



**Public Service
Company of Colorado**

P.O. Box 840
Denver, CO 80201-0840

January 28, 1988
Fort St. Vrain
Unit No. 1
P-88029

R.O. WILLIAMS, JR.
VICE PRESIDENT
NUCLEAR OPERATIONS

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Docket No. 50-267

SUBJECT: NRC Compliance Bulletin
87-02 Response

REFERENCE: NRC Compliance Bulletin
87-02 (G-87399), dated
November 6, 1987

Gentlemen:

In accordance with NRC Compliance Bulletin 87-02, Public Service Company of Colorado (PSC) provides the following response for the Fort St. Vrain (FSV) Nuclear Generating Station. Due to nonconforming conditions identified, an extension of the time period required for reporting was requested and approved by the Chief, Projects Section B, NRC Region IV.

NRC Item 1:

Describe a) the characteristics currently examined during receipt inspection of fasteners (i.e., head markings for grade and manufacturer symbols, review of certified material test report or certificate of conformance), and b) internal controls utilized during storage and issuance from stock to assure the appropriate use of fasteners.

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PSC Response:

- a. Current receipt inspection requirements are set forth in procedures ENG-16, MRIM-1, and Q-4 for all safety-related and, as required, non-safety-related fastener purchase orders. It should be noted that PSC does not currently purchase non-safety-related fasteners for stocking purposes but instead for specific applications only. Characteristics examined by QC receipt inspection for safety-related fasteners are designated by the purchase order and normally include dimensional verification, documentation review, and other requirements applicable to the referenced ANSI, SAE, or ASTM specification, such as markings or hardness. Non-safety-related fasteners are receipt inspected by QC personnel if requested.
- b. Internal controls for storage and issuance of fasteners are delineated in procedure P-5. Tags are used to identify and segregate materials in the warehouse. Direct charge requisitions (DCR) are utilized to assure traceability for materials issued from the warehouse for use. These DCRs reflect the work order (if applicable, or the location of work, or the use of the material), or station service request (SSR) number, and any other pertinent designators and are verified in the field by QC inspectors for the particular installation.

NRC Items 2-5:

2. Select a minimum sample of ten (10) non-safety related fasteners (studs, bolts, and/or cap screws), and ten (10) safety-related fasteners (studs, bolts, and/or cap screws) from current, in use, stock. The sample is to be obtained by the licensee with the participation of an NRC inspector. Fasteners procured to meet the following chemical and mechanical properties are of interest: A-193 grades B7, B8, and B16; SAE J429 grades 5 and 8; A-449; A-325 Types 1, 2 or 3; A-354 grades BB, BC, BD; A-490; A-320 LTM; A-307; A-563; or equivalent.
3. For the selected sample of fasteners in item 2, include a sample of typical nuts that would be used with each fastener (one-for-one). In particular, nuts purchased to the chemical and mechanical specifications of A-194 are of interest.
4. Chemical testing shall be performed on all samples. Mechanical testing shall be performed on each safety-related fastener. Hardness testing shall be performed by a laboratory which the licensee has qualified for this type of testing and appears on the licensee's approved vendor list. Testing performed shall be done in accordance with the requirements of the fastener's specification, grade, and class, and the test shall evaluate the ultimate tensile strength, hardness and chemical properties as required by the fastener's specification, grade, and class. Each sample shall be tagged with the sample's ID number.

5. The results of all tests, together with supporting information, are to be reported to the NRC utilizing the format shown in Attachments 1 and 2 of this bulletin. Include the names and addresses of suppliers and manufacturers of safety-related fasteners and, to the extent possible, of non-safety-related fasteners. For any fastener found out of specification, provide an evaluation of the safety significance including consideration of the most limiting application.

PSC Response:

Sample and test information required by Items 2-5 is represented in Attachments 1 (safety-related fastener and nut data sheets), 2 (safety-related fastener and nut test data), 3 (non-safety-related fastener and nut data sheets), and 4 (non-safety-related fastener and nut test data). Samples were chosen with the assistance of the NRC Resident Inspector and were tested by Coffey Laboratories, Inc., a PSC-approved vendor.

All safety-related samples met the required specifications with the following clarification: sample S20SR did not meet the thread number required by ASTM A354 Gr. BD, with 16 threads per inch (10 specified), and was documented on Nonconformance Report 88-009. Upon further investigation, it was found that ANSI B18.2.1 was also specified in the purchase order, which allows alternate thread numbers while still meeting testing requirements of ASTM A354 Gr. BD. Therefore, Nonconformance Report 88-009 was dispositioned "use-as-is" with no further evaluation required. Also, sample S12SR was not able to be tensile tested due to the size and shape of the head, i.e., the fastener was not long enough to be machined and the standard tensile machine fixtures/attachments are not compatible with this head shape. Sample S12SR was from the same manufacturer and purchase order number as sample S11SR (also ASTM A193 Gr. B8M), which met all requirements. The chemical analysis for sample S12SR was satisfactory, and hardness testing was performed with an approximate tensile strength value obtained that met specification requirements.

Non-safety-related fasteners were tested and then evaluated to the most applicable specification that they represented due to the limited traceability of non-safety-related fasteners. Nonconformance Report 88-011 was issued because sample S6N was marked as representing ASTM F593, alloy 304, but chemical analysis revealed that it was actually alloy 305. The manufacturer is unknown; Nonconformance Report 88-011 was dispositioned "use-as-is" because the mechanical properties are the same for these alloys, according to ASTM F593, and they will be used for non-safety-related applications only.

January 28, 1988

NRC Item 6:

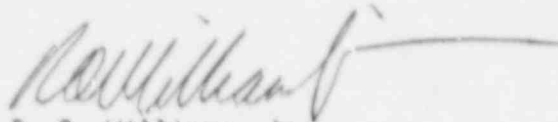
Based on the results of the testing and review of current procedures, describe any further actions being taken to assure that fasteners used in the plant meet the requisite specifications and requirements and that the operability of safety-related plant components is not affected.

PSC Response:

Based on the testing results and review of current procedures, PSC has determined that no further actions are necessary.

If there are any questions, please contact Mr. M. H. Holmes at (303) 480-6960.

Very truly yours,



R. O. Williams, Jr.
Vice President,
Nuclear Operations

ROW/wMD/lmb

Attachments

cc: Regional Administrator, Region IV
ATTN: Mr. T. F. Westerman, Chief
Projects Section B

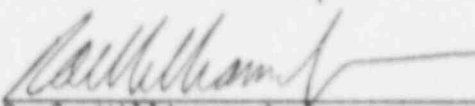
Mr. Robert Farrell
Senior Resident Inspector
Fort St. Vrain

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter)
)
Public Service Company of Colorado) Docket No. 50-267
Fort St. Vrain Unit No. 1)

AFFIDAVIT


R. O. Williams, Jr., being first duly sworn, deposes and says:
That he is Vice President, Nuclear Operations, of Public Service
Company of Colorado, the Licensee herein, that he has read the
foregoing information and knows the contents thereof, and that the
statements and matters set forth therein are true and correct to the
best of his knowledge, information and belief.



R. O. Williams, Jr.
Vice President
Nuclear Operations

STATE OF Colorado)
COUNTY OF Denver)

Subscribed and sworn to before me, a Notary Public on this
28th day of January, 1988.



Notary Public
2930 Palamath Circle
Thornton

My commission expires Aug 22, 1989.

ATTACHMENT 1

P-88029

Fastener Testing Data Sheet

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*Sample ID Number: FSV S11ASR (PO# N-7806)

Fastener Description: NUT (HEX) 5/8 - UNC

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712965)

Material Specification as Documented by Licensee Records:
ASTM A 563 GR B

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: C OF C TO SELLERS ASME NUCLEAR
CERTIFICATE OF AUTHORIZATION. MARKING OR C OF C TO MATERIAL SPEC.

Licensee Representative:

Signature Bert S. Bellon Date 1/20/88

Fastener Testing Data Sheet

.....

*Sample ID Number: FSV S12ASR (PO# N-7887A)

Fastener Description: NUT (HEX) 1 1/8 - 7

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711827)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS TO ASTM A 194 GR 2H. C OF C TO ASTM A 194 GR 2H. C OF C
TO SELLERS NUCLEAR CERTIFICATE OF AUTHORIZATION.

Licensee Representative:

Signature Bret Schell Date 1/19/88

Fastener Testing Data Sheet

.....

*Sample ID Number: FSV S13ASR (PO# N-7806)

Fastener Description: NUT (HEX) 1/4 - UNC

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712961)

Material Specification as Documented by Licensee Records:
ASTM A 563 GR B

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: C OF C TO SELLERS ASME NUCLEAR
CERTIFICATE OF AUTHORIZATION. MARKING OR C OF C TO MATERIAL SPEC.

Licensee Representative:

Signature Bret Schella Date 1/28/88

Fastener Testing Data Sheet



*Sample ID Number: FSV S14ASR (PO# N-2530A)

Fastener Description: NUT (HEX) 1/2 - 13

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712906)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: B & G MFG., CO.
3067 UNIONVILLE PIKE
HATFIELD, PA 19440

QA Requirements Imposed on Vendor: C OF C TO APPLICABLE MATERIAL SPEC.

Licensee Representative:

Signature Bret Shelton Date 1 / 19 / 88

Fastener Testing Data Sheet

*Sample ID Number: FSV S15ASR (PON N-7048A)

Fastener Description: NUT (HEX) 1 - 8

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712910)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

Manufacturer: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

QA Requirements Imposed on Vendor: C OF C TO SELLERS NUCLEAR
CERTIFICATE OF AUTHORIZATION (QSC-485 OR QSC-486). C OF C TO
MATERIAL SPECIFICATION. ACTUAL CHEMICAL AND PHYSICAL TEST REPORTS
TO APPLICABLE MATERIAL SPECIFICATIONS.

Licensee Representative:

Signature Bret Shelton Date 1/19/88

Fastener Testing Data Sheet

.....
*Sample ID Number: FSV S16ASR (PO# N-2530A)

Fastener Description: NUT (HEX) 7/16 - 14

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712905)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundary, Structural):
PRESSURE BOUNDARY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: C OF C TO APPLICABLE MATERIAL
SPEC.

Licensee Representative:

Signature Bret Shelton Date 1/19/08

Fastener Testing Data Sheet

Attachment 1
P-88029
Page 7 of 20

*Sample ID Number: FSV S17ASR (PO# N-7806)

Fastener Description: NUT (HEX) 5/8 - UNC

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712963)

Material Specification as Documented by Licensee Records:
ASTM A 563 GR B

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundary, Structural):
PRESSURE BOUNDARY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: C OF C TO SELLERS ASME NUCLEAR
CERTIFICATE OF AUTHORIZATION. MARKING OR C OF C TO MATERIAL SPEC.

Licensee Representative:

Signature Bret S. Bellon Date 1/28/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S18ASR (PO# N-2379)

Fastener Description: NUT (HEX) 7/8 - 9

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712909)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundary, Structural):
PRESSURE BOUNDARY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS TO ASTM A 194 GR 2H-83. C OF C TO SELLERS NUCLEAR
CERTIFICATE OF AUTHORIZATION. C OF C TO ASTM A 194 GR 2H.

Licensee Representative:

Signature Bret Schellum Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S19ASR (PO# N-7584)

Fastener Description: NUT (HEX) 5/8 - 11

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711855)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 8M

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS TO ASTM A 194 GR 8M. C OF C TO SELLERS NUCLEAR
CERTIFICATE OF AUTHORIZATION.

Licensee Representative:

Signature Bret S. Shelton Date 1/19/88

Fastener Testing Data Sheet

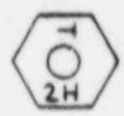
*Sample ID Number: FSV S20ASR (PO# N-7887A)

Fastener Description: NUT (HEX) 3/4 - 10

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711826)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: TEXAS BOLT
3233 WEST 11TH STREET P.O. BOX 1211
HOUSTON, TX 77001

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS TO ASTM A 194 GR 2H. C OF C TO ASTM A 194 GR 2H. C OF C
TO SELLERS NUCLEAR CERTIFICATE OF AUTHORIZATION.

Licensee Representative:

Signature Bret Schellon Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S11SR (PO# N-7478)

Fastener Description: CAP SCREW (HEX) 5/8 - 11 X 3 1/4

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711589)

Material Specification as Documented by Licensee Records:
ASTM A 193 GR B8M

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS. C OF C TO SELLERS ASME NUCLEAR CERTIFICATE OF AUTHORIZAT-
ION. C OF C TO ANSI B 18.2.1. C OF C TO ASTM A 193-85 GR B8M
(316 SST).

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S12SR (PO# N-7478)

Fastener Description: SOCKET HEAD CAP SCREW 1/4 - 28 X 1 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711595)

Material Specification as Documented by Licensee Records:
ASTM A 193 GR B8M

Head Marking (Specification and Manufacturer): NO AVAILABLE AREA
FOR MARKING.

**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: A & G ENGINEERING CO.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS. C OF C TO SELLERS ASME NUCLEAR CERTIFICATE OF AUTHORIZAT-
ION. C OF C TO ASME B 18.3.

Licensee Representative:

Signature Bret S. Shelton Date 1 / 28 / 88

Fastener Testing Data Sheet

*Sample ID Number: FSV S13SR (PO# N-7569A)

Fastener Description: CAP SCREW (HEX) 1/4 - UNC X 4

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712073)

Material Specification as Documented by Licensee Records:
ASTM A 354 GR B0

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

Manufacturer: LAKE ERIE SCREW CORP.
13001 ATHENS AVE.
LAKEWOOD, OH 44107

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS. C OF C TO SELLERS QA MANUAL, REV. 0, DATED 9/15/86.

Licensee Representative:

Signature Bret S. Hollman Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S14SR (PO# N-8070A)

Fastener Description: CAP SCREW (HEX) 1/2 - 13 X 2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712165)

Material Specification as Documented by Licensee Records:
ASTM A 354 GR BD

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OGUENDO
LAS VEGAS, NV 89118

Manufacturer: LAKE ERIE SCREW CORP.
13001 ATHENS AVE.
LAKEWOOD, OH 44107

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS. C OF C TO SELLERS QA MANUAL REV. 1, DATED 12/15/86.

Licensee Representative:

Signature Bret Schallhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S15SR (PO# N-7873)

Fastener Description: STUD BOLT 1 - 8 X 5 11/16

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712750)

Material Specification as Documented by Licensee Records:
ASTM A 193 GR B7

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

Manufacturer: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS. C OF C TO SELLERS QA MANUAL REV. 1, DATED 12/15/86.

Licensee Representative:

Signature Bret S. Bellhorn Date 1 / 19 / 88

Fastener Testing Data Sheet

*Sample ID Number: FSV S16SR (PO# N-7704B)

Fastener Description: CAP SCREW (HEX) 7/16 - 20 X 3

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711694)

Material Specification as Documented by Licensee Records:
ASTM A 193 GR B8

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

Manufacturer: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS TO ASTM A 193 GR B8. MANUFACTURERS C OF C TO PO SPECIFIED
REQUIREMENTS. C OF C TO SELLERS QA MANUAL REV. 0, DATED 9/15/86.
VISUAL INSPECTION REPORT.

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S17SR (PO# N-7072A)

Fastener Description: STUD FLG. 5/8 - 11 X 2 3/4

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1712719)

Material Specification as Documented by Licensee Records:
ASTM A 193 GR B7

Head Marking (Specification and Manufacturer): (B7)
C

**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: VINSON SUPPLY
3855 LIMA STREET P.O. BOX 1349
DENVER, CO 80201

Manufacturer: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OQUENDO
LAS VEGAS, NV 89118

QA Requirements Imposed on Vendor: C OF C TO SELLERS QA MANUAL REV.
0, DATED 8/21/85 AND ADDENDA #1, REV. 1, 3RD EDITION DATED 3/10/86.
MARKING OR C OF C TO MATERIAL SPEC.

Licensee Representative:

Signature Bret S. Bellhorn Date 1/28/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S18SR (PO# N-7704B)

Fastener Description: CAP SCREW (HEX) 5/16 - 24 X 1 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711686)

Material Specification as Documented by Licensee Records:
ASTM A 193 GR B8

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OGUENDO
LAS VEGAS, NV 89118

Manufacturer: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OGUENDO
LAS VEGAS, NV 89118

QA Requirements Imposed on Vendor: ACTUAL CHEMICAL AND PHYSICAL TEST
REPORTS TO ASTM A 193 GR B8. MANUFACTURERS C OF C TO PO SPECIFIED
REQUIREMENTS. C OF C TO SELLERS QA MANUAL REV. 0, DATED 9/15/86.
VISUAL INSPECTION REPORT.

Licensee Representative:

Signature Bret Shelton Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S19SR (PO# N-6828B)

Fastener Description: CAP SCREW (HEX) 5/8 - 11 X 5

Description of Sample Stock Location: MAIN WAREHOUSE (SC#1712213)

Material Specification as Documented by Licensee Records:
ASTM A 354 GR BD

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: CARDINAL INDUSTRIAL PRODUCTS INC.
3873 WEST OGUENDO
LAS VEGAS, NV 89118

Manufacturer: LAKE ERIE SCREW CORP.
13001 ATHENS AVE.
LAKEWOOD, OH 44107

QA Requirements Imposed on Vendor: C OF C TO SELLERS QA MANUAL 3RD EDITION, REV. 0, DATED 8/1/85. C OF C THAT MATERIAL MANUFACTURED AND SUPPLIED IN ACCORDANCE WITH 10CFR50 APPENDIX B. MANUFACTURERS C OF C TO INDICATED MATERIAL SPECIFICATIONS.

Licensee Representative:

Signature Bret S. Shelton Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S20SR (PO# N-7228A)

Fastener Description: CAP SCREW (HEX) 3/4 - 16 X 2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1711272)

Material Specification as Documented by Licensee Records:
ASTM A 354 GR B0

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS

Vendor: A & G ENGINEERING CO., INC.
4640 EAST LA PALMA AVE.
ANAHEIM, CA 92807

Manufacturer: LAKE ERIE SCREW CORP.
13001 ATHENS AVE.
LAKEWOOD, OH 44107

QA Requirements Imposed on Vendor: C OF C TO SELLERS ASME NUCLEAR
CERTIFICATE TO AUTHORIZATION. C OF C TO ASTM A 354 OR SAE J429.
ACTUAL CHEMICAL AND PHYSICAL TEST REPORTS.

Licensee Representative:

Signature Bret Shelton Date 1/19/88

ATTACHMENT 2

P-88029

Data Summary - Safety Related Fasteners

Mechanical Analysis			Chemical Analysis										
ID#	Hardness	UTS(psi)	0.2% YS(psi)	C	Mn	P	S	Si	Mo	Cr	Ni	B	
FVS11SR(1)	--	84,900	42,700	.031	1.68	.029	.019	.55	2.04	16.41	11.88	--	
FVS12SR(1)	HRB 95.5	(2)	(2)	.056	1.56	.039	.004	.70	2.12	16.70	10.51	--	
FVS13SR	--	168,239	(3)	.42	1.44	.012	.014	--	--	--	--	.0003	
FVS14SR	--	165,609	(3)	.35	.87	.010	.008	--	--	--	--	<.0004	
FVS15SR	--	169,800	157,000	.43	.91	.010	.028	.21	.18	.91	--	<.0004	
FVS16SR(1)	--	93,400	51,200	.063	1.73	.023	.024	.54	--	18.63	8.95	--	
FVS17SR	--	137,800	129,600	.41	.87	.015	.013	.22	.15	.85	--	<.0004	
FVS18SR(1)	--	102,900	(4)	.058	1.11	.023	.024	.52	--	18.18	8.34	--	
FVS19SR	--	163,938	(3)	.39	.65	.018	.006	--	--	--	--	.0006	
FVS20SR	--	165,600	157,300	.41	.58	.006	.007	--	--	--	--	.0014	

NOTES:

1. These fasteners supplied in the carbide solution treated condition.
2. Not tensile tested due to size and shape of head. Estimated tensile strength from hardness: 102,000 psi.
3. These fasteners tested full size and not machined, per specification. Thus YS, % elong., ROA were not determined.
4. Due to the small size of this sample, an extensometer was not utilized. Therefore, YS was not determined.
5. UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-manganese; P-phosphorous; S-sulfur; Si-silicon; Mo-molybdenum; Cr-chromium.

Data Summary - Safety Related Nuts

Mechanical Analysis

Chemical Analysis

ID#	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo	Cr	Ni
FSVS11ASR	HRB 93.2	--	--	.12	.42	.007	.016	--	--	--	--
FSVS12ASR	HRC 27.2	--	--	.45	.69	.006	.015	--	--	--	--
FSVS13ASR	HRB 94.7	--	--	.18	.75	.013	.014	--	--	--	--
FSVS14ASR	HRC 32.5	--	--	.47	.81	.022	.034	--	--	--	--
FSVS15ASR	HRC 25.8	--	--	.43	.69	.019	.014	--	--	--	--
FSVS16ASR	HRC 24.2	--	--	.42	.69	.027	.008	--	--	--	--
FSVS17ASR	HRB 94.0	--	--	.12	.44	.007	.017	--	--	--	--
FSVS18ASR	HRC 30.3	--	--	.43	.56	.015	.014	--	--	--	--
FSVS19ASR	HRB 84.0	--	--	.032	1.69	.029	.022	.56	2.12	16.59	11.94
FSVS20ASR	HRC 28.2	--	--	.42	.59	.010	.027	--	--	--	--

ATTACHMENT 3

P-88029

Fastener Testing Data Sheet

*Sample ID Number: FSV S1N

Fastener Description: CAP SCREW (HEX) 3/4 - 10 X 1 1/4

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1208222)

Material Specification as Documented by Licensee Records:
GR 8 ALLOY

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Shelton Date 1 / 19 / 88

Fastener Testing Data Sheet

*Sample ID Number: FSV S2N

Fastener Description: CAP SCREW (HEX) 7/8 - 9 X 6

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1208543)

Material Specification as Documented by Licensee Records:
GR 8 ALLOY

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: THE STEEL COMPANY TO CANADA, LIMITED
STELCO TOWER
100 KING STREET WEST
HAMILTON, ONTARIO, CANADA L8N 3T1

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Bellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S3N

Fastener Description: CAP SCREW (FLAT) 1/2 X 1 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1223320)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Shelton Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S4N

Fastener Description: CAP SCREW (SOC. HEAD) 3/8 - 16 X 2 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1219340)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet


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*Sample ID Number: FSV S5N

Fastener Description: CAP SCREW (HEX) 1/4 - 20 X 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1246520)

Material Specification as Documented by Licensee Records:
316 SST

Head Marking (Specification and Manufacturer):  316

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S6N

Fastener Description: CAP SCREW (HEX) 1/4 - 28 X 1 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1250019)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Shelton Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S7N

Fastener Description: CAP SCREW (HEX) 7/16 - 20 X 1 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1250062)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellon Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S8N

Fastener Description: CAP SCREW (HEX) 1/2 - 20 X 3

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1249999)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellon Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S9N

Fastener Description: CAP SCREW (SOC) 5/16 - 24 X 1 1/4

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1249982)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S10N

Fastener Description: CAP SCREW (HEX) 1 - 8 X 3 1/2

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1209800)

Material Specification as Documented by Licensee Records:
EXCEEDS SAE GR 8 SPECS, ASTM SPECS A 354, A 490, AND A 193 B7.
CHROME NICKEL ALLOY STEEL

Head Marking (Specification and Manufacturer):



**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundary, Structural):
PRESSURE BOUNDARY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKOWN

Manufacturer: BOWMAN
850 EAST 72 STREET
CLEVELAND, OH 44103

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Shelton Date 1 / 19 / 88

Fastener Testing Data Sheet

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*Sample ID Number: FSV S1AN

Fastener Description: NUT (HEX, NYLON LOCK) 3/4 - 10

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1295070)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Shelton Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S2AN

Fastener Description: NUT (HEX) 7/8 - 9

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1294274)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundary, Structural):
PRESSURE BOUNDARY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S3AN

Fastener Description: NUT (HEX) 1/2 - 13

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1294050)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Schellhorn Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S4AN

Fastener Description: NUT (HEX) 5/16 - 18

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1294020)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Bellman Date 1/19/88

Fastener Testing Data Sheet

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*Sample ID Number: FSV S5AN

Fastener Description: NUT (HEX) 1/4 - 20

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1294650)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DECIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Bellhorn Date 1 / 19 / 88

Fastener Testing Data Sheet

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*Sample ID Number: FSV S6AN

Fastener Description: NUT (HEX) 1 1/2 - 8

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1291384)

Material Specification as Documented by Licensee Records:
ASTM A 194 GR 2H

Head Marking (Specification and Manufacturer): R2H

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL FER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: LAWSON PRODUCTS
1666 EAST TOUGY AVE.
DES PLANES, IL 60018

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Bellhorn Date 1 / 19 / 88

Fastener Testing Data Sheet

*Sample ID Number: FSV S7AN

Fastener Description: NUT (HEX) 7/16 - 20

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1294304)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Sheldon Date 1/19/88

Fastener Testing Data Sheet

*Sample ID Number: FSV S8AN

Fastener Description: NUT (HEX) 1/2 - 20

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1294305)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Shelton Date 1 / 19 / 88

Fastener Testing Data Sheet

.....

*Sample ID Number: FSV S9AN

Fastener Description: NUT (HEX) 5/16 - 24

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1292721)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): 316

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret Shelton Date 1/19/88

Fastener Testing Data Sheet

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*Sample ID Number: FSV S10AN

Fastener Description: NUT (HEX) 1 - 9

Description of Sample Stock Location: MAIN WAREHOUSE (SC# 1292300)

Material Specification as Documented by Licensee Records:
NOT SPECIFIED

Head Marking (Specification and Manufacturer): NONE

**Class/Procurement Level: NON-SAFETY RELATED

General Plant Application (e.g., Pressure Boundry, Structural):
PRESSURE BOUNDRY, STRUCTURAL PER APPROVED DESIGN SPECIFICATIONS
ON NON-SAFETY RELATED EQUIPMENT.

Vendor: UNKNOWN

Manufacturer: UNKNOWN

QA Requirements Imposed on Vendor: NONE

Licensee Representative:

Signature Bret S. Shelton Date 1/19/88

ATTACHMENT 4

P-88029

Data Summary - Non-Safety Related Fasteners

Mechanical Analysis				Chemical Analysis										
ID#	Hardness	UTS(psi)	0.2% YS(psi)	C	Mn	P	S	Si	Mo	Nb	Cr	Ni	B	
FSV51N	HRC 39.5	--	--	.40	.59	.010	.009	--	--	--	--	--	.0005	
FSV52N	HRC 35.0	--	--	.39	.83	.007	.012	--	--	--	--	--	<.0004	
FSV53H	HRB 88.5	--	--	.18	.77	.007	.009	--	--	--	--	--	<.0004	
FSV54N	HRC 39.7	--	--	.36	.83	.024	.335	--	--	--	--	--	<.0004	
FSV55H	HRC 38.5	--	--	.055	1.56	.028	.007	.52	2.19	--	17.03	12.13	--	
FSV56N	HRB 89.8	--	--	.042	.87	.027	.006	.38	.16	<.01	16.71	13.14	--	
FSV57N	HRC 29.2	--	--	.047	1.03	.024	.013	.51	--	--	18.73	9.10	--	
FSV58H	HRB 94.2	--	--	.08	1.40	.025	.013	.54	--	--	2.17	8.52	--	
FSV59N	HRC 34.3	--	--	.027	1.54	.025	.004	.58	--	--	18.38	8.23	--	
FSV510N	HRC 36.7	--	--	.35	.55	.009	.011	--	--	--	--	--	.0007	

Data Summary - Non-Safety Related Nuts

Mechanical Analysis				Chemical Analysis							
ID#	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo	Cr	Ni
FSVS1AN	HRB 82.3	--	--	.09	.31	.017	.010	--	--	--	--
FSVS2AN	HRB 78.7	--	--	.19	.58	.013	.014	--	--	--	--
FSVS3AN	HRB 87.3	--	--	.08	.31	.007	.002	--	--	--	--
FSVS4AN	HRB 88.8	--	--	.062	.36	.014	.015	--	--	--	--
FSVS5AN	HRC 26.7	--	--	.12	1.49	.079	.340	.58	.20	18.02	9.62
FSVS6AN	HRC 32.5	--	--	.40	.81	.213	.009	--	--	--	--
FSVS7AN	HRB 86.8	--	--	.06	.28	.009	.003	--	--	--	--
FSVS8AN	HRC 28.3	--	--	.32	.69	.009	.021	--	--	--	--
FSVS9AN	HRB 99.7	--	--	.047	1.64	.038	.005	.37	2.37	16.22	12.56
FSVS10AN	HRC 31.0	--	--	.51	.78	.017	.009	--	--	--	--

POSSIBLE SPECIFICATION OF NON-SAFETY RELATED
FASTENERS AND NUTS

<u>Fastener Sample No.</u>	<u>Possible Spec.</u>
1	A354, Gr. BD
2	A354, Gr. BD
3	A307, Gr. B
4	A354, Gr. BD
5	A193, Gr. B8M
6	F593 Alloy 305
7	F593 Alloy 304
8	F593 Alloy 304
9	F593 Alloy 304
10	A354, Gr. BD

<u>Nut Sample No.</u>	<u>Possible Spec.</u>
1	A563, Gr. A
2	A563, Gr. A
3	A563, Gr. A
4	A563, Gr. A
5	A194, Gr. B1
6	A194, Gr. 2H
7	A563, Gr. A
8	A563, Gr. DH
9	A194, Gr. B8M
10	A194, Gr. 2H