

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE NUCLEAR REGULATORY COMMISSION

In the matter of)
)
PACIFIC GAS AND ELECTRIC)
COMPANY)
)
(Diablo Canyon Nuclear Power)
Plant, Units 1 and 2))
_____)

Docket Nos. 50-275
50-323

AFFIDAVIT OF MICHAEL C. THOMPSON

State of California)
)
County of San Luis Obispo)
City of San Luis Obispo)

ss

The above being duly sworn deposes and says:

On January 8, 1985, the staff of Region V, Nuclear Regulatory Commission (Kirsch, Schollenberger and Polich) interviewed me to follow-up on allegations originally presented to Mendonca and Polich of the NRC Staff at Diablo Canyon, as well as portions of subsequent NRC OI testimony. As a result of this interview, I feel it necessary to clarify the following six additional concerns regarding issues examined in depth during the interview. They are listed below:

8503190487 850314
PDR ADOCK 05000275
G PDR

1. Regarding allegations of faked Paramount (M.W. Kellogg) stanchion welds on the Safety Injection System within the reactor pressure boundry in both Units 1 & 2. If Messrs. Russ Nolle and Tony Pacifico, when questioned by the NRC, recalled that the Paramount stanchions 5/5 RR and 6/6 RR were prepared for full penetration welds and basically achieved them, as indicated during the interview by the NRC Inspector Dennis Kirsch, these statements are misleading and false. In July 1983 when Pacifico, Cunningham, Burns, Tynon and I looked at the work, all of us not only commented on the existence of faked welds, but were instrumental in authenticating the existing discrepant condition to justify replacement of the weldments. In fact, on July 13, 1983, Mr. Nolle requested that I add the following note for his cosignature on the Discrepancy Sketch for 5/5 RR signed earlier that day by Jim Cunningham and myself: "No evidence orig. prep. config." (sic. no evidence that the stanchion was prepared for the required full penetration weld configuration.)

The collective amount of time spent at the work locations of 5/5 RR and 6/6 RR by all QC and QC Supervisors was far less than the amount of time that I oversaw the work (which included liaison with night shift turnover). Each individual would allocate only a few minutes a day for inspection of an in-work weldment, ^{not} whereas I closely field-engineered the entire removal and reconstruction of these time critical Cold Hydro work items for 12 or more hours a day. Their contact with the work-in-progress was minimal. Therefore, the accuracy of their recall should be in question. They cannot recall what

they never saw. I personally drafted, compiled, and approved the "Approved for Construction" packages and generated the Discrepancy Sketches at the request of PTGC. (See Exhibit 1.)

2. Regarding allegation of void behind Unit 2 Containment Liner. The NRC Staff improperly justified their refusal to check the existence of a void by asserting that the procedure of "sounding" is not qualified and therefore not sufficient grounds to investigate the phenomenon that what sounds hollow will reveal itself as really hollow.

Soundings have been used for years on lined concrete tank and similar construction with enough of a degree of efficiency that the government should not ignore the statistical probability that excessive voids exist and PG&E's documentation is inaccurate and deceptive.

3. Regarding allegation on alleged void behind Containment Liner. The NRC was mistaken to conclude that the hollow sounds could have occurred from an anticipated 2 to 3 mil gap between the Containment Liner and the concrete. My personal soundings did not disclose expected acoustic variations that would occur if "mudhooks" were installed per plan in a grid and embedded eight inches in the concrete along the measured 20 foot long by 10 foot high void.

Additionally, how could the NRC make a technically based conclusion about the sounding process, when they contend that the sounding procedure is inaccurate due to lack of proper

qualification for application to the nuclear industry.

4. I protest that the NRC only interviewed me with respect to isolated examples of my allegations and in particular did not allow discussion or even presentation of documentation of the full scope of the Paramount (vendor) QA violations which were numerous enough as to dictate the existence of a well-defined generic (common) deficiency, especially the lack of contract-required full penetration welds. (See Exhibit 2.)

5. Mr. Kirsch has derived a misconception from NRC available documentation (i.e.; photographs only) about the existence of a fillet cap on the interior of stanchions 5/5 RR' and 6/6 RR. The reality is that fake TIG roots existed from prior work (Paramount).

6. I strongly and emphatically protest that the NRC Staff has refused to visually inspect the interiors of Paramount stanchions on the Safety Injection System located within the reactor pressure boundary in Unit 1 while the plant is currently shut down for maintenance inspection. I have presented abundant and conclusive evidence concerning this allegation and the staff's failure to inspect Unit 1 is currently and apathetically endangering the public. The gravity of this issue is too solemnly serious to ignore. Failure of any one of these weldments could cause a loss-of-coolant accident.

I have read the above 5 page statement and it is true, accurate and as complete as time allows to the best of my knowledge and true conviction.

Michael C. Thompson
Michael C. Thompson

State of California }
County of San Luis Obispo } SS.

On this the 23 day of January 19 85, before me,

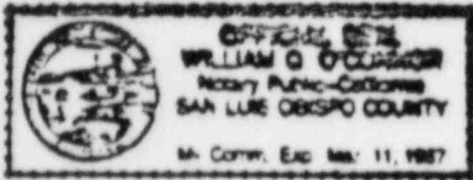
William G. O'Connor

the undersigned Notary Public, personally appeared

Michael C. Thompson

personally known to me
 proved to me on the basis of satisfactory evidence
to be the person(s) whose name(s) is subscribed to the
within instrument, and acknowledged that he executed it.
WITNESS my hand and official seal.

William G. O'Connor
Notary's Signature



ORIGINAL

Exhibit 13A



Pullman Power Products

NO CER-21
(ISI or (IS NOT))
ATTACHED

DISCREPANCY REPORT

D.R. No. 115
Iso. No. NA
Unit No. II
Code No. 01-10-G-P
Hold Tag X
(yes) (no)

CUSTOMER Pacific Gas & Electric SPEC. NO. 8711 DATE 12/21/84
PROJECT Diablo Canyon JOB NO. 7177 INSPECTOR Kimmel/King

DISCREPANT ITEM: CARDINAL INDUSTRIAL PRODUCTS CORP - VENDOR SUPPLIED MATERIAL

EXPLANATION OF DISCREPANCY:

Per PG&E direction, all material in Pullman warehouse which was manufactured by Cardinal Industrial Products Corporation is being placed on Hold.

This request is in part a result of the following:

1. I.E. Information Notice 84-52.
2. Removal of Cardinal Industrial Products Corporation from PG&E's Qualified Suppliers List.

Additional information will be included with this DR when available.

RECOMMENDED DISPOSITION

INDICATE APPROVAL BY CIRCLING THE APPROPRIATE "RECOMMENDED DISPOSITION"

1)

Research the material currently in the Pullman warehouse and storage areas to determine:

- A. What was manufactured and supplied by Cardinal Industrial Products Corporation.
- B. What was manufactured by Cardinal Industrial Products Corporation but supplied by another vendor.

(Example: Purchase Order with A & G who in turn bought material manufactured by Cardinal.)

(Continued - Page 2)

PG&E Q.C.
QUALITY CONTROL

REVIEWED

Approved By: [Signature] Field Q.A. Mgr. Date: 12/21/84

Customer: [Signature] Date: 12/21/84

FINAL DISPOSITION: In Accordance With Above

Other (explanation and approval required)

Work Completed Insp: _____ Date: _____

Work Completed Insp: _____ Date: _____

EXPLANATION (IF NECESSARY):

CONTROLLED COPY

Not Construction

Field Q.A. Manager _____ Date _____ Customer _____ Date _____

STEPS TO PREVENT RECURRENCE Not Applicable

Field Q.A. Manager [Signature]

DISTRIBUTION: Master Q.A. File Auth. Insp. Engineering Dept. Other _____
 Customer Receiving Field Inspector

ATTACH SKETCH IF NECESSARY



ORIGINAL

Pullman Power Products

10 CFR-21
(IS) or (IS NOT)
ATTACHED

DISCREPANCY REPORT

D.R. NO. 9173 - Page 2 of 4
ISO NO. n/a
UNIT NO. II
CODE NO. 01-10-G-P

CUSTOMER: Pacific Gas & Electric SPEC. NO.: 8711 DATE: 12/21/84
PROJECT: Diablo Canyon JOB NO.: 7177 INSPECTOR: Kimmel/King

RECOMMENDED DISPOSITION: (Continued from Page 1)

2) Place all material manufactured by Cardinal Industrial Products Corporation on Hold.

3) Prepare a list of all Cardinal manufactured items currently in stock. The list shall include as a minimum:

- A. P.O. number and item number.
- B. Description of material (type, size, ASTM designation, etc.).
- C. Location (warehouse/sea trains, row number, bin number, etc., if applicable).
- D. Quantities.
- E. Heat numbers or Lot numbers.

4) Identify all items currently ordered from Cardinal but not yet received. Items will be placed on Hold upon receipt.

5) Segregate and retain a minimum of four (4) items of each size and heat number for possible future testing. If less than four (4) items are currently in stock, retain all items.

6) Items placed on Hold may be conditionally released under the following conditions:

- A. Items are permanently marked with the heat number or an identifying marking traceable to the heat number or P.O. number/item number as applicable. (Permanent marking will be either low stress metal stamping or vibro etching.) *WCC, 12/21/84*
- B. The specific location where the item(s) are to be installed is identified. (Such as area, hanger number, system, iso number, flange connection, etc., as applicable.) A record of these locations shall be retained in a separate file. A copy of this file shall be attached to this DR.
- C. Items released and installed are subject to removal if subsequent testing or evaluation determines that the material is unacceptable.

OR,

~~X~~ PG&E to disposition.

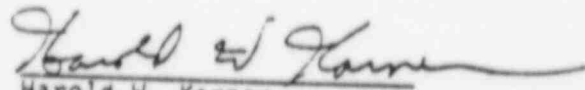
INTEROFFICE CORRESPONDENCE

DR 9173
pg. 3 of 4

DATE DECEMBER 21, 1984
TO P. STIEGER/P. MOKRY/M. SACCOCCIA
FROM H. W. KARNER
SUBJECT MATERIAL SUPPLIED BY CARDINAL INDUSTRIAL PRODUCTS CORPORATION

Per direction from PG&E, all Cardinal supplied material shall be placed on Hold. Please have the manufacturer verified for any bolting material that is requested prior to issue. An inventory and research of our storage areas is being conducted and all Cardinal items are being placed on Hold.

Your assistance in completing this inventory by 12/21/84 will be greatly appreciated. A DR is forthcoming concerning this item.


Harold W. Karner
QA/QC Manager

HWK:sam

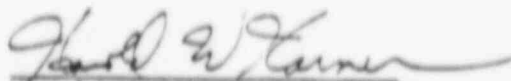
cc: W. Kimmel
C. Neary
R. King
All QA Receiving (days & nights)
Warehouse
Jim Rowley
A. Eck

INTEROFFICE CORRESPONDENCE

DR 9173
pg. 4 of 4

DATE DECEMBER 21, 1984
TO ALL WAREHOUSE QA PERSONNEL
FROM H. W. KARNER
SUBJECT CARDINAL INVENTORY

1. All Cardinal supplied/manufactured items shall be placed on "Hold." (Bolts, nuts, washers, etc.)
2. Class I material shall be the priority items checked.
3. Record ALL pertinent information such as:
 - A. P.O. number.
 - B. Item number.
 - C. Description (bolt, nut, washer, size, ASTM designation).
 - D. Location (warehouse/sea train, row number, bin number, etc.).
 - E. Quantities (if determining the quantity will impede the completion of placing all Cardinal items on Hold by 4:00 p.m. on Friday 12/21/84, then eliminate the physical count to a later time.)
 - F. Heat numbers (record actual heat numbers. If recording heat numbers prevents completion of placing items on Hold by 4:00 p.m. on Friday 12/21/84, then record at a later date.)
4. Place a Hold Tag on the material.
5. Sign and date the form showing the information.
6. After all Cardinal items are on Hold, complete any necessary verification of quantities and heat numbers.


Harold W. Karner
QA/QC Manager

HWK:sam

cc: C. Neary, P. Stieger, P. Mokry

PACIFIC GAS AND ELECTRIC COMPANY

PG&E +

DIABLO CANYON PROJECT • GENERAL CONSTRUCTION
P.O. BOX 117 • AVILA BEACH, CALIFORNIA 93424 • (805) 595-2324

December 21, 1984

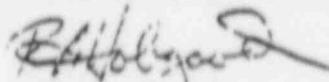
Mr. P. Stieger
Pullman Power Products
P.O. Box 367
Diablo Canyon Project
Avila Beach, CA 93424SUBJECT: Purchase and Control of
Cardinal Fasteners

Dear Mr. Stieger:

The PGandE Quality Assurance Department has identified deficiencies in Cardinal Bolt's quality assurance program which may affect materials supplied to Diablo Canyon (see attached letter dated 12/20/84). As a result, all fasteners in Class One storage supplied by Cardinal Bolt, including those supplied through a third party, must be immediately identified utilizing Pullman's discrepancy reporting systems. This will also apply to fasteners purchased prior to this date which have not yet been received.

The PGandE Quality Assurance Department has requested that all Pullman purchases placed with Cardinal be identified by P.O. number and heat numbers to support any research necessary to trace fasteners for possible qualification testing by an independent laboratory.

Pullman is authorized to release these materials for installation, provided a system is established that will identify each fastener by size, material type, purchase order, heat and/or lot number, and installed location. In addition, fasteners from each heat or lot shall be retained by Pullman for qualification testing conducted by others.


R. R. Lieber
Field Construction Manager

R. A. Hobgood
G. C. Quality Control Supervisor

RRL/RAHobgood:klh

DCC 23174

JRM RECEIVED GMP
 RRL SUPERINTENDENT'S R A H
 JVK OFFICE RYM

PG&E
 FOR INTRA-COMPANY USE

From Division of
 (Use if known)
 To Division or Department
 FILE NO
 RE LETTER OF
 SUBJECT

MANAGER, QUALITY ASSURANCE
 GENERAL CONSTRUCTION
 505.1

LTC 20 1984

STATION CODE DEPARTMENT File
 GM _____ Spec. _____

Prompt Notification of Actions Resulting
 from Supplier Audit of Cardinal Industrial Products

December 20, 1984

MR. J. R. MANNING:
 ATTENTION: MR. R. LIEBER

Quality Assurance Implementation Audit 844085 of Cardinal Industrial Products, Las Vegas, Nevada, December 6-7, 1984, identified significant deficiencies in their past quality assurance program. We are providing this notification prior to the issuance of the formal audit report because the findings may have an adverse impact on material supplied by Cardinal. Cardinal has provided fastener materials for the Diablo Canyon Power Plant on the following purchase orders:

- P.O. 594705 - N.P.O.
- P.O. 577706 - N.P.O.
- P.O. 521791 - N.P.O.
- P.O. 593976 - N.P.O.
- P.O. 4R67175 - G.C.
- P.O. 4R66170 - G.C.
- P.O. 057152 (Foley) - G.C.

The audit identified seven deficiencies in Cardinal's quality program, of which the following three deficiencies were found to be significant:

1. The auditors determined that Cardinal did not have sufficient documented evidence to support the qualifications of their suppliers of certified materials and processes for the fastener material furnished to PGandE.
2. The auditors identified certifications for the heat treating of materials shipped to PGandE that did not contain the heat number of the subject material.
3. The auditors identified materials shipped to PGandE that had not received required tensile strength tests.

Mr. J. R. Manning

- 2 -

December 20, 1984

These deficiencies were identical or similar to the nonconformances identified by the NRC in their recent inspection of Cardinal Industrial Products, and our audit determined that these deficiencies directly related to the materials supplied to Diablo Canyon. As a result, the quality of the fastener materials we have received from Cardinal on the purchase orders listed above is indeterminate at this time.

Cardinal has instituted a revalidation program through third party testing as a result of the NRC inspection, and they have agreed to include the materials supplied to PGandE as a part of that revalidation program. Cardinal still has many samples of the same materials sent to PGandE in their warehouse stock that can be used in the third party tests, but PGandE may be requested to locate and return a sample of some items to Cardinal for testing.

We expect to obtain the revalidation results from Cardinal by February 1985. Meanwhile, we recommend that the items supplied by Cardinal be located and tagged in accordance with the applicable requirements of your departmental procedures. We request that you research your records and notify Mr. D. S. Aaron on extension 3020/3490 if there have been other purchases from Cardinal.

At Cardinal's request, we also conducted a qualification audit of Cardinal's ASME NCA-3800 quality assurance program to determine if we could reinstate them on our Qualified Suppliers List for future orders. We found that Cardinal had taken significant steps in recent months to improve their quality program and that after a few more corrective actions are verified, they could be reinstated as a qualified supplier under Standard Specification SP-4-1.

S. M. Sydmore
S. M. SYDMORE

DBA:an(3020/3490)wpx

cc: R. A. Hobgood
R. S. Bain
J. R. Karrera

Cardinal

INDUSTRIAL PRODUCTS CORPORATION



RECEIVED

84 SEP 21 10:04

(TOLL FREE) 800-634-6861

PHONE (NEVADA) 702-739-1966

LAS VEGAS, NEVADA 89118

3873 WEST OQUENDO +

August 9, 1984

Ellis W. Merschoff
Vendor Program Branch
Division of Quality Assurance, Safeguards,
and Inspection Programs
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Order No. 83000840

Dear Ellis:

I am attaching amended copies of August 8, 1984 letter. Changes have been made to clarify E.5 and F.1, other changes were only to correct typographical errors.

Please advise if you have any questions.

Sincerely,

Dennis C. Fielder
Dennis C. Fielder
President

8409130235 840809
97700840

TE:09
11

Cardinal

INDUSTRIAL PRODUCTS CORPORATION



3873 WEST OQUENDO + PHONE (NEVADA) 702-739-1986
LAS VEGAS, NEVADA 89118

AUGUST 8, 1984

Gary G. Zech, Chief
Vendor Program Branch
Division of Quality Assurance, Safeguards,
and Inspection Programs
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 99900840

Dear Mr. Zech:

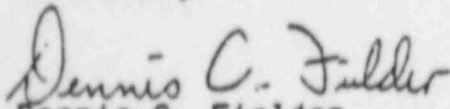
We have received and reviewed your letter of July 23, 1984. In response to your request for additional information with respect to the following items in the Notice of Nonconformance (NON):

- General - We will furnish results of our review as soon as they are available. At this time we are attaching a copy of our Action Plan which details the three major stages of the corrective action plan now in progress.
- NON. Item B.2 - We have performed another audit for analytical services and found them to be acceptable during the time we used them. We are not using them at this time.
- NON. Item B.4 - Retests are being performed using the Charpy V-Notch method, so far all heats tested have passed. See attachment dated August 7, 1984 for current status. As part of the Action Plan we will review all impact tests for nuclear orders. Where appropriate, CMTRs will be amended to indicate actual Charpy Values. All current and future impact tests will be to the applicable specification and be certified accordingly.
- NON. Item C.1 - The standard practice was distributed and reviewed after issue on January 9, 1984. We will conduct an additional training session for Purchasing and Quality Assurance by September 1, 1984 which will be formally documented.

99900840
FEB 1985
RECEIVED
NRC
DIVISION OF QUALITY ASSURANCE
SAFEGUARDS AND INSPECTION PROGRAMS
WASHINGTON, D.C. 20555

- NON. Item E.2 - Attached is a copy of our request. Response has not been received. A follow up call was placed to expedite.
- NON. Item E.3 - Corrective measures have been taken as part of Quality Assurance Review per CSP 3.004, which provides for review by Quality Assurance of customer purchase order to assure that material, subcontractor certifications, and Cardinal's CMTRs are consistent with the customer purchase order.
- NON. Item E.6 - Actual data confirming multiple test per specification will be obtained from subcontractors or tests will be performed. Refer to the attached Action Plan for more on multiple testing.
- NON. Item F.1 - Corrective measures have been taken as part of Quality Assurance Review per CSP 3.004. This review assures that customer purchase order and starting material are compatible before start of production.
- NON. Item F.5 - Under CSP 16.003 when NDE is performed the report is reviewed and approved by Quality Assurance and any material not passing NDE is non conformance, placed in the QA hold area and dispositioned by the chief inspector. The NDE report is attached to all ASME CMTRs and forwarded to the customer.
- NON. Item I. - The Senior Vice President of Quality Assurance is currently visiting subcontractors making the final arrangements to fully implement monitoring. All Cardinal purchase orders contain a right of access clause which permits us to implement monitoring.

Sincerely,


Dennis C. Fielder
President

cc Ellis W. Marschoff

Cardinal

INDUSTRIAL PRODUCTS CORPORATION



3873 WEST OQUENDO + (TOLL FREE) 800-634-6861
PHONE (NEVADA) 702-739-1966
LAS VEGAS, NEVADA 89118

AUGUST 8, 1984

ACTION PLAN

I. SUBCONTRACTOR VALIDATION AND ON-GOING MONITORING/SURVEILLANCE PROGRAM

PURPOSE:

To insure that previous surveys/audits addressed the scope of services provided and to document that current and, to the extent possible, that previously used quality programs comply with the applicable requirements of NCA-3800, 10CFR50 Appendix B, and ANSI N45.2.

SCOPE:

The programs/practices of selected overseas subcontractors will be validated on a one time basis to assure accuracy of CMTR data. The validation will consist of a survey and evaluation of results for impact on supplied material. The priority for validation will be established in the following order: (a) applicability to projects with immediate schedule requirements, and (b) subcontractors who have processed large amounts of material for CIP and/or are currently processing material for CIP. Products covered will include (1) alloy bar (melting, hot rolling, cold drawing, heat treating, and mechanical testing) (2) carbon and alloy nuts (melting, hot rolling, forming, heat treating, tapping and mechanical testing) (3) carbon steel washers (melting, rolling, stamping, heat treating, and mechanical testing) (4) small stainless nuts (melting, cold drawing, heat treating, machining and mechanical testing). If the validation process reveals problems with a subcontractor's quality assurance program in certain areas the number of subcontractors to be validated will be broadened to include those who would likely have similar problems by virtue of

comparable products, operations or programs. If large numbers of deviations are found through the certification review process (see section III) for a subcontractor their program will also be validated. This activity will include establishment of ongoing monitoring/surveillance for subcontractors performing heat treatment to assure compliance as applicable to CIP approved or supplied procedures.

METHOD:

The validation will be conducted employing checklists to be determined by the scope of operations/services which the subcontractor performs. All portions of the checklists will be completed including N/A entries for those attributes determined to be not applicable. Objective evidence will be reviewed and documented. Procedures and/or practices for heat treating and testing will be recorded, reviewed and approved by CIP. Additionally, subcontractors will be required to submit procedure/practice changes to Cardinal for approval prior to use on current and future orders. This will be verified during the CIP monitoring/surveillance program. Concurrent with the validation survey an audit will be conducted. This audit will focus on the historical data in the quality program which may impact status of previous CIP surveys/audits. The audit will also concentrate on subcontractors where certification variances from purchase order requirements were found by CIP.

PERSONNEL:

CIP personnel performing validations will be Cardinal's Senior Vice President of Quality Assurance and our Manager of Administration (see CIP GAM for details on job descriptions). CIP will also retain a third party inspection agency (Hartford Steam Boiler Inspection and Insurance Company) to lead the validation team. A degreed metallurgical engineer or other equivalent approved party will oversee the monitoring/surveillance program of overseas subcontractors.

QUALIFICATION:

The validation team leader from Hartford and Cardinal's Sr. V.P. are qualified in accordance with ANSI 45.2.23 and the Manager of Administration is an auditor-in-training to said standard and will work under the direct supervision of the survey team leader. Qualification records are on file at CIP. The monitor/surveillance personnel will be appointed by the Senior Vice President of Quality Assurance based on his review of their Qualifications.

II. AGENCY FORMALIZATION (TRADING COMPANIES)

BACKGROUND:

It is customary that many of Cardinal's overseas subcontractors work thru agents who perform administrative functions, but are not allowed to change the technical and quality requirements contained in the CIP order. These trading companies do not take physical possession of the material.

PURPOSE:

To insure that subcontract work conducted thru agents is better controlled and that CIP procurement requirements are properly transmitted thru the agents to the appropriate CIP approved subcontractors.

SCOPE:

All overseas agents will be evaluated for placement on the CIP Approved Agents List (AAL). Only approved agents will be utilized for future procurement.

METHOD:

Materials which are regularly procured thru agents will be divided into logical groupings by size, shape or type. Each grouping will receive a designated agent and approved subcontractors prior to issuance of a purchase order. Each approved subcontractor will be designated by product and/or services to be provided. The combination of agent and specific subcontractors for a particular type of product will be called a "channel" and must be qualified and approved by CIP. CIP purchase orders will be issued to a designated agent who will transmit the procurement requirements thru the approved channel. All agents utilized by CIP will be qualified by an evaluation which will include a survey and detailed discussions defining their mode of operations. Upon satisfactory completion of this process the approved agents will be added to the CIP Approved Agent List. The "channels" will be documented; approved by GA and included in the Purchase order. Each CIP P.O. will have an agent acknowledgement that will be signed and returned to CIP when the procurement information has been passed thru the channel (subcontractors in the channel will not be changed without CIP prior approval and/or designation of a change). Subcontractor monitoring/surveillance will verify that procurement information has been passed

thru the "channel" by the agent.

PERSONNEL:

CIP's Senior Vice President of Quality Assurance or his designee will approve agents and channels.

QUALIFICATION:

If the Sr. V.P. Q.A. uses a designee he shall be appropriately qualified and the qualification will include sufficient experience at CIP to have a good understanding of CIP procurement, quality requirements and practices.

III. CERTIFICATION REVIEW

BACKGROUND:

Because of the NRC notice of violation and nonconformance and related customer concerns, CIP determined that it was advisable to verify that materials shipped to customers for nuclear applications i. e., ASME Section III, NCA-3800, NA-3700, 10CFR50 Appendix B, ANSI N45.2, or 10CFR21, met applicable specification, code and purchase order requirements. It was determined to focus on the content and accuracy of Cardinal's certifications so that the customers use of the material is not suspect after CIP has reviewed the certification and determined compliance with the specifications, codes and/or standards referenced there in. Supporting documentation that CIP utilized as a basis for issuing it's certification will be reviewed. Subcontractor supplied data will be reviewed for material and/or services provided by the subcontractor to Cardinal.

PURPOSE:

To insure that the materials shipped by Cardinal conform to the specified quality (or code) requirements and that supporting quality verification documentation is on file to substantiate the CIP certification.

SCOPE:

Cardinal will review for accuracy all of the certifications it has issued to customers for nuclear application. Certifications which do not reference one or more of the following requirements will be excluded: ASME Section III, NCA-3800, NA-3700,

10CFR50 Appendix B, ANSI 45.2 or 10CFR21. When CIP has performed in-house manufacturing operations on material the supporting quality verification documentation will be reviewed to determine accuracy of the data on the certification. When operations on materials were performed by a CIP approved subcontractor the data in the CIP subcontract purchase order file will be reviewed. The results of this review shall be documented. When the applicable code is ASME Section III, Div. I Cardinal's ASME approved Quality Assurance Manual will serve as the acceptance criteria/standard. When the referenced code is 10CFR21 APP B or ANSI N45.2 the acceptance criteria will be Cardinal's approved manual as modified by attached Standard Practice CSP 8.003 which excludes criteria that are concerned only with ASME and incorporates acceptance criteria for 10CFR50 APP B and ANSI N45.2. When none of the above standards apply for the specific order, the material specification will be the criteria for acceptance. The material specification will also be the acceptance criteria for ASME Section III size excluded materials (NX 2600).

METHOD:

-Document results of review, including variances, in accordance with procedure outlined as follows:

1. The data base will be established.
 - Data will be entered enabling CIP to sort and review certifications by customer, heat#, Cardinal PO#, and/or CI#.
 - This will establish a current status of review and identification of variances.
2. The review process
 - a. Selection
 - CMTR's attesting to any one of the requirements referenced in the scope of this section shall be selected.
 - b. Review
 - Shall consist of subcontractor certifications and applicable in-house records.
3. Review Criteria
 - Verify that all quantitative and qualitative data recorded on CIP CMTR's is accurate and supported by adequate Documentation as follows:
 - a. Verify visual inspection prior to May 1983 by assuring CMR has proper G.A. final inspection sign-off After May 1983 visual inspection reports are on file per CSP 11.003.
 - b. Verify NDE, when applicable, was performed by an approved subcontractor and the appropriate sample was examined, and accepted.

- c. Verify heat treatment, when applicable, that times, temperatures, cooling media and heat treated condition are recorded.
- d. Verify Charpy impact tests, when applicable, have been performed by code or specification requirements and that coupon location and orientation are substantiated. To meet NX 2300 when required.
- e. Verify that up grading, when applicable, to Section III of the Code has chemistries performed on each piece used and sufficient mechanical tests were performed for each heat lot. When continuous or batch processing is not documented on heat treat certification the most severe sample plan will be used to determine the number of tests.
- f. Verify that years for Code and Addenda or ASTM specifications which are recorded are accurate and in cases where years an Addenda were not required the material will meet latest year at the time of certification.

3. Dispositioning findings

-When variances are discovered, as a result of the above, they shall be documented. Cardinal shall notify customer(s) of variance per Cardinal Standard Practice, CSP# 17.003 and/or customer's unique reporting method (e.g. Bechtel SDDR), as applicable.

- a. Documentation of findings - both acceptable and not acceptable (in data base)
- b. Evaluation of findings on hardware. The applicable criteria of the governing standard and/or project requirements shall be considered when evaluating for acceptance.
- c. When additional testing is required samples will be pulled from CIP stock, when available, or provided by the customer.
- d. Close out of findings by changing N to Y on data base.
- e. Reporting of deviations for any variation that can not be closed out will be per CSP 17.003.

4. Records

- a. Correction; if necessary, by amending CMTR which will be recorded in the computer system. The new CMTR will reference the old CMTR number.
- b. Customers will be sent amended CMTRs that records results from the review.

PERSONNEL:

Sort and data entry performed by personnel under the direction of the Manager of Administration. Acceptance review performed by

the Quality Verification Documentatiion Review Team, (that group chartered with the responsibility for performing CMTR Review) under the direction of the Director of Quality.

TRAINING AND QUALIFICATION:

Training will encompass: (1) method for performing quality verification documentation review as outlined above, and (2) to the specific requirements of this Corrective Action Plan. Training shall be documented, and shall serve as a basis for qualification. Training and qualification records shall be on file at CIP.

Approved by:

Dennis C. Fuller

CARDINAL INDUSTRIAL PRODUCTS CORP.
STANDARD PRACTICE

This Standard Practice will apply to procurement which invokes Cardinal's Quality Assurance Program and either 10 CFR 50 Appendix B or N45.2 but does not invoke Section III, of the ASME Boiler and Pressure Vessel Code.

A. PURCHASING

Parts and/or materials may be purchased from surveyed and approved vendors as prescribed in the Quality Assurance Manual. As an alternate, vendors may be qualified thru other means such as evaluation of Quality program or product verification as outlined in "D" below at time of receiving inspection.

B. INSPECTION

Per Quality Assurance Manual.

C. CERTIFICATIONS

Vendor Certification: Vendor certifications will not require a Quality Statement but must consist of a Mill Sheet, Certified Material Test Report (CMTS) or a Certificate of Compliance (C of C). In the case of a C of C, heat numbers need not be known if product verification as delineated below is followed.

Cardinal Certification: The Cardinal Certification for material provided under this standard practice shall bear the statement that the certification is issued subject to the provisions of this supplement as approved by the customer. Other data required by the purchase order will be given in the certification except Cardinal will not provide its QSC number.

D. PRODUCT VERIFICATION

Raw Material: For carbon steel raw material, Cardinal will determine that the material is ferro-magnetic and that the hardness range is as expected for the grade of carbon steel. For all other raw materials, Cardinal will additionally verify the chemical content of one piece of material and required mechanical testing and record such verification in the vendor certification file.

Finished Product: If carbon steel finished products are procured, Cardinal will verify that the material is ferro-magnetic and that the product meets the hardness and mechanical properties of the invoked material spec-

ification. The number of pieces tested will be as required by the referenced finished product specification. In the case of procurement for all other types of finished materials, Cardinal will additionally perform a verification of chemistry on one piece of material. This data will be included in the vendor certification file.

E. MARKING

All finished products will be marked in accordance with applicable customer and specification requirements. In cases where Cardinal procures finished products which are properly marked, no additional marking will be applied. If product requires additional marking this will be applied by Cardinal prior to shipment.

JUNE 20, 1984
 REV, AUGUST 7, 1984
 REV 2 AUGUST 9, 1984

ATTACHMENT 1
 MATERIALS WHICH WERE IZOD TESTED
 A193 & SA193 B7 ALL THREAD STUDS

SIZE	AFFECTED HEATS				
1 1/8-8:	4525B (4)	, 6882D (1)	, 9121E (1)	, X107E, X605D (5)	& X606D (1,4)
1 1/4-8:	5450B, 5408B, 3454A, 7536B (1,3)	, 9723D (1)	, 1502E & 8724B (4)		(1)
1 3/8-8:	3454A, 5408B, 5450B, 6409B, 5785D, 7212E (1)	, 9723D (1)			
	9423E & 9214D				
1 1/2-8:	N589B, 9525B, 7157D, 9106D & 3724B (1)				
		(1,4)	(1)		
1 5/8-8:	9233E, 9423E (4)	, 9106D (1)			
1 3/4-8:	9423E & 320E (2)	PO'S			
	(1)	(1)	(1)	(1,4)	(1)
1 7/8-8:	9892D (4)	, 9526B	, 7238D	, 7762E	, 8724B
2-8:	9526B (1,4)		(2)		
2 1/4-8:	D552B (2)	& 7315A (2)			
2 1/2-8:	7315A (2)	, N825D (2)	& N630B (2)		

NOTES:

- 1 - Tested at 0 Deg F per NX2300 with Charpy V-notch. Heat passed.
- 2 - Tested at 10 Deg F per NX2300 with Charpy V-notch. Heat passed.
- 3 - Tested at 20 Deg F per NX2300 with Charpy V-notch. Heat passed.
- 4 - Tested at 68 Deg F per NX2300 with Charpy V-notch. Heat Passed.
- 5 - Material being tested at 0 Deg F per NX2300 with Charpy V-notch.

Cardinal

INDUSTRIAL PRODUCTS CORPORATION



3873 WEST OQUENDO + PHONE (NEVADA) 702-739-1966
LAS VEGAS, NEVADA 89118

(TOLL FREE) 800-634-6881

June 5, 1984

ASTM
1916 Race Street
Philadelphia, PA 19103
Attention: Mr. Earl Sullivan

Dear Mr. Sullivan,

We have a situation where our material, AISI 4140, is tempered at 1150°F and stress relieved at 1040°F. This is our normal practice for ASTM Spec A193-B7 requirements of the current spec, but in some instances the requirements of A193 of 1971 or 1974 must be met.

Recent unofficial opinions by Bill Banks and Albert Zuethen, as to the current issue of A193-B7 have been stated as follows:

"The minimum Tempering Temperature shall be as specified in Table 2." (shown as 1100°F, not actual temperature.)

"The minimum Stress Relief Temperature shall be 100°F below the specified minimum Tempering Temperature of Table 2."

At present we are in need of a verification of these opinions or an official, written interpretation of Minimum Tempering Temperature and Minimum Stress Relief Temperature, and we ask for your help in this matter.

Please send reply to writer at the above address, and accept our grateful thanks for this special favor.

Sincerely Yours,

John J. Simko

John J. Simko,
Chief Engineer

cc- Mr. Bill Banks

JJS/krc

1/31/85

CARDINAL INDUSTRIAL PRODUCTS
ACTION PLAN
INTERIM REPORT #1

#99900840

INTRODUCTION

This report will provide interim information concerning the implementation of Cardinal's Action Plan and proposed amendments thereto. We have substantially completed the Agency Formalization process with the overseas trading companies that will insure the timely and accurate pass down of Cardinal's purchase order requirements to the appropriate subcontract vendors.

We have also substantially completed our Subcontractor Validation commitments. Even though there were some deviations noted with respect to Quality Assurance requirements, Cardinal's materials have been in compliance with chemical and mechanical specification requirements.

We have also implemented Cardinal's Monitoring/Surveillance Program of overseas vendors. Cardinal's Monitor is a bilingual foreign national with a degree in metallurgy and over 20 years of active experience in metals and heat treating. Although we envisioned monitoring as being limited to control of heat treat, we have also used our Monitor to insure that other portions of our subcontractor's Quality Assurance Programs are properly implemented for Cardinal orders.

Cardinal has also partially completed its commitments concerning the review of Cardinal's nuclear certifications. To date this review has shown that, even though there may be technical non-compliances with certain of the Quality Assurance requirements, there are no significant problems with the material which Cardinal has certified. Moreover, after reviewing over 1,200 certifications and conducting hundreds of verification tests prior to accepting material for use, we have issued only 17 notices under 10 CFR Part 21 and none of these notices questions the material's compliance to the specification chemical and mechanical requirements.

Because of our favorable experience concerning the adequacy of Cardinal's materials, we are proposing to modify our Action Plan to limit the Certification Review to those orders with the highest quality requirements (ASME size included material), and to replace the review on other materials with a testing/material verification program. If this testing confirms our initial experience of not having a single product failure with respect to chemical and mechanical requirements, we feel confident that the balance of Cardinal's materials will meet design requirements.

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AGENCY FORMALIZATION (TRADING COMPANIES)

Cardinal has completed the agency formalization of its three principle trading companies. Each of these companies has been surveyed and has acknowledged, in writing, their acceptance of Cardinal's Agency. They are committed to passing down Cardinal's purchase order requirements to the final subcontractor in the "channel". As part of each purchase order the Agents will certify on a standard Cardinal form that the requirements have been passed down through the "channel" and the method they used to transmit these requirements. Sample purchase orders and returned agency certifications are available for inspection to verify implementation.

Cardinal has one agent which is a captive of an overseas subcontractor that has not yet been formalized. This agent is used only for purchase orders involving the parent overseas subcontractor who has been used infrequently by Cardinal. Even though the agency formalization has not been completed, Cardinal visited the parent overseas subcontractor's factory and verified that the purchase order requirements, on a recent purchase order, were transmitted. The only reason this formalization has been delayed is that there was a change in U.S. personnel which was completed shortly before Christmas, and Cardinal wanted to wait for the new management personnel before completing the process. This agent will be formalized on or before April 30, 1985. If any orders are placed through this agent in the interim period Cardinal will have our Monitor verify that the requirements were transmitted.

SUBCONTRACTOR VALIDATION AND ON-GOING MONITORING/SURVEILLANCE PROGRAM

To honor its commitments Cardinal has, since August, 1984, completed two overseas trips involving approximately 800 man hours of overseas site work. Personnel involved in the subcontractor validations have included internationally recognized survey firm's representatives acting as lead auditors, Cardinal auditors qualified as lead auditors under ANSI N45.2.23 and Cardinal auditors in training. The audit teams were joined, as necessary, by the Cardinal Monitor. All validations included a qualified translator. In addition to the validations which were performed, Cardinal also conducted requalification surveys for many of the vendors on its approved vendors list. In total, 18 companies were validated, surveyed for requalification, audited and/or visited. Auditor qualifications and survey reports are available for inspection to verify implementation.

The only portion of Cardinal's Validation work which has not yet been completed involves carbon steel washers (melting, rolling, stamping, heat treating and testing). This work will be completed in accordance with the Action Plan during Cardinal's next overseas survey/audit trip tentatively scheduled for March/ April 1985.

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The findings of the validation and requalification efforts can be summarized by type of vendor as follows:

Raw material producers/mills-In general the validations and surveys verified that the mills have quality assurance programs that meet the applicable requirements of Cardinal's G.A. program and the Code. Traceability is maintained, chemistries are determined with calibrated equipment and records are retained and retrievable upon request.

Heat treaters A)-Those organizations who perform heat treating as their only business were found to be in compliance with applicable requirements of Cardinal's G.A. program and the Code. B)-The organization that was performing heat treating as a side line to a principle business (i. e. chain manufacturing) was found to have problems in the form and/or content of his quality program. Calibration records were not generally available and/or equipment may have been out of calibration. Records preparation and retention also had deficiencies. However, products heat treated by this vendor have passed specification requirements for mechanical properties, suggesting satisfactory process control for Cardinal orders. C)-Those organizations that were performing heat treating as part of other fastener production operations showed mixed results. Some were complying with applicable requirements while others had program deficiencies. The deficiencies generally involved calibration and records retention. Documentation systems to maintain traceability also required strengthening. Despite these problems, products heat treated by these vendors, for Cardinal, have met specification mechanical requirements.

Cold drawers A)-Those organizations performing cold drawing as their principle business were found to be complying with applicable requirements. B)-The organization that was performing cold drawing as part of a production process involving bar products had program deficiencies. Even with these deficiencies, traceability was maintained by use of mill tags showing size, grade and heat number. Records retention and retrievability procedures required changes.

Final subcontractors-Results for these vendors were also mixed. Even though it appears that traceability was maintained, most had program deficiencies. Principle deficiencies were in control of heat treat described above and records retention and retrievability. In one case of a screw machine company, the operations were controlled by verbal communication and could not be audited. Because of the small size of this subcontractor and the unusually high integrity of the owner/manager, Cardinal believes his work met material specification requirements. This has been supported by subsequent product testing.

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Mechanical testing A)-The organization performing mechanical testing as its only business was found to be complying with applicable requirements. B)-Those organization that were performing testing as part of their internal production operations showed mixed results. For these organizations testing equipment was generally calibrated but problems were noted with documentation and/or records retention. In a few cases we could not audit whether they were performing the proper number of tests but those tests performed met specification requirements. We also confirmed the charpy impact testing problem raised by the NRC (discussed more fully later in this report). All charpy verification tests, conducted by Cardinal, have met specification requirements.

General summary-Appropriate corrective action has been taken with all surveyed vendors to place qualifications on their approval status or, as in the case of the screw machine company controlled by verbal communications, removing the companies from Cardinal's approved vendors list. Any products in inventory from vendors with restrictions must be re-worked to insure full compliance prior to use or, in the case of removed vendors, not using the products for Code applications.

As indicated above problems encountered with the validation and requalification principally involved control over heat treat, records retention, charpy impact testing and, in a few cases, programs that were not in sufficient detail and/or not fully implemented to verify traceability. None of these problems appear to have affected product compliance with mechanical or chemical requirements.

Regarding control of heat treat, Cardinal has taken necessary measures, including monitoring of heat treat on current orders and re-heat treating and/or re-testing, as necessary, of existing stock to insure that all requirements are met prior to use.

As was discussed in Cardinal's responses to the NRC Inspection Reports, we found that charpy impact tests were in many cases not run per the full requirements of ASTM A370 and ASME Section III, Paragraph NX2311. As previously reported Cardinal has completed verification of all B7 and L7 materials which were in stock (Attachment 1). All re-tests have fully met specification and Code requirements. Additionally we have found there are suspect charpys on SA194 Grade 6 nuts and some heats of SA194 Grade 7 nuts. These products will not be used on future orders requiring charpy impact testing unless a re-test verifies that the results are fully in compliance with the requirements.

On all current overseas orders Cardinal is performing the impact testing at our facility. If any of the above mentioned Grade 6 and/or Grade 7 nuts with questionable charpys cannot be verified, customer notice will be made in accordance with 10 CFR Part 21 and Cardinal Standard Practice CSP 17.003. Most customer purchase orders for these materials did not require charpy testing and will not be affected.

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With regard to records preparation, retention and retrievability, it can generally be said that records were prepared. The problem with many of the overseas subcontractors, is that records were prepared and retained by work center rather than by order. This is the best approach to track efficiency, in which all of Cardinal's overseas subcontracts are vitally interested. To retrieve this data it is necessary to not only know the work centers through which the material passed, but also the approximate date at which this took place. Cardinal has instituted controls with vendors having this problem which insures that copies of the work center detail are prepared and filed in a Cardinal order file to be verified by Cardinal's Monitor. These records will also be a matter of Cardinal's future overseas vendor audits.

In some cases quality systems could not be satisfactorily audited because of the records retention problem mentioned above, and that no quality orders were being processed for Cardinal. In the few cases where traceability was questionable, Cardinal will not use existing materials in stock for Code orders and will insure that satisfactory controls are implemented prior to placing new orders. If this cannot be done, the vendors in question will not be used and will remain off Cardinal's Approved Vendors List.

As we were not able to validate some subcontractors, Cardinal has amended it's approved vendors list to drop those vendors with serious problems and has placed restrictions on most of it's other overseas vendors to insure full compliance with applicable quality requirements of Cardinal's G.A. Program and the Code. It should be kept in mind that material from the raw material producers was satisfactory and in most cases traceability was not an issue with other vendors. Cardinal is re-working and/or retesting materials in stock to insure full compliance prior to use. If this cannot be done, the material will not be used for Code orders. We have no knowledge of any Cardinal material that has not met required chemical and mechanical properties.

We will enclose under separate cover (at a future date) for NRC review, detailed information obtained from the validation surveys completed to date. We will also attach other survey data that is reflective of the current qualification criteria we are applying to subcontract vendors who did not require validation. Cardinal will requalify all vendors on it's AVL using our current standards.

We are pleased to report that our Monitoring program is now in place and functioning. Cardinal Standard Practice CSP 8.006 describes how monitoring is to be performed. Cardinal's Monitor has received necessary training and is making a significant contribution to insure that all applicable quality requirements are met. We have used our Monitor not only to control heat treat but also to collect and verify data on calibration and/or traceability for some materials in stock. The Monitor's qualifications, training record and reports are available for inspection to verify implementation.

Possible customer notifications, which may be required by 10 CFR Part 21, resulting from the above found conditions will be fully discussed in the remainder of this report.

CERTIFICATION REVIEW

As part of its Action Plan, Cardinal agreed to review all certifications for materials used in nuclear orders. To date we have reviewed, either in part, or in total over 1,200 certifications out of our total commitment of 18,700. The review criteria adopted by Cardinal, involved answering approximately 30 detailed questions all of which had to be answered yes or else the certification would be marked for additional in-depth review and/or testing. Using this most restrictive acceptance criteria we were finding that progress was slow in achieving our commitment. Continuing on the same basis would involve a time period of approximately five years which may not be responsive to potential problems if any. We also found that after reviewing the 1,200 above mentioned certifications we issued only 17 notices to customers under 10 CFR Part 21 (relating mostly to inadvertent processing oversights and/or program non-compliances).

Most of Cardinal's ASME Section III orders invoked Code Editions/Addenda after Winter of 1975. Additionally, the appropriate subsections referenced in the purchase order would allow the use of NX2610 for size excluded materials. Because of the size exclusion rules of NX2610 and/or requirements of 10 CFR 50 Appendix B, ANSI N45.2 or 10 CFR Part 21, the full NCA3800 criteria need not be met on most orders. As part of our Action Plan, we submitted CSP B.003 as an acceptance criteria for orders not invoking ASME Section III but requiring either 10 CFR 50 or ANSI N45.2. We also have had a significant number of orders that require a quality assurance system and/or that the material is "nuclear safety related" but do not give specific quality requirements. In all of the above cases, Cardinal proposes to preform product verification testing in lieu of the detailed certification review. Upon acceptance by the NRC, our customers will be requested to approve this change in our Action Plan. If we have not heard from the customers within 30 days of our request, we will assume their acceptance of this amendment.

Realizing the above, we can prove by example that most of the quality issues raised for orders not involving ASME size included materials can be answered. During our annual audit by Bechtel Power Corporation, a specific review was performed for Arizona Public Service at Palo Verde. As part of Bechtel's audit they applied the most restrictive criteria to orders involving 193 items. Their review indicated that there were 88 deviations from the requirements. After performing a detailed review of all 88 deviations, 80 of them were resolved by either clarifying the review criteria and/or making minor amendments to Cardinal's certifications. Four of the remaining items had questions as to purchase order requirements which were not detailed enough to decide whether a deviation existed. Bechtel accepted all such

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materials as is and said they were in compliance with purchase order requirements. The last four items had minor certification problems (two of which could be solved by using NX2610), one had an insufficient number of tests (the test run were all good) and one had a machine specimen tensile test being run rather than the required full size tensile test (the machine specimen test was good). After an engineering evaluation, Bechtel accepted all of these materials as is with no changes being required in the certifications. Moreover, none of these deviations revealed a material problem.

In addition Cardinal has been running independent testing as part of a controlled inventory material retesting program. To date we have performed over 360 tests under this program and have found that all material complies with the applicable chemical and/or mechanical requirements of the material specification.

MODIFICATION OF CARDINAL'S ACTION PLAN:

A) CERTIFICATION REVIEW

Cardinal has currently performed over 560 verification tests on over 130 heats of material. All of these tests were good, indicating that there have been no defective materials provided by Cardinal to the nuclear industry. The detailed review will, however, continue for all ASME Section III size included materials. Even though Subsection NF allows size exclusion through 2" diameter for bolting, Cardinal will review all orders and certifications for ASME Section III bolting and bar materials over 1" diameter. The same review and acceptance criteria, from the Action Plan, will continue for these size included items. This review will highlight any and all problems with certifications on ASME size included orders including traceability, vendor approval, inspection, chemical and mechanical testing, Charpy impact testing (only required by NX2311 for sizes over 1") and nondestructive examination including magnetic particle, liquid penetrant and ultrasonic (only required by NX2580 for sizes over 1"). We will also determine if a sufficient number of tests and of the right type were conducted. Any deviations resulting from this review will become a matter for possible re-testing and amending certifications and/or issuing notice under 10 CFR Part 21.

B) MATERIAL VERIFICATION

Cardinal will immediately start a material verification program of overseas subcontractors who's Quality Assurance Programs had deficiencies. Excluded from this verification program will be the raw material producers/mills and other overseas subcontractors who's programs were properly validated. The steps in the material verification are as follows:

1. All procurement document files will be pulled for the overseas subcontractors who's material is to be verified.

2. The procurement documents will be sorted by final sub-contractor and product type to make a "category". "Final subcontractors" are defined as the last subcontractor before Cardinal's agent in the "channel".
3. Each category will be sorted by heat and diameter. Each unique heat and diameter will be called a "combination".
4. Cardinal's Quality Assurance Department will review each category and/or combination to determine if they have been, or may be used on nuclear orders.
5. Each category from 4 above will be reviewed against MIL-STD-105 AGL 1.5 to determine the number of combinations which must be verified by testing to insure a 95% confidence level. We will use a single sampling plan for Normal Inspections, General Inspection Level II.
6. The combinations to be tested will be selected on the following basis:
 - a-Top priority to combinations which are in stock.
 - b-Second priority on those materials which should be easiest to recall from the field for testing.
 - c-Lowest priority on materials in the field which can not be easily recalled for testing.
7. The number of combinations for each category to be verified from 6 above, will be tested in accordance with the latest year of the specification as follows:
 - a) Mechanical testing-All mechanical properties of the material specification will be verified with the exception of Charpy impact tests (discussed more fully below). Unusual mechanical tests, such as stress rupture for SA453 Grade 660 material, will only be verified if such test results were certified by Cardinal on a nuclear order, and Cardinal based its certification upon test results submitted by a subcontract vendor whose quality system was questionable.
 - b) Chemical testing-The chemical properties of the material specification will be verified for all alloy, stainless and non-ferrous materials by product analysis. Carbon steels will not be verified because chemistry should have no effect on the intended use of the product.
8. If any of the testing from 7 above fails to meet specification requirements, two re-tests of the failed attribute/s will be made. If both re-tests are good the initial test will be disregarded. If either or both of the re-tests fail, the material will be deemed to be in non compliance with the material specification and will be a matter for notice under 10 CFR Part 21.
9. If the product verification of the combinations meets the requirements of MIL-STD-105 AGL 1.5, the category will be accepted with no further testing or review.

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If the failure rate does not allow acceptance of the category, all combinations in the category will be verified through testing applying the above criteria. If combinations cannot be obtained from customers for verification testing in a category that does not meet MIL-STD 105 AGL 1.5 requirements, all such combinations will become a matter for disclosure under 10 CFR Part 21.

OTHER TOPICS

Although not part of the Action Plan, Cardinal has received an answer from ASTM concerning the stress relief question raised by the NRC for SA/A-193 alloy material produced from bars which were cold finished after heat treating. Our letter to the ASTM and their response are attached (Attachments 2 & 3). As can be seen, the ASTM is divided on the issue.

Cardinal has conducted verification testing on all 32 heats of A193 B7 materials with questionable stress relief, that were in stock, and verified that all heats complied with chemical and mechanical requirements. All of the 32 heats tested came from the same homogenous lot of approximately 150 total heats with questionable stress relief. By using MIL-STD-105 we have a confidence level of over 96% that all heats are good. Cardinal intends, therefore, to disclose this information to its customers in a general letter summarizing our progress to date on the Action Plan and will advise all customers that unless notified to the contrary we will not review the stress relief question further.

All current SA/A-193 B7 orders from affected stock alloy materials are being re-heat treated and re-tested in accordance with the specification to insure full compliance prior to use. Current and future orders for this material from overseas subcontractors will require that heat treat, including stress relief be monitored.

Cardinal has satisfactorily completed verification testing on 34 of 49 heats where charpy impact tests were reported to customers for SA/A-193 B7 and SA/A-320 L7 sizes over 1". Since all heats of material came from the same homogenous lot we can use MIL-STD-105 to establish a confidence level of over 96% that all charpys are good. We will complete a similar program to at least a 95% confidence level for 1) SA/A-194 Grade 6 nuts over 1" that were certified with charpy impact testing and 2) SA/A-194 Grade 7 nuts over 1" from a particular subcontractor who's charpy testing equipment was questionable, if this material was shipped and certified for impact properties. If a 95% confidence level cannot be achieved for either "category" we will test all questionable heats in the "category" or notify customers of untested heats under 10 CFR Part 21. Once this has been done we will issue a general letter to all customers reporting the final charpy results. We will then regard the charpy issue as closed except for individual customers who may require additional information.

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Any tests which may not pass will, of course, become a matter for reporting under 10 CFR Part 21, if such material was certified for impact properties. We have discussed above how this testing is now being controlled by Cardinal to insure full compliance.

If the contents of this report are accepted by the NRC, Cardinal will amend it's Action Plan accordingly. We will also complete the general notification on stress relief and Charpy impact testing described above. Upon completion of the Certification Review for ASME size included orders over 1", the Material Verification Program and the Validation survey on washers, Cardinal will issue a final report to the NRC and ask for closure on the three inspections performed to date.

JUNE 20, 1984
 REV. AUGUST 7, 1984
 REV 2 AUGUST 9, 1984
 REV 3 SEPTEMBER 25, 1984
 REV 4 JANUARY 4, 1985
 REV 5 JANUARY 31, 1985

ATTACHMENT 1
 MATERIALS WHICH WERE IMPROPERLY IMPACT TESTED
 A193 & SA193 B7 ALL THREAD STUDS AND BAR
 (ALL RETESTS AT TEMPERATURES INDICATED BELOW WERE GOOD)

SIZE	AFFECTED HEATS
1 1/8-8:	(4) 4525B, (1) 6882D, (1) 9121E, (1) X107E, (1) X605D, (1) X606D & (1) 8827D
1 1/4-8:	5450B, 5408B, 3454A, 7536B, (1,3) X9723E, (1) 1508E, (1,4) 8724B & 9476B, (1) NO47D
1 3/8-8:	3454A, 5408B, 5450B, (1) 6409B, (1) 5785D, (1,4) 7212E, 9723D & 9423E, (1) 9814D, (1) 9476B & NO11D
1 1/2-8:	N589B, 9525B, 7157D, 9106D & 8724B
1 5/8-8:	9233E, 9423E & 9106D
1 3/4-8:	9425E & X380E (2 PO'S)
1 7/8-8:	9892D, (1) 9526B, (1) 7238D, (1,4) 7762E & (1) 8724B
2-8:	9526B, (4) 9476B
2 1/4-8:	D552B & 7315A
2 1/2-8:	7315A, (2,4) N825D, (2) & (2) N630B

NOTES:

- 1 - Tested at 0 Deg F per NX2300 with Charpy V-notch. Heat passed.
- 2 - Tested at 10 Deg F per NX2300 with Charpy V-notch. Heat passed.
- 3 - Tested at 20 Deg F per NX2300 with Charpy V-notch. Heat passed.
- 4 - Tested at 68 Deg F per NX2300 with Charpy V-notch. Heat passed.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

JUNE 29, 1984

IE INFORMATION NOTICE NO. 84-52: INADEQUATE MATERIAL PROCUREMENT CONTROLS ON
THE PART OF LICENSEES AND VENDORSAddressees:

All nuclear power reactor facilities holding an operating license (OL) or construction permit (CP).

Purpose:

This information notice is provided to inform licensees of deficient procurement controls and quality assurance (QA) practices on the part of suppliers of nuclear materials and to call attention to possible generic problems in procurement activities of licensees. No specific action is required in response to this information notice, but it is expected that recipients will review the information presented for applicability to their facilities.

Discussion:

The Vendor Program Branch (VPB) of the NRC inspects vendors, material manufacturers, and material suppliers of licensees. One purpose of these inspections is to verify that vendors and suppliers of safety-related materials to licensees are complying with the requirements of 10 CFR 21 and Appendix B to 10 CFR 50. These inspections have revealed a large number of quality-related deficiencies on the part of nuclear suppliers such as:

- a. Improper certification of stock materials as being fabricated and/or upgraded in accordance with ASME Code requirements.
- b. Inadequate inspection of materials received.
- c. Failure to ensure satisfactory performance of required mechanical testing and nondestructive examination.
- d. Inadequate and/or incomplete survey and audit records.
- e. Breakdown of procurement controls with respect to the requirements of 10 CFR 21, Appendix B to 10 CFR 50, and the ASME Code.


Table 1 lists vendors and recent VPB inspection reports where specific discrepancies have been identified regarding implementation of the vendors' quality assurance programs. These reports are published quarterly by the NRC in the "Licensee Contractor and Vendor Inspection Status Report," NUREG-0040. Copies of this document (the White Book) may be obtained at a nominal cost

from the National Technical Information Service, Springfield, VA 22161. Correspondence with contractors and vendors relative to the inspection data contained in NUREG-0040 is placed in the NRC Public Document Room, 1212 H St., N.W., Washington, DC 20555.

Deficiencies also have been identified with respect to licensee procurement and associated QA activities. The licensee is responsible for the quality of purchased nuclear materials and for procurement control of its vendors and suppliers of safety-related material. Deficiencies of this type include:

- a. Inadequate specification of code requirements on purchase orders and other documents.
- b. Failure to develop and monitor an approved vendor list.
- c. Inadequate inspection of materials and components when received.
- d. Inadequate survey and auditing of vendor QA programs.
- e. Failure to perform adequate internal audits of the procurement process.
- f. Inadequate training of personnel who procure nuclear materials under the requirements of 10 CFR 21, Appendix B to 10 CFR 50, and the ASME Code.
- g. Insufficient management attention to procurement activities.

No written response to this notice is required. If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC regional office or this office.


Edward L. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Technical Contacts: N. J. Miegel, IE
(301) 492-7557

E. W. Merschoff, IE
(301) 492-4572

Attachments:

1. Table 1
2. List of Recently Issued IE Information Notices

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
84-51	Independent Verification	06/26/84	All power reactor facilities holding an OL or CP
84-50	Clarification of Scope of Quality Assurance Programs Pursuant to 10 CFR 50 Appendix B	06/21/84	All power reactor facilities holding an OL or CP
84-49	Intergranular Stress Corrosion Cracking Leading to Steam Generator Tube Failure	06/18/84	All power reactor facilities holding an OL or CP
84-48	Failures of Rockwell International Globe Valves	06/18/84	All power reactor facilities holding an OL or CP
84-47	Environmental Qualification Tests of Electrical Terminal Blocks	06/15/84	All power reactor facilities holding an OL or CP.
84-46	Circuit Breaker Position Verification	06/13/84	All power reactor facilities holding an OL or CP.
84-45	Reversed Differential Pressure Instrument Sensing Lines	06/11/84	All power reactor facilities holding an OL or CP
84-44	Environmental Qualification Testing of Rockbestos Cables	06/08/84	All power reactor facilities holding an OL or CP
84-43	Storage and Handling of Ophthalmic Beta Radiation Applicators	06/07/84	All medical licensees
84-42	Equipment Availability for Conditions During Outages Not Covered by Technical Specifications	06/05/84	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit

TABLE 1

DEFICIENT PRACTICES IDENTIFIED IN RECENT VPB INSPECTIONS

ISSUES	VENDOR	INSPECTION REPORT
Program for certifying auditors non-existent and/or use of auditors who had not been certified per documented quality assurance (QA) procedures	Taylor Forge (G&W Mfg. Co.) Lone Star Screw Co.	99900783/82-01 99900781/84-01
Use of suppliers not on an approved vendors list and/or failure to perform vendor audits as required by documented QA procedures	Ametek - Texas Flange Div. Tube-Line Corp Capitol Pipe & Steel Products Co. West Jersey Manufacturing Co. Louis P. Canuso, Inc. Cardinal Industrial Products Corp. Diversified Threaded Products Co. Lone Star Screw Co.	99900884/83-01 * 99900015/83-01 99900816/83-01 99900818/83-01 99900840/83-01 99900823/83-01 99900781/84-01
Nondestructive examination (NDE) discrepancies		
a. failure to perform NDE in accordance with or as required by the ASME Code and/or the customer	Tube-Line Corp. West Jersey Manufacturing Co. G&W Taylor Forge Stainless Div. Cardinal Industrial Products Corp.	* 99900816/83-01 99900347/83-01 99900840/83-01
b. failure to document the identity of persons performing visual examinations	Taylor Forge (G&W Mfg. Co.)	99900783/82-01
c. failure to have complete and/or current certification records for NDE personnel	Coffer Corp. Ametek - Texas Flange Div. Tube-Line Corp. Taylor Forge (G&W Mfg. Co.)	99900822/83-01 99900884/83-01 * 99900783/82-01

ISSUES	VENDOR	INSPECTION REPORT
	Cardinal Industrial Products Corp. Lone Star Screw Co. Diversified Threaded Products Co.	99900840/83-01 99900781/84-01 99900823/83-01
d. commercial NDE performed in lieu of required ASME Code NDE	Tube-Line Corp.	*
e. failure to have NDE records, reports, and/or material certification	Capitol Pipe & Steel Products Co. Tube-Line Corp.	99900015/83-01 *
f. use of NDE procedures that are either not approved in accordance with documented QA procedures or do not meet ASME Code requirements	Capitol Pipe & Steel Products Co. Coffer Corp. Tube-Line Corp.	99900015/83-01 99900822/83-01 *
Heat treatment discrepancies		
a. failure to perform heat treatments as required by the ASME Code and/or documented QA procedures	Ametek - Texas Flange Div. Tube-Line Corp. Lone Star Screw Co.	99900884/83-01 * 99900781/84-01
b. no evidence to support heat treatment data stated on CMTRS	Ametek - Texas Flange Div. Coffer Corp. G&W Taylor Forge Stainless Div. Capitol Pipe & Steel Products Co. West Jersey Manufacturing Co. Tube-Line Corp. Cardinal Industrial Products Corp. Lone Star Screw Co.	99900884/83-01 99900822/83-01 99900347/83-01 99900015/83-01 99900816/83-01 * 99900840/83-01 99900781/84-01

ISSUES	VENDOR	INSPECTION REPORT
c. failure to pass on heat treatment requirements to heat treatment vendors	Cardinal Industrial Products Corp.	99900840/83-01
d. failure to document heat treatment required by the customer, invoked codes, standards and/or specifications	Cardinal Industrial Products Corp.	99900840/83-01
Failure to perform and/or document receiving inspections	Taylor Forge (G&W Mfg. Co.)	99900783/82-01
Failure to pass on requirement that material be manufactured in accordance with a QA program meeting ASME Code requirements	Tube-Line Corp. Cardinal Industrial Products Corp. Lone Star Screw Co. Diversified Threaded Products Co.	* 99900840/83-01 99900781/84-01 99900823/83-01
Failure to specify on purchase orders (POs) that 10 CFR 21 was applicable	Cardinal Industrial Products Corp. Diversified Threaded Products Co. Lone Star Screw Co. Coffer Corp.	99900840/83-01 99900823/83-01 99900781/84-01 99900822/84-01
Failure of the QA department to review and/or approve POs	Coffer Corp. Cardinal Industrial Products Corp. Diversified Threaded Products Co.	99900822/83-01 99900840/83-01 99900823/83-01
Failure of QA to review and/or approve drawings and/or manufacturing shop travelers	Coffer Corp. Diversified Threaded Products Co.	99900822/83-01 99900823/83-01

ISSUES	VENDOR	INSPECTION REPORT
Failure to review suppliers' CMTRs and/or acceptance of CMTRs which were not in compliance with PO or material specification requirements	Capitol Pipe & Steel Products Co. Coffer Corp. L. P. Canuso, Inc. Cardinal Industrial Products Corp. Diversified Threaded Products Co.	99900815/83-01 99900822/83-01 99900818/83-01 99900840/83-01 99900823/83-01
Procedures not available at work stations	Coffer Corp.	99900822/83-01
Failure to control ASME Section III flanges from being mixed in with commercial flanges	Coffer Corp.	99900822/83-01
Failure to establish measures to ensure that welding is controlled and accomplished in accordance with the applicable codes	Tube-Line Corp. Cardinal Industrial Products Corp.	* 99900840/83-01
Incorrect attestations of material meeting ASME Code requirements	Tube-Line Corp. Ametek - Texas Flange Div. Cardinal Industrial Products Corp. Lone Star Screw Co.	* 99900884/83-01 99900840/83-01 99900781/84-01
Use of stock materials without properly certifying the material per procedures in the ASME Code, standards, and/or specifications	Ametek - Texas Flange Div. Capitol Pipe & Steel Products Co. Tube-Line Corp. Cardinal Industrial Products Corp. Lone Star Screw Co. Diversified Threaded Products Co.	99900884/83-01 99900015/83-01 * 99900840/83-01 99900781/84-01 99900823/83-01
Failure to perform testing required by the customer, invoked codes, standards, and/or specifications	Cardinal Industrial Products Corp. Lone Star Screw Co. Diversified Threaded Products Co.	99900840/83-01 99900781/84-01 99900823/83-01

ISSUES	VENDOR	INSPECTION REPORT
Failure to provide original CMTRs as required by NCA-3800 in the ASME Code resulting in transmittal of incorrect and/or inaccurate material data	Cardinal Industrial Products Corp.	99900840/83-01

*Information regarding Tube-Line is contained in NRC IE Bulletin 83-06, dated July 22, 1983. This document was mailed to licensees in July 1983 and is available in the Public Document Room.



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION IV
 611 RYAN PLAZA DRIVE, SUITE 1000
 ARLINGTON, TEXAS 76011

CONTAINED IN THIS REPORT AND
 BEEN DELETED

Exhibit 14B

FEE 29 1984

Packet No. 999000540/83-01

Cardinal Industrial Products Corporation
 ATTN: Mr. M. J. Donovan
 President
 3827 W. Oquendo
 Las Vegas, NV 89118

Gentlemen:

This refers to the inspection conducted by Mr. L. E. Ellersha of this office on October 11-14 and November 14-18, 1983, of your facility at Las Vegas, Nevada, and to the discussions of our findings with you and members of your staff at the conclusion of the inspection.

JUN 26 1984
 JUN 26 11:03 AM '84
 RECEIVED

This inspection was made as a result of concerns expressed to the Nuclear Regulatory Commission pertaining to compliance of furnished fastener materials with the quality assurance provisions contained in Subarticle NCA-3800 of Section III of the ASME Boiler and Pressure Vessel Code. Areas examined during the inspection and our findings are discussed in the enclosed report. Within these areas, the inspection consisted of an examination of procedures and representative records, interviews with personnel, and observations by the inspector.

During the inspection it was found that the implementation of your QA program failed to meet certain NRC requirements. The specific findings and references to the pertinent requirements are identified in the enclosures to this letter.

This Notice of Violation is sent to you pursuant to the provisions of Section 206 of the Energy Reorganization Act of 1974. You are required to submit to this office within 30 days from the date of this letter a written statement containing: (1) a description of steps that have been or will be taken to correct these items; (2) a description of steps that have been or will be taken to prevent recurrence; and (3) the dates your corrective actions and preventive measures were or will be completed. Consideration may be given to extending your response time for good cause shown.

10 CFR 2.790 INFORMATION IS CONTAINED
 IN THIS REPORT AND HAS BEEN DELETED

You are also requested to submit a similar written statement for each item which appears in the enclosed Notice of Nonconformance.

The responses requested by this letter are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

It is apparent from the results of this inspection that our inspectors have established that serious deficiencies existed in the implementation of your quality assurance program relative to the manufacture and supply of fastener materials to the nuclear industry. The nature of the inspection findings is such, particularly with respect to use of stock materials for nuclear orders and certification of materials without assuring performance of required examinations and tests, that it raises concerns in regard to the propriety of your actions and both the credibility and adequacy of the quality assurance function. As a result of both your specific failure to comply with applicable provisions of 10 CFR Part 21 and the deficiencies identified by our inspectors, we are concerned that the NRC may not have been adequately informed, pursuant to 10 CFR Part 21, relative to the scope of defects or failure to comply. You are, therefore, required as part of your corrective action to reassess your past actions for conformance to 10 CFR Part 21 requirements.

Should the results of your evaluations conclude that the NRC has not been adequately informed as required under 10 CFR Part 21, you are required to provide in writing a statement addressing your corrective actions as noted above. Additional required NRC actions will be determined after review of your response.

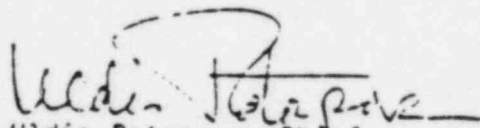
In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within 10 days from the date of this letter of your intention to file a request for withholding; and (b) submit within 25 days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than 7 days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons on the basis which it is claimed that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, the report will be placed in the Public Document Room.

Cardinal Industrial Products
Corporation

-3-

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,



Uldis Potapovs, Chief
Vendor Program Branch
Division of Quality Assurance,
Safeguards, and Inspection Programs

Enclosures:

1. Appendix A - Notice of Violation
2. Appendix B - Notice of Nonconformance
3. Appendix C - Inspection Report No. 99900840/83-01
4. Appendix D - Inspection Data Sheets (4 pages)

APPENDIX A

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

NOTICE OF VIOLATION

As a result of the inspection conducted on October 11-14 and November 14-18, 1983, and in accordance with Section 206 of the Energy Reorganization Act of 1974 and its implementing regulation 10 CFR Part 21, the following violations were identified and have been categorized in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C), 47 FR-9987 (March 9, 1982):

A. Section 21.6 of 10 CFR Part 21 states, in part:

(a) Each individual, partnership, corporation or other entity subject to the regulations in this part, shall post current copies of the following documents in a conspicuous position on any premises, within the United States where the activities subject to this part are conducted (1) the regulations in this part, (2) Section 206 of the Energy Reorganization Act of 1974, and (3) procedures adopted pursuant to the regulations in this part.

(b) If posting of the regulations in this part or the procedure adopted pursuant to the regulations in this part is not practicable, the licensee or firm subject to the regulations in this part may, in addition to posting Section 206, post a notice which describes the regulations/procedures, including the name of the individual to whom reports may be made, and states where they may be examined.

Contrary to the above, Cardinal Industrial Products Corporation (CIPC) had not posted: (1) a current copy of 10 CFR Part 21, (2) Section 206 of the Energy Reorganization Act of 1974, or (3) procedures adopted pursuant to the regulation.

This is a Severity Level V Violation (Supplement VII).

8. Section 21.31 of 10 CFR Part 21 states: "Each individual, corporation, partnership or other entity subject to the regulations in this part shall assure that each procurement document for a facility, or a basic component issued by him, her or it on or after January 6, 1978, specifies, when applicable, that the provisions of 10 CFR Part 21 apply."

Contrary to the above, fasteners were furnished by CIPC to numerous customer purchase orders, for which the applicability of 10 CFR Part 21 was a specific requirement, without similarly specifying its applicability in the CIPC procurement documents for these items.

This is a Severity Level V Violation (Supplement VII).

APPENDIX B

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

NOTICE OF NONCONFORMANCE

Based on the results of an NRC inspection conducted on October 11-14 and November 14-16, 1983, it appears that certain of your activities were not conducted in accordance with NRC requirements. Nonconformances with these requirements are as follows.

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

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

- B. Criterion V of Appendix B to 10 CFR Part 50 states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

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

10 CFR 2790 INFORMATION

2

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

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

1. Acceptance of vendors' Quality Assurance Programs written in

10 CFR 2790 INFORMATION

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

10 CFR 2790 INFORMATION

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

10 CFR 2790 INFORMATION

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

Note: Survey Report No. J-1, dated September 22 and 26, 1983, has

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

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

10 CFR 2790 INFORMATION

6. Approval of a vendor whose quality program was not in complete compliance as evidenced by the survey/audit checklist -
7. Survey/audit checklists apparently filled out by vendor (Self-Audit) -

10 CFR 2790 INFORMATION

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

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

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

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

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

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

1. CIPC did not invoke ASME Code requirements on POs to their vendors.
 2. Numerous POs were not approved by the QA Department.
 3. Certain POs were placed with vendors not on CIPC's AVL.
 4. Numerous CIPC POs did not contain a statement that the material was to be manufactured in accordance with a QA Program meeting the requirements of NCA-3800, and approved by CIPC.
- D. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings"

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

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

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

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

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

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

1. The CMTRs for material received from [redacted] reported Izod impact test results rather than the material specification and ASME Code required CVN impact tests.
2. CIPC accepted CMTRs from [redacted] in which the reported stress relief temperatures were as much as 120°F below the allowable minimum temperature.
3. CIPC accepted a CMTR from [redacted] dated May 6, 1981, in which the stated proof load value of 245,900 lbs was less than the material specification required value of 261,100 lbs. Subsequently on November 9, 1982, CIPC altered the CMTR to reflect the correct value, with the notation, "per [redacted] A corrected CMTR was not obtained from [redacted]"
4. CIPC accepted CMTRs from [redacted] which contained the required QA statement pertaining to the material being manufactured and supplied in accordance with the QA Program as approved by CIPC. However, the name identified in the statement as being the manufacturer and supplier was not [redacted] but [redacted]
5. CIPC accepted a [redacted] CMTR from [redacted] in which the reported stress rupture time was 57.1 hours which did not meet the material specification requirement of 100 hours minimum that was imposed in AP&L's Specification No. APL-M-402 for material used in thermal shield special bolts.
6. CIPC accepted a CMTR from [redacted] in which only single mechanical test results were reported rather than the results of multiple tests required by the material specification for the quantity ordered. The CMTR additionally did not contain any heat treatment information to show compliance with the minimum tempering temperature requirements of the material specification.

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

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

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

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

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

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

1. CIPC failed to comply with AP&L imposed Combustion Engineering Specification No. N-POH16(h) for primary manway studs with respect to:
 - a. Removal of test coupons after heat treatment of production material.
 - b. Testing of both ends of one bar from each heat in each tempering charge.
 - c. Performance of CVN impact testing after all heat treatments had been given to the production material.
 - d. Removal of CVN impact specimens with mid-length of specimens at least one diameter or thickness from a heat treated end.
 - e. Performance of sufficient CVN impact tests to establish upper and lower energy shelves of the CVN transition curve.

2. CIPC failed to comply with AP&L Specification No. APL-M-402 with respect to reporting the cobalt content of the material used for the thermal shield special bolts.
3. CIPC failed to have performed the required number of CVN impact tests on material received which was in excess of the 6000 lbs. heat treatment lot limitation.
4. When CIPC did have CVN impact tests performed, they failed to report the orientation and location of the test specimens on their CMTRs.
5. The following was identified with respect to nondestructive examination (NDE):
 - a. There were no records to show that required magnetic particle examination (MT) had been performed on 28, 1-½ inch bolts supplied to APS on January 11, 1982.
 - b. CIPC CMTR No. 34265 attested that MT had been performed on 20, 1-½ inch nuts supplied to APS; however, there were no MT reports to substantiate that MT had been performed.

CIPC's Customer Production Record (CPR), a route sheet, listed an MT operation referencing a test report (NO. 6708); however, review of Test Report No. 6708 showed that it was a report of CVN impact test results.
 - c. CIPC CMTR No. 31690 dated June 16, 1983, did not report the required MT as being performed on a bolt supplied to Northern States Power Co., nor was there an MT report available.
 - d. CIPC CMTR No. 30162 dated April 26, 1983, stated that 40, 2-½ inch studs supplied to Consumers Power Co. had been ultrasonic examined (UT'd). However, review of the applicable UT reports for this material failed to show that 31 pieces had been UT'd.
6. AP&L imposed Combustion Engineering, Inc., Specification No. N-POH19(b) in procurement of primary manway stud nuts. This specification required that a tensile test be performed on the material used to manufacture the nuts. CIPC furnished, however, inventory nuts from _____ for which the required starting material tensile test had not either been required or performed.
- G. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings . . ."

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

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

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

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

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

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

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

General Test - 30
 Specific - 15 (for each method)
 Practical - 20 (for each method)

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

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

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

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

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

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

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

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

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

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

1. Numerous CMTRs from _____ provided the following heat treatment data for A-193 Grade B7 material: Quench 1530° - 1560°F 40-70 minutes, tempering 1080° - 1150°F 2 hours, and stress relieve 930° - 1040°F 4 hours. CIPC optimized this data without benefit of objective evidence (i.e., temperature recording charts) to produce a master certification which showed: Harden 1560°F 1:10 hours, temper 1150°F 2 hours, and stress relieve 1040°F 4 hours.
 2. CMTRs provided to Consumers Power Co. (Nos. 28961 and 28963) showed the tempering temperature to be 1100°F minimum. However, there was no supporting documentation as to the source of this data.
 3. CMTR No. 25517, provided to Northern States Power, showed a proof load value of 133,700 lbs., but there was no supporting documentation as to the source of this data.
- J. Criterion V of Appendix B to 10 CFR Part 50 states, in part, "Activities affecting quality . . . shall be accomplished in accordance with . . . instructions, procedures, or drawings"

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

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

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

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CORRESPONDENCE ADDRESS: Cardinal Industrial Products Corporation
ATTN: Mr. M. J. Donovan
President
3827 W. Oquendo
Las Vegas, Nevada 89118

ORGANIZATIONAL CONTACT: Mr. N. Henderson, Director, Quality Assurance
TELEPHONE NUMBER: (702)739-1966

PRINCIPAL PRODUCT: Fasteners

NUCLEAR INDUSTRY ACTIVITY: Approximately 40 percent of Cardinal Industrial Products Corporation (CIPC) sales is made to the commercial nuclear industry.

ASSIGNED INSPECTOR:

E. Ellershaw

I. E. Ellershaw, Reactive Inspection Section (RIS) Date

2-24-84

OTHER INSPECTOR(S):

J. T. Conway, RIS
I. Barnes, Chief, RIS

APPROVED BY:

I. Barnes

I. Barnes, Chief, RIS

2-24-84
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 concerns expressed to the Nuclear Regulatory Commission (NRC) pertaining to compliance of furnished fastener materials with the quality assurance provisions contained in Subarticle NCA-3800 of Section III of the ASME Boiler and Pressure Vessel Code. These concerns were evaluated by an inspection of procurement (cont. on next page)

PLANT SITE APPLICABILITY: NCA-3800 Deficiencies: 50-313/368, 50-528/529/530, 50-282/306, 50-329/330, 50/373/374, 50-454/455, 50-324/325, 50-301.

Note: Multiple plant docket nos. have been included where purchase orders (POs) did not identify specific units.

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SCOPE (cont'd): document control, receiving inspection, and process control (mechanical testing and nondestructive examination). The inspection additionally included a review of 10 CFR Part 21 implementation.

A. VIOLATIONS:

1. Contrary to Section 21.6 of 10 CFR Part 21, CIPC had not posted: (a) a current copy of 10 CFR Part 21, (b) Section 206 of the Energy Reorganization Act of 1974, or (c) procedures adopted pursuant to the regulation.
2. Contrary to Section 21.31 of 10 CFR Part 21, fasteners were furnished to numerous customer POs, for which the applicability of 10 CFR Part 21 was a specific requirement, without similarly specifying its applicability in the CIPC procurement documents for these items.

B. NONCONFORMANCES:

1. Contrary to Criterion IX of Appendix B to 10 CFR Part 50, the CIPC Quality Assurance Manual (QAM) did not establish measures to assure that welding was controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes. CIPC supplied 52 Locking Cup Assemblies to Arkansas Power & Light Co.'s (AP&L) Arkansas Nuclear One, Unit 1, in which fabrication, including welding, was to be in accordance with Subsection (b) in Section III of the ASME Code. In addition to the CIPC QAM not establishing the required measures, a welding procedure specification, procedure qualification record, and welder qualifications could not be located during this inspection.
2. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 8 of the CIPC QAM, survey/audit records did not provide objective evidence of, either performance of satisfactory surveys and audits, or that vendors' manuals were the major basis for demonstration of ASME Code compliance as evidenced by the following categories of examples:

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- a. Acceptance of vendors' Quality Assurance Programs written in

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

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

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

Note: Survey Report No. J-1 dated September 22 and 28, 1983, has the following question in Section V, Part B.4: "Are there established measures to show the status and results of any required examination or test for the material at any time." The answer was "Yes", with this note: "Charpy is the only required test per Cardinal PD per material specification." However, all reviewed Certified Material Test Reports (CMTRs) indicated Izod impact tests were performed instead of Charpy V-Notch (CVN) impact tests.

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- e. Placement of vendors on Approved Vendor List (AVL) without required survey/audit being performed -

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- f. Approval of a vendor whose quality program was not in complete compliance as evidenced by the survey/audit checklist -
- g. Survey/audit checklists apparently filled out by vendor (Self-Audit) -

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3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 5 of the QAM, a review of CIPC POs and the associated vendor CMTRs for materials which were subsequently sold for ASME Code Section III applications revealed the following conditions:
- a. CIPC did not invoke ASME Code requirements on POs to their vendors.
 - b. Numerous POs were not approved by the QA Department.
 - c. Certain POs were placed with vendors not on CIPC's AVL.
 - d. Numerous CIPC POs did not contain a statement that the material was to be manufactured in accordance with a QA program meeting the requirements of NCA-3867.4(e) approved by CIPC.
4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Paragraph NCA-3867.4(e) in Section III of the ASME Code, CIPC improperly certified stock materials (i.e., materials procured from manufacturers without specification that the material be produced using a Quality System Program that had been verified by survey to be in accordance with the requirements of Subarticle NCA-3800 in Section III of the ASME Code) as being in compliance with Section III of the ASME Code. Material specification requirements other than those applicable during melting, however, not been performed on either a piece or heat basis and duct analysis was not performed on each piece of stock material.

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

5. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and CIPC Standard Practice No. CSP 7.002, a review of approximately 50 CIPC accepted vendor certification/documentation packages revealed that they were not in accordance with invoked codes, standards and/or specifications as evidenced by the following:
 - a. The CMTRs for material received from [redacted] reported Izod impact test results rather than the material specification and ASME Code required CVN impact tests.
 - b. CIPC accepted CMTRs from [redacted] in which the reported stress relief temperatures were as much as 120°F below the allowable minimum temperature.
 - c. CIPC accepted a CMTR from [redacted] dated May 6, 1981, in which the stated proof load value of 245,900 lbs. was less than the material specification required value of 261,100 lbs. Subsequently on November 9, 1982, CIPC altered the CMTR to reflect the correct value, with the notation, "per [redacted] A corrected CMTR was not obtained from Hamanaka.
 - d. CIPC accepted CMTRs from [redacted] which contained the required QA statement pertaining to the material being manufactured and supplied in accordance with the QA program as approved by CIPC. However, the name identified in the statement as being the manufacturer and supplier was not [redacted] but [redacted].
 - e. CIPC accepted a [redacted] CMTR from [redacted], in which the reported stress rupture time was 57.1 hours which did not meet the material specification requirement of 100 hours minimum that was imposed in AP&L's Specification APL-M-402 for material used in thermal shield special bolts.

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- f. CIPC accepted a CMTR from _____ in which only single mechanical test results were reported rather than the results of multiple tests required by the material specification for the quantity ordered. The CMTR additionally did not contain any heat treatment information to show compliance with the minimum tempering temperature requirements of the material specification.
6. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 15 in the QAM and paragraphs NB/NC-2343, NB-2581 and NX-2321 in Section III of the ASME Code, test and examination requirements have not been performed in accordance with customer requirements, invoked codes, standards, and specifications as evidenced by the following:
- a. CIPC failed to comply with AP&L imposed Combustion Engineering (CE) Specification No. N-POH16(h) for primary manway studs with respect to:
- (1) Removal of test coupons after heat treatment of production material.
 - (2) Testing of both ends of one bar from each heat in each tempering charge.
 - (3) Performance of CVN impact testing after all heat treatments had been given to the production material.
 - (4) Removal of CVN impact specimens with mid-length of specimens at least one diameter or thickness from a heat treated end.
 - (5) Performance of sufficient CVN impact tests to establish upper and lower energy shelves of the CVN transition curve.
- b. CIPC failed to comply with AP&L Specification No. APL-M-402 with respect to reporting the cobalt content of the material used for the thermal shield special bolts.
- c. CIPC failed to have performed the required number of CVN impact tests on material received which was in excess of the 6000 lbs. heat treatment lot limitation.

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- d. When CIPC did have CVN impact tests performed, they failed to report the orientation and location of the test specimens on their CMTRs.
- e. AP&L imposed CE Specification No. N-POH19(b) in procurement of primary manway stud nuts. This specification required that a tensile test be performed on the material used to manufacture the nuts. CIPC furnished, however, inventory nuts from _____ for which the required starting material tensile test had not either been required or performed.
- f. The following was identified with respect to nondestructive examination (NDE):
- (1) There were no records to show that required magnetic particle examination (MT) had been performed on 28, 1½ inch bolts supplied to APS on January 11, 1982.
 - (2) CIPC CMTR No. 34265 attested that MT had been performed on 20, 1½ inch nuts supplied to APS; however, there were no MT reports to substantiate that MT had been performed.

CIPC's Customer Production Record (CPR), a route sheet, listed an MT operation referencing a test report (No. 6708); however, review of test report No. 6708 showed that it was a report of CVN impact results.
 - (3) CIPC CMTR No. 31690 dated June 16, 1983, did not report the required MT as being performed on a bolt supplied to Northern States Power Co., nor was there an MT report available.
 - (4) CIPC CMTR No. 30162 dated April 26, 1983, stated that 40, 2½ inch studs supplied to Consumers Power Co. had been ultrasonic examined (UT'd). However, review of the applicable UT reports for this material failed to show that 31 pieces had been UT'd.

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7. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section 20 in the OAM, the current Level III Examiner in liquid penetrant examination (PT), MT and UT at _____, an associated company performing mechanical testing and NDE for CIPC, was employed in February 1983 and was certified on March 1, 1983, by examinations which were not in accordance with the 1980 edition of SNT-TC-1A.

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

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

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

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

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

8. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and Section III and V of the ASME Code, CIPC has treated required visual examination as an inspection function and not as an NDE discipline. As a result, personnel performing this activity have neither been qualified nor have they been given eye examinations. Further, written procedures did not exist to provide for the performance of visual examination.
9. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph NCA-38674(b) in Section III of the ASME Code, CIPC, when acting as a material supplier, does not transmit all material manufacturer CMTRs to the purchaser. CIPC's practice is to transcribe data from their vendor CMTRs onto their own master certification, which is subsequently provided to the purchaser. With respect to transcription, it was noted during review of vendor CMTRs and CIPC's applicable master certifications that certain conditions existed in which the purchaser may not have received the correct data.

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- a. Numerous CMTRs from _____ provided the following heat treatment data for A-193 Grade B7 material: Quench 1530° - 1560°F 40-70 minutes, tempering 1080° - 1150°F 2 hours, and stress relieve 930° - 1040°F 4 hours. CIPC optimized this data, without benefit of objective evidence (i.e., temperature recording charts) to produce a master certification which showed: Harden 1560°F 1:10 hours, temper 1150°F 2 hours, and stress relieve 1040°F 4 hours.
- b. CMTRs provided to Consumers Power Co. (Nos. 28961 and 28963) showed the tempering temperature to be 1100°F minimum. However, there was no supporting documentation as to the source of this data.
- c. CMTR No. 25517 provided to Northern States Power, showed a proof load value of 133,700 lbs., but there was no supporting documentation as to the source of this data.

10. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph 2.10 in CIPC Standard Practice No. CSP 7.001 and paragraph NCA-3867.4 in Section III of the ASME Code, a statement reflecting performance of normalizing and hardening heat treatments was not reported on certain of the CIPC CMTRs for ASME Code Section III, Class 1 primary manway studs supplied to AP&L on PC No. 73555.

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS AND COMMENTS:

1. Procurement Document Control: The NRC inspectors reviewed Section 5, "Procurement Document Control," Section 7, "Document Control," and Section 8, "Control of Purchased Materials And Services," of the QA. An examination was also made of 179 customer POs placed with CIPC, 27 POs placed with 12 foreign and 10 domestic vendors for ASME Section III Code materials and an evaluation performed of compliance of the vendor documentation with PO, ASME Code, and CIPC QA program requirements. In addition, 30 survey/audit reports of 7 foreign vendors and 11 survey/audit reports of 5 domestic vendors were reviewed to assess CIPC's compliance relating to frequency of audits and the qualification of vendors. Within this area of the inspection, nonconformances B.2 and B.3 were identified.

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The following supporting information was obtained in regard to both the identified nonconformances and additional discrepant conditions:

- a. Liberty Equipment & Supply Co. - A review was performed of CIPC and material vendor documentation which was applicable to HH nuts that had been furnished to Transamerica Deval, Inc. against PO No. N35474TR dated March 24, 1982, from Liberty Equipment & Supply Co. This PO ordered 500 pieces, 3/4 inch, SA 194 grade 2H HH nuts in accordance with the requirements of ASME Section III Code, Class 3, 1980 Edition through the Summer 1981 Addenda. CIPC furnished a Certificate of Compliance for this order which attested to compliance with the PO requirements, use of the CIPC QA program, and that 10 CFR Part 21 was an applicable requirement. Review of the CIPC procurement and vendor documentation applicable to the materials furnished for this order showed that the nuts had been procured from _____ with the manufacturer being _____

The CIPC PO for these items did not denote, however, the applicability of either the ASME Section III Code Subarticle NCA-3800 quality assurance program requirements or 10 CFR Part 21.

- b. Sargent Nut & Bolt Co. - A review was performed of CIPC and material vendor documentation which was applicable to fasteners that had been furnished to Transamerica Delaval, Inc. against POs from Sargent Nut & Bolt Co. As a result of this review, the following examples of deficiencies were identified:

- (1) Sargent PO NO. 713 - This PO was received on September 9, 1979, and included an order for 1000 pieces, 3/4 inch - 10 x 3 1/2 inch, SA-325 Hex. bolts in accordance with the requirements of Subarticle NCA-3800 and Subsection ND in Section III of the ASME Code. CIPC furnished a CTR with the delivered bolts which indicated both compliance with the above requirements and use of the CIPC quality program dated February 14, 1979. Review of the CIPC procurement and vendor documentation applicable to the materials furnished for this order showed that the bolts had been procured from _____ after receipt of the Sargent order. The CIPC PO to (i.e., PO No. 6300) ordered the bolts to the requirements of ASTM A-325 and did not denote the applicability of either Subarticle NCA-3800 or Subsection ND in Section III of the ASME Code.

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- (2) Sargent PO NO. 729 - This PO which was dated October 1, 1979, included an order for 86 pieces, 1 inch - 8 X 4 1/2 inch, SA-325 HH bolts in accordance with the requirements of Subarticle NCA-3800 in Section III of the ASME Code. The CMTR furnished by CIPC for these items indicated compliance with the above requirements and use of the CIPC quality program dated February 14, 1979. Review of the CIPC procurement and vendor documentation applicable to these items showed that the bolts had been manufactured from ASTM A-325 1 inch X 6 inch Hex. blanks which had been procured on CIPC PO No. 1525 dated January 21, 1978, from
- These
- blanks were procured without denoting the applicability of Subarticle NCA-3800 in Section III of the ASME Code. It was additionally noted CIPC PO No. 1525 contained the following note, "C.I.P. will grind all heads and use only as A 307B's or other low carbon bolts." The condition which instigated this statement or the material origins could not be positively verified during the inspection.

c. AP&L - A review was performed of CIPC and material vendor documentation which was applicable to fasteners that had been furnished to AP&L. As a result of this review, the NRC inspector identified the following examples of deficiencies:

- (1) AP&L PO No. 73555 dated August 31, 1982, in addition to other items, included an order for 60 primary manway nuts, 1 1/2 inch - 8 Heavy Hex, SA 194 Grade 7 material, in accordance with Section III, Class 1 of the ASME Code. In addition, the requirements of 10 CFR Part 21 were imposed.

CIPC furnished CMTRs with the delivered nuts which stated both compliance with the above requirements and use of the CIPC QA program dated January 22, 1982. Review of the CIPC procurement and vendor documentation applicable to the nuts furnished for this order showed the following:

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CIPC placed PO No. 10402 dated November 30, 1980, with
 for a number of items, one of
 which was for 8100 pieces of 1½ inch - 8 ASTM A-194 Grade 7
 Heavy Full Nuts. ASME Code requirements and 10 CFR Part 21
 were not invoked. Subsequently, CIPC received a total of
 9840 Heavy Full Nuts which were inspected and accepted as
 follows: 2700 on September 14, 1981; 5400 on April 29,
 1982; 1350 on May 3, 1982, and 390 on June 30, 1982.

The only available CMTR from the nut manufacturer
 was dated May 6, 1981, and was for a
 total of 2700 pieces. This CMTR provided the ladle analysis,
 heat treatment data, hardness, CVN impact results, and proof
 load data for Heat No. 08872.

CIPC apparently used this data as a basis for accepting the
 other 7140 pieces. CIPC subsequently supplied 60 nuts to
 AP&L; 20 on September 26, 1982, and 40 on November 8, 1982.
 The CIPC CMTRs provided to AP&L included all of the data
 supplied by plus a product analysis. However, it
 could not be determined from what group these 60 nuts came
 from.

- (2) AP&L PO No. 75400 dated October 13, 1982, included an order
 for 110, 1 inch - 8 UNR-2A High Strength Bolts (thermal
 shield bolts) of ASME SA-453 Grade 660, Class A material,
 with fabrication to Section III, Subsection NG of the ASME
 Code.

CIPC furnished CMTRs with the delivered bolts which stated
 both compliance with the above requirements and use of the
 CIPC QA program dated January 22, 1982. Review of the CIPC
 procurement and vendor documentation applicable to the
 bolts furnished for this order showed the following:

CIPC purchased the material (72 feet of 2 inch A 453
 Grade 660, Class A material) from
 on PO 18429 dated November 24, 1982, with the
 notation that the material was "to be of
 HT # C10535-8."

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The existing records pertaining to _____ showed that there was an audit record dated October 12, 1979, and another dated August 26, 1983. The Vendor Record Form showed that _____ received their initial survey on October 12, 1979, with Audit No. 1 being conducted on August 4, 1980, although there was nothing to substantiate that Audit No. 1 had actually been conducted. Further, the August 26, 1983, audit consisted of 1½ pages of handwritten notes. One of the notes stated, "For the present time it will be necessary for Cardinal to upgrade in purchases - IAW (In accordance with) the Cardinal Standard Policy."

_____ had previously purchased the material from _____ as shown by Crucible's CMTR which was dated March 24, 1981, and showed Heat No. C10535-8. The material was described as being "VAR A-286 CG Sol Trt. AMS 5731 E except hardness RB 83/93. Capability of AMS 5737H Hi Shear Spec 140 Capability of AMS 5737H." Someone other than _____ subsequently typed in Grade 660 ASTM A-453 Cond. A. A corrected CMTR was supplied by _____ dated January 19, 1983. This CMTR did not make reference to A-453 Grade 660. The statement, "Material produced in accordance with _____ Quality Assurance Program audited and approved by Cardinal Industries," was on the corrected CMTR.

It was additionally noted that CIPC's CMTR stated that the bolts had been radiographed and visually inspected in accordance with ASME Section III requirements. The CIPC CMTR failed to provide the temperature, time, and quenching medium for the solution treatment phase of the heat treatment requirements.

- d. Hub, Inc. - A review was performed of CIPC and material vendor documentation which was applicable to fasteners that had been furnished to Hub.

Hub, Inc. PO No. T-81211-04 dated August 2, 1982, ordered 1 3/4 inch X 18-20 feet random length SA-193 Grade B7 Rounds. The provisions of 10 CFR Part 21 were identified as being applicable and ASME Section III, Class 1 requirements were imposed. The PO further stated that, "... Starting material

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utilized on this order shall be manufactured and supplied under a Quality Program that was audited and approved by Cardinal as conforming to ASME NCA-3800. Material shall be manufactured and supplied under the Quality System Program dated October 17, 1980, Revision 3, that was audited and approved by Hub, Inc. on July 13, 1982. Your quality system program revision and date must appear on all documentation along with date Hub, Inc., approved your program."

The following deficient conditions were noted.

Materials furnished in response to the Hub PO were not manufactured in accordance with the Hub and CIPC approved quality programs, in that the materials had been ordered for inventory stock by CIPC, as much as 2 years before they received the PO from Hub, Inc. Further, the supplier of the material was not on CIPC's AVL at that time and CIPC did not upgrade this material as required by the ASME Code.

CIPC improperly certified the materials by placing the following statement, in part, on their CMTRs to Hub: "We hereby certify that the fasteners supplied under the above PO No. are . . . Per ASME B&PV Code, Section III, Class 1, Subsection NF, 1977 Edition through Summer 77 Addenda. 10 CFR Part 21 applies. This material was supplied and produced in accordance with CIPC's Quality Assurance Program dated January 22, 1982, Revision 3 which meets the requirements of NCA-3800. Quality Assurance Program approved by Hub, Inc., July 13, 1982. The above product has been supplied per American Society of Mechanical Engineers."

It was additionally noted that CIPC's CMTR provided a tempering temperature of 1100°F minimum. However, the CMTR provided by did not address heat treatment.

e. During the NRC inspectors review of CIPC's survey/audit records, the following conditions were identified:

- (1) - The records indicated that this vendor had been surveyed/audited on November 3, 1980; October 17, 1981; and April 7, 1982. Each of these audits

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ORGANIZATION: CARDINAL INDUSTRIAL PRODUCTS CORPORATION
 LAS VEGAS, NEVADA

REPORT NO.: 99900840/83-01	INSPECTION RESULTS:	PAGE 15 of 22
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was documented on the CIPC standard audit checklist which addressed the following areas: Organization; Quality System Program; Responsibility; Quality Control Procedures; Document Control; Control of Purchased Materials; Control of Manufacturing Process; Handling, Storage, and Shipping; Identification of Materials; QA Records; Control of Measuring and Test Equipment; Audits, and Corrective Action. Each of these areas had three columns associated with them: Acceptable; Reject, and Not Applicable, with the appropriate column to be checked off by the auditor in response to a specific question within the area. All of the questions within the areas dealt with "have measures been established to" The questions did not deal with whether or not the established measures had been implemented. All questions in the three audits had been checked off as being "Acceptable." There was no objective evidence to support these results. Further, the QAM was in

(2) _____ - The records indicated that this vendor had been surveyed/audited on April 25, 1979; November 26, 1980; October 26, 1981; and September 29, 1982. The first audit consisted of 15 pages of questions pertaining to the 18 Criteria of Appendix B to 10 CFR Part 50. None of the questions had been checked off. A statement was written on the checklist by the CIPC auditor, which stated, "The QC function is the responsibility of the Metallurgical Department. The procedures are interwoven in the Standard Operating Procedures for each function of the total mill operation. Although companies such as _____ do not make their Standard Operating Procedures available to outsiders, one can determine from a visit, that the total operation is controlled by written procedures spelling out each area of responsibility in detail setting forth the who, what, where, when and how. It is the considered opinion of the undersigned that the requirements set forth in these Survey Questionnaires are being followed in the daily operation of the plant."

The second audit checklist had all the questions checked off as being acceptable. The CIPC auditor wrote a statement in the remarks area, "Much more cooperative than visit in April of 1979. In process of preparing a Quality Control Manual for the plant."

10 CFR 2790 INFORMATION

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The third audit had all questions checked off as being acceptable.

The fourth audit was not filled out; i.e., the questions were not checked off.

- (3) _____ The records indicated that this vendor had been surveyed/audited on November 21, 1980; November 9, 1981; September 22, 1982; and October 6, 1983. All four survey/audits showed that all questions were checked off as being acceptable. However, the QAM is written in
- (4) _____ - The records indicated that this vendor was surveyed/audited on June 18, 1981, and August 5, 1982. The first audit checklist revealed that all questions were checked off as being acceptable, except the six questions dealing with internal audits in Section XIV, which were not checked off at all. A notation entered by the CIPC auditor stated, "See _____ QA Manual Section II," which was on file. Review of Section II in the QAM revealed that annual internal audits were to be performed to determine the effectiveness of the QA Program, using written checklists with results to be retained. The NRC inspector asked the CIPC auditor why the questions in Section XIV of the audit checklist had not been checked off, as appropriate. He responded by saying that _____ had not performed internal audits. He had no answer when asked why the questions were not checked off as being rejectable.
- (5) _____ - The records indicated that this vendor had been surveyed/audited on November 19, 1980; October 5, 1981; March 29, 1982; and September 22 and 28, 1983. Section V of the last audit checklist addresses examinations, tests, and reports. One of the questions asked, "Are there established measures to show the status and results of any required examinations or test for the material at any time?" The answer was "Yes" with the notation, "Charpy is the only required test per Cardinal Purchase Order per material specification."

A review of numerous CMTRs from _____ revealed that CMR impact tests are not performed, rather Izod impact tests are performed.

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- (6) _____ - The records indicated that the vendor was surveyed/audited on October 12, 1979, and August 26, 1983. However, the audit report for 1979 consisted of a cover sheet and one page of handwritten comments and the audit report 1983 was less than two pages of handwritten notes. CIPC purchased material from this vendor on November 24, 1982, which was subsequently supplied as thermal shield bolts to AP&L.
- (7) _____ The records indicated that this vendor was surveyed/audited on April 17, 1979; April 16, 1980; October 30, 1980; October 19, 1981; and September 6, 1982. All the applicable items on two different checklists used on the first four audits were checked "Yes" or "Acceptable" with a minimum number of comments or notes.
- (8) _____ - The records indicated that this vendor was surveyed/audited on April 24, 1979; April 23, 1980; October 27, 1980; October 21, 1981; September 29, 1982; and October 7, 1983. All the applicable items on two different checklists used on the first four audits were checked "Yes" or "Acceptable" with a minimum number of comments or notes. In addition, based on a difference in the handwriting used on the audit report cover sheet and the checklist, it appears that the vendor checked off the columns; i.e., self-audit.
- (9) _____ - This vendor was surveyed/audited on November 6, 1980; October 14, 1981; April 6, 1982; and April 21, 1983. All the applicable statements on the four checklists were checked "Acceptable" with a minimum number of comments or notes. Based on the information contained in the audit report cover sheet, the audit conducted in October 1981 was apparently performed by the vendor.
- (10) _____ - This vendor was surveyed/audited on June 5, 1980; June 19, 1981; and August 4, 1982. All the applicable items were checked "Acceptable" with a minimum number of comments or notes.
- (11) _____ - This vendor was surveyed/audited on February 1, 1979; February 25, 1980; April 20, 1981; and June 22, 1982. It was noted that the checklist for the 1982 audit was completely blank. In addition, the annual audit for 1983 is overdue by 5 months.

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ORGANIZATION: CARDINAL INDUSTRIAL PRODUCTS CORPORATION
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(12) This vendor was on the AVL for August and December 1982 but there was no documented evidence that CIPC had conducted a survey/audit of this vendor who supplied material in December 1981.

(13) - This vendor was on the AVL for March 1982, but there was no documented evidence that CIPC had conducted a survey/audit of this vendor who was awarded a PO in April 1982.

(14) This vendor was surveyed/audited on June 1, 1979. The records also contained an audit report in which the cover sheet was filled in but not dated and the checklist was entirely blank. In addition, the vendor evaluation checklist for the audit of April 1, 1983, was only a single page and addressed the calibration of test equipment.

2. Receiving Inspection: The NRC inspectors reviewed Section 8, "Control of Purchased Materials And Services," Section 9, "Identification And Control of Materials, Parts, and Components," and Section 11, "Inspection," of the QAM.

A review of CIPC POs and vendor documentation pertaining to those POs was performed to assess the receiving inspection and related QA functions in terms of review and acceptance of vendor CMTRs. Within this area of the inspection, nonconformance B.5 was identified.

3. Process Control (Mechanical Testing and Nondestructive Examination (NDE)): The NRC inspectors reviewed Section 10, "Special Process," Section 11, "Inspection," and Section 12, "Test Control," of the QAM. A review of customer POs placed with CIPC and the corresponding CIPC CMTRs was conducted, applicable CPRs were examined, and an evaluation of CIPC's compliance with the PO requirements was performed. NDE personnel records and applicable NDE procedures were reviewed to determine compliance with ASME Code requirements. CIPC CMTRs containing mechanical test and NDE results were compared against the applicable test reports. Within this area of the inspection, nonconformances B.1, B.4, B.6, B.7, B.8, B.9, and B.10 were identified.

10 CFR 2790 INFORMATION

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The following additional information was obtained in regard to certain of the identified nonconformances and other discrepant conditions:

- a. AP&L - The NRC inspectors reviewed CIPC documentation (i.e., CPRs, POs, CMTRs) and supporting NDE and mechanical test records for ASME Section III Code, Class 1, 1½ inch diameter primary manway studs which had been ordered by AP&L in PO No. 73555 dated August 31, 1982. Comparison of these records against the requirements of the PO and the invoked CE Specification No. N-POH16(h) identified the following examples of failure to comply with specified criteria:

- (1) Testing Requirements and Sample Removal - Paragraph 2.6 in CE Specification No. N-POH16(h) states, "Test material shall be removed and tested after the material has been given all heat treatments to be applied to the production material." Paragraph 2.7 states, in part, "One test shall be made from both ends of one bar of each diameter from each heat of steel that is heat treated as one charge or as one continuous operation not to exceed in weight the following: 1-3/4" dia and less 1500 lbs. . . ." Review of CPRs for the primary manway studs showed, however, that bars were cut into test coupons and production blanks prior to performance of normalizing, hardening, and tempering heat treatments. No documented provisions were noted in regard to testing both ends of a bar from each heat that was heat treated in one furnace charge. The CMTRs additionally reflected performance of a single test on material from a given heat that was heat treated as one charge. The NRC inspector additionally noted that CVN impact testing of certain of the studs was performed prior to a second tempering operation and was not repeated after the final heat treatment.
- (2) CVN Impact Specimens - Paragraph NB-2224(b) in Section III of the ASME Code states, "For bolting material, the coupons shall be taken in conformance with the applicable material specification and with the mid-length of the specimen at least one diameter or thickness from a heat treated end." Review of CPRs for the 1½ inch diameter bar material

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showed, however, that 2½ inch length blanks were cut prior to heat treatment for preparation of CVN impact specimens. As a result, the mid-length of the specimen was below one diameter from a heat treated end.

Paragraph NX-2321 in Section III of the ASME Code states, in part, ". . . The results, orientation and location of all tests performed . . . shall be reported in the Certified Material Test Report." Paragraph 12.3 in ASME Material Specification No. SA-540 states, "Tension and impact specimens from bolting material with cross sections of 1½ inch (38.1 mm) or less shall be taken so that their longitudinal axis is on a line representing the center of the diameter or thickness. Review of CMTRs and supporting mechanical test records for the primary studs showed, however, that CVN impact specimen orientation and location had not been reported.

- (3) CVN Impact Transition Curves - Subparagraph e) of paragraph 2.8 in CE Specification No. N-POH16(h) states, in part, "Sufficient impact tests shall be made to establish a CVN transition curve. The temperature range shall be sufficient to establish both the upper and lower energy shelves except tests need not be run at temperatures lower than -320°F" Review of the CVN impact specimen data on the CMTRs showed, a sufficient test temperature range had not been used and the upper and lower shelves had not been established.
- (4) Certification and Performance of Heat Treatment - Paragraph 2.4 in CE Specification No. N-POH16(h) states, "All solid stud materials should be water quenched. The minimum tempering temperature for all materials shall be 1000°F." Paragraph NCA-3867.4(a)(2) in Section III of the ASME Code states, in part, with respect to CMTR reporting requirements, "When specific times and temperatures (or temperature ranges) of heat treatments of materials are required by material specifications, they shall be reported. When specific times and temperatures (or temperature ranges) are not required by the material specification, a statement of the type of heat treated condition shall be reported" Review of CMTRs showed, however, that certain

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issued CMTRs for the primary manway studs indicated only performance of a single tempering heat treatment and did not report that the required prior austenitizing heat treatment and water quench had been accomplished. Review of the relevant available CPRs for these studs also did not indicate any provisions in the listed operations for performance of required material heat treatments. Alternate records (e.g., POs to the CIPC heat treatment vendor, vendor heat treatment certifications, other CPRs) were not located during the inspection which would confirm that the required material heat treatments had been performed.

In addition to the foregoing, the NRC inspectors identified the following anomaly with respect to UT of 20 primary manway studs which were shipped to AP&L on September 26, 1982. The applicable CPR indicated that UT was initiated and completed on September 23, 1982, and showed that PO No. 17486 to _____ was the document which accomplished the UT of the studs. Examination of the _____ test report for PO No. 17486 showed a date of October 7, 1982, for this examination. The circumstances pertaining to this date anomaly were not established during the inspection. Review of CPRs for these studs also showed process control discrepancies of a type which precluded ready confirmation of material identity being controlled during manufacture. Examples noted of such discrepancies were: (a) differences in quantity between parts sent to a subvendor for machining and parts received back from the subvendor, and (b) handwritten changes to CPR Nos. and quantities of issued materials.

- b. Sargent Nut & Bolt Co. - During review of Sargent PO No. 729 and CIPC documentation in regard to ordered ASME Material Specification No. SA-325 fasteners, the NRC inspector identified that a proof load test, a requirement of the material specification, had not been performed for 1 inch - 8 X 4 1/2 inch hex bolts supplied to this PO. Hex blanks were procured from _____ for manufacture of these fasteners. A proof test is performed on the finished fastener which would require CIPC to make provisions for the testing.

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During review of CIPC documentation for Sargent PO No. 1203 with respect to 72 pieces, $\frac{1}{2}$ inch - 13 X 3 7/8 inch double ended B7 studs, the NRC inspector noted the following material identity anomaly. The PO was received on November 15, 1978, and the items shipped on November 22, 1978. CIPC issued a CMTR for the items which showed that the applicable material heat number was 80990. Review of the CPR for these items also showed that heat No. 80990 was used for manufacture and that this material was procured on CIPC PO No. 3328. Examination of this PO confirmed that material of the correct diameter and specification was included in the PO. Review of the vendor CMTR for the received barstock showed, an identified heat No. 8895122. Mechanical test data obtained by CIPC for this latter heat number differed from the values reported on the CIPC CMTR to Sargent. The heat No. 8895122 mechanical test data was also obtained subsequent to shipping of the studs. The reasons for this material identity discrepancy could not be established during the inspection.

During review of CIPC documentation for Sargent PO No. 659 with respect to Item 4 (30 pieces, $\frac{1}{2}$ inch - 20 X 1 $\frac{1}{2}$ inch ASME Material Specification No. SA-449 bolts), the NRC inspector noted that a hardness test, a requirement of the material specification, had not been reported on the CMTR. Examination of the CIPC vendor CMTR for these items showed that CIPC had actually furnished low alloy steel bolting (i.e., ASTM A-193 Grade B7) for the ordered medium carbon steel bolting. Chromium and molybdenum contents were not included in the CIPC CMTR to the customer. Hardness tests are not included as a requirement for Grade B7 in the ASTM A-193 specification.

4. 10 CFR Part 21 Implementation - During review of customer POs placed with CIPC, it was observed that numerous POs included the requirements of 10 CFR Part 21 as being applicable. As a result, an inspection was made to determine whether CIPC was in compliance with posting, procedural, and procurement activities addressed in 10 CFR Part 21. In this area of the inspection, Violations A.1, and A.2 were identified.

INSPECTOR L. Eilershaw
 SCOPE 92705 B

DOCUMENTS EXAMINED

DOCKET NO. 99900840
 REPORT NO. X3 - 01
 PAGE 1 OF 1

ITEM NO.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
1	QAM	-	-	1-22-82	Quality Assurance Manual
2	CSP	5.003-1	-	9-6-80	Purchase Orders for Nuclear Level I Requirements
3	CSP	5.003-2	-	3-18-82	Purchasing
4	CSP	7.001	-	2-16-82	C.I. File
5	CSP	7.002	-	9-6-80	Certification Procedure
6	CSP	10.001	-	9-6-80	Purchase Order - Special Process
7	CSP	11.001	-	3-15-82	Inspection
8	CSP	12.001	-	3-17-82	Receiving Inspection, Purchased Materials, Parts or Service
9	CSP	14.002	-	9-6-80	Handling, Packing, Shipping and/or Storage
10	CSP	15.001	-	9-6-80	Customer Product Record (CPR)
11	CSP	22.001	-	6-23-80	NDE
12	CSP	29.001	-	8-25-83	Vendor Survey/Audits
13	CSP	30.001	-	3-16-82	Procedure To Implement Requirements of 10CFR 21
14	CSP	35.001	-	3-23-82	Inspection, Examination and Testing Personnel Qualification
15	RP	-	-	-	Documentation Packages for 11 Customer Purchase Orders

TYPE OF DOC:

- DWG - DRAWING
- SPEC - SPECIFICATION
- PROC - PROCEDURE
- QAM - QA MANUAL
- QCD - QC DOCUMENT

- TR - LETTER
- SP - Standard Practice
- DE - Documentation Packages (CMRS - vendor/CIR, CPRs, POs - customer/CIPC)

INSPECTOR JIM CONWAY

DOCUMENTS EXAMINED

DOCKET NO. 99900840

REPORT NO. 83 - 01

PAGE 1 OF 1

SCOPE

ITEM NO.	TYPE OF DOCUMENT	DOC. NO.	REV.	DATE	TITLE / SUBJECT
1	QAM		3	1/22/82	QUALITY ASSURANCE MANUAL (APS)
2	P.O.				109 POS from ARIZONA PUBLIC SERVICE TO CARDINAL INDUSTRIAL POWER
3	P.O.				10 POS from NORTHERN STATES POWER TO CIP (NSP)
4	P.O.				11 POS from GEORGIA POWER TO CIP
5	P.O.				25 POS from FLORIDA POWER CORP. TO CIP
6	P.O.				3 POS from IOWA ELECTRIC LIGHT & POWER TO CIP (IE)
7	P.O.				12 POS from CONSUMER POWER CORP. TO CIP
8	OTH				APPROVED VENDORS LIST (8/13/82 - 12/1/82 - 3/11/83)
9	OTH				15 AUDIT REPORTS FOR 3 FOREIGN VENDORS
10	OTH				10 AUDIT REPORTS FOR 4 DOMESTIC VENDORS
11	OTH				3 DOCUMENTATION PACKAGES FOR SECTION III C11 FASTENERS FOR APS
12	OTH				2 DOCUMENTATION PACKAGES FOR " " " " " " NPS
13	OTH				2 DOCUMENTATION PACKAGES FOR " " " " " " CP
14	P.O.				10 CARDINAL POS to 5 DOMESTIC SUPPLIERS
15	P.O.				2 CARDINAL POS to 2 FOREIGN SUPPLIERS

TYPE OF DOC:

- DWG - DRAWING
- SPEC - SPECIFICATION
- PRO - PROCEDURE
- QA - QA MANUAL
- QC - QC DOCUMENT
- PO - PURCHASE ORDER

LTR - LETTER
OTH - OTHER

INSPECTOR I. GRANES

SCOPE 92705 B

DOCUMENTS EXAMINED

DOCKET NO. 79900840

REPORT NO. 83 - 01

PAGE 1 OF 1

ITEM NO.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
1	QAM	-	-	1-22-82	Quality Assurance Manual
2	CSP	5.003-1	-	9-6-82	Purchase Orders For Nuclear Level 1 Requirements
3	CSP	5.003-2	-	3-18-83	Purchasing
4	CSP	7.001	-	2-4-82	C.I. File
5	CSP	7.002	-	9-6-82	Certification Procedures
6	CSP	11.001	-	3-15-82	Inspection
7	CSP	12.001	-	3-17-82	Receiving/Inspection Purchased Materials, Pkts Or Services
8	DP	-	-	-	Demonstration Packages for 20 customer purchase orders

TYPE OF DOC:

- DWG - DRAWING
- SPEC - SPECIFICATION
- PRO - PROCEDURE
- QA - QA MANUAL
- CC - DOCUMENT

- LTR - LETTER
- CSP - ^{Standard} Purchases
- DP - Demonstration Packages (CMTAs - vendor / CTRC, CPMs, FPs, - material / CTRC)

INSPECTOR L. E. Ellershaw
 SCOPE 92205 B

DOCKET NO. 99900840
 REPORT NO. 83 - 01
 PAGE 1 OF 1

DOCUMENTS EXAMINED

ITEM NO.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
1	QAM	-	-	1-22-82	Quality Assurance Manual
2	CSP	5.003-1	-	9-6-80	Purchase Order for Nuclear level I Requirements
3	CSP	5.003-2	-	3-18-82	Purchasing
4	CSP	7.001	-	2-16-80	C.I. File
5	CSP	7.002	-	9-6-80	Certification Procedure
6	CSP	10.001	-	9-6-80	Purchase Order - Special Process
7	CSP	11.001	-	3-15-82	Inspection
8	CSP	12.001	-	3-17-82	Receiving Inspection, Purchased Materials, Parts, or Service
9	CSP	14.002	-	9-6-80	Handling, Packing, Shipping and/or Storage -
10	CSP	15.001	-	9-6-80	Customer Product Record (CPR)
11	CSP	22.001	-	6-23-80	NIDE
12	CSP	29.001	-	8-25-83	Vendor/Survey/Audits
13	CSP	30.001	-	3-16-82	Procedure To Implement Requirements of 10CFR 21
14	CSP	35.001	-	3-23-82	Inspection, Examination and Testing Personnel Qualification
15	RP	-	-	-	Documentation Packages for 11 Customer Purchase Orders

TYPE OF DOC:
 DWG - DRAWING
 SPEC - SPECIFICATION
 PRO - PROCEDURE
 QAM - QA MANUAL
 QCD - QC DOCUMENT

ATR - LETTER
 SFP - Standard Practice
 RP - Examination Packages (CMTRs - Vendor/CIPC, CPRs, POs - Customer/CIPC)

DOCUMENTS EXAMINED

ITEM No.	TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
1	QAM		3	1/22/82	QUALITY ASSURANCE MANUAL
2	P.O.				109 POS from ARIZONA PUBLIC SERVICE TO CARDINAL INDUSTRIAL (APS)
3	P.O.				10 POS from NORTHERN STATES POWER TO CIP (NSP)
4	P.O.				11 POS from GEORGIA POWER TO CIP
5	P.O.				25 POS from FLORIDA POWER CORP. TO CIP
6	P.O.				3 POS from IOWA ELECTRIC LIGHT & POWER TO CIP (EL)
7	P.O.				12 POS from CONSUMER POWER CORP TO CIP
8	OTH				APPROVED VENDORS LIST (8/13/82 - 12/1/82 - 3/11/83)
9	OTH				15 AUDIT REPORTS FOR 3 FOREIGN VENDORS
10	OTH				10 AUDIT REPORTS FOR 4 DOMESTIC VENDORS
11	OTH				3 DOCUMENTATION PACKAGES FOR SECTION III C I FASTENERS FOR APS
12	OTH				2 DOCUMENTATION PACKAGES FOR " " " " " " NPS
13	OTH				2 DOCUMENTATION PACKAGES FOR " " " " " " CP
14	P.O.				10 CARDINAL POS to S. DOMESTIC SUPPLIERS
15	P.O.				2 CARDINAL POS to 2 FOREIGN SUPPLIERS

TYPE OF DOC:

- DWG - DRAWING
- SPEC - SPECIFICATION
- RO - PROCEDURE
- MAN - QA MANUAL
- SCD - QC DOCUMENT
- P.O. - PURCHASE ORDER

LTR - LETTER
 OTH - OTHER



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

10 CFR 2.790 INFORMATION IS
CONTAINED IN THIS REPORT AND
HAS BEEN DELETED

Exhibit 14C

AUG 29 1984

Docket No. 99900840/84-01

Cardinal Industrial Products
Corporation
ATTN: Mr. D. Fielder
President
3827 W. Oquendo
Las Vegas, NV 89118

FOF TCS PROCESSING

Original document not available to NRC

Certified by Sherry Meador

UNCLASSIFIED

Gentlemen:

This refers to the inspection conducted by Mr. I. Barnes of the Vendor Program Branch on May 29-June 1, 1984, of your facility at Las Vegas, Nevada, and to the discussions of our findings with you and members of your staff at the conclusion of the inspection.

This inspection was made to complete a review of concerns expressed to the Nuclear Regulatory Commission pertaining to compliance of furnished fastener materials with the quality assurance provisions contained in Subarticle NCA-3800 of Section III of the ASME Boiler and Pressure Vessel code. Areas examined during the inspection and our findings are discussed in the enclosed report. Within these areas, the inspection consisted of an examination of procedures and representative records, interviews with personnel, and observations by the inspector.

During the inspection it was found that the implementation of your QA program failed to meet certain NRC requirements. The specific findings and references to the pertinent requirements are identified in the enclosures to this letter.

This Notice of Violation is sent to you pursuant to the provisions of Section 206 of the Energy Reorganization Act of 1974. You are required to submit to this office within 30 days from the date of this letter a written statement containing: (1) a description of steps that have been or will be taken to correct these items; (2) a description of steps that have been or will be taken to prevent recurrence; and (3) the dates your corrective actions and preventive measures were or will be completed. Consideration may be given to extending your response time for good cause shown.

10 CFR 2.790 INFORMATION IS CONTAINED
IN THIS REPORT AND HAS BEEN DELETED

9990054 840829

109

AUG 29 1984

You are also requested to submit a similar written statement for each item which appears in the enclosed Notice of Nonconformance. Where appropriate, it is permissible to reference corrective action commitments made in response to NRC Inspection Report No. 99900840/83-01.

The responses requested by this letter are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

The findings of this inspection are confirmatory in nature with respect to the types of deficiencies which were identified during our initial October 11-14 and November 14-18, 1983, inspection of your facility. As a result of your existing commitment to perform a general review of nuclear orders, we have essentially limited identification of items of nonconformance to those inspection findings with tangible product significance and/or which directly pertain to potential use of stock materials for nuclear orders. Consideration should be given, however, during your general review and determination of the necessary quality assurance program corrective actions, to the full scope of deficiencies identified in the enclosed inspection report.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within 10 days from the date of this letter of your intention to file a request for withholding; and (b) submit within 25 days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than 7 days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons on the basis which it is claimed that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, the report will be placed in the Public Document Room.

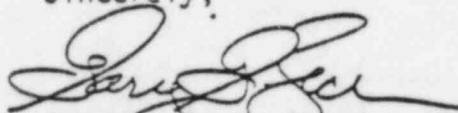
Cardinal Industrial Products
Corporation

-3-

AUG 29 1984

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,



Gary G. Zech, Chief
Vendor Program Branch
Division of Quality Assurance,
Safeguards, and Inspection Programs

Enclosures:

1. Appendix A - Notice of Violation
2. Appendix B - Notice of Nonconformance
3. Appendix C - Inspection Report No. 99900840/84-01
4. Appendix D - Inspection Data Sheets (2 pages)

Cardinal Industrial Products
Corporation

-3-

AUG 29 1984

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

ORIGINAL SIGNED BY:
GARY G. ZECH


Gary G. Zech, Chief
Vendor Program Branch
Division of Quality Assurance,
Safeguards, and Inspection Programs

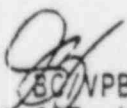
Enclosures:

1. Appendix A - Notice of Violation
2. Appendix B - Notice of Nonconformance
3. Appendix C - Inspection Report No. 99900840/84-01
4. Appendix D - Inspection Data Sheets (2 pages)

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APPENDIX A

Cardinal Industrial Products
Corporation
Docket No. 99900340/84-01

NOTICE OF VIOLATION

As a result of the inspection conducted on May 29-June 1, 1984, and in accordance with Section 206 of the Energy Reorganization Act of 1974 and its implementing regulation 10 CFR Part 21, the following violation was identified and categorized in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), 49 FR 8583 (March 8, 1984):

Section 21.21 of 10 CFR Part 21 dated August 31, 1983, states, in part, "(a) Each individual, corporation, partnership or other entity subject to the regulations in this part shall adopt appropriate procedures to: (1) Provide for: (i) Evaluating deviations or (ii) informing the licensee or purchaser of the deviation in order that the licensee or purchaser may cause the deviation to be evaluated unless the deviation has been corrected"

Contrary to the above, the Cardinal Industrial Products Corporation adopted procedure, Cardinal Standard Practice No. 17.003, did not provide for informing the licensee or purchaser of an identified deviation that would require their evaluation.

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

APPENDIX B

Cardinal Industrial Products
Corporation
Docket No. 99900840/84-01

NOTICE OF NONCONFORMANCE

Based on the results of an NRC inspection conducted on May 29-June 1, 1984, it appears that certain of your activities were not conducted in accordance with NRC requirements.

Criterion V of Appendix B to 10 CFR Part 50 states: "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

Nonconformances with these requirements are as follows:

- A. Paragraph NCA-3866.6 in Section III of the ASME Code states, in part, "Measures shall be established for controlling and identifying material throughout the manufacturing processes and during shipment"

Paragraph 3.2 in Cardinal Standard Practice (CSP) No. 12.001 states, "The Receiving Department shall be responsible for verifying quantities to the purchase order requirements." Paragraphs 2 and 3.1 in CSP No. 9.002-A state, in part, "Scope: To assure all Bolt Blanks on receipt and after receipt inspection and acceptance are stored in a segregated condition with proper identification, marking and the usage is recorded for inventory control. After the Receiving Inspection has been performed in accordance with CSP 12.001 the Bolt Blanks ... shall be moved to the stockroom."

Contrary to the above, material control quantity verification activities were observed to be not effectively implemented as evidenced by the following:

1. The final operation on a Customer Production Record (CPR) for 1-1/2" x 6-1/2" hex head bolts, of which a portion were furnished for Arizona Public Service Purchase Order (PO) No. 10407-F-140441, showed in the final operation that a total of 110 bolt blanks were placed in stock on November 25, 1981.

2. Records for prior operations on the CPR (i.e., heading, heat treating, receiving inspection) showed, however, that a total of only 100 bolt blanks had been produced.

This quantity discrepancy brings into question whether a loss of traceability occurred.

- B. Paragraph 15-3 in Section 15 of the Quality Assurance Manual (QAM) states, in part, "... The test requirements shall be in accordance with the customer requirements; invoked codes, standards and specifications."

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

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

1. Cardinal Industrial Products Corporation (CIPC) failed to perform required ultrasonic examination of 4, 3-1/2" -8 x 26" studs which were ordered in PO No. 5008-3634-QA (Midland) by Consumers Power Company to ASME Section III Code, Class 1 requirements.
2. Required magnetic particle examination or liquid penetrant examination was not performed on 300, 1-1/4" -8 nuts which were ordered by Daniels Construction (Wolf Creek) in PO No. 7158-SR-6620 to ASME Section III Code, Class 1 requirements.

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

Contrary to the above, vendor certification/documentation packages were accepted by CIPC which were not in accordance with invoked codes, standards, and/or specifications as evidenced by the following:

1. Acceptance of numerous CMTRs from a material vendor which reported Izod impact test results rather than the material specification and ASME Code required Charpy V-notch impact tests.
 2. Acceptance of vendor certified material test reports which did not contain the required QA statement pertaining to the material being manufactured and supplied in accordance with the QA program as approved by CIPC.
- D. Paragraph NCA-3867.4(e) in Section III of the ASME Code states, in part, "The Material Manufacturer who certifies material made from stock produced by a manufacturer whose Quality System Program has not been qualified under NCA-3800 may accept the certification of the requirements of the material specification which must be performed during the melting and of the heat analysis from the manufacturer of the stock provided ... (1) ... The Material Manufacturer performs or subcontracts all other requirements of the material specification on each piece of stock material. Alternatively, the Material Manufacturer may perform or subcontract all other requirements of the material specification on each heat and lot of material, provided traceability has been established by this Program or the Program of the Certificate Holder who uses the material ... (2) The Material Manufacturer performs or subcontracts a product analysis to verify the chemical composition of each piece of stock material furnished by the stock material manufacturer"

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

- E. Paragraph 11.1.2 in Section 11 of the QAM states, "Receipt, in-process and final inspections shall be performed and documented by QA inspectors in accordance with customer requirements."

Paragraph NC-2580 in Section III of the ASME Code states that bolts, nuts, and stocks shall be examined in accordance with the material specification. Material Specification SA-614 in Section II of the ASME Code states that bolts, nuts, and studs shall receive visual inspection. Article 9 in Section V of the ASME Code states that written procedures and checklists shall be used if the code requires visual inspection.

Contrary to the above, written procedures were neither developed nor used for performing visual inspections of ASME Section III Code Class 2 and Class 3 bolting material.

ORGANIZATION: CARDINAL INDUSTRIAL PRODUCTS CORPORATION
LAS VEGAS, NEVADA

REPORT NO.: 99900840/84-01	INSPECTION DATE(S): 5/29-6/1/84	INSPECTION ON-SITE HOURS: 75
CORRESPONDENCE ADDRESS: Cardinal Industrial Products Corporation ATTN: Mr. D. Fielder President 3827 W. Oquendo Las Vegas, NV 89118		
ORGANIZATIONAL CONTACT: Mr. N. Henderson, Director, Quality Assurance TELEPHONE NUMBER: (702) 739-1966		
PRINCIPAL PRODUCT: Fasteners		
NUCLEAR INDUSTRY ACTIVITY: Approximately 75 percent of Cardinal Industrial Products Corporation (CIPC) sales are made to the commercial nuclear industry.		
ASSIGNED INSPECTOR: <u><i>[Signature]</i></u> F. I. Barnes, Inspector, Region IV		<u>8/20/84</u> Date
OTHER INSPECTOR(S): L. E. Ellershaw, Region IV E. W. Merschoff, Office of Inspection and Enforcement		
APPROVED BY: <u><i>[Signature]</i></u> E. W. Merschoff, Chief, Reactive Inspection Section		<u>8/20/84</u> Date
INSPECTION BASES AND SCOPE: A. <u>BASES</u> : 10 CFR Part 21 and 10 CFR Part 50, Appendix B. B. <u>SCOPE</u> : This inspection was made to complete a review of concerns expressed to the Nuclear Regulatory Commission (NRC) pertaining to compliance of furnished fastener materials with the quality assurance provisions contained in Subarticle NCA-3800 of Section III of the ASME Boiler and Pressure Vessel (cont. on next page)		
PLANT SITE APPLICABILITY: Material control deficiency, 50-528/529/530; non-performance of required nondestructive examinations, 50-329/330, 50-482; NCA-3800 deficiencies, 50-482. Note: Multiple docket nos. have been included where purchase orders (POs) did not identify a specific unit.		

10 CFR 2.790 INFORMATION HAS BEEN DELETED

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<p><u>SCOPE</u> (cont.) Code. These concerns were evaluated by an inspection of procurement source selection and an integrated procurement and process control inspection. The inspection included a review of visual examination criteria and completion of a review of 10 CFR Part 21 implementation.</p>		
<p>A. <u>VIOLATIONS:</u></p> <p>Contrary to Section 21.21 of 10 CFR Part 21, the CIPC adopted procedure, Cardinal Standard Practice (CSP) No. 17.003, did not provide for informing the licensee or purchaser of an identified deviation that would require their evaluation.</p>		
<p>B. <u>NONCONFORMANCES:</u></p> <ol style="list-style-type: none">1. Contrary to Criterion V of Appendix B to 10 CFR Part 50, paragraph NCA-3866.6 in Section III of the ASME Code and CIPC CSP Nos. 12.001 and 9.002-A, material control quantity verification activities were observed to be not effectively implemented as evidenced by the following:<ol style="list-style-type: none">a. The final operation on a Customer Production Record (CPR) for 1-1/2" x 6-1/2" hex head bolts, of which a portion were furnished for Arizona Public Service Purchase Order (PO) No. 10407-F-140441, showed in the final operation that a total of 110 bolt blanks were placed in stock on November 25, 1981.b. Records for prior operations on the CPR (i.e., heading, heat treatment, receiving inspection) showed, however, that a total of only 100 bolt blanks had been produced. This quantity discrepancy brings into question whether a loss of traceability occurred.2. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 15 in the QA Manual and paragraph NB-2581 in Section III of the ASME Code, test and examination requirements have not been performed in accordance with customer requirements, invoked codes, standards and specifications as evidenced by the following:<ol style="list-style-type: none">a. CIPC failed to perform required ultrasonic examination (UT) of 4, 3 1/2"-8 x 26" studs which were ordered in PO No. 5008-3634-QA (Midland) by Consumers Power Company (CP) to ASME Section III Code Class 1 requirements.		

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- b. Required magnetic particle examination (MT) was not performed on 300, 1½"-8 nuts which were ordered by Daniels Construction (Wolf Creek) on PO No. 7158-SR-6620 to ASME Section III Code Class 1 requirements.
3. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and CSP No. 7.002, vendor certification/documentation packages were accepted by CIPC which were not in accordance with invoked codes, standards and/or specifications as evidenced by the following:
- a. Acceptance of numerous CMTRs from a material vendor which reported Izod impact test results rather than the material specification and ASME Code required Charpy-V notch impact tests.
- b. Acceptance of vendor CMTRs which did not contain the required QA statement pertaining to the material being manufactured and supplied in accordance with the QA program as approved by CIPC.
4. Contrary to Criterion V of Appendix B to 10 CFR Part 50 and paragraph NCA-3867.4(e) in Section III of the ASME Code, CIPC improperly certified stock materials (i.e., materials procured from manufacturers without specification that the material be produced using a Quality System Program that had been verified by survey to be in accordance with the requirements of Subarticle NCA-3800 in Section III of the ASME Code) as being in compliance with Section III of the ASME Code. Material specification requirements other than those applicable during melting had, however, not been performed on either a piece or heat basis and product analysis was not performed on each piece of stock material.
5. Contrary to Criterion V of Appendix B to 10 CFR Part 50, Section 11 of the CIPC QA Manual, Material Specification SA-614, paragraph NC-2580 in Section III of the ASME Code and Article 9 in Section V of the ASME Code, written procedures were neither developed nor used for performing visual inspections of ASME Section III Code, Class 2 and Class 3 bolting material.

C. UNRESOLVED ITEMS:

None

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D. STATUS OF PREVIOUS INSPECTION FINDINGS:

Review of previous inspection findings (i.e., Inspection Report No. 99900840/83-01 - Notice of Violation, Items A and B; Notice of Nonconformance, Items A through J) was restricted during this inspection to providing clarifications and additional examples to CIPC. Formal review of implementation of corrective actions will be performed in a future inspection after completion of corrective action correspondence.

E. OTHER FINDINGS AND COMMENTS:

1. General: Records from and pertaining to the following CIPC material and service vendors were utilized to perform this inspection:

- a. Vendor 1 10 CFR 2790 INFORMATION
- b. Vendor 2 10 CFR 2790 INFORMATION
- c. Vendor 3 10 CFR 2790 INFORMATION
- d. Vendor 4 10 CFR 2790 INFORMATION
- e. Vendor 5 10 CFR 2790 INFORMATION
- f. Vendor 6 10 CFR 2790 INFORMATION
- g. Vendor 7 10 CFR 2790 INFORMATION
- h. Vendor 8 10 CFR 2790 INFORMATION
- i. Vendor 9 10 CFR 2790 INFORMATION
- j. Vendor 10 10 CFR 2790 INFORMATION
- k. Vendor 11 10 CFR 2790 INFORMATION
- l. Vendor 12 10 CFR 2790 INFORMATION
- m. Vendor 13 10 CFR 2790 INFORMATION
- n. Vendor 14 10 CFR 2790 INFORMATION
- o. Vendor 15 10 CFR 2790 INFORMATION
- p. Vendor 16 10 CFR 2790 INFORMATION

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- q. Vendor 17 10 CFR 2790 INFORMATION
- r. Vendor 18 10 CFR 2790 INFORMATION
- s. Vendor 19 10 CFR 2790 INFORMATION
- t. Vendor 20 10 CFR 2790 INFORMATION
- u. Vendor 21 10 CFR 2790 INFORMATION

The NRC inspectors utilized the documented QA program which was in effect prior to the November 1983 ASME survey for performance of this inspection. The current ASME accepted QA program was not reviewed because the inspection concentrated on procurement and process control activities that occurred before the ASME survey took place.

2. Procurement Source Selection: The procurement source selection files including survey and audit records were reviewed for Vendors 1 through 10 to determine the adequacy of CIPC's program for evaluating suppliers of ASME Code and safety-related equipment. Each of these ten vendors had been surveyed and audited by CIPC and their QA programs accepted by CIPC as being consistent with the requirements of Subarticle NCA-3800 in Section III of the ASME Code. The results of the NRC review were as follows:

- a. Vendor 1 (Nut Manufacturer) - A copy of the vendor's QA manual was available in both the vendor's native language and in English. The English language version did not fully meet the requirements of NCA-3860, "Quality System Identification and Verification Programs." Specifically, adequate provisions were not established to assure control of purchased materials and services (NCA-3866.3) or for controlling and identifying material throughout the manufacturing process (NCA-3866.6).

One day surveys or audits were conducted by CIPC on April 17, 1979 (survey); April 16, 1980 (audit); October 19, 1981 (audit); and September 6, 1982 (survey). The April 16, 1980, audit was incomplete in that the portion of the audit checkoff list dealing with the requirement to maintain personnel records (NCA-3864.3) was left blank. Vendor 1 was maintained on CIPC's Approved Vendor List (AVL) after performance of the April 16, 1980, audit.

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- b. Vendor 2 (Steel Mill) - An English language version of the Quality System Program dated November 22, 1982, was available for review.

This document was actually a brief (i.e., 5-1/2 pages, double spaced) overview of the QA program rather than a detailed QA manual and, as such, did not fully address the requirements of NCA-3800 in Section III of the ASME Code. For example, the requirements to control and identify material throughout the manufacturing process (NCA-3866.6) and the requirements for certification of materials (NCA-3867.4) were not adequately addressed.

One day surveys or audits were conducted by CIPC on November 2, 1980 (survey); March 31, 1982 (audit); January 31, 1983 (survey); and February 13, 1984 (survey). The only portion of the February 13, 1984, checklist which was filled out was the section dealing with personnel qualification. All other NCA-3800 criteria were left blank. Vendor 2 is currently listed on CIPC's AVL based on the February 13, 1984, survey.

- c. Vendor 3 (Steel Mill) - An English translation of this vendor's QA program was available for review. This document did not fully address the requirements of NCA-3800 in Section III of the ASME Code in that the QA program did not include any form of an identification and verification program to assure traceability of materials.

One day surveys or audits were conducted by CIPC on November 21, 1980 (survey); November 9, 1981 (audit); September 22, 1982 (survey); and October 6, 1983 (survey). The September 22, 1982, survey was incomplete in that the checklist sections dealing with responsibility and QC procedures were left blank.

- d. Vendor 4 (Nut Manufacturer) - The only QA manual available for review was not in the English language and, therefore, a determination could not be made in regard to the adequacy of the QA program it described.

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One day surveys or audits were conducted by CIPC on April 12, 1979 (survey); April 17, 1980 (audit); October 28, 1980 (audit); October 20, 1981 (not specified); and September 28, 1982 (not specified). The September 28, 1982, checkoff sheet was entirely blank except for the section dealing with organization, yet the vendor was listed on the CIPC AVL based on this report. When asked why a complete survey or audit was not performed, the auditor (CIPC Senior Vice President) indicated that the September 28, 1982, report reflected simply a "visit" and was neither a survey nor an audit. He further stated that placing the vendor on the AVL based on this visit was a mistake. It is currently not known whether CIPC purchased any fastener material from this vendor during the time period it was inadvertently approved as a vendor.

- e. Vendor 5 (Product not identified) - A QA manual was not on file for this vendor and, therefore, an independent determination could not be made in regard to QA program adequacy.

One day surveys or audits were conducted on November 6, 1980 (survey); October 14, 1981 (audit); April 6, 1982 (audit); and April 21, 1983 (survey). Only the April 21, 1983, survey checkoff sheet was completely filled out. The portion of the November 6, 1980, survey checkoff list dealing with the requirement to maintain personnel records (NCA-3864.3) was left blank. The portion of the October 14, 1981, audit checklist dealing with the requirement to maintain QA records (NCA-3867.2) was left blank and portions of the April 6, 1982, audit checklist were also left blank with respect to requirements for audits (NCA-3869.1); handling, storage, and shipping (NCA-3866.5); control of purchased materials and services (NCA-3866.3); and QA organization (NCA-3864).

- f. Vendor 6 (Steel Mill) - A QA manual was not on file for this vendor and, therefore, an independent determination could not be made in regard to QA program adequacy. The CIPC survey and audit reports for this vendor were not reviewed in their entirety.

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g. Vendor 7 (Nut and Bolt Manufacturer) - A QA manual was not on file for this vendor and, therefore, an independent determination could not be made in regard to QA program adequacy. One day surveys or audits were conducted by CIPC on November 3, 1980 (survey); October 17, 1981 (audit); and April 7, 1982 (survey). All portions of these survey and audit checkoff sheets were completed.

h. Vendor 8 (Nut and Bolt Manufacturer) - The only QA manual available for review was not in the English language and, therefore, a determination could not be made in regard to the adequacy of the QA program it described.

One or two day surveys or audits were conducted by CIPC on April 24, 1979 (survey); April 23, 1980 (audit); October 27 and November 13, 1980 (audit); October 21, 1981 (audit); and September 20, 1982 (survey). All survey and audit checkoff sheets were completed except for the April 23, 1980, audit in which the following sections were left blank: quality assurance records; corrective actions; control of nonconformances; control of inspection, test, and operation; and control of handling, storage, and shipping. The vendor was maintained on the CIPC AVL after the April 23, 1980, audit.

i. Vendor 9 (Steel Mill) - An English language version of the vendor's QA program dated February 13, 1978, was available for review. The portions reviewed were found to be consistent with the requirements of NCA-3800 in Section III of the ASME Code.

One day surveys or audits were conducted by CIPC on April 9, 1979 (survey); April 15, 1980 (audit); October 21, 1980 (audit); November 2, 1981 (audit); April 14, 1982 (survey); April 29, 1983 (audit); and April 27, 1984 (survey). The April 29, 1983, audit checklist was not completed in the areas of: corrective action; certification of material; identification of material; and handling, storage, and shipping. The April 27, 1984, survey checklist was not completed in the areas of: identification and marking of material; control of purchased material and services; examinations, tests, and reports;

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certification of materials; and internal audits. The CIPC auditor (CIPC Senior Vice President) was asked why, in light of the incomplete April 27, 1984, survey, was the vendor identified on the current CIPC AVL. He replied that he knew the vendor's QA program was consistent with the requirements of NCA-3800 in Section III of the ASME Code based on the notations made in the comments column of the survey checklist, and he then checked off all incomplete sections of the survey as being satisfactory.

- j. Vendor 10 (Steel Mill) - A QA manual was not on file for this vendor and, therefore, an independent determination could not be made in regard to QA program adequacy.

One or two day surveys or audits were conducted by CIPC on November 19, 1980 (survey); October 5, 1981 (audit); March 29, 1982 (audit); and September 26 and 28, 1983 (survey). The 1983 survey, which provided the basis for placing the vendor on the CIPC AVL, did not evaluate the vendor with respect to QA organization independence, control and documentation of heat treatment, and corrective action.

- k. Summary Comments -

- (1) Audit Performance - All surveys and audits reviewed for Vendors 1 through 10 were conducted by the CIPC Senior Vice President. The auditor stated that in all cases he was accompanied by an interpreter who was familiar with the steel industry and who, as part of each survey or audit, verbally translated the vendor's QA manual or changes made to it since the last visit. These verbal translations apparently formed the basis for CIPC acceptance of the QA manual with respect to the requirements of NCA-3800 since, in most cases, no notes or supporting documentation were included in the file. From discussion with the auditor, it was ascertained that the auditor perceived that there was general QA program compliance with the requirements of NCA-3800 by steel mills in the country where vendors 1 through 10 are located. The NRC inspector was also informed that the auditor had never rejected a steel mill in that country based on a survey or audit he had performed.

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99900840/84-01

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- (2) Objective Evidence of Satisfactory Performance of Audits and Surveys - Of the ten vendor files inspected, four did not contain a QA manual in any language and two had native language versions only without an English language translation. Four had some form of English language translation of the vendor's QA program, of which three were clearly inadequate with respect to the requirements of NCA-3800 in Section III of the ASME Code.

A nonconformance was identified during the previous inspection of CIPC (i.e., Item B, Notice of Nonconformance, NRC Inspection Report No. 99900840/83-01) with respect to survey/audit records not providing objective evidence of either satisfactory performance of surveys and audits or that vendor manuals were a major basis for demonstration of ASME Code compliance. The findings made during this inspection are applicable to and supportive of this nonconformance and will be factored into NRC planned CIPC vendor QA program evaluation activities.

3. Integrated Procurement and Process Control Inspection:

A detailed evaluation was made of CIPC compliance with the requirements of selected CIPC customer POs. The evaluation included: (a) a review of CIPC vendor test and certification data with respect to CIPC PO, material specification, and applicable ASME Code requirements; (b) examination of Customer Production Records (CPRs) for control of processing and specification and performance of required mechanical tests and nondestructive examination (NDE); (c) review of supporting NDE and mechanical test records; (d) control of sub-contracted operations; and (e) review of CIPC Certified Material Test Reports (CMTRs) against supporting data for correctness and compliance with ASME Code requirements. The findings of this inspection with respect to specific customer POs are detailed below:

- (a) Arizona Public Service Company (APS) PO No. 10407-F-140441 (Pafo Verde) - APS ordered 28 hex head bolts, 1-1/2"x 6-1/2" long, on this PO dated December 14, 1981, in accordance with ASME Material Specification SA-325 and the requirements of Section III, Class 1 of the ASME Code.

ORGANIZATION: CARDINAL INDUSTRIAL PRODUCTS CORPORATION
LAS VEGAS, NEVADA

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The material used to fill this order had been previously purchased by CIPC from Vendor 15 on PO No. 3960 dated May 30, 1980. This PO, in addition to other items, called for 2500' of 1½" AISI 4140 hot rolled bar totalling 1500 lbs. This material was subsequently received by CIPC on September 4, 1981, with final acceptance occurring on September 8, 1981. CIPC commenced to process some of this material (127' of bar) on September 9, 1981. CPR No. 1245209, which was the applicable traveler, shows that the bars were cut to the specified size on September 10, 1981, resulting in 100 pieces and 2-6" test coupons.

The 100 pieces were sent to Vendor 18 for heading, with the vendor invoice (No. 8324 dated September 28, 1981) showing that 100 pieces were headed. The NRC inspector was informed that this figure should be an actual count, in that the heading machine has a counter. The next identified CPR operation was heat treatment. CIPC placed blanket PO No. 12338 dated May 6, 1981, with Vendor 17, in which Line Item 13 showed 100 each, 1-1/2" x 12", 4140 Bolt Blanks and Coupon. This PO also required Vendor 17 to spot check the hardness and certify the heat number, with this information appearing on all certifications. Certified Test Report No. 33513, dated September 28, 1981, from this vendor shows that 100, 1½" x 12", bolt blanks were heat treated, but the certification did not, as required, identify or certify the heat number.

The next operation on the CPR, No. 50, shows that 100 pieces were received back from the heat treat vendor and inspected on September 30, 1981. The last CPR operation, No. 75, states, "Put In Stock." The CPR record shows, however, that 110 pieces were placed in stock on November 25, 1981. The origins of the extra ten pieces could not be determined from available records. As a result of this condition, nonconformance B.1 was identified.

To fill the APS PO, CIPC generated CPR No. 2599801 dated December 14, 1981, which shows that 28 bolt blanks were pulled from stock on December 28, 1981. Processing of the bolts was completed on January 8, 1982. It was noted that both the Internal Order Form and the CPR stated that NDE was not required and that this was to be confirmed with the customer. Apparently, confirmation was not made and ASME Code Section III Class 1 required NDE was not performed. The 28 heavy hex bolts were shipped to APS with a certification dated January 11, 1982, which attested to the bolts meeting ASME Code Section III, Class 1 requirements. Notice of Nonconformance Item F.5, NRC Inspection Report No. 99900840/83-01, was previously written with respect to this inspection finding.

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- b. CP PO No. 5008-3634-QA (Midland) - CP ordered, in addition to other items, 32 stud bolts, 3-1/2" x 24" long, on this PO dated January 27, 1983, in accordance with ASME Specifications SA-193 Grade B7 and SA-614, and the requirements of ASME Code Section III, Class 1.

The NRC inspector did not identify any problems in regard to 2 shipments totalling 28 stud bolts. The following was identified, however, with respect to four stud bolts that were shipped to the CP Midland Plant on March 16, 1983. CIPC placed PO No. 19958 with Vendor 19 on February 7, 1983, for a total of 60' of 3-1/2" ASTM A-193 Grade B7 rod, hot rolled and heat treated. This material had been previously purchased by Vendor 19 from Vendor 21. The material was received and accepted by CIPC with a Vendor 19 CMTR dated February 9, 1983.

CIPC commenced to process 16' of this material on February 28, 1983, as shown on CPR No. 2879612. A scheduled initial operation was for the performance of UT. This operation was not signed off as having been completed, nor were there any UT reports or other documentation available to show that UT had been performed. Manufacturing of the four bolts continued and was completed on March 15, 1983, with shipment being made on March 16, 1983, with CMTR No. 28969 dated March 16, 1983. The CMTR attested to performance of UT in accordance with the requirements of Section II Specification SA-614 and Section V of the ASME Code and that the results had been found acceptable.

Nonconformance B.2.a has been identified as a result of these inspection findings.

- c. Daniel Construction Co. (DC) PO. No. 7158-SR-66208 (Wolf Creek) -

- (1) DC ordered 100, ASME SA-194 Grade 7, 2"-8, heavy hex nuts on Release 2 of this blanket PO dated May 25, 1983. This blanket PO invoked the requirements of Section III, Class 1 of the ASME Code (1974 Edition through the Summer 1975 Addenda). Fasteners were required to be examined in accordance with paragraph NB-2580 in Section III of the ASME Code and Charpy-V notch (CVN) impact tests at 30° F maximum were specified for fasteners greater than 1" in diameter.

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Review of CIPC and CIPC vendor documentation for the 2"-8 heavy hex nuts showed the following anomalies and deficiencies in regard to QA records and demonstration of compliance with NCA-3800 by the nut supplier. The nuts were procured from Vendor 8 by a now defunct affiliated company of CIPC on their PO. No. 0018661 dated November 24, 1982. Standard certification requirements attached to the PO included a requirement that the fastener vendor report that the product was provided in accordance with their QA program as surveyed and approved by CIPC on the date of the latest survey in 1982. Certification to that effect from Vendor 8 was not contained in the documentation provided to the NRC inspector.

Review of heat treatment certification from a subvendor showed that their customer was another manufacturer and not Vendor 8. It would thus appear that the nuts may have been produced by this other manufacturer and not by the organization receiving the PO. The heat treat subvendor and the other manufacturer were identified on the CIPC AVL in this procurement time frame. It was additionally noted that the mechanical test data required by ASME SA-194 and the PO standard certification requirements had not been furnished by the nut supplier. Required testing was obtained by CIPC from Vendor 16 after receipt of the nuts. A CMTR from the raw material manufacturer, Vendor 11, was present in the documentation package which attested to, as required by the PO standard certification requirements, use of a QA program that had been surveyed and approved by CIPC on September 22, 1982. A survey report for this date was not, however, located for Vendor 11, during this inspection.

- (2) Release 6 to DC PO No. 7158-SR-6620 included orders for ASME SA-194 Grade 2H, 1-1/4" -8, nuts; ASME SA-193 Grade B7, 1-1/2" -8 x 1', threaded studs; ASME SA-193 Grade B7, 1 3/4"-8 x 1' studs; ASME SA-193 Grade B7, 2"-8 x 1' threaded studs; and ASME SA-193 Grade B7, 1 3/8"-8 x 1' threaded studs. As stated above in 3.c.(1), the requirements of Section III, Class 1 of the ASME Code were applicable to these orders.

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SA-194 Grade 2H, 1-1/4"-8, Nuts - Review of CIPC and CIPC vendor documentation for the ASME SA-194 Grade 2H, 1-1/4"-8, nuts showed that a total of 14,580 pieces was procured from Vendor 8 by handwritten CIPC PO No. 10396 dated November 27, 1980. This PO required that the product be manufactured in accordance with the Vendor 8 QA program which was approved by CIPC in November 1980. The bar steel was also to be obtained from a CIPC approved mill. The standard certification requirements which were referenced by the PO were not attached to the PO copy reviewed by the NRC inspector. An undated certification from the raw material manufacturer, Vendor 3, was present in the documentation package which attested to manufacture of the bar material using the quality program that had been surveyed and approved by CIPC on November 7, 1980. A survey date of November 21, 1980, was indicated, however, on the CIPC 1980 survey report for this manufacturer. The Vendor 8 CMTR dated April 24, 1981, did not indicate use of a CIPC surveyed and approved QA program for manufacture of the nuts. It was additionally noted that the CMTR did not include a statement of heat treated condition as required by paragraph NCA-3867.4 in Section III of the ASME Code. Only the tempering cycle was documented on the CMTR. This type of deficiency was previously identified as a nonconformance; i.e., Item J, Notice of Nonconformance, NRC Inspection Report No. 99900840/83-01.

Review of the CPR for the 1-1/4" -8 nuts showed that required MT (i.e., for ASME Section III Code, Class 1 compliance) had been accomplished by CIPC PO No. 17561-E. Examination of the applicable MT report from Vendor 16 for this PO showed, however, that this report applied to a sample of 50 nuts which had been examined in accordance with MIL-S-1222G. All 50 nuts had been rejected by MT because of linear indications. No records were available to indicate that MT in accordance with ASME Section III Code requirements had been performed on the nuts furnished to Wolf Creek. CIPC CMTR No. 0035174 dated November 15, 1983, attested, however, to MT compliance with the provisions of paragraph NB-2580 in Section III of the ASME Code.

The failure to perform required MT has been identified as nonconformance B.2.b. Acceptance of Vendor 8 certification for the 1-1/4"-8 and 2"-8 (c.(1) above) nuts, which did not provide the required confirmation of use of the CIPC surveyed and approved QA program, has been identified as nonconformance B.3.b.

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SA-193 Grade B7, 1-1/2"-8 x 1', Threaded Studs - Review of CIPC and CIPC vendor documentation showed that the material had been supplied by Vendor 10 in response to CIPC PO No. 16805 dated July 14, 1982. Examination of the vendor CMTR identified that Izod impact test values had been reported by Vendor 10 and not the required CVN impact test results. The Izod impact test values were transcribed, however, on the CIPC CMTR as being the results of CVN impact tests.

This finding and the other examples noted later in this report have been identified as nonconformance B.3.a. This nonconformance was previously identified in NRC Inspection Report No. 99900840/83-01 as Item E.1, Notice of Nonconformance.

It was additionally noted that Vendor 10 heat treatment information had been transcribed onto CIPC CMTRs to show only the maximum temperatures of the ranges reported for hardening, tempering, and stress relief. This condition was previously identified in Item I.1, Notice of Nonconformance, NRC Inspection Report No. 99900840/83-01. The use of a stress relief temperature range by this vendor which allowed the minimum temperature to be below that specified by the material specification was similarly documented as Item E.2 in the Notice of Nonconformance of NRC Inspection Report No. 99900840/83-01. No basis was seen in Vendor 10 documentation to support the statement made on the CIPC CMTR with respect to impact specimen location.

SA-193 Grade B7, 1 3/4"-8 x 1', Studs - Review of CIPC and CIPC vendor documentation showed that this material had been supplied by Vendor 10 in response to CIPC PO No. 0013308 dated August 6, 1981. The same conditions, as noted above for the 1 1/2"-8 studs, were observed with respect to heat treatment information and transcription by CIPC of reported Izod impact values as CVN impact test results.

SA-193 Grade B7, 2"-8 x 1', All Threaded Studs - These items were also furnished by Vendor 10 in response to CIPC PO No. 14101 dated October 20, 1981. The same conditions, as noted above, were observed with respect to transcription of reported Izod impact test values as CVN impact test results on the CIPC CMTR. In this instance, CIPC did not list on their CMTR the stress relief performed by Vendor 10 after cold drawing. It was additionally noted that Vendor 10 had referenced on their CMTR the use of the steelmaker's QA program and not their own. This latter condition was previously identified as Item E.4, Notice of Nonconformance NRC Inspection Report No. 99900840/83-01.

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SA-193 Grade B7, 1 3/8"-8 x 1', All Threaded Studs - These items were furnished by Vendor 10 in response to CIPC PO No. 12140 dated April 21, 1981. The same findings were made, as noted previously, with respect to transcription of reported Izod impact test values as CVN values, heat treatment information, and no apparent basis for the impact specimen location statement on the CIPC CMTR.

- (3) Release 5 to DC PO No. 7158-SR-6620 included orders for ASME SA-194 Grade B7, 1-1/2"-6, heavy hex nuts; and ASME SA-193 Grade B7, 1-1/2"-6 x 1", all threaded rod.

SA-194 Grade 7, 1-1/2"-6, Heavy Hex Nuts - Review of CIPC documentation showed that a memorandum dated September 30, 1983, had been sent to DC which confirmed the CIPC understanding that the nuts were to be furnished in accordance with Section III, Subsection NF of the ASME Code, with Class 2 being provided since a class had not been specified by DC. No DC documentation was seen confirming this apparent change in PO requirements from Subsection NB of Section III of the ASME Code. Subsequently, the nuts were returned by DC to CIPC for upgrading to Subsection NB requirements. These nuts were manufactured by Vendor 1 in response to CIPC PO No. 10402 dated November 25, 1980. CIPC reported only the vendor tempering information in their CMTR and did not include either the vendor hardening heat treatment information or a statement reflecting performance of a hardening heat treatment. This is contrary to paragraph NCA-3867.4 in Section III of the ASME Code.

On performing required MT examination of returned nuts for upgrading to Subsection NB requirements, a total of 279 were accepted and 31 rejected for cold shuts and cracked flats.

SA-193 Grade B7, 1-1/2"-6 x 1', All Threaded Rod - Review of CIPC and CIPC vendor documentation showed that CIPC had purchased the material from Vendor 12 on CIPC PO No. 7888 dated March 19, 1980. The material was procured as ASTM A-193 Grade B7, with no requirements invoked in regard to either use of a documented surveyed QA program or the applicability of Section III of the ASME Code. The vendor handwritten CMTR similarly attested to furnishing only ASTM A-193 Grade B7

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and contained no information with respect to heat treatment, other than tempering, or use of an NCA-3800 QA program. Survey/audit checklists were not present at CIPC for this vendor which was previously identified in Item B.2, Notice of Nonconformance, NRC Inspection Report No. 99900840/83-01. No information was made available to indicate upgrading had been performed in accordance with the provisions of NCA-3867.4(e) in Section III of the ASME Code. The furnishing of apparent stock materials for Class 1 application has been identified as nonconformance B.4. This nonconformance subject was previously identified as Item D, Notice of Nonconformance, NRC Inspection Report No. 99900840/83-01.

Additional rod of this size was provided to DC for Release 5 of the PO using material furnished by Vendor 10 in response to CIPC PO No. 16805 dated July 14, 1982. The same conditions were noted with respect to CIPC transcription of reported Izod impact test values as CVN values and heat treatment information as described previously for other items furnished by this vendor.

4. 10 CFR Part 21 Implementation: To complete the review of CIPC 10 CFR Part 21 implementation initiated in the prior inspection of CIPC (NRC Inspection Report No. 99900840/83-01), a detailed review was performed of the adopted CIPC procedure (i.e., CIPC Standard Practice No. 17.003) for compliance with the procedural requirements of the regulation. In this area of the inspection, the violation identified in paragraph A was identified.
5. Visual Examination Criteria: The NRC inspectors reviewed CIPC's practices for performing NDE on ASME Section III fasteners. Although the ASME Code requires visual inspections to be performed in accordance with written procedures (i.e., Section II, SA-614; Section III, NC-2580; and Section V, Article 9), written procedures were not used when performing the required visual inspections for Class 2 and 3 fasteners. Methods for performing visual inspections, and inspection acceptance criteria based on IFI-105, "Recommended Practice on Surface Discontinuities on Bolts & Screws for Automotive Applications," as well as other Society of Automotive Engineers (SAE) sources are included as part of the inspector training program. However, specific procedures detailing how to perform a visual inspection and what constitutes a rejectable indication have not been developed. Nonconformance B.5 was identified in this area of the inspection.



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

M. Rockoff

May 4, 1984

Exhibit 14D

Certified Mail - Return Receipt Requested

Docket No. 99900840

Mr. Dennis Fielder
President
Cardinal Industrial Products
3873 West Oquenda
Las Vegas, Nevada 89118

Dear Mr. Fielder:

This is in reference to your letter of March 23, 1984 in which you petitioned the NRC not to disclose the names and locations of Cardinal Industrial Products Corporation (CIPC) customers, vendors and subcontractors referenced in NRC Inspection Report 99900840/83-01 dated February 29, 1984. As a result of your request, we have reviewed the report and considered your petition.

With regard to the disclosure of names and locations of the customers, I do not intend to withhold that information. The findings of our inspection as contained in the inspection report, even allowing for the disagreements contained in your April 12, 1984 letter, raise significant questions concerning the adequacy of CIPC's implementation of its quality assurance program. Components manufactured by CIPC are used in safety-related systems. Their failure to conform to codes and standards could impact the operability of such systems under accident conditions and, therefore, could have an adverse impact on the public health and safety. Nuclear customers that have received or may receive products either directly from CIPC, through a distributor, or from another nuclear project need to be aware of the types of problems that may exist with CIPC supplied components in order for these users to take appropriate corrective action. I am planning to issue an Information Notice covering nonconforming components supplied by CIPC and other companies. I am also considering issuing a Bulletin which would direct holders of construction permits and operating reactor licenses to determine if they possess CIPC components in safety-related systems and to take whatever corrective action is necessary. The disclosure of the customers referenced in the report is necessary to permit licensees to perform an adequate review. Therefore, I have determined that the potential adverse impact resulting from the possible use of nonconforming CIPC fasteners in safety-related applications takes priority over your stated proprietary interest in withholding the identity of your customers. Accordingly, I am not addressing the question of whether the names were, as you stated, given in confidence to the NRC.

With regard to disclosing the names and locations of CIPC vendors and subcontractors, it does not appear at this time that releasing this information is necessary to protect the public health and safety. Therefore, this information will be withheld pending further evaluation of the effect of withholding it on the ability of licensees to take appropriate corrective action.

Alb



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

December 20, 1984

Exhibit 15

Mr. Tom Devine
Government Accountability Project
1555 Connecticut Avenue, N.W.
Suite 202
Washington, DC 20555

Dear Mr. Devine:

This letter is a follow-up to our telephone conversation of December 13, 1984. During that conversation, we further discussed the proposals to improve our dialogue with your organization regarding the Diablo Canyon project that resulted from your December 5, 1984 meeting with Darrell Eisenhut and staff.

As I indicated, these proposals have merit. The NRC staff has expended a substantial effort to date addressing the concerns raised by your clients relative to Diablo Canyon. To further consider these proposals, it would be extremely helpful if you could identify any new concerns relative to Diablo Canyon as soon as possible. In our conversation, you indicated that you would be identifying additional concerns shortly.

In addition, it would also be helpful for you to identify any concerns that, in your or your clients' view, may require an inspection of hardware in Diablo Canyon Unit 2.

It is our view that if we can identify a number of issues to focus on, we may be able to agree on a process to maintain a dialogue between our organizations.

Sincerely,

A handwritten signature in cursive script that reads "Frank J. Miraglia".

Frank Miraglia, Deputy Director
Division of Licensing
Office of Nuclear Reactor Regulation



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

January 11, 1985

Mr. Thomas Devine
Legal Director
Government Accountability Project
1555 Connecticut Avenue, N. W.
Suite 202
Washington, D. C. 20036

Dear Mr. Devine:

This is in response to your petition, dated November 16, 1984, filed pursuant to 10 CFR 2.206 on behalf of Messrs. James L. McDermott and Timothy J. O'Neill, requesting certain actions regarding the Diablo Canyon Nuclear Power Plant. The petition includes 18 exhibits, 12 of which were provided to the Office of Investigation. In accordance with the Commission's usual practice, the request was referred to the staff for appropriate action pursuant to 10 CFR 2.206.

Several of the issues in your petition are the same as you raised in correspondence and discussions with Mr. William J. Dircks, the Executive Director for Operations. In his letter of September 24, 1984, Mr. Dircks stated that he did not agree with your suggested actions for proposed major reinvestigations of the Diablo Canyon Plant or circumvention of Region V. Mr. John B. Martin, Regional Administrator for Region V, also addressed at that time several actions requested by you which have been reiterated in this most recent petition.

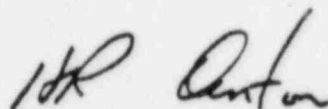
Our preliminary review of your recent petition has not revealed any information which would make it likely for me to propose a different response to these items at this time. We have initiated, of course, our review, investigation, and evaluation of the specific factual allegations which you submitted. In our preliminary review of the petition, including its 18 exhibits, we were not able to identify the 491 specific allegations as stated in the petition. We therefore request that you provide us with an index to the specific reference for each of the 491 allegations.

As Mr. Darrell G. Eisenhut, Director, Division of Licensing, and other members of the NRC staff indicated to you in a meeting on December 5, 1984 regarding your concerns about the Diablo Canyon facility, we will proceed as expeditiously as possible to evaluate in detail and resolve as necessary the potential safety issues raised by the information you have submitted.

- 2 -

I have enclosed for your information a copy of a notice being filed with the Office of the Federal Register.

Sincerely,

A handwritten signature in dark ink, appearing to read "HR Denton". The signature is written in a cursive, somewhat stylized hand.

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: See next page

Diablo Canyon

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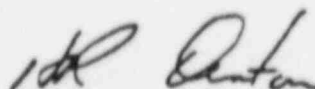
NUCLEAR REGULATORY COMMISSION
DOCKET NOS. 50-275 AND 50-323
PACIFIC GAS & ELECTRIC COMPANY
DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 & 2
REQUEST FOR ACTION UNDER 10 CFR 2.206

Notice is hereby given that by petition dated November 16, 1984, the Government Accountability Project, on behalf of Messrs. James L. McDermott and Timothy J. O'Neill, has requested that the Commission take a number of actions, chiefly appropriate resolution of numerous allegations of quality assurance problems and intimidation of onsite workers, prior to allowing commercial operation of Diablo Canyon Unit 1 or further licensing decisions on Unit 2. The petition is being handled pursuant to the provisions of 10 CFR 2.206 and, accordingly, the staff will take appropriate action on the request within a reasonable time.

A copy of the petition is available for public inspection in the Commission's Public Document Room at 1717 H Street, N.W., Washington, D. C. 20555 and in the local public document room at California Polytechnic State University, Government Documents and Maps Department, Robert F. Kennedy Library, San Luis Obispo, California 93401.

Dated in Bethesda, Maryland the 11th day of January, 1985.

FOR THE NUCLEAR REGULATORY COMMISSION



Harold R. Denton, Director
Office of Nuclear Reactor Regulation



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

FEB 6 1985 -

Exhibit 17

Mr. Thomas Devine, Legal Director
Government Accountability Project
1555 Connecticut Avenue, NW
Suite 202
Washington, DC 20036

Dear Mr. Devine:

At our meeting on December 5, 1984, we discussed a number of matters relating to the handling of allegations concerning the Diablo Canyon Nuclear Power Plant in an effort to assure a continued dialogue between the NRC staff and GAP to resolve all safety issues. Subsequent to that meeting, we have given careful consideration to the various suggestions recently discussed.

Since the initiation of the Diablo Canyon Allegation Management Program in late 1983, we believe that there has been substantial progress. While many of the proposals to improve this process may have merit, we are concerned that a significant change at this point would likely be complicating and confusing, ultimately hampering our efforts to address these issues in a timely manner. Several of the concerns you raised were previously presented in correspondence and discussions with Mr. William J. Dircks, Executive Director for Operations. In Mr. Dircks' letter to you dated September 24, 1984, he stated that a cooperative spirit is needed to ensure the timely resolution of all allegations which could adversely affect the public health and safety. We also share his view that changes to either the procedures or the NRC staff involved is unnecessary to achieve that objective. Nevertheless, we will continue to strive to improve this process, wherever we reasonably can, to ensure that the results of our efforts are clearly understood.

We believe that the timely resolution of safety concerns regarding Diablo Canyon can continue to be accomplished within the existing procedures of the Diablo Canyon Allegation Management Program. To assure this, the staff will meet with you and/or your clients, where practical and to the extent necessary, to assure a correct and complete understanding of the issues raised. We would also renew the request made at our December 5, 1984 meeting, that you and/or your clients similarly be prepared to succinctly and accurately state the concerns and identify or provide any supporting documentation. Consistent with manpower and budgetary constraints, the staff will, to the extent practical, also meet with you and/or your clients to present the staff's resolution of the matters raised. As we agreed, such followup discussions should not to be used as a forum to delay the process by raising new issues that could and should have been brought forward initially.

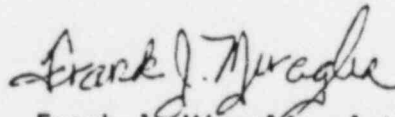
Thomas Devine

-2-

We will continue our efforts to assure a satisfactory resolution for all allegations. At the same time, we recognize, and trust that you do as well, that sincere differences of professional judgment may be encountered and prevent mutual agreement on the appropriate resolution for any given issue. Such eventuality, however, should not deter us from continuing in a cooperative spirit.

Please contact me if you wish to discuss this matter further.

Sincerely,

A handwritten signature in cursive script that reads "Frank J. Miraglia".

Frank J. Miraglia, Acting Director
Division of Licensing
Office of Nuclear Reactor Regulation

cc: See next page

Diablo Canyon

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

Exhibit 18

January 8, 1985

Docket Nos. 50-445/446

Mr. M. D. Spence, President
Texas Utilities Generating Company
400 North Olive Street
Lock Box 81
Dallas, Texas 75201

Dear Mr. Spence:

Subject: Comanche Peak Review

On July 9, 1984, the Comanche Peak Technical Review Team (TRT) began an intensive onsite effort to complete a portion of the reviews necessary for the NRC staff to reach its decision regarding the licensing of Comanche Peak Unit 1. The onsite effort covered a number of areas, including the review of allegations of improper construction practices at the facility.

On September 18, 1984, the NRC met with you and other Texas Utilities Electric Company representatives to provide you with a request for additional information in the electrical and instrumentation, civil and structural, and test program areas having potential safety implications. On November 29, 1984, we reported to you on the status of our technical review in the protective coatings area and requested additional information in the mechanical, and miscellaneous areas. TRT reviews of construction QA/QC allegations and technical issues have progressed to the point where we can now provide you with the status of our efforts in the construction QA/QC area and a request for a program plan specifically addressing our concerns. Further background information regarding these allegations and technical issues will be published in Supplements to the Comanche Peak Safety Evaluation Report (SSER), which will document the TRT's detailed assessment of the significance of all issues examined.

The TRT effort constitutes one element in the process of the agency's review of the Comanche Peak license application. The QA review group on the TRT was comprised of about 20 individuals having a total of over 300 years experience in nuclear engineering, QA, and related fields. This group spent several months at the Comanche Peak site examining the construction QA program in depth.

The TRT findings are provided in the enclosure to this letter. We have not proposed specific TUEC corrective actions as we have in previous reports from the TRT. We request that you evaluate the TRT findings and consider the implications of these findings on construction quality at Comanche Peak. We request that you submit to the NRC, in writing, a program and schedule for completing a detailed and thorough assessment of the QA issues presented in the enclosure to this letter.

Your programmatic plan and the plans for its implementation will be reviewed and evaluated by the staff before NRC considers the issuance of an operating license for Comanche Peak Unit 1. The TRT considers the construction QA/QC findings to be generic to both Units 1 and 2 and your program plan and schedule should address both units. This program plan shall: (1) address the root cause of each finding and its generic implications on safety-related systems, programs, or areas, (2) address the collective significance of these deficiencies, and (3) propose an action plan from TUEC that will ensure that such problems do not occur in the future. Your actions should consider the use of management personnel with a fresh perspective to evaluate the TRT's findings and implement your corrective actions. Finally, you should consider the use of an independent consultant to provide oversight to your program.

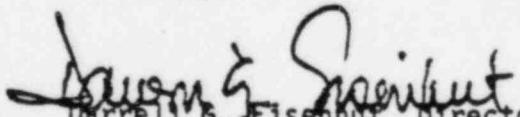
The findings of TRT with respect to QA/QC allegations, along with the TRT's assessments of your response to this letter, will be provided to the Senior Management Panel on Contention 5 established by the Executive Director on December 24, 1984. The Senior Management Panel will determine an overall NRC staff position on Contention 5 based on an integrated review of a number of sources of information concerning QA/QC at Comanche Peak in addition to the TRT findings, including information from the CAT team, the SRT team, OI, Region IV and the Hearing Board.

The TRT's overall evaluation of the technical issues and allegations is nearing completion. As we finalize information received in conversations with allegers, and further assess the implications of our findings we will inform you of additional concerns, as they arise. In the mean time, your examination of the potential safety implications of the TRT findings should include, but not be limited to the areas or activities selected by the TRT.

In order to fully discuss these concerns with you we are scheduling a meeting for January 17, 1985 which will be held in our office in Bethesda, Maryland. This meeting will provide an opportunity to ask questions regarding these concerns prior to formulating your program plan. Additional meetings will be held at NRC request as your program plan is formulated.

This request is submitted to you in keeping with the NRC practice of promptly notifying applicants of outstanding information needs that could potentially affect the safe operation of their plant. Future requests for information of this nature will be made, if necessary, as TRT technical reviews continue.

Sincerely,


Darrell G. Eisenhut, Director
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Office of Nuclear Reactor Regulation

Enclosure: As stated

cc w/enclosure:
See next page

COMANCHE PEAK

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Enclosure

Technical Review Team Findings Resulting From Quality Assurance/Quality Control Allegations

In evaluating the QA/QC program at CPSES, the Technical Review Team (TRT) completed the following: (1) interviewed Texas Utilities Electric Company (TUEC) and Brown & Root (B&R) personnel and alleged, (2) reviewed quality assurance records, selected affidavits, transcripts and depositions, and NRC Regional and Office of Investigations reports, and (3) physically inspected hardware to evaluate the safety significance of quality assurance/quality control (QA/QC) allegations at Comanche Peak Steam Electric Station (CPSES).

1 QUALITY ASSURANCE PROGRAM

The TRT found that although the TUEC QA program documentation met NRC requirements, the weaknesses of its implementation in several areas demonstrate that TUEC lacked the commitment to aggressively implement an effective QA/QC program in several areas:

- A. TUEC failed to periodically assess the overall effectiveness of the site QA program in that there have been no regular reviews of program adequacy by senior management. Further, TUEC did not assess the effectiveness of its QC inspection program.
- B. During the peak site construction period of 1981-2, TUEC employed only four auditors, all of whom had questionable qualifications in technical disciplines. Although charged with overview of all site construction and associated vendors, these Dallas based auditors provided only limited QA surveillance of construction activities.
- C. Repetitive NCRs were issued that identified the need to retrain construction personnel in the requirements and contents of QA procedures. One corrective action request (CAR) dealing with inadequate construction training and records remained open for one year. The identical problem was identified in a subsequent CAR, which still had not been closed at the time of the TRT's onsite review.
- D. The TRT found many examples of incomplete and inadequate workmanship and ineffective QC inspection in TUEC's evaluation of the as-built program. (See Section 4 for a detailed discussion.)
- E. Some craft workers newly assigned as QC inspectors were in a position to inspect their own work and records. Site management did not view this lack of separation between production and inspection roles as a potential conflict-of-interest.
- F. There were potential weaknesses in the TUEC 10 CFR 50.55(e) deficiency-reporting system. Applicable procedures did not identify what types

of deficiencies constituted significant breakdowns in the QA program, nor how they should be evaluated for reportability to the NRC. Evaluation guidelines for reporting hardware deficiencies lacked clarity and definitive instructions and the threshold for reporting deficiencies was too high. Specific past and present construction deficiencies that were not reported by TUEC are listed in Sections 4, 5 and 11 of this enclosure.

- G. The TUEC exit interview system for departing employees appeared to be neither well structured nor effective, as evidenced by the lack of employee confidence, limited implementation, failure to document explanations and rationale, and failure to complete corrective actions and to determine root causes.
- H. The B&R corrective action system was generally ineffective and was bypassed by the B&R QA Manager, as exemplified in the following instances:
 - 1. There were no definitive instructions to describe the types of problems that required corrective action. Minimal procedural instructions resulted in corrective action decisions frequently being left to the judgement of the QA Manager.
 - 2. Since June 1983, B&R had issued no Corrective Action Requests (CARs), and was substituting memos and letters of concern for this function. This shortcut had become a regular method of operation and appeared to bypass the CAR system.
- I. The TUEC corrective action system was poorly structured and ineffective in that:
 - 1. Controlling procedures were brief and general.
 - 2. There was no translation of FSAR requirements on trending and no details on how trend analyses were to be accomplished.
 - 3. Quarterly reports were not issued in a timely manner.
 - 4. The method of categorizing problems by building did not assure meaningful trend analysis.
 - 5. A 1984 CAR report identified three items requiring action; however, none had been taken.
 - 6. CAR 029 was used as a vehicle for a specific disposition rather than for generic action, as intended by the CAR system.

2 QUALITY CONTROL INSPECTION

The TRT evaluated the CPSES QC program to determine if it was functionally effective and if the QC system and organization effectively ensured consistent quality of design, procedures, processes and product at the plant. The results of this review showed the following problems.

- A. Based on the TRT review of about 200 fuel pool travelers, TUEC was unable to maintain an effective and controlled QC program for fuel pool liner fabrication, installation, and inspection. Typical fuel pool traveler irregularities were:
1. There was apparently a routine practice during construction of the fuel pool that allowed craft personnel to complete a portion of the inspection report forms prior to the actual inspection. Craft personnel entered the word "SAT," dated the entry, and left blank only the space for the QC inspector's signature. It appeared that the craft personnel were judging the inspection results prior to inspections.
 2. The date accompanying the signature for visual examination of an inside weld was changed to a date that appeared to precede the examination.
 3. Entries by the same inspector for two different inspections did not appear to match in that one entry appeared to be written by another person.
 4. The procedure number for a dye penetrant inspection was changed by an inspector different from the one who conducted the inspection.
 5. The date for a dye penetrant inspection was changed by an inspector other than the one who performed the inspection.
 6. Fuel pool travelers were found with missing QC signoffs for fitup and cleanliness. No proof could be found that some of the required weld fitup and cleanliness inspections were ever performed.
 7. The TRT review disclosed the following irregularities with traveler entries in addition to those listed above:
 - (a) Date changes after the fact
 - (b) Signoffs for functions out of sequence
 - (c) Corrections after the fact
 - (d) Changes to first party inspector date signoffs
 - (e) Missing signatures
- B. There were examples of limited corrective action, including vendor-supplied pipe whip restraints that had received inadequate source inspections. Twelve NCRs were issued involving weld defects on these restraints. TUEC corrective action included paint removal from only a sample of the welds and 21 restraints were selected for reanalysis; however, the TRT found no basis or criteria for paint removal or how the worst case restraints were identified.

The reviews of allegations in the Civil and Structural, Coatings, Electrical, Test Programs, and Piping and Mechanical areas also indicate QC inspection deficiencies, as provided in our letters of September 18, and November 29, 1984.

3 T-SHIRT INCIDENT

The T-shirt incident has previously been explored in many forums, including hearings before the Atomic Safety and Licensing Board. The TRT has examined this matter, but will not now describe all of the associated issues. Importantly, however, the TRT believes that TUEC management failed to adequately investigate the incident to determine its root cause, but reacted as though the QC inspectors involved were guilty of disruptive behavior. Of particular concern to the TRT is the strong perception that TUEC QA management may have acquiesced to pressures and complaints from construction personnel and may have failed to adequately support their QC workforce.

4 INSPECTIONS OF AS-BUILT PIPE AND ELECTRICAL RACEWAY SUPPORTS

The TRT conducted a series of inspections encompassing as-built safety-related pipe support and electrical raceway support installations. These inspections were of completed systems or components that had been previously inspected and accepted by TUEC QC as meeting the respective construction and installation requirements.

A. Pipe Support Inspections

Tables 1 and 2 are indicative of the scope of the TRT pipe support as-built inspection effort. Of the 42 pipe supports inspected, 37 were randomly selected, while 5 originated from an allegor's list. Forty-six deficiencies were identified in the supports inspected. Following are examples of the deficiencies identified and the applicable criteria. TUEC's final QC inspections of this sample ranged from December 1982 to October 1984.

1. Component Support Welds:

(a) Applicable criteria

ASME Section III, NF Subsection and subarticles NF-4424 and NF-5360 set forth rules for examining welds.

B&R QI-QAP-11.1-28 Revision 25, Paragraph 3.5.5.1 delineates criteria for the examination of welds, including inspection parameters for acceptable weld sizes.

The TRT found supports exhibiting welds that did not appear to be in accordance with the above-referenced codes and procedures.

(b) Examples of deficient welds

- (1) Support No. AF-1-001-001-S33R. Discrepancies included porosity; insufficient weld leg; incomplete welds and insufficient fill. This support was removed, scrapped, and completely rebuilt subsequent to the TRT inspection.
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Table 1 Pipe supports in unit 1

Supports Inspected by TRT As-Built group	*42
Class 1 supports inspected	4
Class 2 supports inspected	14
Class 3 supports inspected	24
Hangers with problems	26
Total problems identified	46
Procedure adequacy problems	5
Hardware-related problems	16
As-built drawing related problems	8
Component identification problems	2
Weld-related problems	10
QC record problems	1
Material identification problems	4
Welds inspected without paint by TRT	305
Welds inspected with paint by TRT	89
Total welds inspected by TRT	394
Welds needing weld repair	10
% of welds inspected	2.5%
Supports needing welding repair	6
% of supports inspected	14%

<u>Bldg</u>	<u>System</u>	<u>No. of Supports Inspected</u>
Containment	Safety Injection (SI)	1
Containment	Reactor Coolant (RC)	6
Containment	Residual Heat Removal (RHR)	2
Fuel Handling	Component Cooling (CC)	11
Safeguards	Residual Heat Removal (RHR)	1
Safeguards	Containment Spray (CT)	8
Safeguards	Demineralized Water (DD)	1
Safeguards	Auxiliary Feedwater (AF)	8
Auxiliary	Chemical Volume & Control (CS)	1
Safeguards	Main Steam (MS)	2
Safeguards	Chilled Water (CH)	1

*All 42 pipe supports inspected by the TRT had been previously accepted by site QC.

Table 2 Pipe supports in unit 1*

<u>Problem Category</u>	<u>Hanger No.</u>	<u>No. of Problems</u>	<u>Type</u>
1. No locking device for threaded fasteners	RC-1-901-702-C82S CS-1-085-003-A42K	2	Hardware problem
2. Min. edge distance (on base plate) violated	CC-X-039-006-F43R	1	Hardware prob.
3. Baseplate hole-location dimensions out of tolerance	CC-X-039-007-F43R CC-1-126-010-F33R CC-1-126-011-F33R CC-1-126-012-F33R	4	As-Built prob.
4. Spherical bearing/washer gap excessive	CC-1-126-015-F43R RC-1-052-016-C41K RC-1-052-020-C41K MS-1-416-001-S33R	4	Hardware prob.
5. Spherical bearing contamination	SI-1-090-006-C41K MS-1-416-002-S33R	2	Hardware prob.
6. Snubber adapter plate-insufficient thread engagement	MS-1-416-002-S33R SI-1-090-006-C41K CT-1-013-012-S32K	3	Proced. prob.
7. Insufficient threaded eng't, threaded rod (sight holes)	RC-1-901-702-C82S	1	Hardware prob.
8. Snubber/Strut load pin locking device broken or missing	AF-1-001-014-S33R	1	Hardware prob.
9. Load side of pipe clamp halves not parallel	AF-1-001-001-S33R AF-1-001-014-S33R	2	Proced. prob.
10. Pipe clearances w/support out of tolerance	CC-1-126-013-F33R AF-1-001-702-S33R	2	Hardware prob.
11. Pipe clamp locknut loose	AF-1-035-011-S33R	1	Hardware prob.

*All 42 pipe supports inspected by TRT had been previously accepted by site QC.

Table 2 (Continued) Pipe supports in unit 1*

<u>Problem Category</u>	<u>Hanger No.</u>	<u>No. of Problems</u>	<u>Type</u>
12. Snubber/Sway strut misalignment	CC-1-126-014-F43R RC-1-052-020-C41R	2	Hardware problem
13. Snubber cold set dimension does not match drawing	CS-1-085-003-A42k	1	As-Built prob.
14. Snubber orientation does not match drawing	CT-1-005-004-S22K CT-1-013-010-S22K	2	As-Built prob.
15. Component type/model no. installed does not match drawing	SI-1-090-006-C41K RC-1-052-020-C41R	2	Compon. ID prob.
16. No identification for support materials, parts, and components	CT-1-013-014-S32R CC-1-126-012-F33R CC-X-039-005-F43R AF-1-035-011-S33R	4	Matl. identific. prob.
17. BRP column line dimension does not match BRHL Dimension	Support not affected	1	As-Built prob.
18. Weld porosity excessive	AF-1-001-001-S33R	1	Weld-related prob.
19. Weld undercut excessive	AF-1-001-702-S33R	1	Weld-related prob.
20. Weld length undersized	AF-1-001-001-S33R	1	Weld-related prob.
21. Weld leg or effective throat undersized	AF-1-001-001-S33R RH-1-006-012-C42R CC-X-039-007-F43R	3	Weld-related prob.
22. Weld called out on drawing does not exist in field	CC-1-126-013-F33R	1	Weld-related prob.
23. Welds added in field are not reflected on drawing	AF-1-001-702-S33R numerous welds	1	Weld-related prob.
24. Excessive grinding resulting in min. thickness violations (weld clean-up)	AF-1-037-002-S33R CT-1-013-014-S32R	2	Weld-related prob.
25. No QC Buy-off on weld data card	CC-1-126-013-F33R	<u>1</u>	QC record problem
		46	Total problems identified by TRT

*All 42 pipe supports inspected by TRT had been previously accepted by site QC.

- (2) Support No. AF-1-001-702-S33R. Exhibited extraneous welding that was not documented on the as-built drawing. One of the required welds was undercut beyond the limits of acceptance (this weld was subsequently repaired).
- (3) Support No. CC-1-126-013-F33R. Support drawing required a 1/4" fillet weld to connect item 5 to item 6. This weld was omitted in the field.
- (4) Support No. CC-X-039-007-F43R. A required 5/16" all-around fillet weld had an approximately 1/16" undersize weld leg for the length across the top flat of the tube steel.
- (5) Support No. RH-1-006-012-C42R. An all-around 1/4" fillet weld connecting item 5 to item 7 was undersized by 1/32" to 1/16" across the top.
- (6) Support No. AF-1-037-002-S33R. This support exhibited a 1/16" to 3/32" reduction in plate thickness and weld size due to excessive grinding of the weld at the base plate. Base material thickness of the support plate was reduced beyond the limits of acceptance in three locations.
- (7) Support No. CT-1-013-014-S32R. Excessive overgrinding of welds resulted in notching of the sway strut rear brackets. This condition was repaired subsequent to the TRT inspection.

2. Locking Device for Threaded Fasteners:

(a) Applicable criteria

Subarticle NF-4725 states in part that all threaded fasteners, except high-strength bolts, shall be provided with locking devices to prevent loosening during service.

ASME Sect. III, Div. 1, Interpretation No. III-1-83-49R provides that the user should satisfy himself that any other device than those described in NF-4725 is capable of acting as a locking device under all service conditions.

Brown & Root Procedure QI-QAP-11.1-28, Attachment 2, Operation 7, Inspection Attribute h., requires that all exposed threads be free of extraneous material.

CPSES/FSAR, Paragraph 17.1.2 states that the design verification procedure assure that drawings, specifications, procedures, and instructions meet stipulations of related codes and standards.

10 CFR 50.55(e)(1) directs that the holder of the construction permit shall notify the NRC regarding each deficiency found in design and construction which, if not corrected, could adversely affect the safety of operations at any time throughout the expected lifetime of the plant.

There appeared to be a difference in locking devices on threaded fasteners for similar pipe support hardware made by two separate vendors. Whereas in some cases Nuclear Power Service Incorporated (NPSI) specified only one nut and no locking device, ITT-Grinnell required two nuts in those same applications. If the design of NPSI models indeed should be found to need the locknuts or their equivalent, there could be hundreds of pipe supports installed without adequate locking devices.

The TRT found examples in Unit 1 where deficiencies existed so that TUEC was in potential violation of the codes, procedures, guidelines, and commitments concerning locking devices for threaded fasteners. In spite of the requirements pursuant to 10 CFR 50.55(e)(1), TUEC did not report to the NRC the omission of thread-locking devices in the Unit 1 nuclear safety systems and did not attempt corrective action until May 1984, when TUEC tested previously applied paint for thread-lock capability. That test was inconclusive, since it did not establish that the paint, an epoxy process, would reliably perform as an effective locking device under all service conditions and throughout the expected lifetime of the plant. Further, TUEC could not identify to the TRT which paint was the subject of testing.

TUEC had a potentially inadequate quality assurance specification No. 2323-AS-31, which did not cover inspection of painted threaded fasteners. The paint was applied to ASME code-controlled, NF hardware per specification 2323-AS-30 (non-Q) which required no inspection. This issue appears to be generic for Unit 1.

The TRT notes that TUEC did not initiate an NCR identifying the widespread problem of missing locknuts; only a Request for Information was generated, which TUEC could not locate for the TRT. An NCR, required by procedure, would have brought the problem and its ramifications to management attention and would have provided a vehicle for controlled, organized, and approved engineering disposition.

(b) Examples of deficient locking devices.

Pipe support RC-1-901-702-C82S had a load bolt at a beam attachment which did not exhibit an approved locking device. (The bolt material type was SA-307 grade A.) Additionally, pipe support CS-1-085-003-A42K had no approved locking device on the "special clamp" bolts, even though the design drawing for this clamp showed each bolt with a nut and a locknut.

3. Minimum Edge Distance for Bolts:

(a) Applicable criteria

- QI-QAP 11.1-28 Revision 19, Paragraph 6.1 required that bolt holes in structural members shall not be closer than 1-1/2 times the bolt diameter from the edge of the member to the center of the bolt hole.

ASME Sect. III Div. 1, Subsection NA, Appendix XVII, Table XVII-2462-1(b)-1, gives specifically allowed minimum edge distances for bolt holes (reamed, punched or drilled) at sheared or rolled edges of plates, shapes, or bars.

(b) Example of minimum edge distance violation

- The baseplate for pipe support CC-X-039-006-F43R, located in the component cooling system, Room 249A, Fuel Handling Building, violated minimum edge distance criteria for bolt holes.

4. Base Plate Hole-Location Dimensions:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 19, Attachment 4, Paragraph 2, under fabrication tolerances, limits a "hole centerline location to $\pm 1/4$ " or as shown on the design drawing."

(b) Examples of hole-location dimension problems

The TRT found the horizontal member of Support CC-1-126-010-F33R was 3 inches lower at its centerline relative to the upper bolt-hole centerline than shown on the vendor-certified drawing. The as-built drawing had not been revised to reflect the actual installed condition in the plant. This support was located in the component cooling system, Room 247A, in the Fuel Handling Building. Other supports with similar hole-location violations found in the inspections were: CC-X-039-007-F43R, CC-1-126-011-F33R, and CC-1-126-012-F33R.

5. Spherical Bearing Gap:

(a) Applicable criterion

Brown & Root Procedure, QI-QAP 11.1-28, Revision 25 paragraph 3.7.3.1 states that "a sufficient number of spacers shall be used to prevent the spherical bearings from becoming dislodged," and "in no case shall the resulting gap be more than the thickness of one vendor-supplied spacer."

(b) Examples of spherical bearing gap deficiencies

An excessive free gap existed between spherical bearing and washers on the sway strut assembly of support CC-1-126-015-F43R. Other supports with similar bearing gap anomalies found in TRT's inspections were: RC-1-052-016-C41K, RC-1-052-020-C41K, and MS-1-416-001-S33R. The frequency of this type of procedure violation in the TRT's limited inspection suggests that this problem is generic for Unit 1.

6. Spherical Bearing Contamination:

(a) Applicable criterion

QI-QAP-11.1-28 Revision 22, Paragraph 6.3.1 Note 2 states in part - that "bearing internal and external surfaces shall be free of rust and foreign material, and bearing shall move freely within the housing."

(b) Examples of spherical bearing contamination

The TRT found paint contamination in the bearings of both snubber assemblies on component support SI-1-090-006-C41K that severely obstructed the bearing cavities and limited their movement. This Class 1 component support is located in the Containment Building of the Unit 1 safety injection system. A similar condition exists on support MS-1-416-002-S33R.

7. Snubber Adapter Plate Bolting - Lack of Full Thread Engagement:

(a) Applicable criteria

QI-QAP-11.1-28, Revision 22, Paragraph 6.1, states that "all bolts, studs, or threaded rods shall have full thread engagement in the nut."

ASME Sect. III, Div. 1, Subsection NF, Subarticle NF 4711 states that "the threads of all bolts or studs shall be engaged for the full length of thread in the nut."

QI-QAP-11.1-28, Revision 25, Attachment 29 permits less than full thread engagement in threaded plates. This allowance for less than full thread engagement is a potential violation of the ASME Code Sect. III, NF-4711; no code case was invoked to set aside this procedure. The requirement of NF-4711 that "the threads of all bolts or studs shall be engaged for the full length of thread in the nut" also implies that there be a full length of a threaded hole in plates, shapes, or bars where the required threaded hole length is the same as the bolt diameter. Further, there is no evidence that partial thread engagement at the snubber adapter plate connection has been given consideration in the design procedures for linear-type supports, nor does it appear that sufficient design margins have been introduced to allow for less than full-threaded connection. The TRT did not check "as-built" analyses to determine whether any such variations from the design norm had been considered in the "as-built" stress calculations.

What is in question is whether any calculations had been made to address this particular thread engagement condition for each size snubber being used in the plant.

(b) Examples of lack of full thread engagement

Snubber (shock arrester) adapter-plate bolt threads were insufficiently engaged in all four threaded holes of component support MS-1-416-002-S33R. The worst condition was 0.095" short, or more than 25% less than full thread engagement. Similar lack of full thread engagement deficiencies was found on NF supports SI-1-090-006-C41K and CT-1-013-012-S32K.

8. Threaded Rod Thread Engagement:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 21, Paragraph 6.3.2.a. directs that "QC shall verify thread engagement if sight [sight] holes are present in the strut body."

(b) Example of rod thread engagement deficiency

Sight holes were present in the strut body to verify threaded rod engagement. The rod was not visible through the sight hole for support RC-1-901-702-C82S.

9. Snubber/Sway Strut Load Pin Locking Device:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 22, Paragraph 6.3.1.1.b states that "the size of the cotter pins, when used, should be the maximum size the hole will accommodate and shall be fully opened."

(b) Example of locking device deficiency

Sway strut No. AF-1-001-014-S33R had a broken cotter pin.

10. Load Side of Pipe Clamp Halves Not Parallel:

(a) Applicable criterion

QI-QAP-11.1-28, Rev. 25, Sec. 3.7.3.1 states that "pipe clamp halves, in relation to attaching eyerod end, shall be parallel."

(b) Examples of halves not parallel

Clamp halves for pipe supports AF-1-001-001-S33R and AF-1-001-014-S33R were not parallel.

11. Pipe Clearances Outside of Allowable Tolerance:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 19, Attachment 4, item 3.b states "where the design shows 0" on one side and 1/16" on the other, 0" must be maintained while 1/16" ± 1/32" is required on the other side."

(b) Examples of pipe clearance violations

Pipe support CC-1-126-013-F33R exhibited no clearance on top or bottom, while the hanger drawing called out 0" on the bottom and 1/16" on top. A similar problem existed for pipe support AF-1-001-702-S33R.

12. Pipe Clamp Locknut Loose:

(a) Applicable criterion

QI-QAP-11.1-28 Revision 21, Sect. 6.1 states that "unless otherwise shown on the drawing, fasteners will be tightened securely."

(b) Example of loose locknut

A pipe clamp locknut for pipe support AF-1-035-011-S33R was found loose (less than finger-tight).

13. Snubber/Sway Strut Misalignment:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 18, Sect. 6.3.1.d states that "maximum sway strut misalignment shall not exceed 5° for ITT-Grinell and NPSI from the centerline of the sway strut."

(b) Examples of misalignment

Pipe support CC-1-126-014-F43R exhibited angularity that exceeded this requirement. A similar problem existed with pipe support RC-1-052-020-C41R.

14. Snubber Cold Set (AC) Dimension Did Not Match Drawing:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 24, Sec. 3.8.3.5.b states that "deviation of more than $\pm 1/8$ " from the specified cold setting (AC dimension shown on the design drawing) is not permitted, unless authorized by a design change."

(b) Example of incorrect AC dimension

Pipe support CS-1-085-003-A42K deviated by approximately 1" from the cold set dimension shown on the design drawing.

15. Support Configuration Did Not Match Drawing:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 24, Attachment 2, Operation 3 lists the following inspection attribute: "support configuration complies with the design drawing."

(b) Examples of configuration problems

Pipe support snubber CT-1-005-004-S22K was installed end-to-end opposite from the orientation shown on the drawing. A similar problem existed with pipe support CT-1-013-010-S22K, where dimensional discrepancies existed on the support drawing that detailed the orientation of the snubber.

16. Component Type/Model No. Installed Did Not Match Drawing:

(a) Applicable criterion

QI-QAP-11.1-28, Revision 24, Sect. 3.2.1.1 states that "vendor-supplied NPT stamped component supports shall bear marking (i.e., name plate) traceable to the design drawing."

(b) Examples of component identification problems.

Model numbers of installed snubbers for pipe support SI-1-090-006-C41K did not match the model number on the design drawing. A similar problem existed with pipe support RC-1-052-020-C41R.

17. Weld Data Card Missing QC Initials For Welds:

(a) Applicable criterion

QI-QAP-11.1-28, Rev. 25, Paragraph 3.5.3 Welder and Welding Material Verification states that "The QCI shall verify that the welder is qualified to make the weld utilizing the welder qualification matrix (attachment 16, typical), that the use of the WPS (Attachment 17, typical), and the type of filler material listed on the WFML [weld filler material log] are the same as those listed on the weld data card (WDC), and the welder's symbol has been recorded on the WFML."

(b) Example of deficient weld data card

Support number CC-1-126-013-F33R had some welds performed with no QC inspector initials or signature on the corresponding blocks of the weld data card for that support inspection package.

18. Identification of Materials and Parts:

(a) Applicable criteria

10 CFR 50 Appendix B, Criterion VIII states that "measures shall assure that identification of the item is maintained by heat number, part number, serial number or other appropriate means either on item or on records traceable to the item, as required throughout fabrication, erection, installation and use of the item."

QI-QAP-11.1-28, Revision 19, Sect. 3.1.2 states that "at installation inspection, the QC inspector shall verify the hanger number, the material type, grade and heat number ... using the information provided on the Material Identification Log."

(b) Examples of material identification deficiencies

A replacement part (sway strut eyerod) for pipe support CT-1-013-014-S32R had no apparent material identification either on the hardware or in the documentation package for the support. The Material Identification Log (MIL) did not list any identification traceable to the origin of the replacement part. A similar problem existed with pipe supports CC-1-126-012-F33R, CC-X-039-005-F43R, and AF-1-035-011-S33R.

B. Deficiencies with High Rate of Occurrence

The following pipe support inspections by the TRT were in addition to those already listed in the previous examples. Results of these ancillary inspections are summarized in Table 3.

The TRT identified six specific deficient items which need further evaluation to assess their generic implications. The TRT concern is that these items may have a high rate of occurrence throughout plant safety-related systems. The specific "frequently occurring" items and relevant inspection criteria were as follows:

- (1) Strut and snubber load pin spherical bearing clearance with washers was excessive (Ref. QI-QAP-11.1-28, Sec. 3.7.3.1 Rev. 25).
- (2) Strut and snubber load pin locking devices (cotter pins or snap lock rings) were damaged or missing (Ref. QI-QAP-11.1-28 Rev. 25, which did not specifically address load pin locking devices).
- (3) Pipe clamp halves on load side were not parallel (Ref. QI-QAP-11.1-28, Sec. 3.7.3.1 Rev. 25).
- (4) Bolts threaded into tapped holes of snubber adapter plates had less than full thread engagement (a "frequently occurring" deficiency; see related discussions on pipe supports, example 7 "Snubber Adapter Plate Bolting - Lack of Full Thread Engagement" within Part A of this section on as-built inspection).
- (5) "Hilti Kwik" bolts (concrete expansion anchors) as installed did not meet minimum effective embedment criteria (Ref QI-QP-11.2-1, Sec. 3.5.1 Rev. 16).
- (6) Locking devices for threaded fasteners were missing or of a non-approved type (see item 2 "Locking devices for threaded fasteners" on pipe support deficiencies within Part A of this section on as-built inspection).

Table 3 Summary of additional TRT inspections

Area: Room 77N, E1 810'-6" Unit 1, Safeguards Bldg				
	<u>Deficiency</u>	<u>No. of Supports Inspected</u>	<u>No. of Supports Deficient</u>	<u>% Deficient</u>
Item 1.	Excessive Spherical Bearing Clearance	92	5	5.4%
Item 2.	Load Pin Locking Device Missing	92	14	15.2%
Item 3.	Pipe Clamp Halves Not Parallel	40	9	22.5%
Item 4.	Snubber Adapter Plate Bolts With Less Than Full Thread Engagement	19	*13	to be determined

Area: Cable Spread Room 133, E1 807'-0"
Unit 1, Auxiliary Bldg

	<u>Deficiency</u>	<u>Bolts Inspected</u>	<u>Number Deficient</u>	<u>% Deficient</u>
Item 5.	Hilti Kwik Bolt Does Not Meet Minimum Embedment**	24	3	12.5%

*Bolts had less than full thread engagement.

**Taking into account the "allowed" slippage of the bolt for a distance of one nut thickness due to torquing (Ref. "Installation of 'Hilti' Drilled-In Bolts" 35-1195-CEI-20, Rev. 3, Para. 3.1.4.1) and the minimum specified embedment, the above Hilti bolts violated the "effective" embedment requirements.

The TRT undertook additional hardware inspections to ascertain the regularity with which these specific items may exist. All accessible pipe supports in Room 77N, at the 810-foot, 6-inch elevation of the Unit 1 Safeguards Building, were inspected for "frequently occurring" deficiencies 1, 2, 3 and 4 listed above. To assess the level of occurrence of "frequently occurring" deficiency 5, electrical support 'Hilti' baseplates located in the Cable Spread Room 133, at the 807-foot elevation of the Unit 1 Auxiliary Building, were inspected. For details on "frequently occurring" deficiency 6, see item A.2, "Locking Device for Threaded Fasteners," of the pipe support deficiencies, described above.

C. Electrical Raceway Support Inspections

The TRT inspected electrical conduit supports and cable tray hangers to the requirements of QI-QP-11.10-1, Inspection of Seismic Electrical Support and Restraint Systems; QI-QP-11.21-1, Requirements of Visual Weld Inspection; and other applicable instructions for conduit support and cable tray hanger inspections. All electrical raceway supports included in TRT inspections had been previously QC accepted. Table 4 summarizes the results of the TRT inspections not previously provided as part of our letter of September 18, 1984.

The TRT found the following discrepancies during its inspection of selected electrical conduit supports and cable tray hangers in Unit 1:

1. Undersize Welds:

(a) Applicable criterion

DCA 3464, Rev. 23, page 3 of 32, note 3 states in part that "welding requirements as shown on various details should be read as the minimum requirement."

(b) Examples of undersize welds

Three of four welds on conduit support C120-21-194-3 (cable spread room) were undersized. The required weld size was 1/4" at all weld joints, while the measured weld size was 7/32" to 5/32" for the full lengths of three out of the four welds.

Similarly, cable tray hanger CTH 5824 (Containment Building) had 12 undersize welds. The all-around welds on the six horizontal beams should be 1/4" in size, according to details L₁ and L₂ on Drawing FSE-00159, sheet 5824, 1 of 2. The measured size of these welds was 3/16" to 5/32" at each connection. Also, support IN-SP-7b exhibited undersize welds measuring 7/32" to 5/32" instead of the required 1/4".

Table 4 Summary of electrical raceway support inspection by the TRT - unit 1

Support welds inspected	59
Supports inspected	5*
Supports with problems	3 (60%)

Types of problems

Hardware-related, other than welding	6
Unauthorized configuration change	1
Weld-related types of problems (categories)	2

Welds requiring rework	41
Welds made in field but not recorded on drawing	80**
Beam stiffeners added but not recorded on drawing	40

Building/Area

Supports

Cable Spread Room	CTH 12646 C 130-21-250-3 C 120-21-194-3
Auxiliary Building	CTH 6742
Containment	CTH 5824

*All electrical supports inspected by the TRT had been previously inspected and accepted by QC.

**Full visual inspection was not performed by the TRT on these extra welds.

2. Misplaced Welds:

(a) Applicable criterion

QI-QP-11.10-1, Revision 29, Paragraph 3.5.2, Assembly Inspection, includes the requirement to inspect a support for configuration. Paragraph 3.6.2 of the same procedure requires that support welds receive visual inspection and that nonconforming welds be reported.

(b) Examples of misplaced welds

During inspection of Hanger CTH-6742, the TRT found that two structural welds were made in the wrong direction. The 3/16" shop welds which join MK-10 and MK-11 were made horizontally instead of vertically, as shown on drawing FSE-00159, sheet 6742. QC Inspection Report ME-I-0024909, dated February 16, 1984, accepted all inspectable attributes as satisfactory prior to the TRT inspection.

3. Unauthorized Configuration Changes:

(a) Applicable criterion

QI-QP-11.10-1, Inspection of Seismic Electrical Support and Restraint Systems, paragraph 3.5.2 includes the requirement for inspection of a support for configuration compliance.

(b) Examples of configuration change

The TRT found that cable tray hanger CTH 5824 (Containment Building) had been fabricated to include 40 more stiffeners and 80 more welds than required or shown on drawing FSE-00159, sheet 5824, 2 of 2, Detail L₂. Inspection Report ME-1-0006155 verified final QC inspection and acceptance on January 3, 1984.

Further, cable tray hanger CTH-6742 (Auxiliary Building), Clip, MK-12, should be 6" x 6" x 3/4" angle stock in accordance with FSE-00159, sheet 6742. The actual flange thickness of MK-12 was 3/8".

4. Hilti Anchor Bolt Installation Deficiencies:

(a) Applicable criterion

QI-QP-11.2-1, Concrete Anchor Bolt Installation, provided requirements for proper installation and inspection of Hilti anchor bolts.

(b) Examples of Hilti bolt deficiencies

CTH-6742 (Auxiliary Building) anchor bolt torque was not verified (paragraph 3.5 of the procedure). Hilti bolts were not marked in accordance with attachment 1 of the procedure, nor was the length of these bolts verifiable (paragraph 3.2).

CTH-5824 (Containment Building) base plate bolt holes had violated minimum edge distance--edge distance cannot be less than 1 7/8" (Attachment 2 of the procedure). Actual distance was 1 5/8" to 1 3/8" from the nearest plate edge. This condition affected five of the eight Hilti anchor bolt holes in the base plates for this hanger.

One Hilti bolt was skewed to more than 15 degrees. Maximum allowable skew was 6 degrees without corrective bevel washers (paragraph 3.1.2).

The Hilti bolt torque on this hanger CTH 6741 (Auxiliary Building) was not documented as being verified by QC (paragraph 3.5).

5. Undersize Nuts:

There was inconsistency in the application of nuts for SA-325 bolts in that both standard and heavy hex nuts were used. No stipulation was found which would permit the use of standard (non-heavy) hex nuts. This condition is a potential violation of the Material Specification ASTM A325 (ASTM, Part 4-1974) paragraph 1.5, which provides that "heavy hex structural bolts and heavy hex nuts shall be furnished unless other dimensional requirements are stipulated..." B&R Drawing No. FSE-000159, sheet 5824, 2 of 2, required the use of ASTM A325 bolts for cable tray hanger number CTH-5824.

D. Summary of Pipe Support and Electrical Raceway Support Inspections

The as-built verification effort conducted by the TRT provides evidence of faulty construction by craft personnel, installed hardware that does not match as-built drawings, and ineffective QA and QC inspections. Despite the small size of the TRT's sample, there appears to be a large number of deficiencies. The potential also exists that these deficiencies are not represented correctly in the final stress analysis.

5 DOCUMENT CONTROL

The TRT evaluated the CPSES document control system to determine if it was effective and if it ensured consistent quality of documents for construction practices and records. The results of this review showed the following problems.

- A. The TRT found that there was a potential for document control center (DCC) field distribution centers (satellites) to issue deficient document packages to craft personnel. Typical problems identified were: packages were not thoroughly examined; procedures and guidelines were not specific or were not followed; and documents controlling operation of the centers existed in the form of guidelines and charts rather than as controlled procedures.
- B. The TRT found that many problems indicative of inadequate drawing control existed at CPSES from September 1981 to April 1984. These problems had been identified prior to the TRT's evaluation by both TUEC and NRC Region IV audits and reviews.

Prior to placing the satellites in operation (a phased effort between February and August 1983), DCC distributed drawings, component modification cards (CMCs), and design change authorizations (DCAs) to file custodians, welding engineering, the pipe fabrication shop, QC, and the hanger task force. Document control through this system proved to be ineffective.

In an attempt to correct identified problems, DCC satellites were created to distribute drawings to field personnel, rather than use the file custodians. However, between August 1983 and April 1984, recurring problems with document control were identified. Examples of the types of document control problems that existed between August 1983 and April 1984 were as follows:

1. Drawings released to the field were not current.
2. Drawing and specification changes were not current.
3. Design documentation packages were incomplete.
4. DCC did not provide the satellites with up-to-date drawings, CMCs, DCAs and document revisions.
5. Drawings hanging from an open rack, which had no checkout control, were available to craft and QC personnel.
6. Design change logs were inaccurate.
7. Design documents were not always properly accounted for in DCC.
8. Current and superseded copies of design documents were filed together.
9. Satellite distribution lists were inaccurate.
10. There were discrepancies between drawings contained in the satellites and those in DCC.

11. Some drawings were missing from the satellite files.
12. Telephone requests for design documents resulted in the issuance of documents that bypassed the controlled distribution system.

In April 1984, top management took a direct interest in recurring document control problems. Their efforts appear to have been successful. For instance, in April 1984 satellites 306 and 307 had error rates of 30% and 10%, respectively; but by July 1984, these error rates had fallen to less than 1% for both satellites. The TRT has found that TUEC document control after July 1984 was adequate; however, the effects of document control inadequacies prior to July 1984 have yet to be fully analyzed by TUEC.

- C. Deficiency reporting procedure CP-EP-16.3 appeared to relate only to craft and engineering personnel and was not directed to noncraft and nonengineering personnel who may have had knowledge of reportable items. Procedure CP-EP-16.3 indicated that the applicable manager was responsible for documenting and reporting Deficiency and Disposition Reports (DDRs); but there were no checks or balances to ensure that a manager or a designated substitute would process a DDR.
- D. TUEC did not consider the CYGNA audit findings regarding the DCC as appropriate for formal reporting to the NRC pursuant to 10 CFR 50.55(e), as required by procedure CP-EP-16.3, "Control of Reportable Deficiencies."
- E. The TRT found that the DCC issued a controlled copy stamp to the QC department to expedite the flow of hanger packages to the Authorized Nuclear Inspector. Methods for this kind of issuance and control of such stamps were not described in TUEC's procedures.

6 TRAINING/QUALIFICATION

The TRT identified numerous weaknesses during its review of the ASME and non-ASME training, certification, and qualification of QC and DCC personnel. TUEC's training and certification program lacked the programmatic controls to ensure that the requirements in 10 CFR 50, Appendix B were achieved and maintained. The items identified by the TRT include those listed below, in addition to the items previously provided in our letter of September 18, 1984.

- A. Twenty percent of the training records reviewed contained no verification of education or work experience.
- B. The results of Level I certification tests were used for some Level II certifications rather than the results of a Level II test.
- C. After failing a certification test, a candidate could take the identical test again.

- D. Certifications were not always signed or dated.
- E. White-out was used on certification tests.
- F. Seven inspectors had questionable qualifications.
- G. There was no limit or control on the number of times an examination could be retaken.
- H. No guidelines were provided for the use of waivers for on-the-job training.
- I. In some cases recertification was accomplished by a simple "yes" from a supervisor.
- J. There was no formal orientation training for DCC personnel prior to August 1983.
- K. The responsibility for administration of the non-ASME training program was not clearly assigned to a single individual or group.
- L. Non-ASME personnel capabilities were loosely defined by levels (I, II, III).
- M. There were numerous additional problems in non-ASME certification testing, such as: no requirement for additional training between a failed test and the retest; no time limitation between a failed test and a retest; two different scoring methods to grade a test and a retest; no guidelines on how a test question should be disqualified; no program for periodically establishing new tests except when procedures changed; and no details on how the administration of tests should be monitored.
- N. The exemption provision in ANSI N45.2.6, which allowed substitution of previous experience or demonstrated capability, was the normal method for qualifying inspection personnel rather than the exceptional method.

7 VALVE INSTALLATION

The TRT found that installation of certain butt-welded valves in three systems required removal of the valve bonnets and internals prior to welding to protect temperature-sensitive parts. The three systems involved were the spent fuel cooling and cleaning system, the boron recycle system, and the chemical and volume control system. This installation process was poorly controlled in that disassembled parts were piled in uncontrolled areas, resulting in lost, damaged, or interchanged parts. This practice created the potential for interchanging valve bonnets and internal parts having different pressure and temperature ratings.

8 ONSITE FABRICATION

The TRT findings regarding onsite fabrication shop activities indicated that:

- A. The scrap and salvage pile in the fabrication (fab) shop laydown yard was not identified and did not have restricted access.
- B. Material requisitions prepared in the fab shop did not comply with the applicable procedure.
- C. The fab shop foremen were not familiar with procedures that controlled the work under their responsibility.
- D. Fabrication and installation procedures did not include information to ensure that B&R-fabricated threads conformed to design specifications or to an applicable standard.
- E. Indeterminate bulk materials that accumulated as a result of site cleanup operations were mingled with controlled safety and nonsafety material in the fab shop laydown yard.
- F. Site surveillance of material storage was not documented.
- G. Work in the fab shop was performed in response to memos and sketches instead of hanger packages, travelers, and controlled drawings.

9 HOUSEKEEPING AND SYSTEM CLEANLINESS

TRT inspections at CPSES indicated that the facility was well maintained. However, two issues were identified that indicate housekeeping and system cleanliness deficiencies.

- A. The TRT reviewed the August 6, 1984, draft of flush procedure FP-55-08. The purpose of this procedure was to verify the cleanliness of Unit 1 reactor coolant loops, including the reactor vessel, by means of hand-wiping, visual inspection, and swipe testing. Tests to determine surface chloride and fluoride contamination were performed by TUEC systems test engineers and Westinghouse representatives. The TRT notes, however, that FP-55-08 required only two swipe tests of the reactor vessel—one on the side and one on the bottom. This limited number of swipe tests may not provide adequate assurance that the vessel had been properly cleaned.
- B. In rooms 67, 72, and 74 of the Unit 2 Safeguards Building, the TRT observed that not all snubbers were wrapped with protective covering when welding was being done in close proximity to them. This practice was a violation of B&R procedure CP-CPT-14.1, which required protection of installed equipment during welding. This condition was immediately corrected when the TRT reported it to TUEC QA management, and an inspection was performed by TUEC to correct similar conditions in other areas as well.

10 NONCONFORMANCE REPORTS (NCRs)

There were several weaknesses in the NCR and deficiency identification reporting systems. The TRT found that:

- A. The TUEC procedure for preparation and processing of NCRs did not contain explicit instructions for handling voided NCRs.
- B. NCRs were used as a tracking document to record removal of a part from equipment on a permanent equipment transfer rather than for reporting a nonconforming condition; such usage of the NCR was not defined in procedures.
- C. There was an inconsistency between paragraphs 2.1 and 3.2.1 in procedure CP-QP-16.0. Paragraph 2.1 required all site employees to report nonconformances to their supervisor or to the site QA supervisor, while paragraph 3.2.1 required persons other than QA or QC personnel to submit a draft NCR to the Paper Flow Group.
- D. The NCR form had no form number or revision date to indicate that the form was being adequately controlled.
- E. There were two versions of the TUEC NCR form, one with and one without a space for the Authorized Nuclear Inspection (ANI) review.
- F. The NCR form had no space to identify the cause of the nonconformance and the steps taken to prevent its recurrence.
- G. The NCR form had no provision for quality assurance review.
- H. The TRT found approximately 40 different forms (other than NCRs) for recording deficiencies. Many of these forms and reports were not considered in trending nonconforming conditions.

11 MATERIALS

The as-built review effort by the TRT included a material traceability check on 33 of the same pipe supports that the TRT had field inspected. The material traceability was adequate for those 33 pipe supports, with the exception of four material identification discrepancies, as noted in section 4 on as-built inspections.

In another case, TUEC failed to maintain material traceability for safety-related material and numerous hardware components. This QA breakdown was identified in an ASME Code survey in October 1981 yet was not reported to the NRC in accordance with the requirements of 10 CFR 50.55(e).