



Wisconsin Electric POWER COMPANY
231 W. MICHIGAN, P.O. BOX 2046, MILWAUKEE, WI 53201

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VPNPD-88-018
NRC-88-002

January 13, 1988

U. S. NUCLEAR REGULATORY COMMISSION
Document Control Desk
Washington, D. C. 20555

Gentlemen:

DOCKETS 50-266 AND 50-301
RESPONSE TO NRC COMPLIANCE BULLETIN 87-02
FASTENER TESTING TO DETERMINE CONFORMANCE
WITH APPLICABLE MATERIAL SPECIFICATIONS
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

This letter is in response to NRC Compliance Bulletin 87-02 and provides the results of testing performed on a selected sample of in-stock fasteners at Point Beach Nuclear Plant. This testing was performed and results are being reported as required by this bulletin (see enclosures).

Bulletin 87-02 requires that fasteners be selected from safety-related and non-safety-related stock. Point Beach Nuclear Plant uses two procurement levels, QA-scope or non-QA-scope. QA-scope, as used in the attachments, applies to items (including fasteners) which may be used in safety-related applications, non-safety-related applications such as fire protection where select QA requirements apply, and for those applications where Wisconsin Electric elects to apply quality assurance program requirements. These items are controlled in accordance with the Wisconsin Electric nuclear quality assurance program as described in the Point Beach Nuclear Plant Final Safety Analysis Report. Conversely, non-QA-scope items are for general use within the plant, excluding those QA-scope applications as described above.

The following information is provided in response to the specific requests within Bulletin 87-02:

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1. a) All incoming fasteners are inspected at Point Beach Nuclear Plant upon receipt. For non-QA-scope fasteners, the inspection generally involves a visual examination for shipping damage, quantity, sizing, and any special requirements if specified within the purchase order. In general, no documentation or material testing is required.

For QA-scope fasteners, the receipt inspection process is controlled by approved inspection procedures. Inspection criteria are established for fasteners and generally include visual and dimensional examination. Additionally, documentation as specified in the purchase order (typically certificates of compliance for fasteners less than one inch in size and certified material test reports for one inch in size or greater) is reviewed. Visual examination includes inspection of physical characteristics such as thread galling, cracks or corrosion, and overall finish and appearance. When appropriate, per applicable material specifications, the grade and manufacturer's ID symbol are also verified. Fasteners may also be dimensionally inspected for length, diameter, thread parameters, and fit class requirements.

Storage and handling requirements, when necessary, are also included in the receipt inspection criteria. This may include protective coatings, special packaging or markings, or special handling necessary to prevent damage or deterioration.

- b) Fasteners at Point Beach Nuclear Plant are physically segregated in storage by size and type (material specification, grade, etc.) and are generally issued on a direct replacement basis. When a fastener from stock is required, the requestor provides information such as size, grade, and QA-scope classification to the storeroom stock handler. The stock handler then issues material consistent with these requirements.

For non-QA-scope items, material traceability is not maintained. QA-scope items are traceable to objective evidence of quality and receipt inspection results via a QA Release (QAR) number. Further, the QAR number is recorded on applicable modification requests, maintenance/work requests, or installation procedures to provide end use traceability.

2. Twenty samples of fasteners in storage at Point Beach Nuclear Plant were withdrawn for testing in accordance with the requirements of Bulletin 87-02. The samples were selected in an effort to obtain a cross section of manufacturers, size, and material types of interest (as listed in the bulletin). Since the Point Beach inventory of fasteners is limited, only ASTM A193 Grades B7 and B16 were tested. A total of ten QA-scope and ten non-QA-scope fasteners were tested. The sampling was witnessed by, and had the concurrence of, the NRC Senior Resident Inspector.
3. Samples of twenty nuts which would typically be used with the selected fasteners were also tested. Again, due to inventory limitations, the samples taken were limited to ASTM A194, Grades 4 and 2H. This sampling was also witnessed by, and had the concurrence of, the NRC Senior Resident Inspector.
4. The samples were provided to the Charles C. Kawin Company, a metallurgical laboratory, in Maywood, Illinois for testing. The Charles C. Kawin Company is included on the Point Beach Nuclear Plant Qualified Suppliers List for this type of service. Chemical testing was performed in accordance with ASTM A751, "Chemical Analysis of Steel Products," and mechanical testing to ASTM A370 (Supplement III), "Mechanical Testing of Steel Products." All results were compared to the applicable material specifications for each respective sample. All samples were identified with unique ID numbers to assure traceability.
5. Fastener data and results of testing are reported in the enclosures to this letter using the format as required by Bulletin 87-02. A total of four samples were found to be outside specification limits. Each "out of specification" condition has been documented and has been, or is being, resolved in accordance with non-conformance procedures. A summary of each non-conforming condition, our evaluation of safety significance, and completed or pending corrective action is presented below:
 - a. Samples PBNP - QAN1 and QAN3 - The carbon content of these nuts was reported as 0.01 weight percent below the material specification minimum for this element (inclusive of accepted tolerances for chemical content). This condition has been evaluated, and it was determined that this minor

variation would not adversely affect the item's physical properties and, thus, was not of significance. Accordingly, these items have been accepted as-is. Future products provided by the subject supplier will, however, be sampled and analyzed on a periodic basis.

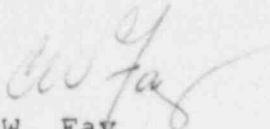
- b. Sample PBNP - QAF2 - Tensile strength and yield strength for these studs (multiple samples were taken to confirm results) were found to be an average of 2.3% and 5.1%, respectively, below minimum material specification limits. Since chemical properties were within specification limits, improper heat treatment is considered to be the cause. It was determined that three of the subject fasteners had been issued, although all three were used in non-QA applications. As such, no safety implications at Point Beach Nuclear Plant result; however, as part of the final resolution of this non-conformance, potential impact on non-QA equipment or systems will be reviewed. The remainder of the items in stock have been placed on hold and will be returned to the supplier or discarded. Future products provided by this supplier will also be sampled and tested on a periodic basis.
- c. Sample PBNP - F2 (Non-QA-Scope) - Chromium (Cr) and molybdenum (Mo) content for this sample (studs) were found to be 0.64 and 0.11 weight percent, respectively, below minimums as required by the material specification. In this case, the fasteners were identified as alloy steel; however, the material chemical properties are consistent with those for plain carbon steel. None of these fasteners have been issued. The fasteners will be returned to the vendor or discarded. Future products provided by this supplier will also be sampled and analyzed on a periodic basis.

- 6. Based on the results of this testing program, we concluded that additional monitoring of incoming QA-scope fasteners is appropriate. Periodic sampling and testing of these items on receipt is planned and will be implemented immediately.

NRC Document Control Desk
January 13, 1988
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Please contact us if you have any additional questions concerning this response.

Very truly yours,



C. W. Fay
Vice President
Nuclear Power

Enclosures

Copies to NRC Regional Administrator, Region III
NRC Resident Inspector

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF1

Fastener Description: Stud 1/4" - 20 X 3" Carbon Steel continuously threaded; Lot #901-9758 (supplied with two 2H nuts)

Description of Sample Stock Location: Location RSK9K2 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A-193 GR B-7

Head Marking (Specification and Manufacturer): VB7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope or non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications

Vendor: Victor Products
& Mfg. 2635 Belmont Avenue
Chicago, IL 60618

QA Requirements Imposed on Vendor: Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature  Date 4/12/83

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN1

Fastener Description: Nut - Hex Head 1/4" - 20
(Two supplied with stud - Lot #901-9758)

Description of Sample Stock Location: Location RSK9K2 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 GR. 2H
(ASA 194 GR.2H)

Head Marking (Specification and Manufacturer): X2H

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications

Vendor: Victor Products Mfg: Unknown
2635 Belmont Avenue
Chicago, IL 60618

QA Requirements Imposed on Vendor: Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF2

Fastener Description: Stud 9/16" - 12 X 5-3/4" carbon steel continuously threaded, Lot #902-2732

Description of Sample Stock Location: Location RS K9L7 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7
(ASME SA 193 GR B7)

Head Marking (Specification and Manufacturer): K B7


**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor: Certificate of Compliance, 10CFR21

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN2

Fastener Description: Nut - Heavy Hexagon 9/16" - 12
Lot #902-2741

Description of Sample Stock Location: Location RS K9L9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 GR.2H

Head Marking (Specification and Manufacturer): X2H

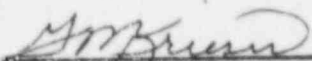
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope or non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering Mfg. Unknown
9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:
Certificate of Compliance, 10CFR21.

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF3

Fastener Description: Stud 3/4" - 10 X 5" carbon steel
Continuously threaded - Lot #902-4581

Description of Sample Stock Location: Location RSK9P6 - Main Storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): T B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope or non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

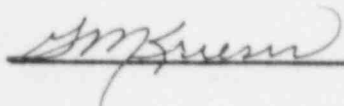
Vendor: Hardware Specialty Co., Inc.
4875 36th street
Long Island City, NY 11101

Mfg. Texas Bolt
3233 W. 11th Street
Houston, TX 77001

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, 10CFR21 and Certified Material Test Reports.

Licensee Representative: Gary M. Krieser

Signature



Date

1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN3

Fastener Description: Nut - Heavy Hexagon 3/4" - 10
Lot #901-7062

Description of Sample Stock Location: Location RSK9Q3 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): Δ 2H

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope or non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Cardinal Industries	Mfg. INFASCO
3873 W. Oquendo	700 Rue Quellette
Las Vegas, NV 89118	Marleville, Quebec, Canada

QA Requirements Imposed on Vendor: JOL 1JO
10CFR50 Appendix B, 10CFR21 and Certified Material Test Reports.

Licensee Representative: Gary M. Krieser

Signature Gary M. Krieser Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF4

Fastener Description: Stud 3/8" - 16 X 4" Carbon steel
Continuously threaded - Lot #901-9812

Description of Sample Stock Location: Location RSK9L4 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): K B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

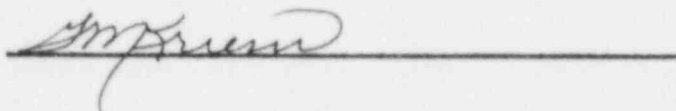
General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, Certificate of Compliance and Certified Material Test Reports.

Licensee Representative: Gary M. Krieser

Signature



Date

1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN4

Fastener Description: Nut - Heavy Hexagon 3/8" - 16
Lot #901-7038

Description of Sample Stock Location: Location RSK9L6 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): M2H

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

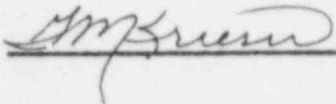
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
9226 W. Flagg Avenue
Milwaukee, WI 53225

Mfg. Marquette Bolt & Rivet Co.
8216-34 Brenhan Avenue
Chicago, IL 60617

QA Requirements Imposed on Vendor:
Certificate of Compliance, 10CFR21

Licensee Representative: Gary M. Krieser

Signature 

Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF5

Fastener Description: Stud 1/2" - 13 X 3" carbon steel
Continuously threaded - Lot #901-9821

Description of Sample Stock Location: Location RSK9M3 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): C B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

General plant use, QA scope which includes general safety related applications.

Vendor: Cardinal Industries
& Mfg. 3873 W. Oquendo
Las Vegas, NV 89118

QA Requirements Imposed on Vendor:

10CFR50 Appendix B, 10CFR21, Certificate of Compliance, and Certified Material Test Reports

Licensee Representative: Gary M. Krieser

Signature 

Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN5

Fastener Description: Nut - Heavy Hexagon 1/2 - 13
Lot #901-7046

Description of Sample Stock Location: Location RSK9M9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K 2HB

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

General plant use, QA scope which includes general safety related applications.

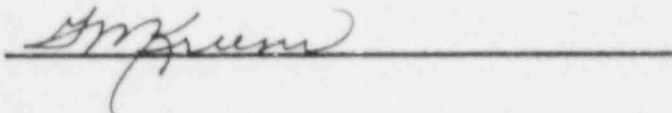
Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:

10CFR50 Appendix B, Certificate of Compliance and Certified Material Test Reports.

Licensee Representative: Gary M. Krieser

Signature



Date

1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF6

Fastener Description: Stud 3/8" - 16 X 4" Carbon steel

Continuously threaded - Lot #901-9812

(supplied with two 2H nuts)

Description of Sample Stock Location: Location RSK9L4 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): VB7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

General plant use, QA scope which includes general safety related applications.

Vendor: Victor Products

& Mfg. 2635 Belmont Avenue

Chicago, IL 60618

QA Requirements Imposed on Vendor:

Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature



Date

4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN6

Fastener Description: Nut 3/8" - 16 Hex head
(Two supplied with stud - Lot #901-9812)

Description of Sample Stock Location: Location RSK9L4 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): X2H

**Class/Procurement Level: The procurement classification system consists of two levels: QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Victor Products
2635 Belmont Avenue
Chicago, IL 60618

Mfg. - Unknown

QA Requirements Imposed on Vendor:
Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature 

Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF7

Fastener Description: Stud 1/2" - 13 X 3" carbon steel
Continuously threaded - Lot #901-9821

Description of Sample Stock Location: Location RSK9L4 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): KB7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, and Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN7

Fastener Description: Nut - Heavy Hexagon 1/2" - 13
Lot #901-7046

Description of Sample Stock Location: Location RSK9M9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K ARL 2HB

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

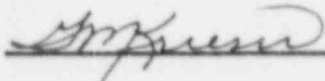
General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, 10CFR21, Certificate of Compliance and Certified Material Test Reports

Licensee Representative: G. M. Krieser

Signature



Date

4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF8

Fastener Description: Stud 1/4" - 20 X 2" carbon steel
Continuously threaded - Lot #901-9766
(supplied with two 2H nuts)

Description of Sample Stock Location: Location RSK9K1 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): VB7

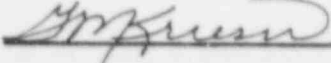
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Victor Products
& Mfg. 2635 Belmont Avenue
Chicago, IL 60618

QA Requirements Imposed on Vendor:
Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature  Date 4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN8

Fastener Description: Nut - Hex Head 1/4" - 20
(two supplied with stud - Lot #901-9766)

Description of Sample Stock Location: Location RSK9K1 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H
(ASA 194 Gr. 2H)

Head Marking (Specification and Manufacturer): X2H

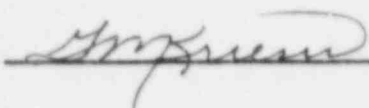
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Victor Products Mfg. Unknown
2635 Belmont Avenue
Chicago, IL 60618

QA Requirements Imposed on Vendor:
Certificate of Compliance

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNF - QAF9

Fastener Description: Stud 1/2" -13 X 3-1/2" carbon steel
Continuously threaded. Lot #902-0454

Description of Sample Stock Location: Location RSK9M7 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): JB7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

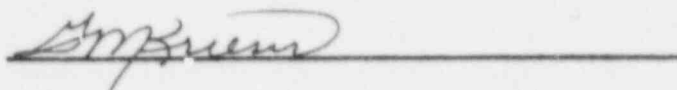
Vendor: Hardware Specialty Co., Inc.
4875 36th Street
Long Island City, NY 11101

Mfg. B&G Mfg., Inc.
3067T Unionville Pike
Hatfield, PA 19440

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, 10CFR21, and Certified Material Test Reports

Licensee Representative: Gary M. Krieser

Signature



Date

4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN9

Fastener Description: Nut - Heavy Hexagon 1/2" - 13
Lot #901-7046

Description of Sample Stock Location: Location RSK9M9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K 2HB

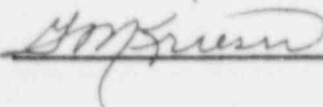
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, Certificate of Compliance, 10CFR21 and Certified Material Test Reports

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAF10

Fastener Description: Stud 5/8" - 11 X 3-1/2" carbon steel
Continuously threaded. Lot #901-9855.

Description of Sample Stock Location: Location RSK9N4 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): WWW KB7

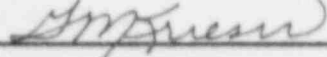
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:
10CFR50 Appendix B, Certificate of Compliance, 10CFR21 and Certified
Material Test Reports

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - QAN10

Fastener Description: Nut - Heavy Hexagon 5/8" - 11
Lot #901-7054

Description of Sample Stock Location: Location RSK9S9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): Δ 2H


****Class/Procurement Level:** The procurement classification system consists of two levels; QA scope and non-QA scope. This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use, QA scope which includes general safety related applications.

Vendor: Cardinal Industries Mfg. INFOCO
3873 W. Oquendo 700 Rue Quellette
Las Vegas, NV 89118 Marleville, Quebec, Canada

QA Requirements Imposed on Vendor: JOL IJO
10CFR50 Appendix B, Certificate of Compliance, 10CFR21 and Certified
Material Test Reports

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F1

Fastener Description: Stud 1-1/2" - 8 X 18"
Continuously threaded. Lot #914-4021

Description of Sample Stock Location: Location 3FQ7B7 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B16

Head Marking (Specification and Manufacturer): JB 16

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

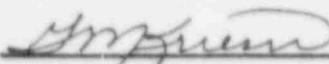
General Plant Application (e.g., Pressure Boundary, Structural)
Low pressure turbine rotor supports

Vendor: Endries Fasteners
12500 W. Silver Spring Dr.
Butler, WI 53007

Mfg. B&G Mfg., Inc.
3067T Unionville Pke
Hatfield, PA 19440

QA Requirements Imposed on Vendor: None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N1

Fastener Description: Nut - Heavy Hex 1-1/2" - 8 (Class 2B)
Lot #914-0328

Description of Sample Stock Location: Location 3FP9F5 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 4

Head Marking (Specification and Manufacturer): T4

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Low pressure turbine rotor jacks

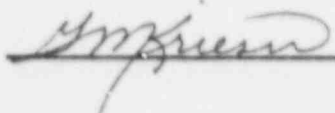
Vendor: Kilbourn Engineering
9226 W. Flagg Avenue
Milwaukee, WI 53225

Mfg. Texas Bolt
3233 W. 11th Street
Houston, TX 77001

QA Requirements Imposed on Vendor: None

Licensee Representative: Gary M. Krieser

Signature



Date

1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Fastener Testing Data Sheet

*Sample ID# PBNP - F2

Fastener Description: Bolt - Heavy Hex Head 7/16" - 14 X 4-3/4"
Lot #904-6300

Description of Sample Stock Location: Location RSM2H7 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): B7

**Class/Procurement Level: The procurement classification system consists of two levels: QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

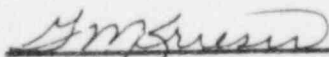
Sight glass holders

Vendor: Endries Fasteners
12500 W. Silver Spring
Butler, WI 53007

Mfg. Forest City Bolt Co.
6100 Material Avenue
Rockford, IL 61111

QA Requirements Imposed on Vendor:
None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N2

Fastener Description: Nut 7/16" - 14 (galvanized)
Lot #914-4625

Description of Sample Stock Location: Location RSM2H9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 GR. 2H

Head Marking (Specification and Manufacturer): S 2H

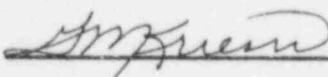
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
General plant use only (non-QA and non-safety related applications)

Vendor: Endries Fasteners Mfg. Unknown
Highway 10 West
Brillion, WI 54110

QA Requirements Imposed on Vendor: None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F3

Fastener Description: Bolt 7/16"-14 X 4-3/4" (galvanized)
Lot #914-4617

Description of Sample Stock Location: Location RSM2H9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A193 GR. B7

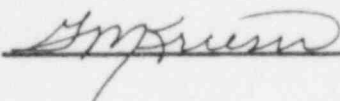
Head Marking (Specification and Manufacturer): B/S B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Main steam reheater sight glasses

Vendor: Endries Fasteners	Mfg. Big Bolt Corp.
Highway 10 West	235 Williams Street
Brillion, WI 54110	Bensenville, IL 60106
QA Requirements Imposed on Vendor: None	

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N3

Fastener Description: Nut - hex head (galvanized) 7/16"-14
Lot #914-4625

Description of Sample Stock Location: Location RSM2H9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 GR. 2H

Head Marking (Specification and Manufacturer): S 2H

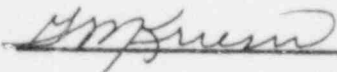
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Main steam reheater sight glasses

Vendor: Endries Fasteners
Highway 10 West
Brillion, WI 54110
Mfg. Unknown

QA Requirements Imposed on Vendor: None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F4

Fastener Description: Bolt - Heavy Hex Head 1/2"-13 X 1-1/8"
Lot #914-7004

Description of Sample Stock Location: Location 3FQ9L3 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): TB B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

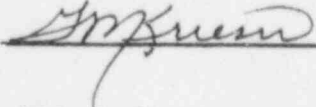
General Plant Application (e.g., Pressure Boundary, Structural)
Turbine bolting

Vendor: Endries Fasteners
Highway 10 West
Brillion, WI 54110

Mfg. Big Bolt Corp.
235 Williams Street
Bensenville, IL 60106

QA Requirements Imposed on Vendor: None

Licensee Representative: Gary M. Krieser

Signature 

Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N4

Fastener Description: Nut - Heavy Hexagon 1/2" - 13
Lot #901-7046

Description of Sample Stock Location: Location RSK9M9 - main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K 2HB

Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. *This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

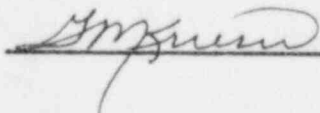
***General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor: 10CFR50 Appendix B, Certificate of Compliance, and Certified Material Test Reports

Licensee Representative: Gary M. Krieser

Signature



Date

4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

***To limit inventory, this nut is purchased at the highest procurement level and is utilized in QA and non-QA applications.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F5

Fastener Description: Stud 3/4"-10 X 4-1/4"
Continuously threaded. Lot #914-6725

Description of Sample Stock Location: Location 3MG9F3 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): J B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Feedwater Heaters

Vendor: American Bolt
2160 S. Calhoun
New Berlin, WI 53151

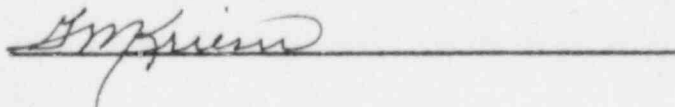
Mfg.

FASMAC
5150 S. 100 East Avenue
Tulsa, OK 74146

QA Requirements Imposed on Vendor: None

Licensee Representative: Gary M. Krieser

Signature



Date

1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N5

Fastener Description: Nut Heavy Hex 3/4" - 10 (Class 2B)
Lot #914-6733

Description of Sample Stock Location: Location 3MG9F5 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): Δ 2H

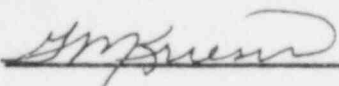
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Feedwater heaters

Vendor: American Bolt	Mfg. Industrial Fastener Corp.
2160 S. Calhoun	7 Harbor Drive N
New Berlin, WI 53151	Roslyn Industrial Park

QA Requirements imposed on Vendor:	Port Washington, NY 11050
None	

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F6

Fastener Description: Bolt - Heavy Hex Head 1/2" - 13 X 5/8"
Lot #914-6989

Description of Sample Stock Location: Location 3F Q9L1 - Warehouse #3

Material Specification as Documented by Licensee Records:

ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): TB B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

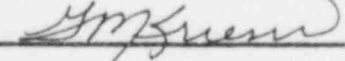
General Plant Application (e.g., Pressure Boundary, Structural)

Turbine

Vendor:	Endries Fasteners	<u>Mfg.</u>	Big Bolt Corporation
	Highway 10 West		235 Williams Street
	Brillion, WI 54110		Bensenville, IL 60106

QA Requirements Imposed on Vendor:
None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N6

Fastener Description: Nut - Heavy Hexagon 1/2" - 13
Lot #901-7046

Description of Sample Stock Location: Location RSK9M9 - Main storeroom

Material Specification as Documented by Licensee Records:

ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K2HB

Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. * This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

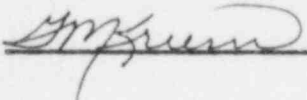
*** General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:

***10CFR50 Appendix B, Certificate of Compliance, and Certified Material Test Reports

Licensee Representative: Gary M. Krieser

Signature 

Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

*** To limit inventory, this nut is purchased at the highest procurement level and is utilized in QA and non-QA applications.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F7

Fastener Description: Bolt Heavy Hex Head 3/4" - 10 X 2"
Lot #914-6997

Description of Sample Stock Location: Location 3FQ9L1 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): JB7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

Turbine

Vendor: Endries Fasteners
Highway 10 West
Brillion, WI 54110

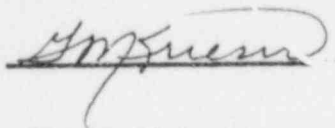
Mfg.

B&G Manufacturing, Inc.
3067T Unionville Pke
Hatfield, PA 19440

QA Requirements Imposed on Vendor:
None

Licensee Representative: Gary M. Krieser

Signature



Date

1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N7

Fastener Description: Nut Heavy Hex 3/4" - 10 (Class 2B)
Lot #914-6733

Description of Sample Stock Location: Location 3MG9F5 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): Δ 2H

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Feedwater Heaters

Vendor:	American Bolt	Mfg.	Industrial Fastener Corp.
	2160 S. Calhoun		7 Harbor Drive N
	New Berlin, WI 53151		Roslyn Industrial Park
QA Requirements Imposed on Vendor:			Port Washington, NY 11050

None

Licensee Representative: Gary M. Krieser

Signature  Date 4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F8

Fastener Description: Bolt - Heavy Hex Head 1/2" - 13 X 1-1/4"
Lot #914-6962

Description of Sample Stock Location: Location 3MGO - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): TB B7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Feedwater Heaters

Vendor: Endries Fasteners	Mfg.	Big Bolt Corporation
Highway 10 West		235 Williams St.
Brillion, WI 54110		Bensenville, IL 60106

QA Requirements Imposed on Vendor:
None

Licensee Representative: Gary M. Krieser

Signature  Date 4/2/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N8

Fastener Description: Nut - Heavy Hexagon 1/2" - 13
Lot #901-7046

Description of Sample Stock Location: Location RS K9M9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K 2HB

Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. *This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

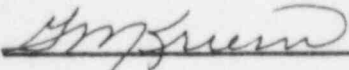
***General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor?

10CFR50 Appendix B, Certificate of Compliance, and Certified Material Test Reports

Licensee Representative: G. M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

***To limit inventory, this nut is purchased at the highest procurement level and is utilized for QA and non-QA applications.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F9

Fastener Description: Bolt - Heavy Hex 1/2" - 13 X 1-1/2"
Lot #914-6741

Description of Sample Stock Location: Location 3MG9F4 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): JB7

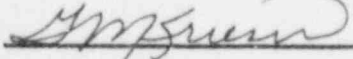
**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Feedwater Heaters

Vendor: American Bolt	Mfg. FASMAC
2130 S. Calhoun	5150 S. 100 East Avenue
New Berlin, WI 53151	Tulsa, OK 74146

QA Requirements Imposed on Vendor:
None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - N9

Fastener Description: Nut - Heavy Hexagon 1/2" - 13
Lot #901-7046

Description of Sample Stock Location: Location RS K9M9 - Main storeroom

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): K 2HB

Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. *This part is QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

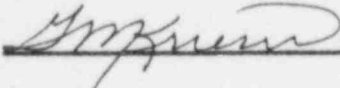
***General plant use, QA scope which includes general safety related applications.

Vendor: Kilbourn Engineering
& Mfg. 9226 W. Flagg Avenue
Milwaukee, WI 53225

QA Requirements Imposed on Vendor:

*** 10CFR50 Appendix B, Certificate of Compliance and Certified Material Test Reports.

Licensee Representative: Gary M. Krieser

Signature 

Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

*** To limit inventory, this nut is purchased at the highest procurement level and utilized for QA and non-QA applications.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP - F10

Fastener Description: Stud 1-3/8" - 8 X 7-1/4"
Continuously threaded. Lot #914-6695

Description of Sample Stock Location: Location 3MG9E1 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A193 Gr. B7

Head Marking (Specification and Manufacturer): OB7

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)
Feedwater Heaters

Vendor: American Bolt	<u>Mfg.</u> FASMAC
2160 S. Calhoun	5150 S. 100 East Avenue
New Berlin, WI 53151	Tulsa, OK 74146

QA Requirements Imposed on Vendor:

None

Licensee Representative: Gary M. Krieser

Signature  Date 1/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 1

Fastener Testing Data Sheet

*Sample ID# PBNP -- N10

Fastener Description: Nut - Heavy Hex 1-3/8" - 8
Lot #914-6709

Description of Sample Stock Location: Location 3MG9F2 - Warehouse #3

Material Specification as Documented by Licensee Records: ASTM A194 Gr. 2H

Head Marking (Specification and Manufacturer): JS 2H

**Class/Procurement Level: The procurement classification system consists of two levels; QA scope and non-QA scope. This part is non-QA scope.

General Plant Application (e.g., Pressure Boundary, Structural)

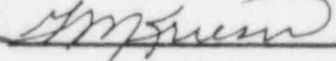
Feedwater Heaters

Vendor: American Bolt	Mfg. FASMAC
2160 S. Calhoun	5150 S. 100 East Avenue
New Berlin, WI 53151	Tulsa, OK 74146

QA Requirements Imposed on Vendor:

None

Licensee Representative: Gary M. Krieser

Signature  Date 4/12/88

*The sample ID# shall have a prefix that contains the licensee facility initials.

**If applicable, please provide an explanation for your classification system.

Attachment 2

Data Summary

ID#	<u>Mechanical Analysis</u>			<u>Chemical Analysis</u> ¹						
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-QAF1	-	145,025	112,085	0.44	0.91	0.017	0.017	0.23	0.23	0.96
PBNP-QAF2	-	*122,100	*100,130	0.40	0.88	0.012	0.010	0.25	0.23	1.01
PBNP-QAF3	-	151,330	137,525	0.44	0.91	0.015	0.020	0.22	0.23	1.00
PBNP-QAF4	-	147,755	134,520	0.41	0.90	0.014	0.023	0.24	0.16	1.02
PBNP-QAF5	-	129,485	124,345	0.40	0.84	0.017	0.015	0.25	0.13	0.85

UNITS: Chemical - Weight Percent
 Hardness - Rockwell "C" scale
 Ultimate tensile strength - PSI
 0.2% Yield strength - PSI

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

¹The elements listed apply to ASTM A193 B7 or SA193 P7 material. The elements to be reported for other materials tested, shall conform to those reported in the applicable material specification. Properties found out of specification shall be noted with an asterisk.

Attachment 2

Data Summary

ID#	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-QAF6	-	141,875	129,750	0.42	0.88	0.013	0.024	0.27	0.22	0.97
PBNP-QAF7	-	145,295	124,975	0.40	0.87	0.015	0.022	0.23	0.15	1.01
PBNP-QAF8	-	156,640	119,590	0.38	0.85	0.015	0.016	0.29	0.21	0.88
PBNP-QAF9	-	135,390	125,570	0.40	0.82	0.017	0.025	0.22	0.16	0.84
PBNP-QAF10	-	143,440	131,225	0.40	0.90	0.015	0.023	0.23	0.17	1.05

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

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Data Summary

<u>ID#</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-QAN1	34/35/34	-	-	*0.36	-	0.017	0.018	-	-	-
PBNP-QAN2	35/36/36	-	-	0.43	-	0.013	0.027	-	-	-
PBNP-QAN3	31/30/30	-	-	0.43	-	0.014	0.011	-	-	-
PBNP-QAN4	30/30/30	-	-	0.43	-	0.024	0.019	-	-	-
PBNP-QAN5	28/28/27	-	-	0.48	-	0.016	0.027	-	-	-

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

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Data Summary

<u>ID#</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-QAN6	33/32/33	-	-	0.42	-	0.017	0.021	-	-	-
PBNP-QAN7	30/29/30	-	-	0.49	-	0.012	0.028	-	-	-
PBNP-QAN8	27/27/26	-	-	*0.36	-	0.015	0.018	-	-	-
PBNP-QAN9	27/28/28	-	-	0.49	-	0.013	0.028	-	-	-
PBNP-QAN10	32/31/32	-	-	0.43	-	0.023	0.015	-	-	-

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

¹The elements listed apply to ASTM A193 B7 or SA193 B7 material. The elements to be reported for other materials tested, shall conform to those reported in the applicable material specification. Properties found out of specification shall be noted with an asterisk.

Attachment 2

Data Summary

<u>ID#</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u> <u>V</u>
PBNP-F1	30/31/30	-	-	0.42	0.52	0.019	0.015	0.26	0.54	0.85 0.26
PBNP-F2	25/24/25	-	-	0.37	0.78	0.017	0.020	0.21	*0.02	*0.06 -
PBNP-F3	28/28/27	-	-	0.42	0.87	0.018	0.011	0.25	0.20	0.96 -
PBNP-F4	30/31/31	-	-	0.38	0.85	0.019	0.012	0.31	0.16	0.90 -
PBNP-F5	29/30/30	-	-	0.46	0.92	0.025	0.014	0.28	0.17	0.90 -

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

¹The elements listed apply to ASTM A193 B7 or SA193 B7 material. The elements to be reported for other materials tested, shall conform to those reported in the applicable material specification. Properties found out of specification shall be noted with an asterisk.

Attachment 2

Data Summary

<u>ID#</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-F6	33/34/34	-	-	0.38	0.83	0.019	0.012	0.30	0.15	0.87
PBNP-F7	29/30/30	-	-	0.41	0.95	0.017	0.010	0.25	0.16	1.00
PBNP-F8	32/33/32	-	-	0.35	0.84	0.035	0.020	0.28	0.19	0.91
PBNP-F9	29/29/28	-	-	0.41	0.84	0.017	0.010	0.22	0.19	0.90
PBNP-F10	29/29/30	-	-	0.43	0.82	0.017	0.015	0.21	0.20	0.97

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

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Attachment 2

Data Summary

ID#	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNT-N1	34/35/34	-	-	0.47	0.80	0.010	0.026	0.25	0.22	-
PBNP-N2	30/30/31	-	-	0.43	-	0.012	0.032	-	-	-
PBNP-N3	26/26/25	-	-	0.44	-	0.015	0.011	-	-	-
PBNP-N4	27/27/27	-	-	0.49	-	0.007	0.029	-	-	-
PBNP-N5	34/35/34	-	-	0.44	-	0.015	0.013	-	-	-

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

¹The elements listed apply to ASTM A193 B7 or SA193 B7 material. The elements to be reported for other materials tested, shall conform to those reported in the applicable material specification. Properties found out of specification shall be noted with an asterisk.

Attachment 2

Data Summary

<u>ID#</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-N6	26/27/26	-	-	0.49	-	0.011	0.028	-	-	-
PBNP-N7	29/30/30	-	-	0.43	-	0.014	0.011	-	-	-
PBNP-N8	27/27/27	-	-	0.48	-	0.009	0.028	-	-	-
PBNP-N9	27/27/27	-	-	0.48	-	0.007	0.029	-	-	-
PBNP-N10	25/26/25	-	-	0.41	-	0.019	0.034	-	-	-

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

¹The elements listed apply to ASTM A193 B7 or SA193 B7 material. The elements to be reported for other materials tested, shall conform to those reported in the applicable material specification. Properties found out of specification shall be noted with an asterisk.

Attachment 2

Data Summary

<u>ID#</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> ¹							
	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
PBNP-QAF2-1	-	133,340	111,370	0.39	0.89	0.009	0.010	0.23	0.20	1.00
PBNP-QAF2-2	-	*124,730	*101,860	0.41	0.87	0.005	0.012	0.23	0.22	0.99
PBNP-QAF2-3	-	*123,120	*99,620	0.43	0.89	0.002	0.013	0.23	0.20	0.99
PBNP-QAF2-4	-	130,835	111,135	0.40	0.88	0.003	0.011	0.22	0.20	0.99
PBNP-QAF2-5	-	126,400	*102,765	0.40	0.89	0.002	0.011	0.23	0.21	1.00

Note: Multiple samples of these studs were taken to confirm results. (The average of these results are identified on page 1 of this attachment.)

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

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