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LICENSEE CONTRACTOR AND VENDOR INSPECTION STATUS REPORT

QUARTERLY REPORT
APRIL 1988 - JUNE 1988

UNITED STATES NUCLEAR REGULATORY COMMISSION

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Manuscript Completed: July 1988
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Division of Reactor Inspection and Safeguards
Office of Nuclear Resctor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

CONTENTS

PREFACE

A fundamental premise of the Nuclear Regulatory Commission's (NRC) nuclear facility licensing and inspection program is that licensees are responsible for the proper construction and safe operation of their nuclear power plants. The total government-industry system for the inspection of nuclear facilities has been designed to provide for multiple levels of inspection and verification. Licensees, contractors, and vendors each participate in a quality verification process in accordance with requirements prescribed by, or consistent with, NRC rules and regulations. The NRC inspects to determine whether its requirements are being met by a licensee and his contractors, while the great bulk of the inspection activity is performed by the industry within the framework of ongoing quality verification programs.

In implementing this multilayered approach, a licensee is responsible for developing a detailed quality assurance (QA) plan. This plan includes the QA programs of the licensee's contractors and vendors. The NRC reviews the licensee's and contractor's QA plans to determine that implementation of the proposed QA program would be satisfactory and responsive to NRC regulations.

In the case of the principal licensee contractors, such as nuclear steam supply system designers and architect engineering firms, the NRC encourages submittal of a description of corporate-wide QA programs for review and acceptance by the NRC. Once accepted by NRC, a corporate QA program of a licensee's contractor will be acceptable for all license applications that incorporate the program by reference in a Safety Analysis Report (SAR). In such cases, a contractors's QA program will not be reviewed by the NRC as part of the licensing review process, provided that the incorporation in the SAR is without change or modification. However, new or revised regulations, Regulatory Guides, or Standard Review Plans affecting QA program controls may be applied by the NRC to previously accepted QA programs.

When design and construction activities were high, firms designing nuclear steam supply systems, architect engineering firms designing nuclear power plants, and certain selected major equipment vendors were inspected on a regular basis by NRC to ascertain through direct observation of selected activities whether these design firms and vendors were satisfactorily implementing the accepted QA program. However, with the substantial decline of new plant design activities, the inspection of QA program implementation has been deemphasized. Instead, the NRC vendor inspection focus has been shifted to vendor activities associated with nuclear plant operation, maintenance, and modifications. Inspection emphasis in now placed on the quality of the vendor products including hardware fabrication, licensee-

vendor interfaces, environmental qualification of equipment, and equipment problems found during operation and corrective action. If nonconformances with NRC requirements and regulations are found, the inspected organization is requested to take appropriate corrective action and to institute preventive measures to preclude recurrence. If generic implications are identified, NRC assures that affected licensees are expeditiously informed.

In addition to the above, the Vendor Program Branch has begun inspections at licensee facilities covering the areas of procurement of replacement parts for use in safety-related systems and licensee/vendor interface programs as requested in Generic Letter 83-28. This edition of the White Book contains copies of the inspection reports of inspections completed to date. Subsequent issues will contain those reports that are issued in the quarterly report period covered by that White Book.

In the past, NRC issued confirming letters to the principal contractors to indicate that NRC inspections have confirmed satisfactory implementation of the accepted QA programs. Licensees and applicants could, at their option, use the letters to fulfill their obligation under 10 CFR 50 Appendix B, Criterion VII, that requires them to perform initial source evaluation audits and subsequent periodic audits to verify QA program implementation. However, based on the above described change in nuclear plant design and construction activities, NRC will no longer issue confirming letters to principal contractors since future NRC vendor program inspections will focus on selected areas rather than addressing the implementation of their respective QA programs. Therefore, confirming letters that have already exceeded their three year effective period will not be renewed. Confirming letters issued less than three years ago will remain in effect until the stated effective period expires. Therefore, as the confirming letters expire, licensees and applicants will no longer be allowed to take credit for the NRC acceptance of the implementation of a principal contractor's QA program. Licensees continue to be responsible for the conduct of initial source evaluation audits and subsequent periodic audits to verify QA program implementation.

The White Book will continue to be published and will contain copies of all vendor inspections issued during the calendar quarter specified. The vendor inspection reports list the nuclear facilities to which the results are applicable thereby informing licensees and vendors of potential problems. In addition, the affected NRC Regional Offices are notified of any significant problem areas that may require special attention. The White Book also contains copies of I&E Information Notices, concerning vendor issues released during the calendar quarter.

The White Book contains information normally used to establish a "qualified suppliers" list; however, the information contained in this document is not adequate nor is it intended to stand by itself as a basis for qualification of suppliers.

Correspondence with contractors and vendors relative to the inspection data contained in the White Book is placed in the USNRC Public Document Room, located in Washington, D.C.

ORGANIZATION: COMPANY, DIVISION
CITY, STATE

REPORT NO.: Docket/Year/Sequence	INSPECTION DATE:	INSPECTION ON-SITE HOURS:

CORRESPONDENCE ADDRESS: Corporate Name
Division
ATTN: Name/Title
Address
City, State Zip Code

ORGANIZATIONAL CONTACT: Name/Title
TELEPHONE NUMBER: Telephone Number

NUCLEAR INDUSTRY ACTIVITY: Description of type of components, equipment, or services supplied.

ASSIGNED INSPECTOR: _____ _____
Name/Vendor Program Branch Section Date

OTHER INSPECTOR(S): Name/Vendor Program Branch Section

APPROVED BY: _____ _____
Name/Chief - Section/Vendor Program Branch Date

INSPECTION BASES AND SCOPE:

A. BASES: Pertain to the inspection criteria that are applicable to the activity being inspected; i.e., 10 CFR Part 21, Appendix B to 10 CFR Part 50 and Safety Analysis Report or Topical Report commitments.

B. SCOPE: Summarizes the specific areas that were reviewed, and/or identifies plant systems, equipment or specific components that were inspected. For reactive (identified problem) inspections, the scope summarizes the problem that caused the inspection to be performed.

PLANT SITE APPLICABILITY: List plant name and docket numbers of licensed facilities for which equipment, services, or records were examined during the inspection.

ORGANIZATION: ORGANIZATION
CITY, STATE

REPORT NO.:	INSPECTION RESULTS:	PAGE 2 of 2

A. VIOLATIONS: Shown here are any inspection results determined to be in violation of Federal Regulations (such as 10 CFR Part 21) that are applicable to the organization being inspected.

B. NONCONFORMANCES: Shown here are any inspection results determined to be in nonconformance with applicable commitments to NRC requirements. In addition to identifying the applicable NRC requirements, the specific industry codes and standards, company QA manual sections, or operating procedures which are used to implement these commitments may be referenced.

C. UNRESOLVED ITEMS: Shown here are inspection results about which more information is required in order to determine whether they are acceptable items or whether a violation or nonconformance may exist. Such items will be resolved during subsequent inspections.

D. STATUS OF PREVIOUS INSPECTION FINDINGS: This section is used to identify the status of previously identified violations, items of nonconformance, and/or unresolved items until they are closed by appropriate action. For all such items, and if closed, include a brief statement concerning action which closed the item. If this section is omitted, all previous inspection findings have been closed.

E. INSPECTION FINDINGS AND OTHER COMMENTS: This section is used to provide significant information concerning the inspection areas identified under "Inspection Scope." Included are such items as mitigating circumstances concerning a violation or nonconformance, or statements concerning the limitations or depth of inspection (sample size, type of review performed and special circumstances or concerns identified for possible followup). For reactive inspections, this section will be used to summarize the disposition or status of the condition of event which caused the inspection to be performed.

F. PERSONS CONTACTED: Typed, Name, Title

*present during exit meeting

SAMPLE PAGE
(EXPLANATION OF FORMAT AND TERMINOLOGY)

INSPECTION REPORTS

ORGANIZATION: CRUCIBLE MATERIALS CORPORATION
TRENT TUBE DIVISION
EAST TROY, WISCONSIN

REPORT NO.: 99902008/88-01	INSPECTION DATES: 02/16-19/88	INSPECTION ON-SITE HOURS: 23

CORRESPONDENCE ADDRESS: Mr. John Tverberg, Vice President
Technology
Crucible Materials Corporation
Trent Tube Division
2188 Church Street
East Troy, Wisconsin 53120

ORGANIZATIONAL CONTACT: H. D. Kurtz, Chief Metallurgist
TELEPHONE NUMBER: (416) 642-7321

NUCLEAR INDUSTRY ACTIVITY: Tubing for heat exchangers and condensers.

ASSIGNED INSPECTOR: J. T. Conway 4-11-88
J. T. Conway, Program Development and Reactive Inspection Section (PDRIS) Date

OTHER INSPECTOR: T. Tinkle (consultant)

APPROVED BY: J. T. Conway 4-14-88
E. H. Baker, Acting Chief, PDRIS, Vendor Inspection Branch Date

INSPECTION BASES AND SCOPE:

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

B. SCOPE: The inspection was conducted to perform a programmatic evaluation of the implementation of Trent Tube's (TT) QA program as it relates to the fabrication of tubing for nuclear facilities.

PLANT SITE APPLICABILITY: "Sea-Cure" tubing - Beaver Valley 2 (50-412) and Point Beach 1/2 (50-266/301).

A. VIOLATIONS:

Contrary to Section 21.31 of 10 CFR Part 21, a review of purchase orders (PO) to vendors revealed that while 10 CFR Part 21 was imposed upon TT, TT did not impose 10 CFR Part 21 requirements on POs 54133 (December 30, 1985) to Anderson Laboratories, 50005 (February 27, 1985) to Conam, and 58684 (January 22, 1987) to Instrumatics (January 22, 1987). (88-01-01)

B. NONCONFORMANCES:

1. Contrary to Criterion IV of Appendix B to 10 CFR Part 50, Subsection NCA 3856.3 of Section III of the ASME Code, and Section 5 of ANSI N45.2, the requirement for a vendor to have an approved QA program was not stated on POs 54113 (December 30, 1985) to Anderson Laboratories, 50005 (February 27, 1985) to Conam, 58684 (January 22, 1987) to Instrumatics, 59715 (April 30, 1987) to Page Wilson, and 57224 (September 2, 1986) to Magnetic Analytical Corporation (MAC). (88-01-02)

2. Contrary to Subsection NCA-3867.4(a) of Section III of the ASME Code and Sections 8.9.5 and 19.5 of the Quality Systems Manual (QSM), TT did not include the chemical product analyses which had been performed by steel manufacturers and/or a laboratory on the following CMTRs for nuclear orders: (88-01-03)

   °Two to Joseph Oat Corporation (JOC) for heat Nos. 360090 and 360314 on mill order No. N5-85027-6.

   °Three to JOC for heat Nos. 230183, 340467 and 340911 on mill order No. N5-80173-4.

   °Two to Wisconsin Electric Power Company (WEPC) for heat No. 94164 on mill order Nos. 4N5-10364-7 and 3N5-10365-7.

   °One to Duquesne Light Company (DLC) for heat No. 1G4894 on mill order No. N5-70005-5.

3. Contrary to Section 7.3 of Procedure No. QCS-134 and Section 9.6.1 of SNT-TC-1A, a review of qualification records for 13 nondestructive examination (NDE) personnel revealed that the records for all the examiners did not contain a statement indicating satisfactory completion of training in accordance with TT's written practice No. QCS-134. (88-01-04)

4. Contrary to Criterion II of Appendix B to 10 CFR Part 50, Section II of ANSI N45.2, and Sections 4.1 and 4.4 of the QSM, a review of training records and training schedules for 1986 and 1987 indicated that TT failed to indoctrinate and train personnel performing activities affecting quality in the requirements of the QSM. (88-01-05)

5. Contrary to Subsection NCA-3867.4(e) of Section III of the ASME Code and Section 8.9 of the QSM, TT failed to upgrade stock material used for safety-related tubing on two orders from DLC (PO No. 28559 dated February 4, 1985) and WEPC (PO No. C397325 dated November 11, 1987). (88-01-06)

6. Contrary to Criterion XII of Appendix B to 10 CFR Part 50, Subsection NCA-3868, and Section 17.5.1 of the QSM, a review of calibration records indicated that calibration cards for three pressure gauges (S/Ns 8325-4, 8247-7, and 1286) had not been updated to reflect current calibration status. (88-01-07)

7. Contrary to Criterion II of Appendix B to 10 CFR Part 50, Section 2 of ANSI N45.2, and Section 6 of the QSM, documented evidence was not available to show that a "Nuclear Review" form was generated for two nuclear orders from DLC (PO No. 28559 dated February 4, 1985) and WEPC (PO No. C397325 dated November 11, 1987). (88-01-08)

C. UNRESOLVED ITEMS:

None.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

None. This was the first inspection of this facility.

E. OTHER FINDINGS AND COMMENTS:

1. Trent Tube (TT)

TT is one of six divisions of Crucible Materials Corporation which is an employee owned company with corporate headquarters located in Syracuse, New York. TT produces stainless steel and alloy pipe and tubing at three manufacturing plants. At East Troy, Wisconsin, the CWA (cold work annealed) Plant produces tubing (1/2" to 1 1/2" diameter) to 150 feet in length, and piping (1/8" to 4" diameter) to

50 feet in length is produced at the Trentweld Plant. The TT East Troy facilities have an ASME Quality System Certificate (QCS-289 expiration date May 20, 1989) for a Material Manufacturer of ferrous and nonferrous seamless and welded without filler metal tubular products. The plant in Carrollton, Georgia has a QSC (Materials) and certifications for NPT and U stamps, and it produces welded pipe and tubing from 2 7/8" - 72" outside diameters (OD).

2. E-Brite 26-1

E-Brite 26-1 is a high purity ferritic stainless steel alloy developed and fabricated by Airco Vacuum Metals (AVM) until 1977 when the patent rights were purchased by Allegheny Ludlum (AL). The inspector was interested in knowing if TT had purchased E-Brite 26-1 from either AVM or AL and subsequently fabricated the alloy into a product that was used in a nuclear power plant.

In discussions with the Vice-President Technology, Chief Metallurgist, and Director of Marketing on this subject, the following information was obtained. TT has not fabricated any E-Brite orders since AL has been producing the Registered Trademark alloy. However, from 1974 through 1978, TT did a number of conversion orders (approximately 25) for AVM. To the best of their recollections, TT management indicated that the orders, all for tubing, did not contain quality or nuclear requirements, and the tubing was shipped to suppliers or to AVM. They stated that TT did not supply any E-Brite tubing to any US commercial nuclear facility. TT was able to retrieve QA records pertaining to only two E-Brite orders. The records for both orders in 1977 were procurement document change orders and Returned Material Reports for tubing returned to TT due to suspected weld defects. TT performed ultrasonic tests (UT) on the tubing, which was identified only as ASTM A268 Grade XM-27, and shipped the tested tubes which passed UT back to AVM and Southwest Alloys in Houston, Texas.

3. Plant Tour

The inspector toured the CWA manufacturing facility in the presence of the Manager, Technical Services. Due to the nature of this inspection and the time available, activities at the Trentweld Plant were not reviewed during this inspection.

Approximately 80 percent of the raw material from vendors is slit to size at TT's processing plant in Chicago, Illinois and sent to TT's CWA Plant in East Troy, Wisconsin. The strip is roll formed into a

circular shape and welded using the Tungsten Inert Gas (TIG) Process with argon-helium or hydrogen shielding on 10 weld mills. The weld bead is cold worked to produce a smooth surface on the OD and ID. The tubing goes through in-line induction annealing followed by final straightening and sizing on rolls. In-line eddy current testing (ET) and destructive tests (mechanical and hardness) are performed four times a shift assure the integrity of the weld. An off-line two-zone annealing furnace with an oxidizing atmosphere is also available. Stretch or rotary straightening assures straight tube lengths. A pneumatic (250 psi air) test is performed on all straight tubes.

The tubes are cut to length and samples are taken for the laboratory tests. The laboratory performs tensile, hardness, flange, flatten, and reverse bend tests and also corrosion tests if required by the specification or the customer. Finishing includes deburring and pickling (nitric/hydroflouric bath) followed by a dual rinse (treated plus demineralized water). A calibrated ring gauge is used on the tube, the OD and wall thickness are checked with a calibrated micrometer, and a visual inspection of the weld's inside diameter (ID) and OD is undertaken at final inspection. All the tubes are ET, and ultrasonic testing (UT) can be done if required by the customer. MAC and Conam calibrate the ET and UT equipment, respectively. The tubes are U-bent using a rotary die method with no lubricant followed by stress relieving using an electric resistance heated unit which is calibrated by Instrumatics. The bent or straight tubing is hydro tested at 1000 psi using demineralized water followed by purging with Argon. The radius of the bent tubes are checked on a template table, final cut to length, and deburred. A felt plug is blown through the ID of all tubes. Each tube is marked (type, heat number, row number for installation in vessel, and mill order number) and packaged for shipment.

4. Documentation Packages (DP)

Four DPs for nuclear orders were reviewed in detail. Two JOC orders (PO 17265 dated September 19, 1984 and Revision 6 dated February 18, 1986) were for approximately 2400 U-bend, SA 249, 304L tubes. The POs invoked Section III, Class 1 of the ASME Code but did not reference 10 CFR Part 21 requirements.

Each DP consisted of a number of documents. TT assigned mill order Nos. N5-80173-4 (October 26, 1984) and NS-85027-6 (June 19, 1986) to these orders. Each mill order (i.e., traveler) identified manufacturing operations and witness/hold points for the work. Nuclear Review Sheets identified procedure numbers for the manufacturing

operations. Procedures relating to stress relieving, UT, ET, tube cleaning, and hydrostatic testing were sent to JOC for their approval prior to use by TT.

For these orders, TT purchased Type 304L stainless steel from Armco Specialty Steels on POs 47941 (September 20, 1984) and 1257 (February 26, 1986). Armco CMTRs certified the chemical analysis and mechanical properties for heat Nos. 230183, 340911, and 340467 (PO 17265) and heat Nos. 360090 and 360314 (PO 17265, Revision 6). Anderson Laboratories performed spectrographic metallurgical analyses on samples from the five heats on TT POs 54113 (December 30, 1985) and 43358 (no date since TT could not locate a copy). TT failed to impose quality or 10 CFR Part 21 requirements upon Anderson Laboratories (see Violation 88-01-01 and Nonconformance 88-01-02).

Two TT Laboratory Reports gave the chemical analysis (same as Armco CMTRs) and mechanical properties (yield and tensile strength, elongation, and hardness) for the five heats. The flatten, flare, and reverse bend tests were also satisfactory. Five TT CMTRs, one for each heat, documented the chemical analysis and mechanical test results. Each CMTR stated that the tubing conformed to the requirements of SA 249 and Section III, Class 1 of the ASME Code; gave the results from the pneumatic, hydrostatic, ET, and UT tests; and indicated that the results of the flange, flatten, and reverse bend tests were satisfactory. It was noted that the five TT CMTRs failed to document the product chemical analysis performed by Anderson Laboratories (see Nonconformance 88-01-03).

Other documents in these packages included CWA row sheets, raw material release/disbursement, Weld Production Reports, Pressure Test Reports (both pneumatic and hydrostatic), Inspection Tally Sheets (ITS), Solution Annealing Reports, ET charts, calibration check-off sheets, U-bend-process inspection sheets, and Shipping Notices. The CWA row sheet identifies various parameters (e.g., bend radius, tangent length, etc.) for each row of tubing, and the ITS documents the results of visual, dimensional and ET test results.

Two DPs for "Sea-Cure" tubing for DLC and WEPC for use in safety-related component cooling heat exchangers were reviewed. DLC's PO 28559 (February 4, 1985) was for 2400 3/4" tubes, and 5080 5/8" tubes were ordered by WEPC on PO C39732S (November 11, 1987) for units at Beaver Valley and Point Beach nuclear plants, respectively. Both POs invoked the requirements of 10 CFR Part 21 and Appendix B

to 10 CFR Part 50. TT purchased strip material from Universal Cyclops (UC) for the DLC order and from Jones & Laughlin Specialty Products (JLSP) for the WEPC order. The CMTRs from UC (heat No. 1G4894) and JLSP (heat No. 94164) gave chemicals and mechanical values but did not certify that the material was produced in accordance with a QA program that met the requirements of Appendix B to 10 CFR Part 50 or ANSI N45.2 (i.e., this indicates that "stock material" was sent to TT).

TT performed mechanical testing and documented the results in laboratory reports dated January 28, 1985 and November 12, 1987. These results along with the results of the flange and reverse flat tests were identified in TT CMTRs to the customers. Chemical analysis was not performed by an independent laboratory. TT did not report the product chemical analysis which had been performed by UC and JLSP (see Nonconformance 88-01-03). The results of the pneumatic and ET were reported on the CMTRs, but there was no evidence that hydrotesting had been performed, and the CMTRs did not certify that the tubes were manufactured to a QA program meeting the requirements of Appendix B to 10 CFR Part 50 or ANSI N45.2. Based upon a review of all the documents made available to the inspector for these two orders, it appears that TT failed to upgrade stock material for these nuclear orders (see Nonconformance 88-01-06).

In addition, a Nuclear Review Sheet was not in the DP for the DLC order. This matter was brought to the attention of the Manager Technical Services, CWA Plant, who reviewed the situation with the Chief Metallurgist and concluded that the order had been processed as a standard (non-nuclear) order rather than a non-standard (nuclear) order. He further stated that a standard order was probably used because the PO did not invoke the requirements of Section III of the ASME Code. (see Nonconformance 88-01-08)

The remaining documents (e.g., Weld Product Report, Inspection Tally Report, etc.) were similar to those in the DPs for the JOC orders.

DL PO 26314 (September 20, 1984) was for tubing for a refrigerant condenser at Beaver Valley Unit No. 1. The PO invoked 10 CFR Part 21, Appendix B to 10 CFR Part 50, and DL specification NDS-0082. The DP on this order was not reviewed by the inspector.

5. Calibration of Measuring and Test Equipment (M&TE)

The inspector reviewed Section 17, "Calibration" of the QSM records to assure that M&TE is properly controlled and calibrated. It was

noted that the QA Coordinator is responsible for preparing and maintaining a calibration card for each device. The card identifies the calibrator (personnel or subcontractor), the calibration procedure, and the results of the calibration. The calibration card file was reviewed to ascertain the calibration status for selected test equipment. The equipment included three pressure gauges, two UT transducers, two UT testers MKII, three micrometers, one ring gauge, one digital panel, one Tinius Olsen tester, one ET unit, one optical pyrometer, and two sets of gauge blocks. For the three micrometers, it was noted that the earliest calibration date on the current card was June 1986, but the equipment was used in November 1984 (S/N 248-A) and May 1986 (S/Ns 154-A and 709-A). The calibration cards for the three pressure gauges (S/Ns 8325-4, 8247-7, and 1286) had not been updated following the last calibration. (See Nonconformance 88-01-07)

6. Control of Purchased Material and Services

The inspector reviewed Section 8, "Purchasing" and Section 9 "Vendor Qualification" of the QSM, procurement documents, Approved Supplier List (ASL), and external audits to assure that items and services conform to the procurement documents and are purchased from approved vendors.

Procurement documents to five vendors of services were selected to determine if technical and quality requirements were included in POs. PO 54113 (December 30, 1985) to Anderson Laboratories covered spectrographic metallurgical analysis of steel alloys for calendar year 1986. Page Wilson calibrated the Tinius Olsen 60,000 lb. tensile tester under PO 59715 (April 30, 1987). Although the PO to Page Wilson did not invoke quality or 10 CFR Part 21 requirements, the Chief Metallurgist stated that the calibration service was performed on-site under the supervision of TT and in accordance with TT procedures. The pressure gauges were calibrated off-site by Instrumatics under PO 58684 (January 22, 1987), and Conam calibrated the Sonic instruments under PO 50005 (February 27, 1985) also off-site. PO 57224 (September 2, 1986) to MAC was for calibration of equipment. It was noted that QA program requirements were not included in POs 54113, 50005, 58684, 59715, and 57224. In addition, POs 54113, 50005, and 58684 did not reference 10 CFR Part 21 requirements. (see Violation 88-01-01 and Nonconformance 88-01-02)

TT receives raw material (i.e., strip, sheet, and plate) from a number of domestic vendors which include Allegheny Ludlum (AL), JLSP, UC, Armco, Jessop Lukens, and International Nickel. A review

of TT POs (e.g., 36285 dated September 24, 1982 to UC; 1207 dated February 4, 1986 to LSP; 1257 dated February 26, 1986 and 47941 dated September 20, 1984 both to Armco) indicated that TT purchased stock material which would have to be upgraded to meet the requirements of a nuclear order.

Three QA audit reports of AL, Anderson Laboratories and Armco were reviewed. Two of the audits were conducted by the Manager QC - Trentweld Plant, and the audit of AL was by an individual from the Carrollton Plant. A review of the qualification records for the auditors indicated that the most recent data for the Carrollton employee was August 1986. This matter was brought to the attention of the QA Coordinator who had a copy of the individual's current record telecopied from the Carrollton Plant.

7. Nondestructive Examination (NDE)

The inspector reviewed Section 14, "Nondestructive Testing" of the QSM, TT's written practice QCS-134, Revision 6, "General Requirements for NDT Training and Certification," qualification records for 13 NDE personnel, and two NDE procedures. A memo from the President dated November 19, 1987 on the subject of Non-Destructive Training and Grading delegated the authority to administer the training of Level I and Level II NDE personnel to the Chief Inspectors of the Trentweld and CWA Plants. TT performs both ET and UT during fabrication. Procedures QCS-110, Revision 5 "Ultrasonic Inspection of Tubing and Pipe" and QCS-109, Revision 13 "Eddy Current Testing" were reviewed. For both procedures, there was no indication who wrote, reviewed, and/or approved the documents.

In general, the type of information found in the record files for the 13 NDE personnel (four - Level III and nine - Level II) included educational background, training record, record of qualification, certification statements, copies of examinations (general, specific, and practical), and eye exams. With one exception, the qualification records appear to satisfy the requirements SNT-TC-1A. The exception is that the qualification records for each examiner did not contain a statement showing satisfactory completion of training in accordance with Procedure No. QCS-134 (see Nonconformance 88-01-04).

8. Indoctrination and Training

The inspector reviewed Section 4 "Training" of the QSM and training records for both the CWA and Trentweld Plants. The CWA Training

Schedule for 1986 was a matrix showing the subject, instructor, and the month in which the training was given. The Training/Meeting sign up sheets for each session were reviewed. The sessions were titled DuPont Specification, Nuclear Training, Nuclear Orders, Auditor Training, Manager Technical Service Training, Welder Quality Training, Multicathode, Inspector Training, and Level III Training. A nuclear training outline for "Welding and Furnishing" was reviewed. This session was given in November 1986, and a session on "Fundamentals of Ultrasonics" was given by the Chief Inspector in October 1986.

The CWA Training Schedule for 1987 indicated 10 areas were covered. These sessions included Nuclear Training Welding, Level III Training, Practical Nuclear Order, Mill Inspection Training, Management Production & Inspection Training, Advanced Training for Final Inspector, Forester Training, New Product Lines, Training for Welders, and UT Training.

A review of the Trentweld Training Schedule for 1986 indicated that only three subjects out of 32 identified on the matrix were given. The schedule for 1987 included nine subject areas. Training/Meeting sign up sheets for these sessions were reviewed.

There was no indication that a Training Schedule for 1988 for either plant had been prepared. In addition, documentation was not made available to the inspector to show that training had been performed prior to 1987. Following the review of all the training records presented to the inspector, it was noted that personnel performing quality affecting activities had not been trained or indoctrinated with applicable requirements of the QSM (see Nonconformance 88-01-05).

9. 10 CFR Part 21

The inspector reviewed TT Procedure No. QCS-147 which addresses the evaluation and reporting of deviations. The procedure along with Section 206 of the Energy Reorganization Act of 1974 and 10 CFR Part 21 were posted on the employee's bulletin board in the CWA Plant. There was no documented evidence presented to the inspector that TT has a dedication program in effect to upgrade "commercial grade" material as defined in Section of 10 CFR Part 21 in the event that the material is used as a safety-related basic component in a nuclear facility.

10. Ferritic Stainless Steel

Two other ferritic stainless steel alloys have been fabricated by TT for heat exchanger applications in nuclear power plants. The two alloys are Type 439 which is a stabilized material (17-19% Cr) that has been used in condensers, feedwater heaters, lube oil coolers, and component cooling heat exchangers; and SEA-CURE, a Registered Trademark stabilized material (approximately 27.5% Cr) that has been used in condensers and other plant cooler tubing applications. Based on discussions with TT management personnel, the following list is a summary of the ferritic materials produced by TT for balance of plant installations. TT stated that none of the orders were for Section III tubing.

Licensee	Plant	Application	Date Shipped
Wisconsin Public Service (WPS)	Kewaunee	----	----
Northeast Utilities	Conn. Yankee	Condenser	08/81 - 11/85
Niagara Mohawk	Nine Mile Point	Condenser	02/84
DLC	Beaver Valley	Condenser Component Cooling Exchanger Refrigeration Condensing Unit	09/84 - 02/85
WEPC	Point Beach	Component Cooling Exchanger Lube & Seal Oil Coolers	11/87
Southern California Edison	San Onofre	Low Pressure Blow Down	11/87

The order from WPS was for Type 439 stainless steel, and Sea-Cure was the alloy for the remaining orders.

F. PERSONNEL CONTACTED:

B. Grant, President
*J. Tverberg, Vice President Technology
*H. Kurtz, Chief Metallurgist

*D. Janikowski, Manager Technical Services - CWA
*R. Billiat, Sales
*H. Hubbell, Production Manager Sales
*T. Matuszak, Production Manager Sales
*D. Burt, QA Coordinator
*J. DeClark, Manager QC - Trentweld
*J. Stam, Plant Manager - Trentweld
*D. Greeley, Plant Manager - CWA
L. Lundwall, Chief Inspector - CWA
J. Thackray, Director Marketing

*Attended exit meeting.

ORGANIZATION: ELGAR CORPORATION
SAN DIEGO, CALIFORNIA

REPORT NO.: 99900871/88-01	INSPECTION DATES: 01/25-28/88	INSPECTION ON-SITE HOURS: 52

CORRESPONDENCE ADDRESS: Elgar Corporation
ATTN: Mr. P. A. Zecos
President and Chief Executive Officer
9250 Brown Deer Road
San Diego, California 92121

ORGANIZATIONAL CONTACT: Mr. Clyde B. McVicker, QA Manager
TELEPHONE NUMBER: (619) 450-0085

NUCLEAR INDUSTRY ACTIVITY: Elgar manufactures electrical inverters, uninterruptible power supplies and associated products.

ASSIGNED INSPECTOR: _____ Apr. 18 1988
J. J. Petrosino, Program Development and Reactive Inspection Section (PDRIS) — Date

OTHER INSPECTOR(S): W. E. Gunther, Brookhaven National Laboratory

APPROVED BY: _____ 4-19-88
E. T. Baker, Acting Chief, PDRIS, Vendor Inspection Branch — Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 21 and Appendix B to 10 CFR Part 50.

B. SCOPE: This inspection was made as a result of recurring problems experienced with Elgar's 25 KVA electrical inverters by the Palo Verde Nuclear Generating Station (PVNGS) units II and III. The inspection was limited to the Elgar 25 and 7.5 KVA inverter design change activities.

PLANT SITE APPLICABILITY: Clinton (50-461); Commanche Peak (50-445/446); Crystal River (50-302); Dresden (50-237/249); Fitzpatrick (50-333); Hatch (50-321/366); Indian Point (50-286); Millstone (50-245/336/423); (continued)

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PLANT SITE APPLICABILITY: Monticello (50-263); Nine Mile Point (50-220/410); Oconee (50-269/270/287); Palo Verde (50-528/529/530); Perry (50-440); Point Beach (50-266/301); Rancho Seco (50-312); River Bend (50-458); San Onofre (50-206/361/362); Seabrook (50-443); South Texas (50-498/499); St. Lucie (50-335/389); Vermont Yankee (50-271); Vogtle (50-424/425); WPPSS (50-392); Waterford (50-382); and Yankee Rowe (50-029).

A. VIOLATIONS:

Contrary to Section 21.21, "Notification," of 10 CFR Part 21, several deviations were revealed where Elgar neither performed its required evaluation of potentially reportable 10 CFR 21 issues nor informed the end user so they could cause an evaluation to be performed. A number of the deviations are likely to constitute defects and would have been reportable if evaluated (88-01-01).

This is a Severity Level III violation (Supplement VII).

B. NONCONFORMANCES:

1. Contrary to Criterion I, "Organization," Criterion II, "Quality Assurance Program," Criterion V, "Instructions, Procedures and Drawings," of Appendix B to 10 CFR Part 50, Elgar has failed to clearly establish the duties and authorities of its engineering personnel to assure its safety-related design and engineering activities are satisfactorily accomplished (88-01-02).

2. Contrary to Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 and Elgar's quality assurance manual (QAM), it was noted that (88-01-03):

   a. Elgar has failed to ensure that its design control measures provide for an independent verification of the technical adequacy of its design changes for at least its 7.5 and 25 KVA inverters. A review of approximately 55 Elgar engineering design changes (ECN) revealed that 12 out of the 55 ECN's were prepared, reviewed and approved by the same person;

   b. Elgar has failed to assure that the cumulative effect of multiple design changes on a given drawing does not affect the functionality of the safety-related system or component in regard to the original design. A review of the 55 forementioned ECN's revealed that no design function reviews are performed by Elgar to assess the possible affects of the collective design changes on the original system design function;

c. Elgar could not provide previous revisions of its current drawings to the NRC inspector for any of the nine safety-related inverter component drawings that were being reviewed to determine the extent of design changes. This activity was being performed in parallel with an ECN review; and

d. Nine ECN's that were reviewed did not indicate whether an engineering evaluation had been performed.

3. Contrary to Criterion XVIII, "Audits," of Appendi B to 10 CFR Part 50, it was noted that the last two internal QA department audits used QA personnel as audit team members and the QA manager was the audit team leader for one of the two audits (88-01-04).

C. UNRESOLVED/OPEN ITEMS:

1. Setpoints - Technical discussions were conducted with the cognizant Elgar engineers to determine whether or not generic problems may exist in regard to maintaining setpoint parameters on its logic system circuit cards. A problem with the setpoints was identified at the PVNGS units II and III and has not been fully resolved by Elgar to date. The scope of the discussions between NRC staff and Elgar personnel included the collective functional affect on a system due to several minor design changes over a period of time. Additional discussions and evaluations are required. Therefore, this issue will be classified as an OPEN item (88-01-05).

2. Notification of end users - Numerous ECN documents were generated with "design error/deviation" stated by Elgar as the reason for the change. The functionality of licensee inverter units with respect to the original design parameters is in question. This issue is UNRESOLVED (88-01-06).

3. IC Sockets (ECN 1680) - This issue could effect the seismic qualification of licensee inverters that are currently using the associated circuit card. Until further Elgar review is performed, this issue will remain UNRESOLVED (88-01-07).

4. Field Changes - Further review and discussions will be performed during a future inspection to determine the method in which Elgar controls its field design changes. This issue is an OPEN item (88-01-08).

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

Neither reviewed nor discussed during this inspection.

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E. INSPECTION FINDINGS AND OTHER COMMENTS:

1. Entrance and Exit Meetings

The NRC staff informed the Elgar Corporation management representatives of the scope of the inspection during the entrance meeting on January 25, 1988 and summarized the inspection findings, observations, and NRC staff concerns during the exit meeting on January 28, 1988.

2. Background

The NRC Region V staff revealed in May of 1987, that the Palo Verde Nuclear Generating Station (PVNGS) Units II and III had experienced numerous problems with its Elgar electrical inverters. However, the licensee was not able to adequately resolve the inverter problems and PVNGS continued to experience an undesirable number of outages due to problems such as blown fuses, failed silicon control rectifiers (SCRs) and printed circuit logic card problems.

The PVNGS facility uses four 25 KVA single phase inverters (model INV253-1-101) and two three phase 25 KVA inverters (model INV253-3-101) on each of its three units. The four single phase inverters are energized during normal operation to supply power to the vital bus while the three phase inverters are in a standby condition to supply emergency power to the shutdown cooling isolation valve motor.

An overall review of the problems that PVNGS experienced was performed by the staff, and an inspection at Elgar was deemed appropriate.

3. 10 CFR Part 21 Requirements

Section 21.21, Notification," of 10 CFR Part 21 requires, in part, that each corporation adopt procedures to provide for either evaluating deviations identified in a basic component delivered to a nuclear power plant facility or to inform the customer of the deviation in order that the customer may cause the deviation to be evaluated.

Contrary to this, two examples were found where Elgar identified deviations or errors in its designed components and neither performed the required evaluation nor informed the applicable customers. Violation item 88-01-01 was identified in this area.

The first example was discovered during discussions with Elgar personnel. Elgar determined that PVNGS was having a high number of silcon controlled rectifier (SCR) failures because they were not applying adequate torque when installing SCRs. Without the proper torque applied, the SCR will heat up beyond its normal operating temperature and prematurely fail.

However, further discussion determined that Elgar had omitted the specific SCR torque requirement in its maintenance instructions for the 25 KVA inverters. Consequently, if a licensee replaced an SCR in an inverter, the required torque value may not be applied. For a normally energized inverter application, the resulting consequences could be a loss of power to important instrument and control functions causing an electrical transient which could include a reactor trip. Conversely, if a SCR was replaced on an inverter used for a standby function, a premature SCR failure could cause a total loss of that function during an actual transient when the inverter was energized for emergency operations.

Consequently, since a premature SCR failure in an inverter performing a safe shutdown function could result in the loss of that function, this issue should have been reported to all customers.

The second example was discovered during a review [illegible] engineering change notices (ECN's). Several ECN's [illegible] viewed which indicated that they were generated because of a d[illegible]or or deviation. Even though the Elgar ECN corrected th[illegible]ediate problem, notifications were not made to other customers that they may have equipment which would require modifications nor was a review performed by Elgar to determine what other equipment was involved. Examples of the errors/deviations include the following:

a. ECN 6379, dated April 1, 1987, "25 KVA Inverter PWM Analog Logic Card," Dwg. 643-102-41. The problem involved a .1 microfarad disc capacitor [part number 821-104-05] that was replaced because "the leads are weak and broken easily causing customer complaints." No Part 21 evaluation was performed;

b. ECN 6539, dated December 14, 1987, "7.5 KVA Inverter Filter Assembly," Dwg. 642-211-43. The ECN was issued to correct a documentation error in that a "non-nuclear" SCR had to be changed to "nuclear-grade" for eight assembly drawings. However, even though a large number of SCRs and circuit boards were involved,

no review was performed to determine if the incorrect SCRs had been sold for use in nuclear power plants prior to the time period that the ECN was approved;

c. ECN 1499, December 30, 1980, "25 KVA Inverter, Alarm Logic Board," Dwg. 643-103-42, referenced the need to increase resistor wattage in order to "reduce the stress factor of resistors" in accordance with IEEE-650, which is the qualification standard for nuclear inverters. No Part 21 evaluation was performed;

d. ECN 4530, dated June 22, 1984, "Static Switch Logic Assembly," Dwg. 549-000-2. Ibidem;

e. ECN 5589, dated August 30, 1985, "Static Switch Logic Assembly." Ibidem; and

f. ECN 3530, dated February 14, 1983, "25 KVA Inverter Alarm Logic Board," Dwg. 643-103-42. This ECN was issued to change the value of a resistor on a printed circuit board in order to effect latching of an alarm function, i.e., ensure that an out-of-tolerance condition remained annunciated. This change was indicated as "mandatory" requiring rework of all units in production; however, no determination was documented as to the affect on previously shipped units.

The above examples are issues that should have been reported to the end user as a minimum so that the end user could perform the evaluation for substantial safety hazard required by 10 CFR Part 21.

4. QA Program Establisment and Implementation

In parallel with the inspector's ECN review, the applicable QA manual sections, procedures, and instructions that control Elgar's safety-related design and engineering activities were reviewed. The review identified numerous inconsistencies and an overall lack of specificity in the documents that are supposed to provide guidance for the engineering department's safety-related activities. Certain aspects of the regulations were not fully and/or correctly translated into the Elgar program requirements. Nonconformance Item 88-01-02 was identified in this area.

As an example, for design changes, Elgar's QAM section 04, "Design," requires, in part, that engineering will maintain drawing and change control as prescribed in QAM Section 07. Section 07 requires, in

part, that engineering will assure that "drawing and change controls are maintained in accordance with this procedure." However, the procedure did not provide specific instructions for the engineering personnel. The lower tier documents were found to be written in the same manner. The documents were found to not clearly establish what the specific duties and authorities of Elgar's engineering personnel were.

Conversely, the Elgar "Engineering Design Review" procedure, number EEP-20, delineates specific duties for the Design Review Board Members However, the duties, as performed as stated, do not meet the intent of an NRC Appendix B [illegible] CFR Part 50 requirement which states, in part, that "measures shall be established for the selection and review for suitability of application of materials and parts that are essential to the safety-related functions [of a system]."

The section of EEP-20 that was found to be inconsistent with the regulation states, in part, "Design Review Board members will...ask questions, probe...to sufficiently satisfy themselves that the design approach is sound...They should be on the lookout for over-designed hardware...giving the customer more than he asked for. The members should be mindful of product costs. Any process, material, or part type that appears too expensive should come under investigation to determine if a less expensive approach could suffice." Other Elgar documents that were found to not clearly establish its engineering duties and responsibilites include:

(a) Part 5.0, "Design," of Section 04 of Elgar's QAM.
(b) Section 17, "QA Records," of Elgar's QAM.
(c) Procedure EEP-1, "Engineering Release and Change."
(d) Procedure EEP-3, "Engineering Change Requests."
(e) Procedure 36007-01, "Flow Diagram" [design changes].
(f) Procedure 60002-01, "Change Notices" [design change notices].
(g) Procedure 60003-01, "Change Control Board."

5. Design Control

The NRC inspectors reviewed numerous Elgar engineering design changes (ECNs), drawings, and change requests (ECRs) to evaluate the adequacy of the Elgar design change control in its 25 and 7.5 KVA electrical inverter areas. As a result of the design control review, three major areas of inadecuate design change control were revealed. Nonconformance item 88-01-03 was identified in this area. The three areas are as follows:

a. Lack of Independence In The Preparation, Review and Approval Process for Design Control - A review of 55 ECNs revealed that 12 out of 55 were prepared, reviewed and approved by the same individual. The 12 ECNs are: ECN 1104, ECN 1397, ECN 1473, ECN 1493, ECN 1499, ECN 1687, ECN 1796, ECN 1836, ECN 2212, ECN 3800, ECN 5988, and ECN 6216.

b. Inadequate Technical Evaluation of The Collective Effect of Multiple ECNs - A review was performed of the majority of ECN's associated with a particular drawing to verify whether or not an engineering evaluation was periodically performed to assess the cumulative effect of the design changes on the original design function of the system/component. While their individual importance varies for ECNs, even minor design changes, when considered cumulatively, may significantly change the ability of the equipment to operate within its original design specifications.

No objective evidence could be provided to the inspectors that would indicate such a review was performed or that Elgar identified and controlled its design interfaces. Additionally, discussions with the cognizant design engineers revealed that reviewing for the cumulative design change affect was not a typical past or present engineering practice. Examples include the following ECNs:

(1) ECN 1680, dated March 10, 1981, 25 KVA Inverter, multiple drawings. This ECN was issued to add integrated circuit (IC) sockets to certain safety-related printed circuit boards. The documentation associated with this change does not include or address the added mass in regard to its seismic integrity, nor does it address the seismic qualification of the subassembly and inverter panel;

(2) ECN 2790, dated May 19, 1982, 25 KVA inverter, multiple drawings. This ECN was issued to negate further implementation of ECN 1680 and to revert back to soldering the ICs to the boards. However, it could not be determined if any boards shipped during the 14 month interval when IC sockets were used have been identified to the end users so they may either change out the cards or evaluate the impact on their inverter panel qualification;

(3) ECN 3252, dated November 19, 1982, Dwg. 643-209-42 (INV253-1-101). This ECN was issued to change the existing model GE-364 SCR to SCR model GE-384. However, no documentation was provided to indicate that an evaluation of the affect of the change on the original circuitry design and function was performed;

(4) ECN 4031, dated November 30, 1983, Dwg. 643-209-42 (INV253-1-101). This ECN changed the size of fuse F1 from 200 amperes to 250 amperes. No calculations (or reference to) were documented to indicate that adequate protection of internal components and circuitry would still exist. The design change was not referenced back to the previously shipped inverters (INV253-1-101) even though the ECN indicated "Mandatory" action and "Rework" was required;

(5) ECN 4812, dated January 7, 1985, Dwg. 643-102-41 (INV253-1-101). This ECN changed resistor and capacitor values for the Analog Logic Board. No documented evidence existed to indicate that an evaluation was performed to ensure that the original design criteria and functions were within tolerances;

(6) ECN 5988, dated January 30, 1986, Dwg. 549-000-2. This ECN for the Static Switch Logic Assembly required the replacement of circuit board resistors because the SETPOINTS on the overvoltage and undervoltage trip and reset points were too close together. This change was indicated as mandatory for new units and those in production, but did not indicate whether or not an evaluation was performed to assess the impact on the original design function or the existing cards at any licensee facilities;

(7) ECN 5711, dated October 16, 1985, Dwg. 549-000-2. This ECN for the Static Switch Logic Assembly required the addition of a resistor and a diode to a circuit board to correct a problem in which the static switch would not stay in "Reverse" when manually selected. The ECN stated that the change was not safety-related even though the referenced drawing is labeled "Nuclear Safety-Related;"

(8) ECN 2075, dated August 11, 1981, Dwg. 643-101-42. This ECN for the 25 KVA inverter Logic Board changed the

resistance values for three resistors. It was not indicated whether or not an evaluation to assess the impact on the original design or other ECN changes was performed;

(9) ECN 3116, dated September 27, 1982 Dwg. 642-211-43. This ECN for the Filter Assembly of the 7.5 KVA inverter required the addition of a 2.5 K, 25 watt resistor across the primary of the transformer. No reference to an evaluation of the impact on the original design or other ECN changes was in evidence; and

(10) ECN 3726, dated June 1, 1983, Dwg. 642-107-40. This ECN for the Analog Logic Board for the 7.5 KVA inverters required several resistive and capacitive device changes. No reference to an evaluation of the impact on the original design was in evidence.

c. Inadequate Objective Evidence of Satisfactory Performance of Safety-Related Activities - During the review of the ECRs and ECNs it was obvious that in many cases the design change documents did not contain enough detail to show circuit changes, device location changes and other associated details. The applicable drawing revisions were requested that the specific ECNs were written against. It was then revealed that Elgar had not retained any of the previous revisions to its current drawings that were requested by the inspectors. Therefore, the ECNs and other change documents could not be compared or correlated with the applicable drawing revisions that would show the "Before" condition and following revision, the "After" condition.

Without the benefit of all the associated documentation to review, it could not be determined if Elgar adequately performed its safety-related design change activities.

6. Quality Assurance Records

As discussed in 5.c above, it was revealed that Elgar has not retained previous revisions to several of its 25 and 7.5 KVA inverter drawings, even though its QA manual requires that it retain "obsolete drawing masters." The specific drawings that were requested by the NRC inspectors for their previous revisions are as follows: Drawings 643-209-42, 643-101-42, 643-102-41, 642-107-40, 643-103-42, 642-211-43, 549-000-2, 543-118-1 and 549-000-9. Nonconformance item 88-01-03 was identified in this area.

7. Audits

Criterion XVIII, "Audits" of Appendix B to 10 CFR Part 50 requires, in part, that a comprehensive system of planned and periodic audits be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of its QA program. The audits shall be performed by personnel not having direct responsibilities in the areas being audited, and the audit results will be reviewed by the management having responsibility in the audited area.

Contrary to the above, the inspectors revealed that the Elgar 1987-1988 audit schedule, revision 1, indicated numerous examples of QA personnel performing the duties of "auditor" in different QA department audits. The last two QA department audits, "Inspection" (July 1987) and "Incoming Inspection" (September 1987) did not have personnel from any department other than auditors from the QA department on the audit team.

The "Inspection" audit contained two auditors who were both assigned to Elgar inspection activities. The "Incoming Inspection" audit included one auditor who was assigned to "Receiving" inspection activities. Additionally, on the later audit, the QA manager was the designated audit team leader. Nonconformance item 88-01-04 was identified in this area.

F. PERSONS CONTACTED:

*T. Erickson
*S. Reeves
*R. Parrish
*C. McVicker
*D. Risdon
H. McAlpin
S. Sedio

*Attended entrance and exit meeting.

ORGANIZATION: SOUTHERN BOLT & FASTENER CORPORATION
SHREVEPORT, LOUISIANA

REPORT NO.: 99900735/88-01	INSPECTION DATES: 03/7-11/88	INSPECTION ON-SITE HOURS: 51

CORRESPONDENCE ADDRESS: Mr. Thomas Goin, Vice President
Quality Assurance
Southern Bolt & Fastener Corporation
Post Office Box 7196
Shreveport, Louisiana 71137

ORGANIZATIONAL CONTACT: Mr. Walt Oehlkers, QA Coordinator
TELEPHONE NUMBER: (318) 221-4251

NUCLEAR INDUSTRY ACTIVITY: Supplier of large studs, nuts and fasteners.

ASSIGNED INSPECTOR: Claudia M. Abbate 4/11/88
C. M. Abbate, Program Development and Reactive Inspection Section (PDRIS) Date

OTHER INSPECTOR(S): C. Czajkowski, Consultant

APPROVED BY: For James C. Stone 4/15/88
E. T. Baker, Acting Chief, PDRIS, Vendor Inspection Branch Date

INSPECTION BASES AND SCOPE:

A. BASES: ASME BPV Code, Section III, Subsection NCA-3800, 10 CFR Part 21.

B. SCOPE: This inspection was performed to review Southern Bolt & Fastener's QA program and its implementation. Areas examined during the inspection included the procurement program, the calibration system, the NDE program, the heat treating program, upgrading of ASME material, nonconforming item control and finished product packages. The inspection consisted of observation of work and review of records.

PLANT SITE APPLICABILITY: Multiple plants.

A. VIOLATIONS:

There were no violations identified during the inspection.

B. NONCONFORMANCES:

1. Contrary to Paragraph NCA-3867.4(e) of Section III of the ASME Boiler and Pressure Vessel (BPV) Code and Paragraph 1.A. of Section 65.0 of the SBF QA Manual, Revision 0, dated November 13, 1986, material being upgraded for SBF Production Orders 4016 and 4097 lacked the required number of tensile tests needed to meet the ASME BPV Code requirements. The material has been shipped to the purchasers (88-01-01).

2. Contrary to Paragraph NCA-3867.3 of Section III of the ASME BPV Code, Paragraphs 2 and 3 of the SBF QA Manual, Revision 0, dated November 13, 1986, and Paragraph 4.5.2 of Section 410.01 of the SBF Procedure Manual, Revision 2, dated January 31, 1985;

   a. No nonconformance report (NCR) was written for studs, nuts and bolts which required rework. The rework was performed due to various nicks and dings which were identified during a SBF final/receipt inspection (88-01-02).

   b. No NCR was written for two measurements of lateral expansion (Charpy Impact test results) for SBF Production Order 4218 which did not meet the minimum value specified in Section NB-2333-1 of the ASME BPV Code (88-01-03).

   c. No NCR was written for material for SBF Production Order 4218 which contained a high carbon content and was rejected by the purchaser, Hub, Inc. (88-01-04).

3. Contrary to Paragraph NCA-3867.3 of Section III of the ASME BPV Code and Paragraphs 3, 6, and 9 of the SBF QA Manual, Revision 0, dated November 13, 1986, NCRs 1345 and 1352, dated August 15, 1987 and August 16, 1987 respectively, could not be located by SBF; a number of NCRs initiated in 1987 have not been closed out; and some NCRs have been signed as closed out, but no disposition was recorded (88-01-05).

4. Contrary to Paragraph NCA-3861(a)(3) of Section III of the ASME BPV Code and Paragraphs 4 and 8 of Section 50.0 of the SBF QA Manual, Revision 0, dated November 13, 1986, Metallurgical Services was not

listed as evaluated and approved for an NCA-3800 program on the Approved Vendor List (A.V.L.) although it is used by SBF to provide chemical analysis of ASME Section III material (88-01-06).

5. Contrary to Paragraph 10 of Section 50.0 of the SBF QA Manual, Revision 0, dated November 13, 1986, four suppliers on the A.V.L. were being evaluated every three years as opposed to the required annual evaluation (88-01-07).

C. UNRESOLVED ITEMS:

No unresolved items were identified during the inspection.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (Item A, 81-01):

Contrary to Subsection NF-2300 of the ASME BPV Code and Section 130.0 of the SBF QA Manual, records did not exist to substantiate that calibration had been performed on temperature instruments or the impact test machine.

The calibration program in place at SBF was reviewed during the inspection. A sample of ring gages, plug gages, and other test equipment used at SBF was examined to verify calibration at the correct frequencies and to verify that the calibrations were performed by qualified calibration vendors. The inspectors also observed the calibration of the Charpy Impact machine. No nonconformances were identified in this area and further details can be found in Section 3 of the report. This nonconformance is closed.

2. (Open) Nonconformance (Item B, 81-01):

Contrary to Paragraph NCA-3867.4(e) of the ASME BPV Code, Section III and Section 60.0 of the SBF QA Manual, certain materials used in ASME Code Section III applications had been received from unqualified vendors and verification of compliance of these materials with material specifications had not been accomplished in accordance with the provisions of NCA-3867.4(e).

Additional nonconformances were identified during the inspection in these areas, therefore, this nonconformance is closed. This item will be tracked as 88-01-01.

E. OTHER FINDINGS AND COMMENTS:

1. Entrance and Exit Meetings

An entrance meeting was conducted on March 7, 1988 at the SBF facility in Shreveport, Louisiana. The purpose and scope of the inspection were discussed during this meeting. During the exit meeting, conducted March 11, 1988, the inspection findings and observations were summarized.

2. Observation of Work

Throughout the inspection, the inspectors observed work being performed at SBF. The inspectors observed tensile tests, the calibration of the Charpy Impact machine and measurements of the lateral expansion of test specimens (results of impact tests). The inspectors also observed hold tags in use, heat treating being performed and production order packages accompanying material on the shop floor. It was observed that the appropriate revisions of the procedures were present at the work stations and the personnel were knowledgeable of the procedures.

The inspectors also examined the controlled warehouse. This is where stock material which is traceable back to certifications is kept. The inspectors selected four control numbers from items in the warehouse and reviewed the certifications. All four certifications were readily available for review and correctly identified the stock material.

3. Calibration Program

The inspectors examined the calibration program in place at SBF. Section 120.0 of the SBF QA Manual and Section 430 of the SBF Procedure Manual were reviewed. The inspector selected at random a number of ring gages, plug gages and go-no-go gages in the controlled test equipment cabinet to ensure proper calibration. All of the selected equipment was marked with a serial number, last date calibrated and calibration due date. The equipment serial number was traceable to the calibration log which listed the same information. Also reviewed were the calibration results received by SBF from the calibration vendors. If a piece of equipment was found to be out of calibration, it was pulled from service and the information was noted in the log and on the piece of equipment.

The equipment examined was properly calibrated and the records reviewed were kept in accordance with the QA manual and the procedure, thus closing out Nonconformance Item A in inspection report No. 81-01.

4. Approved Vendor List (A.V.L.)

The A.V.L. was acquired from SBF personnel to ensure the requirements of Section 50.0 of the SBF QA Manual and Section 440 of the SBF Procedure Manual were being met. Various production orders were reviewed to identify what suppliers SBF procures material from and if the suppliers are qualified and on the A.V.L. During this review, it was noted that Metallurgical Services had not been evaluated and approved for an NCA-3800 program. Metallurgical Services is used by SBF to perform chemical analysis on Code and non-Code production orders.

Also identified during this review was the fact that four vendors who hold Quality System Certificates (QSC) were being evaluated every three years instead of being evaluated annually. The three year evaluation schedule by SBF corresponded to the three year interval of the QSC. Because a QSC can be terminated during the three year period, the suppliers need to be evaluated on a yearly basis. During the NRC inspection, SBF contacted the four suppliers to ensure the QSCs were still in effect.

Nonconformances 88-01-06 and 88-01-07 were identified in this area.

5. Review of Production Order Packages

Several production order packages were reviewed during the inspection. The review consisted of completed production orders and in-process production orders. The packages included the purchase order to SBF, purchase orders to suppliers, Certificates of Test, heat treatment reports, NDE reports, NDE personnel qualifications, results of chemical analyses, test data reports, and Certificates of Compliance.

During this review, it was noted that rework had been performed on bolts, studs, and nuts received from Texas Bolt (purchase order 20011) without an NCR written to identify the nonconformance. Various nicks and dings were identified on the threads of the finished parts during a SBF final/receipt inspection. The nicks and dings required rework which would require an NCR to be written. The results of the rework and reinspection were noted on the SBF "Finished Fastener Receiving Inspection Report."

Nonconformance 88-01-04 was identified in this area.

During the review of the package for Production Order 4218 (purchase order T-8027103 from Hub, Inc.), it was noted that the Test Data Sheet (Lab order No. 05302) had two measurements of lateral expansion (Charpy Impact test results) which did not meet the minimum value specified in Section NB-2333-1 of the ASME BPV Code. The material was accepted by SBF QA without an NCR being written. The finished parts were shipped to the customer with one of the out of specification values noted on the Certificate of Test. The other out of specification value was apparently transcribed erroneously onto the Certificate of Test and appeared as an acceptable value. During the NRC inspection, SBF issued NCR 1525 and required the three test coupons be remeasured for lateral expansion. The NRC inspectors observed the remeasuring performed as a result of NCR 1525 and these measurements were significantly different from the original measurements. The second set of measurements fell within the acceptable values, thus rendering the material acceptable. Because of the large variation in results between the original measurements and the second set of measurements, SBF is conducting a search for previously inspected impact test specimens to perform a reinspection of those specimens. This is being done to develop a level of confidence in the data taken by the inspector who measured the first set of values.

Nonconformance 88-01-02 was identified in this area.

6. Upgrading of Stock Material for Code Work

A total of four packages which contained material upgrades were reviewed. Two of the four packages met the requirements of the ASME BPV Code, Section NCA-3867.4(e). The two remaining packages failed to meet certain requirements of that section.

Production Order 4016 was for 144 manways studs and nuts being manufactured for Westinghouse under purchase order MN 83129. AISI 4140 material was being upgraded to ASTM-A-193 Grade B7 material. The Code requires that a tensile test be performed on each piece of stock material. For this order there were three pieces of stock used, but only two pieces of stock had tensile tests performed on them. SBF cannot trace which studs and nuts came from which piece of stock and therefore plans on notifying the customer that the material was not properly upgraded.

This problem was previously identified during an ASME accreditation survey and SBF was in the process of responding to the ASME survey team's finding.

Production Order 4097 was for 32 trunnion bolts being manufactured for Westinghouse under purchase order PE 21815 MSA. This material was being upgraded from ASTM-A-193 Grade B16 to SA-540 Grade B21. As with Production Order 4016, the code required a tensile test be performed on each piece of stock material. Three pieces of stock material were used for this order while only two pieces were tensile tested. The individual bolts cannot be traced to the piece of stock used to manufacture the bolts. At the time of the inspection, SBF stated they plan on notifying the customer of the improper upgrading.

Nonconformance 88-01-01 was identified in this area.

Nonconformance 88-01-03 was identified in the upgraded material package for Production Order 4218. In this package, material had been upgraded, but contained a carbon content value in excess of that allowed by the chemical specifications. The purchaser, Hub, Inc. (purchase order T-8027103), rejected the material in a letter to SBF, dated November 5, 1987, due to the high carbon content. No NCR was written to identify the disposition of the material. During the NRC inspection, SBF issued NCR 1523 and the NRC inspectors verified that the material was being kept in the controlled warehouse with the proper certification available for review.

7. Nonconforming Item Control

The SBF nonconforming item control program was reviewed. Section 110.0 of the SBF QA Manual and Section 460.01 of the SBF Procedure Manual describe the requirements of the program and were reviewed by the NRC inspectors. NCRs, corrective action reports and the nonconformance/corrective action report log were reviewed. During this review, it was noted that a number of NCRs which were initiated in 1987 had not been closed out. Additionally, upon review of several NCRs, it was noted that the former QA Manager had signed NCRs as being closed out, but no disposition had been indicated on the NCR. Two NCRs, 1345 and 1352, dated August 15, 1987 and August 16, 1987 respectively, were written on nuclear production orders and could not be located by SBF. The nonconformance/corrective action report log indicated that they had not been closed out, but the material has been shipped to the purchasers. It is not known what type of nonconformance existed for these two NCRs nor is it known what disposition,

if any, was performed. SBF indicated that an effort is being made to correct problems associated with the NCR program.

Nonconformance 88-01-05 was identified in this area.

8. Heat Treatment

The inspectors examined SBF's heat treating facilities. The equipment was calibrated and the latest revision of the procedures were available at the work station. The SBF personnel were knowledgeable of heat treatment and the procedures. Heat treatment charts which were included in production order packages were also reviewed to ensure the material was kept at the correct temperature for the appropriate amount of time as specified in the Code.

9. Nondestructive Examination (NDE)

The inspectors reviewed the certification for NDE personnel and found them in accordance with SBF's written practice, which meets the requirements of SNT-TC-1A. The inspectors also reviewed the certifications of the material used at SBF for magnetic particle testing and liquid penetrant testing. This was done to ensure that contaminants were not present in the material. NDE test reports were reviewed in addition to inspecting the facilities used for NDE. Based on the review, the NDE program is being performed in accordance with the SBF QA Manual and the accompanying SBF procedures.

10. Internal Audits

The inspectors reviewed the SBF internal audits for 1986 and 1987. Both audits were performed with checklists and in accordance with Section 200.0 of the QA Manual and Section 450 of the SBF Procedure Manual. Corrective action was taken for deficient areas identified during the audits and follow-up was performed.

F. PERSONS CONTACTED:

Thomas A. Goin, Vice President, Quality Assurance
Peter Lillys, Vice President, Technology
E. W. Nelson, President
Walter G. Oehlkers, Quality Assurance Coordinator
R. Pettway, Forge Foreman
G. Sepulvado, Chief Inspector
J. Williams, Warehouse Foreman
A. J. Wilson, Supt. Heat Treating

SELECTED INFORMATION NOTICES

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

June 24, 1988

NRC INFORMATION NOTICE NO. 88-44: MECHANICAL BINDING OF SPRING RELEASE DEVICE IN WESTINGHOUSE TYPE DS-416 CIRCUIT BREAKERS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees to potential problems resulting from the mechanical binding of the spring release device (SRD) in Westinghouse type DS-416 metal clad circuit breakers. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On May 25, 1988, the South Texas Project Unit 1 (STP-1 or licensee) performed a loss-of-offsite power test. During this test, two Class 1E electrical circuit breakers failed to reclose as required during load sequencing. Subsequent investigation by the licensee identified the failed breakers as Westinghouse type DS-416 metal clad breakers. These DS-416 electrical breakers are located in main 480-Vac load centers and are tie and feeder breakers for 480-Vac components.

The breaker has an SRD that initiates the sequence for the breaker closing. The SRD is attached to the breaker housing and is comprised of a coil housing that is attached to the breaker casing, a closing coil, and a lever that is attached to the coil housing. The lever travels up and down through a window (a punched out opening) in the breaker casing. When the breaker is signaled to close, the coil is energized and the lever is designed to move up and make contact with the spring release latch that mechanically releases the breaker closing springs. These SRDs also are used in Westinghouse type DS-420 and DS-206 circuit breakers.

Discussion:

The licensee's preliminary investigation indicates that the breakers failed to reclose because the closing coils had overheated and burned out. The licensee

believes that the coils burned out as a result of mechanical binding between the lever and the edge of the breaker casing window. The licensee physically inspected and electrically tested 28 other DS-416 breakers installed in Unit 1 and 18 breakers installed in Unit 2 as of June 16, 1988, and identified 10 additional cases where the lever and the edge of the breaker casing window were making contact.

Although the root cause of the binding has not been determined, the licensee has taken several steps to alleviate the problem. The licensee has replaced the SRD in the STP-1 breakers that indicated signs of possible binding and has verified that the clearances between the lever and the casing are sufficient to preclude further binding. In addition, the licensee has extensively briefed the STP control room personnel on this binding problem. It should be noted that although the SRD may bind, it is still possible to manually trip the breaker closing springs by pushing the "CLOSE" button located at the circuit breaker.

The licensee has contacted Westinghouse for assistance in determining the root cause of the binding. The NRC will remain cognizant of any new developments and await the results of the South Texas and Westinghouse investigation. The NRC will issue a further generic communication if warranted by the availability of additional information or if additional regulatory action is deemed necessary.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

Charles E. Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: Kamal Naidu, NRR
(301) 492-0980

Jaime Guillen, NRR
(301) 492-1170

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-42	Circuit Breaker Failures Due to Loose Charging Spring Motor Mounting Bolts	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-41	Physical Protection Weaknesses Identified Through Regulatory Effectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-37	Flow Blockage of Cooling Water to Safety System Components	6/14/88	All holders of OLs or CPs for nuclear power reactors.
88-36	Possible Sudden Loss of RCS Inventory During Low Coolant Level Operation	6/8/88	All holders of OLs or CPs for PWRs.
88-35	Inadequate Licensee Performed Vendor Audits	6/3/88	All holders of OLs or CPs for nuclear power reactors.
88-34	Nuclear Material Control and Accountability of Non-Fuel Special Nuclear Material at Power Reactors	5/31/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

July 8, 1988

NRC INFORMATION NOTICE NO. 88-46: LICENSEE REPORT OF DEFECTIVE REFURBISHED CIRCUIT BREAKERS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees of licensee reported information that defective refurbished electrical equipment, such as circuit breakers (CBs), may have been supplied to nuclear power plants. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Pacific Gas and Electric Company (PG&E) has informed NRC that it placed a purchase order for 30 new, non-safety-related, molded-case, KHL 36125-type CBs manufactured by the Square D Company (Square D) with a local electrical distributor. These CBs were intended for use in non-safety-related applications at PG&E's Diablo Canyon Nuclear Power Plant.

According to PG&E, the distributor in turn placed the order with a local supplier who bid the lowest price and promised the quickest delivery. The CBs were delivered directly to the Diablo Canyon plant by the supplier; the distributor did not have an opportunity to inspect the CBs. Square D, aware of the purchase order, questioned its failure to receive an order for the unique vintage KHL 36125-type CBs. With PG&E's permission, Square D inspected the CBs and determined that PG&E had been given refurbished, rather than new, CBs. Square D tested and performed detailed examinations of the CBs, and the results reported by PG&E follow.

A. Physical Examination

The yellow side labels used on the CBs were suspect in that the CB model numbers were typed on the labels whereas authentic labels are preprinted. The CBs departed from normal appearance in other respects as well.

The individual CB cases and each of the CB components appeared to be Square D products; however, the individual CBs incorporated components of different years of manufacture. Each CB bore evidence of having been opened and reassembled.

B. Electric Testing

Square D subjected the CBs to five electrical tests. None of the CBs complied with Square D or Underwriters' Laboratory (UL) specifications for all of the tests, and several of the CBs were out of tolerance on each of the tests. At least four of the CBs failed to trip under circumstances in which they are designed to trip.

Discussion:

In the past, there have been instances in which licensees purchased commercial-grade components, such as CBs, relays, trip units, and other electrical components, from electrical distributors and have received components that did not meet the original purchase order requirements. NRC has received additional information indicating that the problem of surplus or defective refurbished CBs may also apply to CBs sold under other manufacturers' names (e.g., General Electric, Westinghouse, ITE, Cutler Hammer, and Sylvania).

The electrical suppliers involved in refurbishing and sales of circuit breakers, including the Diablo Canyon, Square D circuit breakers, apparently include five California corporations. These companies are (1) General Circuit Breaker & Electric Supply, Inc., (2) HLC Electric Supply Co., Inc., (3) Pencon International, Inc., doing business as General Magnetics/Electric Wholesale, (4) California Breakers, Inc., and (5) Anti-Theft Systems, Inc., doing business as ATS Circuit Breakers and as AC Circuit Breaker-Electrical Supply.

NRC has an investigation and vendor inspection in progress at the above companies. On the basis of the information developed to date, a preliminary list of customers of the five companies including a list of nuclear utilities (where available) is provided in Attachment 1. Attachment 2 contains a list of original equipment manufacturers whose names may have been used on surplus or refurbished equipment sold as new equipment. The information included in Attachments 1 and 2 is only preliminary and is provided to assist licensees in reviewing the potential of having procured suspect electrical equipment at their facilities.

Licensees are reminded of the requirements to ensure that procured items meet the relevant specifications and codes and are suitable for the intended application. Licensees should consider, as a matter of prudence, the need to inquire of and to verify with their authorized distributors the sources of procured materials, equipment, and components. Licensees may meet these requirements by effectively implementing their quality assurance (QA) programs, particularly in the areas of vendor evaluations, vendor surveillances, receipt inspection, bench tests, and post-installation tests.

NRC is gathering additional information to determine what further actions are necessary. The primary purpose of this information notice is to alert addressees of the situation as soon as possible. The NRC is considering issuing a bulletin to followup on this information notice when the NRC has sufficient information to define requirements.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

Charles E. Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: K. R. Naidu, NRR
(301) 492-0980

Jaime Guillen, NRR
(301) 492-1170

Attachments:
1. Preliminary List of Customers (Intermediate Suppliers) of Suspect Electrical Equipment
2. Preliminary List of Original Equipment Manufacturers Whose Names May Have Been Used on Surplus or Refurbished Equipment Sold as New Equipment
3. List of Recently Issued NRC Information Notices

PRELIMINARY LIST OF CUSTOMERS (INTERMEDIATE SUPPLIERS)
OF SUSPECT ELECTRICAL EQUIPMENT

Organization	Location	Nuclear Utility (if available)
Westinghouse Electric Supply Co. (WESCO)	St. Louis, MO; Boston, MA; Boise, ID; Atlanta, GA; Charleston, SC; Panama, FL; Santa Clara, CA; Fresno, CA; Sacramento, CA; Shreveport, LA; Green Bay, WI; Elk Creek, IL; Albuquerque, NM; Mobile, AL; Ft. Worth, TX; Baton Rouge, LA; Birmingham, AL; East Hartford, CT; Kokomo, IN; Jackson, MS; Milwaukee, WI; Beaumont, TX; Nashville, TN; Skelton, WV; Albany, NY; Hartford, CT; Portland, ME; St. Paul, MN; Minneapolis, MN; other locations	
Power Conversion	Huntington Beach, CA	
Rockwell International	Los Angeles, CA	
Arkansas Power and Light	Little Rock, AR	ANO
Southern California Edison	San Clemente, CA; other locations	SONGS
Phoenix Electric	Phoenix, AZ	
Rensenhouse Electric	Topeka, KS	
Breaker and Control	Houston, TX	
General Electric Company	Baltimore, MD; Houston, TX; Landover, MD; Chantilly, VA; Emeryville, CA; Elmhust, IL	
Southern Electric Supply Company	Alexandria, LA	
Cleveland Electric Company		

PRELIMINARY LIST OF CUSTOMERS (INTERMEDIATE SUPPLIERS)
OF SUSPECT ELECTRICAL EQUIPMENT

Organization	Location	Nuclear Utility (if available)
Stokley Enterprises	Norfolk, VA	
Taylor Electric Company	Portland, OR	
Graybar	Ventura, CA; Atlanta, GA	
Hughes Aircraft	El Segundo, CA	
Houston Electric Distribution Company	Houston, TX	
ITE Electrical Products	Atlanta, GA; Knoxville, TN	
Knudson Corporation	Los Angeles, CA	
Georgia Power Company	Milledgeville, GA	

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-45	Problems In Protective Relay and Circuit Breaker Coordination	7/7/88	All holders of OLs or CPs for nuclear power reactors.
88-44	Mechanical Binding of Spring Release Device in Westinghouse Type DS-416 Circuit Breakers	6/24/88	All holders of OLs or CPs for nuclear power reactors.
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-42	Circuit Breaker Failures Due to Loose Charging Spring Motor Mounting Bolts	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-41	Physical Protection Weaknesses Identified Through Regulatory Effectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-37	Flow Blockage of Cooling Water to Safety System Components	6/14/88	All holders of OLs or CPs for nuclear power reactors.
88-36	Possible Sudden Loss of RCS Inventory During Low Coolant Level Operation	6/8/88	All holders of OLs or CPs for PWRs.

OL = Operating License
CP = Construction Permit

PRELIMINARY LIST OF ORIGINAL EQUIPMENT
MANUFACTURERS WHOSE NAMES MAY HAVE BEEN USED
ON SURPLUS OR REFURBISHED EQUIPMENT SOLD AS NEW EQUIPMENT

Manufacturer	Model Number	Equipment Description
Westinghouse	225N	Navy trip units
ITE	EF-3B100	100-amp circuit breaker
General Electric	AK-2-75-3	Circuit breaker
General Electric	AK-2	Circuit breaker
General Electric	AK-1-50	Circuit breaker
General Electric	AK-1-75	Circuit breaker
General Electric	B; TDQ; TFJ	Circuit breakers
General Electric	TCVVFS	Circuit breaker
ITE	ET; KA	Circuit breakers
Cutler Hammer	--	Circuit breakers
Zinsco/Sylvania	--	Circuit breakers
Bryant	--	Circuit breakers
Murry	--	Circuit breakers
Federal Pacific Electric Company	--	Circuit breakers

PRELIMINARY LIST OF ORIGINAL EQUIPMENT
MANUFACTURERS WHOSE NAMES MAY HAVE BEEN USED
ON SURPLUS OR REFURBISHED EQUIPMENT SOLD AS NEW EQUIPMENT

Manufacturer	Model Number	Equipment Description
Square D	B19.5; B22	Heater for overload relay
General Electric	12HGA11S52	Auxiliary relay
Exide Company	NX400	
Spectro Inc.	V00014	Mercury lamps
Bussman Company	REN15	15-amp 250-V fuse
Bussman Company	NOS-30	30-amp 600-V fuse
(unknown)	FSN 5925-628-0641	Circuit breaker
Westinghouse	DB-50	Trip unit
Westinghouse	DB-25	400-amp circuit breaker
Westinghouse	HKB3150T	Trip unit
Westinghouse	KB3250F	Frame
Westinghouse	FB3020	Circuit breaker
Westinghouse	FB3070	Circuit breaker
Westinghouse	FB3050	Circuit breaker
Westinghouse	EHB3040	Circuit breaker
Westinghouse	EHB3025	Circuit breaker
Westinghouse	LBB3125	Circuit breaker
Westinghouse	HKA31250	Trip unit
Westinghouse	JA3200	Circuit breaker
Westinghouse	EHB2100	Circuit breaker
Westinghouse	CAH3200	Circuit breaker

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

July 12, 1988

NRC INFORMATION NOTICE NO. 88-48: LICENSEE REPORT OF DEFECTIVE REFURBISHED VALVES

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert licensees to potential problems with refurbished valves. It is expected that recipients will review this information for applicability to their facilities and consider action, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

In April 1988, Pacific Gas and Electric (PG&E) informed the NRC about a potential problem concerning Vogt 2-inch valves (Vogt Figure No. SW 12111), which were leaking steam at the bonnet and packing. According to PG&E, the valves were purchased from a local supply company in May 1986 and installed in non-safety-related applications. Although the supply company is now out of business, additional information was obtained by PG&E that indicated that the valves, although supplied as new, were actually shipped from CMA International of Vancouver, Washington, a valve salvage supply house. Henry Vogt Company examined the valves at the Diablo Canyon plant and determined that it had not manufactured the valves. The valves at Diablo Canyon had square flanges, and all Vogt-manufactured valves have round flanges.

Discussion:

NRC again stresses the importance of the licensee's role in ensuring that procurement activities for both safety-related and non-safety-related components and materials are given attention commensurate with their importance. Had an adequate review of the source of the valves been performed, this problem would have been identified and salvage valves would not have been installed.

On the basis of discussions with Vogt representatives, these valves would not be appropriate as replacement valves in safety-related applications. These valves are full-port design; that is, the valve port is the same size as the

inside diameter of the pipe. Vogt valves designed and sold for safety-related use are standard-port design; that is, the valve port is slightly smaller than the inside diameter of the pipe. Vogt representatives were not aware of any full-port design valves sold for safety-related applications to nuclear power plants.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate regional office.

Charles E. Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contact: Edward T. Baker, NRR
(301) 492-3221

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-47	Slower-Than-Expected Rod-Drop Times	7/14/88	All holders of OLs or CPs for PWRs.
88-46	Licensee Report of Defective Refurbished Circuit Breakers	7/8/88	All holders of OLs or CPs for nuclear power reactors.
88-45	Problems In Protective Relay and Circuit Breaker Coordination	7/7/88	All holders of OLs or CPs for nuclear power reactors.
88-44	Mechanical Binding of Spring Release Device in Westinghouse Type DS-416 Circuit Breakers	6/24/88	All holders of OLs or CPs for nuclear power reactors.
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-42	Circuit Breaker Failures Due to Loose Charging Spring Motor Mounting Bolts	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-41	Physical Protection Weaknesses Identified Through Regulatory Effectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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VENDOR INSPECTION REPORTS RELATED TO REACTOR PLANTS

PLANTS / VENDORS	BEAVER VALLEY 1 & 2	CALVERT CLIFFS 1 & 2	CATAWBA 1 & 2	CRYSTAL RIVER 3	DAVIS-BESSE 1	HADDAM NECK	INDIAN POINT 2 & 3	JAMES A. FITZPATRICK	MAINE YANKEE	MILLSTONE 1 & 2	NORTH ANNA 1 & 2	OCONEE 1, 2 & 3	PALISADES	PALO VERDE 1, 2 & 3	POINT BEACH 1 & 2	PRAIRIE ISLAND 1 & 2	RANCHO SECO 1	ROBINSON 2	SALEM 1 & 2	SAN ONOFRE 1	SEQUOYAH 1 & 2	SOUTH TEXAS 1 & 2	ST. LUCIE 1 & 2	SURRY 1 & 2	TURKEY POINT 3 & 4	WATERFORD 3	WOLF CREEK 1	YANKEE ROWE	ZION 1 & 2
CRUCIBLE MATERIALS CORPORATION	412																											
ELGAR CORPORATION		461	X	X	237 249	X	286	X	X	X	X	X	X															
SOUTHERN BOLT & FASTENER CORPORATION	MULTIPLE PLANTS																											

X-APPLIES TO ALL UNITS DOCKETNO.- APPLIES ONLY TO THE IDENTIFIED UNIT

VENDOR INSPECTION REPORTS RELATED TO REACTOR PLANTS

PLANTS / VENDORS	PERRY 1 & 2	POINT BEACH 1 & 2	RANCHO SECO 1	RIVER BEND 1 & 2	SALEM 1 & 2	SEABROOK 1	SOUTH TEXAS 1 & 2	STERLING 1	VEGP 3 & 4	VOGTLE 1 & 2	WATTS BAR 1	WNP 1 & 3	WNP 2	YANKEE ROWE
CRUCIBLE MATERIALS CORPORATION		X												
ELGAR CORPORATION	440	X	X	458	X	443	X	X	X	X	X	392	X	
SOUTHERN BOLT & FASTENER CORPORATION														

X-APPLIES TO ALL UNITS DOCKETNO.- APPLIES ONLY TO THE IDENTIFIED UNIT

NRC FORM 335 (2-84) NRCM 1102, 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

SEE INSTRUCTIONS ON THE REVERSE

1. REPORT NUMBER (Assigned by TIDC add Vol. No., if any)
NUREG-0040
Vol. 12, No. 2

2. TITLE AND SUBTITLE
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3. LEAVE BLANK

4. DATE REPORT COMPLETED
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Same as 7. above

11a. TYPE OF REPORT
Quarterly

b. PERIOD COVERED (Inclusive dates)
April 1988 - June 1988

12. SUPPLEMENTARY NOTES

13. ABSTRACT (200 words or less)

This periodical covers the results of inspections performed by the NRC's Vendor Inspection Branch that have been distributed to the inspected oraganizations during the period from April 1988 through June 1988. Also included in this issue are the results of certain inspections performed prior to April 1988 that were not included in previous issues of NUREG-0040.

14. DOCUMENT ANALYSIS - a. KEYWORDS/DESCRIPTORS
vendor inspection

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