The interfaces and communications between the various organizations processing a customer's PO were observed to be well established and implemented in a professional manner.

3.6 Nuclear Procurement Issues Committee (NUPIC) Joint Licensee Audit

The inspectors reviewed information related to a NUPIC joint utility audit, performed at Nova on April 23 through 25, 1997. The lead utility for this audit was Nebraska Public Power District, Cooper Nuclear Station, with an audit team consisting of a lead auditor and a technical specialist from the Nebraska Public Power District and a quality assurance engineer from Niagara Mohawk Power. The technical specialist evaluated Nova's sampling plan including its use in CGI dedication activities. The technical specialist identified no findings, adverse observations, or weaknesses in these areas.

Nebraska Public Power issued the Nova audit report, including completed audit checklists, to the NUPIC members by cover letter dated May 23, 1997. During the NRC inspection, the inspectors identified concerns to Nova regarding the NUPIC audit report and checklists. As a result of a subsequent internal critique and various comments from NUPIC members and by Nova, Nebraska Public Power District issued a revision to the audit report, dated June 18, 1997, and distributed this revision to the NUPIC members.

Based on a review of the Nova CGI dedication program and its associated sampling plans, the NRC inspectors determined that the original and revised NUPIC joint utility audit reports and checklists, dated May 23, 1997, and June 18, 1997, respectively, lacked sufficient detail for a NUPIC member to adequately assess NOVA's CGI dedication process.

Specifically, the NUPIC audit report notes that the sampling plans, used in Nova's CGI dedication program, meet the provisions of MIL-STD-105E and/or EPRI NP-7218. However, the audit reports failed to identify that NOVA's Procedure No. NP-12, Revision 10, permitted the use of sampling plans for CGI dedication that did not meet

either NP-7218 or MIL-STD-105E. As discussed in Sections 3.5.b.2 and 3.5.b.2(e) of this inspection report, Nova's destructive testing sampling plan used for CGI dedication is based on ASTM A-490(93).

Additionally, although Nova's practice of stamping CMTRs from approved suppliers is addressed, the completed NUPIC audit checklists and audit reports do not address how Nova processes CMTRs received from nonqualified suppliers when performing CGI dedication. According to Nova's procedures/practice, CMTRs received from nonqualified sources are stamped "Nova QA Approved," meaning that Nova has reviewed and compared the information on the nonqualified CMTR against applicable specification requirements and found it acceptable. Nova then processes the associated CGI through its dedication program, defined in Procedure NP-12. Further, should the chemical and mechanical overchecks performed by Nova vary from the values listed on the CMTR, Procedure NP-12 does not require Nova to take any action to investigate such variances. Thus, a customer receiving a CMTR stamped "Nova QA Approved" would not be aware that; a) the item associated with the CMTR may have been dedicated and the CMTR is from a nonqualified source, b) there is a possibility that test results and other the information listed on the CMTR may vary from the actual Nova overcheck test results (Nova does not provide its CGI dedication chemical and mechanical test results unless specifically requested by its customers), and, c) there is a possibility that information listed on the nonqualified suppliers CMTR has not been independently overchecked by Nova.

In summary, the NRC inspectors noted that the effectiveness and usefulness of joint audits are dependent on capturing sufficient information to enable the potential users of the audit information to reasonably assess the vendor's program controls and implementation for specific activities that are important to the user's procurement needs. The Nebraska Public Power District joint audit reports and checklists do not appear to contain sufficient detail for NUPIC members to assess Nova's controls for its commercial grade item dedication process. For example, as discussed above, the provisions of Procedure No. NP-12 are not adequately described. The "Test and Inspection" section contained in the audit report, could be assumed to mean that Nova's destructive testing sampling program meets MIL-STD-105E (neither the audit report nor checklist address the fact that Nova's destructive testing sampling plan is based on ASTM A-490 nor do they address the acceptability of the sample size provided in ASTM A-490 shipping lot sampling plan).

Based on the above discussion, Nova's sampling plan, as described in NP-12 and as evaluated by NUPIC members, may not be adequate for items that are intended to be used in high-safety-significant applications or applications where environmental conditions are of particular concern. For such applications, the licensee may desire the use of a sampling plan that will provide a higher confidence level than that provided by a destructive sampling plan based on ASTM A-490. Also, for these applications, the licensee may have the need for a CMTR produced under an Appendix B QA Program or the actual Nova test results rather than using information delineated on a CMTR from a nonqualified source.

3.7 Entrance and Exit Meetings

In the Entrance meetings , on June 2, 1997, and October 2, 1997, the NRC inspectors discussed the scope of the inspection, outlined the areas to be inspected, and established interfaces with Nova management. In the exit meetings, on June 5, 1997, and October 2, 1997, the inspectors discussed their findings and concerns.

PARTIAL LIST OF PERSONS CONTACTED

James A. Mraz, President and CEO
Tim Walker, Executive Vice President
John Burk, General Manager
Jim Fitzwilliam, Quality Assurance Manager
Dave Nenstiel, Laboratory Manager
Sandy Jacoby, QC Documentation
Kurt Bartley, Level II Inspector
Tony Holloway, Level III Inspector
Tim Corrigan, Materials Director

ITEMS OPENED, CLOSED, AND DISCUSSED

Open/Closed

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Selected Generic Correspondence on the Adequacy of
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Information Notice 97-81	Deficiencies in Failure Modes and Effects Analyses for Instrumentation and Control Systems

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This periodical covers the results of inspections performed by the NRC's Quality Assurance, Vendor Inspection and Maintenance Branch that have been distributed to the inspected organizations during the period from October through December 1997.

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