

# Cardinal

INDUSTRIAL PRODUCTS CORPORATION



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August 23, 1985

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. 99900840/85-01

Dear Mr. Zech,

We have received your letter dated July 26, 1985 including the Notice of Nonconformance and the Inspection Report #99900840/85-01. With regard to the Notice of Nonconformance (NOC) please refer to the attached, Exhibit I, for our answers.

The Inspection Report mentions that the Material Verification part of Cardinal's Amended Action Plan was only partially completed as of the inspection date. We are therefore attaching as Exhibit II our Amended Action Plan Interim Report #2 updating you in this matter. Please note that all required testing under the Material Verification Program is complete except for five combinations where we are waiting on customers to return material. Notices have been issued where required to affected customers. We are pleased that only 1.13% of the materials in question showed any deviation from the material specification and that actual deviations noted were mostly small variances from the specification requirements.

Since the Material Verification Program included items over 1" diameter and is substantially complete, we are planning to consider deviations found during Certification Review, now underway, as a variance from the Purchase Order only and will not consider them a matter for reporting under 10 CFR Part 21.

Even though we view our Certification Review commitments as limited to the period ending November 1983 when Cardinal adopted a new Q.A. Manual and received our ASME Certificates, we have decided to continue the review to August 15, 1985. The certification review criteria to be used for this latter period will, however, be amended to focus more on NCA 3800 requirements.

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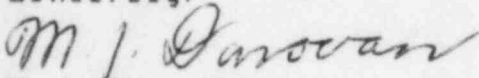
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We are also concerned that many of our customers will not add Cardinal to their approved vendor's list because they are of the opinion that the NRC Inspections are incomplete and of continuing serious concern to the Commission. This situation has persisted now for over 18 months and has contributed to a continuing and deepening financial crises. As Nuclear materials are our only business, we need support from customers and regulators to continue in business. We would therefore ask, assuming our enclosed responses are acceptable, that you confirm the NRC's concerns are satisfactorily resolved and regarded as closed, subject to normal verification of our last responses.

Cardinal has been and will continue to use its best efforts to comply with not only the "letter of the law" but also the "spirit". It is difficult to exercise a responsible leadership roll where other industry participants may not share our commitment to meet the "spirit of the law". We feel there is hope to change the attitude of the industry to willingly adopt regulatory and Code objectives for the public benefit, but it will require a commitment to change the status quo and improve the industry's reputation. We recently heard that since we are in the nuclear fastener industry we are guilty by association. We would like to see the nuclear fastener industry lead in the transition to an improved industry image and would appreciate your assistance in realizing this goal.

Sincerely,



M. J. Donovan  
Chairman of the Board

August 22, 1985

EXHIBIT I

Response To Notice of Nonconformance  
Docket No. 99900840/85-01

NON, Item A.1 - "Purchase From Unapproved Sources"

The Amended Action Plan has prescribed the use of check lists as follows:

Attachment #1 Customer Certification Review Checklist, Revision 2 dated 5/2/85 (Items I thru VII). Attachment #2 Cardinal Purchase Order Review Checklist, Revision 2 dated 5/2/85. (Items A thru D).

Although we felt that questions A2, A3 and B1 of Attachment #2 would answer the question of an approved vendor, we have added question A4 to avoid any possible ambiguity. All certifications reviewed prior to the 5/2/85 revision date will or have been reviewed again to answer question A4. Current orders are reviewed by Q.A. at the time material is assigned to insure vendors are properly qualified.

NON, Item A.2- "Lack of, or insufficient NDE"

The finding was regarding ASTM A490 bolting which requires sample plan NDE by the material specification. Since Cardinal has been performing 100% magnetic particle examination on all A490's for Nuclear use since April 1, 1985 we will review the magnetic particle certifications issued prior to that date for all ASTM A490's used in Nuclear applications and answer question II.d. Other ASME Section III NDE is already covered for materials other than A490's by questions II.b. and II.c.

NON, Item A.3 - "Insufficient Number of Tensile Tests".

Attachment #1 question III.d and Attachment #2 question B.6 were clarified to specifically determine the number of tensile tests performed. All certifications reviewed prior to 5/2/85, will be or have been reviewed again to determine this specific answer. Under our current Q.A. Program, Q.A. verifies that the proper number of tensile tests were performed prior to issuance of Cardinal's Certification.

Exhibit I  
Page Two

Inspection  
Report Item  
C. I. b

Even though it was not mentioned as a specific nonconformance please note that Attachment #1 questions VII.a and VII.b were added to the checklist to ensure that traceability was maintained. As mentioned above certifications reviewed prior to 5/2/85 will be or have been reviewed against this criteria.

With regard to the specific finding on CI 31267, Cert #38789 be advised that an additional 30 pieces were magnetic particle examined with all pieces being acceptable. An additional tensile test was run with acceptable results. Results are on file.

NON, Item B.1 - "Improperly Adding Vendor To AVL".

The vendor in question was dropped from the AVL. No purchase orders were placed during the period in question nor did the vendor perform work directly or indirectly for Cardinal. The vendor was however surveyed on 10/15/84 as a single process subcontractor who would perform work for another Cardinal approved subcontractor. The controls to be utilized to maintain traceability through this single process would have been achieved by using a procedure approved by Cardinal and the second subcontractor. Before this process was put into effect, Cardinal developed an alternate channel for the work with reduced complexity.

Under current procedures, all vendor surveys must be reviewed and approved by the Director of Quality prior to adding a vendor to the Approved Vendor's List.

NON, Item B.2 - "No Evaluation Audits of Subcontractor's Calibration Services".

As part of our Vendor Validation Program, Cardinal committed to re-survey all of it's overseas subcontractors. All overseas vendors on the AVL have now been re-surveyed. As part of this process Cardinal has assured that these subcontractors have controlled the calibration of measuring equipment where the results will be used by Cardinal as part of our certification. The controls were accomplished by:

- A) Having the National Standards organization perform and certify the calibration or



B) Having a calibration organization perform the calibration using certified standards traceable to the National Standards and in accordance with procedures reviewed and approved by Cardinal. Our monitor witnessed heat treat calibrations where calibration organizations were used.

The above comply with ASME interpretations III-80-132 and III-I-77-186 and Cardinal's current ASME approved Quality Assurance Manual.

NON, Item C. - "Survey Findings Not Communicated to Subcontractors". This nonconformance was written with regard to three vendor validation surveys performed by Hartford Steam Boiler acting as a lead auditor in conjunction with a Cardinal lead auditor and auditor trainee.

The first vendor survey indicated four findings by the outside Lead Auditor. Two of these were against Cardinal and resolved internally. For the third finding a CAR was initiated and closed. The last finding will be closed as part of a subsequent audit to be performed either during August or November 1985.

The second vendor had a finding of not maintaining records on NDE personnel. Cardinal has never used this vendor for NDE and has no intention of doing so in the future. The finding was not applicable.

The third vendor has two approved facilities. The findings were discussed at the exit meeting and a copy of the completed survey was forwarded to the vendor for appropriate corrective action. As part of a follow up audit on 10/16/84, most of the findings/concerns were closed and verified. A few of the less significant items were not verified as closed at the time, but will be verified either during the August or November audits.

On all future audits and surveys, any significant findings will be covered under a CAR with the vendor required to issue a response and take necessary corrective action.

AMENDED ACTION PLAN  
CUSTOMER CERTIFICATION REVIEW  
CHECK LIST

I. VISUAL

- a. ORDERS WITH INSPECTION ON OR AFTER MAY 1, 1983 - NEED "VISUAL INSPECTION REPORT (CF11.1)
- b. ORDERS PRIOR TO MAY 1, 1983 - NEED VERIFICATION THAT INSPECTION (PRIOR TO PACK STEP) HAS Q.A. STAMP OR INITIAL AND DATE.

II. NDE

- a. SUBSECTIONS NB, NC, AND ND (MATERIAL 1" AND LESS) AND SUBSECTIONS NF, CLASSES 1,2,&3 (MATERIAL 2" AND LESS), N/A.
- b. MATERIAL OVER 1" VERIFY STEP FOR NDE TEST HAS JOB # OR Q.A. STAMP AND DATE (MT/PT)
- c. MATERIAL OVER 2" VERIFY STEP FOR NDE TEST HAS JOB # OR Q.A. STAMP AND DATE (UT)
- d. ASTM A490 VERIFY SAMPLE IS APPROPRIATE AQL.

III. HEAT TREAT

- a. WHEN SPECIFICS ARE APPLICABLE VERIFY CERTIFICATION HAS DATA RECORDED.
  - (1) WHEN ACCOMPLISHED FOR SPECIFIC ORDER ASSURE CMR HAS STEP WITH Q.A. OR OPERATOR SIGN OFF.
  - (2) WHEN ACCOMPLISHED FOR HEAT LOT, WILL BE VERIFIED ON P.O. REVIEW.
- b. WHEN NO SPECIFICS ASSURE MESSAGE UNIT STATES THE HEAT TREAT CONDITION.
- c. OTHER MEET ASTM REQUIREMENTS.
- d. IN HOUSE TREATMENT VERIFY MECHANICAL SAMPLE SIZE.

IV. CHARPY IMPACT

- a. VERIFY CUSTOMER P.O. REQUIRES TEST. (TEMPERATURE & ACCEPTANCE CRITERIA)
  - (a) WHEN APPLICABLE AND ACCOMPLISHED FOR SPECIFIC ORDER ASSURE CMR HAS STEP WITH Q.A. SIGN OFF OR JOB #. WHEN DIAMETER IS OVER 1 1/2" VERIFY COUPON LENGTH IS ADEQUATE FOR CODE REQUIREMENTS NX2300. ORIENTATION & LOCATION. (USE CSP 10.005 FOR LENGTH CRITERIA).

V. UPGRADING

- a. REVIEW CMR FOR CHEM/AND IF APPLICABLE FLAG ITEM FOR P.O. REVIEW.

VI. CODE/SPECIFICATION YEAR.

- a. VERIFY MESSAGE UNIT STATES YEAR FOR ASME ORDERS REQUIRED BY CUSTOMER P.O.
- b. VERIFY ASTM YEAR DESIGNATED FOR NON ASME ORDERS REQUIRED BY CUSTOMER P.O.
- c. WHEN CUSTOMER HAS NOT REQUIRED YEAR VERIFY MATERIAL MEETS YEAR OF C. I. P. CERTIFICATION DATE.

VII. TRACEABILITY

- a. VERIFY HEAT NUMBER = VENDOR CMTR.
- b. VERIFY MATERIAL DESCRIPTION = VENDOR CMTR.

\* This revision has not only added criteria for review of ASME size included materials and the NDE of ASTM A490's, but has also removed criteria to review other items which were superseded by the Material Verification Program.

AMENDED ACTION PLAN  
CARDINAL PURCHASE ORDER REVIEW  
CHECKLIST

A. APPROVAL OF P. O.

1. VERIFY Q. A APPROVAL ON P. O
2. VERIFY QUALITY STATEMENT LEGEND, ASTM REQUIREMENTS, CHEM/MECH IS ON P. O. ATTACHMENT
3. VERIFY AUDIT DATE IS IN LINE WITH P. O. DATE
4. VERIFY VENDOR WAS ON CURRENT AVL.

B. VENDOR CERTS

1. VERIFY Q. A. STATEMENT IS VERIFIABLE WITH AUDIT DATE
2. VERIFY SIZE, GRADE, SPEC IS AS ORDERED
3. VERIFY QUANTITY = RECEIVED OR ORDERED
4. VERIFY CHEMISTRY - PER SPEC
5. VERIFY HEAT TREAT - TIME, TEMP, COOLING MEDIA, CONDITION - PER SPEC
6. VERIFY MECHANICALS - PER SPEC INCLUDING SAMPLE SIZE.
7. VERIFY OUR P. O. REFERENCED BY SUBTIER VENDOR AND THAT SIZE, QTY ORDERED AND ANY SPECIAL REQUIREMENTS ARE MET BY SUBTIER VENDOR

C. MASTER CERTS

1. VERIFY DESCRIPTION = MILL CERT
2. VERIFY P. O. #
3. VERIFY HEAT NUMBER = MILL SHEET
4. VERIFY CHEMISTRY = MILL CERT
5. VERIFY MECHANICAL = MILL CERT/VENDOR CMTR

D. RECEIPT INSPECTION

1. VERIFY P. O. #
2. VERIFY QTY = MILL CERT/VENDOR CMTR
3. VERIFY "A" (ACCEPT) FOR EACH ATTRIBUTE, IF "R" (REJECT) THERE MUST BE A NCR NUMBER
4. VERIFY Q. A. STAMP OFF
5. VERIFY DESCRIPTION = MILL CERT/VENDOR CMTR
6. VERIFY HEAT NUMBER = MILL CERT



August 23, 1985

EXHIBIT II

CARDINAL INDUSTRIAL PRODUCTS

AMENDED ACTION PLAN INTERIM REPORT #2

As part of our Amended Action Plan, Cardinal has identified all overseas subcontractors whose quality programs could have questionable elements. Even though these questions may not have affected the materials' chemical or mechanical compliance with specification, they were included in the scope of the Material Verification Program. As part of this program, we divided each questionable subcontractor (channel) into product categories and verified the products in all categories. This means, for instance, that if a particular contractor formed nuts for SA 194 2H, SA 194 Gr. 4, SA 194 Gr. 7 and SA 194 Gr. 6, we conducted material verification for each of the four product categories. The material verification was performed to develop a confidence factor of 95% for each category, or else each heat and size combination in the category will be verified.

As part of the Material Verification Program, Cardinal performed all mechanical tests required by the applicable specification and chemistries for alloy, stainless and non-ferrous materials. In total 54 categories were identified for testing. These categories were comprised of 620 unique combinations of diameter and heat number. Results to date are as follows:

Categories	54
Nuclear Combinations	620
Combinations to be Tested	187
Combinations Tested	178

See the Material Verification Summary on the next page for full details.

## MATERIAL VERIFICATION SUMMARY

Cat. #	Material Type	Nuclear Combinations	Combinations To Be Tested	Combinations Tested	Remarks
1	A36 Hvy Square Nuts	4	2	2	OK
2	B7 Hex Bolts	4	3	1	Att. II
3	B7 All Thread Rod	11	3	3	OK
4	B8 All Thread Rod	1	1	1	OK
5	B8 C1 2 All Thread Rod	3	3	3	Att. II
6	BBM All Thread Rod	1	1	1	OK
7	B16 All Thread Rod	8	8	4	Att. II
8	B16 Pitch Dia. Bar	3	2	2	OK
9	2H Hvy Hex Nuts	12	3	3	OK
10	2H Hvy Hex Nuts	32	8	8	OK
11	2H Hvy Hex Nuts	41	8	8	OK
12	2H Hvy Hex Nuts	12	3	3	OK
13	2H Hvy Jam Nuts	4	2	2	OK
14	2H Square Nuts	2	2	2	OK
15	2H Hvy Hex Nuts	1	1	1	OK
16	2H Hvy Nuts	2	2	1	Att. I
17	2H Nuts	10	6	6	OK
18	2H Hvy Hex Nuts	49	8	8	OK
19	Gr 4 Hvy Hex Nuts	4	2	2	OK
20	Gr 4 Hvy Hex Nuts	16	5	5	OK
21	Gr 6 Hvy Hex Nuts	9	3	3	OK
22	Gr 6 Hvy Hex Nuts	7	2	2	OK
23	Gr 6 Hvy Hex Nuts	17	5	5	OK
24	Gr 7 Hvy Hex Nuts	7	2	2	OK
25	Gr 7 Hvy Hex Nuts	18	5	5	OK
26	Gr 7 Hvy Hex Nuts	9	3	3	OK
27	Gr 7 Hvy Hex Nuts	2	2	2	OK
28	Gr 7 Hvy Hex Nuts	22	5	5	OK
29	Gr 8 Hvy Hex Nuts	5	2	2	OK
30	Gr 8 Hvy Hex Nuts	1	1	1	OK
31	Gr 8 Hvy Nuts	9	9	8	Att. II
32	Gr 8M Hvy Nuts	9	3	3	OK
33	Gr 8M Nuts	7	2	2	OK
34	Gr 8M Heavy Hex Nuts	16	5	5	OK
35	A 307 Hvy Nuts	6	2	2	OK
36	A 307 Fin. Hex Nuts	2	2	2	OK
37	A 307 Fin. Hex Nuts	2	2	2	OK
38	A 307B Hvy Hex Bolts	15	3	3	OK
39	A 307B Hvy Hex Bolts	3	2	2	OK
40	A 307B Hvy Hex Bolts	6	2	2	OK
41	A 307B Hvy Hex Bolts	15	3	3	OK
42	A 307B Fin. Hex Bolts	8	2	2	OK
43	B7/L7 All Thread Rod	6	2	2	OK
44	B7/L7 All Thread Rod	87	13	13	OK
45	L7 Bolts	21	5	5	OK
46	L7 Hvy Hex Bolts	12	3	3	OK
47	A 325 Hvy Hex Bolts	11	3	3	OK
48	A 325 Hvy Hex Bolts	7	2	2	OK
49	A 453 Gr 660 A/T Rod	7	2	2	OK
50	A 490 Hvy Hex Bolts	11	3	3	OK
51	A 563 Gr A Hvy Nuts	1	1	1	OK
52	A 563 Gr A Hvy Nuts	3	2	1	Att. I
53	F 436 Flat Washers	28	8	8	OK
54	4340 Hvy Hex Nuts	11	3	3	OK
TOTAL		620	187	178	

## MATERIAL VERIFICATION SUMMARY

## ATTACHMENT I

## REMAINING CATEGORIES TO BE QUALIFIED

Cat. #	Category/Summary	Size	Heat	Remarks
16	A194 2H Hvy Nuts Vendor: SY 7 combinations (2 nuclear) 2 tests required 1 good (No material available Notices issued)	1 3/4 1 3/8	81357 82209	No mat.-issued notices Tested (good)
52	A563 GRA Hvy Nuts Vendor: KM 3 combinations 2 tests required (1 more good test req'd - Waiting for material)	1 1/8 1 1/4 1 1/8	363480 363479 363479	No stock-wait. mat. " " " " Tested (good)

## SUMMARY

Categories	Nuclear Combinations	Tests Required	Tests Complete
2	5	4	2

## MATERIAL VERIFICATION SUMMARY

## ATTACHMENT II

## CATEGORIES WITH REJECTED TESTS

Cat. #	Category/Summary	Size	Heat	Remarks
2	A193 B7 Capscrews Vendor: M	1/4 5/16	Y140990 J113076	* Tested (reject) No material available - Issued notice
	7 combinations (3 nuclear) 1 reject	1/4	YOR3231	Recall mat. for test
5	A193 BB Class 2 A/T Rod Vendor: SI	1 1/4 1 1/4 1 1/8	41959 54970 11987	Reject C1 2 - OK C1 1 " " " " " " " " (Notices issued on all 3 combinations)
	3 combinations 3 rejects as C1 2 (all pass C1 1 rqmts)			
7	A193 B16 A/T Rod Vendor: SI	3/4 1 3/8 3/4	601456 608866 409555	No material available - Issued notice * Tested (reject) * " "
	10 combinations (8 nuclear) 2 rejects 2 accept	5/8 1 1 1/8 1 1/4 1 1/2	601456 600536 606079 602386 306857	No material available - Issued notice Recall mat. for test Tested (good) " " No material available - Issued notice
31	A194 GRB Hvy Nuts Vendor: S	3/8 9/16 1 1/8 5/8 3/4 7/8 1 1 1/4 1/2	58146 57601 XF755 8F843 A3729 K7436 XF755 A6741 6F706	* Tested (reject) Tested (good) " " " " " " " " " " Recall mat. for test Tested good
	9 combinations 1 reject 7 accept (test 1 more combination waiting for material)			

## SUMMARY

Categories	Nuclear Combinations	Combinations With Tests Required or Notices Issued	Tests Complete
4	23	23	16

\* Required notices issued.