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NRCCB 87-02

February 5, 1988

William G. Council  
Executive Vice President

U. S. Nuclear Regulatory Commission  
Attn: Regional Administrator, Region IV  
Arlington, Texas 76011

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)  
DOCKET NOS. 50-445 AND 50-446  
NRC COMPLIANCE BULLETIN 87-02:  
FASTENER TESTING TO DETERMINE CONFORMANCE WITH  
APPLICABLE MATERIALS SPECIFICATIONS

REFERENCE: TU Electric letter (TXX-88029) from W. G. Council to R. D. Martin  
dated January 11, 1988

Gentlemen:

The subject bulletin requested that we, 1) review our receipt inspection requirements and internal controls for fasteners, and 2) independently determine, through testing, whether fasteners (studs, bolts, cap screws, and nuts) in stores at our facility met required mechanical and chemical specification requirements.

Detailed responses to each item required by the bulletin (including documentation requirements) are contained in Attachments 1 through 4.

Very truly yours,

W. G. Council

By: John W. Beck  
John W. Beck  
Vice President,  
Nuclear Engineering

- BSD/grr
- Attachment 1 Response to NRC Compliance Bulletin 87-02
  - Attachment 2 Fastener Test Specimen List and Fastener Testing Data Sheets
  - Attachment 3 Results of Mechanical and Chemical Tests on Safety Related Fasteners
  - Attachment 4 Results of Mechanical and Chemical Tests on Non-Safety Related Fasteners

c - Document Control Desk  
Mr. R. F. Warnick, USNRC OSP-CPSES  
Resident Inspectors, CPSES (3)

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TXX-88193  
February 5, 1988

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
Texas Utilities Electric Company	)	Docket Nos. 50-445
(Comanche Peak Steam Electric	)	50-446
Station, Units 1 & 2)	)	

AFFIDAVIT

John W. Beck being duly sworn, hereby deposes and says that he is Vice President, Nuclear Engineering of TU Electric, the Applicant herein; that he is duly authorized to sign and file with the Nuclear Regulatory Commission this response to NRC Compliance Bulletin 87-02 that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

\_\_\_\_\_  
John W. Beck  
Vice President,  
Nuclear Engineering

STATE OF TEXAS     )  
                          )  
COUNTY OF DALLAS    )

Subscribed and sworn to before me, a Notary Public in and for  
\_\_\_\_\_, on this \_\_\_\_\_ day of \_\_\_\_\_, 1988.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_.

ATTACHMENT 1

## RESPONSE TO NRC COMPLIANCE BULLETIN 87-02

### Item No. 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.

### Response to Item 1.a

The following CPSES procedures establish quality requirements and controls to ensure that material, parts, and equipment used in safety-related applications are receipt inspected, controlled, stored, and issued from stock in accordance with applicable codes, standards, specifications, and purchase order requirements.

1. NQA 6.02, "Quality of Procurement Documents" (Operations)
2. Receipt Inspection Instruction No. 01, "Receipt of Code C and V Items" (Operations)
3. Receipt Inspection Instruction No. 04, "Receipt of Code A Items" (Operations)
4. WHS-001, "Receiving and Inspection of Material, Parts and Components" (Operations)
5. WHS-002, "Handling and Storage" (Operations)
6. WHS-003, "Issues and Returns" (Operations)
7. NQA-3.09-11.02, "Construction Receiving Inspection" (Construction "Q" Non-ASME Items)
8. AQP-11.4, "Receiving Inspections" (Construction "Q" ASME Items)
9. CP-CPM 8.1, "Receipt, Storage, and Issuance of Items" (Construction)
10. ACP-9.1, "Identification, Issuance and Control of Items" (Construction)

The following characteristics are examined, reviewed or inspected as part of the above procedures during receipt of fasteners.

Characteristics Examined	Construction Q-ASME	Construction Q-Non-ASME (Code A)	Construction Q-Non-ASME (Code C&V)	Operations Code A	Operations Code C&V
A. Packaging Requirements Maintained	X	X	X	X	X
B. Physical Damage	X	X	X	X	X
C. Cleanliness	X	X	X	X	X
D. Required Manufacturing Documentation Present	X	X	X	X	X
E. Dimensions & Workmanship	X	X	X	X	X
F. Vendor is on Approved Suppliers/ Vendors List and Shipped from Approved Facility	X	X	NA	X	NA
G. ASME Certificate of Authorization Number and Expiration Date	X	NA	NA	Applicable to ASME Orders only	NA
H. Required Data Package Complete, legible and Traceable	X	X	X	X	X

Characteristics Examined	Construction Q-ASME	Construction Q-Non-ASME (Code A)	Construction Q-Non-ASME (Code C&V)	Operations Code A	Operations Code C&V
I. Coatings and Preservatives are in Accordance with Procurement Documents	X	X	X	X	X
J. Certificate of Conformance	X	X	NA	X	NA
K. Review Material Test Report For:					
1) Purchase Order Number, Manufacturer's Name, and Vendor Quality System Certificate Number	X	X	X	X	X
2) Material Descrip. Including Spec. Number, Grade, Class, Type, Size and Markings	X	X	X	X	X
3) Chemical and Mechanical Test Results and Any Other Supplementary Results	X	X	X	X	X

Characteristics Examined	Construction Q-ASME	Construction Q-Non-ASME (Code A)	Construction Q-Non-ASME (Code C&V)	Operations Code A	Operations Code C&V
4) Certification to ASME Section III	X	NA	NA	Applicable to ASME orders only	NA
L. Material Markings in Accordance With:					
1) ASME/ASTM Specification	X	X	X	X	X
2) Manufacturers Identification	X	X	X	X	X
3) Heat Number/Code	X	X	X	X	X
4) Procurement Documents	X	X	X	X	X

Procurement QA Codes are defined as follows:

QA Code H - As a minimum, a Certificate of Conformance is required of the vendors for QA Code A items or services. QA Code A items or services have special or added manufacturing requirements beyond what is normally found in the commercial non-nuclear industry; therefore, to assure adequate quality, special requirements are imposed on the vendor. The degree of quality assurance imposed on a vendor is dependent upon the complexity of the item or service being supplied. The applicable criteria of Title 10 of the Code of Federal Regulations, Part 50, Appendix B and ANSI N45.2 are imposed on vendors of QA Code A items or services. These criteria are extended, as applicable, to sub-tier vendors.

QA Code C - Documentation is not required; however, special documentation may be specified. QA Code C items are considered commercial quality and do not require any special quality assurance requirements beyond receipt inspection.

QA Code V - Documentation is not required; however, special documentation may be specified. QA Code V items or services require that critical characteristics be verified by inspection and/or tests performed prior to, upon or after receipt of the item or service.

The following characteristics are examined during receipt of non safety-related fasteners:

- A. Material type, grade, class, and size is checked when required by Purchase Order.
- B. Visual inspection is performed for physical damage.
- C. Documentation when required by Purchase Order.



Response to Item 1.b

The following storage controls are procedurally defined and implemented during the construction phase:

- A. The Quality Control Inspector (QCI) documents on the Receiving Inspection Report (RIR) the storage locations and storage types of the items. Where required by site procedures, color coding is verified by a QCI. Material is then placed in warehouse storage.
- B. Safety-related items within each storage environment classification, (type A-E) are physically segregated from non-safety-related material. Where segregation is not practical due to size, configuration, or specific storage requirements, positive identification of the item is maintained.  
  
Fasteners are stored in Type "C" storage condition. Type "C" is defined as:  
  
"A fire resistant, tear resistant, weathertight and well ventilated building or equivalent enclosure with controlled access which does not require temperature and humidity control. The floor is paved or equal and well drained."
- C. A monthly surveillance of all warehousing storage areas containing "Q" material is presently performed to ensure proper storage.
- D. Items are clearly identified by purchase order numbers.
- E. Storage areas are kept clean and neat.

The storage of fasteners as controlled by the Operations department is essentially the same as that of the Construction department with the following exceptions:

- A. Items are assigned a TU Electric Stock number (TSN). Storage locations are documented using a Materials Identification System (MIS) instead of a RIR.
- B. The storage environment is classified as Level A-D. As a minimum fasteners are stored in Level "D" storage condition. Level "D" is defined as:  
  
"Items classified to Level D are those that are less sensitive to the environment than Level C. These items require protection against the weather, acceleration forces, airborne contamination, and physical damage as applicable."

The following issuance controls are procedurally defined and implemented during the construction phase:

- A. An authorized Material Requisition (MR) is required for item issuance.
- B. For quality related items, a QCI verifies item acceptability for intended use.

C. Information on the MR provides item traceability and the purchase order number. Minimum information required includes:

1. Item description
2. Item identification (e.g., heat number, code number, lot number, tag or serial number and purchase order number)
3. Intended use

The following issuance controls are procedurally defined and implemented by the Operations department:

A. A "Warehouse Issue Report" (WIR) is prepared for each different work document number, special project, or account. Quality and non-quality items are not listed together on the same WIR.

B. The WIR contains the following information:

- a. Warehouse Group
- b. Work Document Number
- c. Material use
- d. Account distribution
- e. TSN
- f. Item description
- g. Check if item is a repairable stock item

C. Warehouse personnel perform the following:

- a. Record location on the issue request
- b. Denote whether item is a repairable stock item as appropriate
- c. Record QA acceptance tag and purchase order number

Item No. 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 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 J-429 Grades 5 and 8; A-449; A-325 Types 1, 2 or 3; A-354 Grades BB, BC, BC; A-490; A-320 L7M; A-307; A-563, or equivalent.

Item No. 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.

Response to Items No. 2 and 3

Warehouse stock reports for Warehouse A, Warehouse B, Warehouse C, and the Electrical Warehouse which list current, in use, bulk stock fasteners and nuts, were presented to the NRC site representatives by TU Electric. The NRC site representatives selected all fasteners and nuts to be tested. The sample of tested fasteners and nuts consisted of:

- Twenty-one (21) safety-related fasteners (bolts, capscrews, or studs)<sup>1</sup>
- Twelve (12) safety-related nuts<sup>2</sup>
- Ten (10) non-safety-related fasteners (bolts, capscrews, or studs)
- Ten (10) non-safety related nuts

A complete list of tested fasteners and nuts is shown in Attachment 2, together with individual Fastener Testing Data Sheets.

The NRC site representative hand-picked each test specimen from the appropriate storage bin or rack. Representatives from Quality Assurance-Receiving, TU Electric-Civil Engineering, and warehouse personnel were present during sampling.

- 1 Includes eleven (11) extra safety-related fasteners selected by the NRC site representative over and above IEB requirements.
- 2 Includes two (2) extra safety-related nuts selected by the NRC site representative over and above IEB requirements.

Item No. 4

Chemical testing shall be performed on all samples. Mechanical testing shall be performed on each safety-related fastener. Hardness testing shall be performed on each nut and non-safety-related fastener. All 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.

Response to Item No. 4

Testing was performed by Southwestern Laboratories, Houston, Texas, a CPSES qualified testing facility. Each specimen was tested in accordance with the fastener/nut's current specification, grade, and class. Test results are addressed in the response to Item No. 5.

Item No. 5

Test 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.

Response to Item No. 5

Test results for safety and non-safety-related fasteners and nuts are shown in Attachments 3 and 4, respectively. These results indicated all fasteners and nuts met requirements as specified by the materials current (1987) specification, grade, and class except for the following:

1. CPSES-QF-11 is a safety-related ASTM-A354 Grade BD Hex Bolt (2" diameter x 7-1/4" long). The bolt specification states that hardness requirements are to be 33-39 on the Rockwell Hardness C scale. The test results indicated a deviation from the requirements (33, 32, and 32).

Evaluation

Two of three hardness tests deviated from specifications by one hardness point. However, the primary design consideration at CPSES for this material is yield strength. The results of Ultimate Tensile Strength (154.6 ksi) and 0.2% Yield Stress (127.3 ksi) exceeded specification requirements (150 and 130 ksi, minimum respectively).

Section 6.4 of ASTM Specification A354 states:

"For fasteners on which both hardness and tension tests are performed, acceptance based on tensile requirements shall take precedence in the event that there is controversy over low readings of hardness tests."

Therefore this bolt is considered acceptable.

2. CPSES-QF-12 is a safety-related ASTM-A490 type I Hex Bolt (1" diameter x 5" long). The bolt specification states that hardness requirements are to be 33-38 on the Rockwell Hardness C scale. The test results were 32, 33 and 33.

The test result for Ultimate Tensile Strength (UTS) was 178.7 ksi which is higher than the range given by ASTM of 150-170 ksi for this material.

### Evaluation

One hardness test deviated from specification requirements by one hardness point. In addition, the upper range for UTS (170 ksi) was exceeded for this material. However, the primary design consideration at CPSES for the material is yield strength. When tested for yield strength the Proof Load Test Method 1 for this bolt met specification requirements. Section S11.1.1, ASTM-A370 states that the Proof Load Test Method 1 shall be the arbitration method in case of any dispute as to the acceptance of a bolt for tension tests. Therefore, this bolt is considered acceptable.

3. CPSES-QF-18 is a safety-related ASTM-A490 Hex Bolt (1" diameter x 3-1/2" long). The bolt specification requires the UTS value be in the range of 150-170 ksi. The UTS test result for this bolt was 193.7 ksi which is above the range given by ASTM for this material.

### Evaluation

The primary design consideration at CPSES for this material is yield strength. When tested for yield strength the Proof Load Test Method 1 for this bolt met specification requirements. Section S11.1.1, ASTM-A370 states that the Proof Load Test Method 1 shall be the arbitration method in case of any dispute as to the acceptance of a bolt for tension tests. Therefore, this bolt is considered acceptable.

4. CPSES-QF-20 is a safety-related ASTM-A325 Hex Bolt (1-1/2" diameter x 4" long). The bolt specification requires a minimum yield strength (0.2% offset) of 81 ksi. The test result (78.1 ksi) indicates a deviation from the requirement.

### Evaluation

Section 6.1 of ASTM Specification A325 states:

"Bolts shall not exceed the maximum hardness specified in Table 3. Bolts less than three diameters in length shall have hardness values not less than the minimum nor more than the maximum in hardness limits required in Table 3, as hardness is the only requirement."

Section 6.1 applies to this bolt because the bolt is less than three diameters in length. This section states that hardness is the only mechanical requirement for this bolt; yield strength is not part of the specification requirements. The test results for hardness are well within the range defined by ASTM. Therefore, this bolt is considered acceptable.

Please note the tensile tests were performed to satisfy NRC Compliance Bulletin 87-02 requirements but normally would not be performed for short (less than 3 bolt diameters) length bolts as indicated above.

5. CPSES-NQF-09 is a non-safety-related ASTM-A193 Grade B7 Capscrew (1" diameter x 3-5/8" long). The material specification states that phosphorus shall be 0.040% maximum. Test results (0.048%) indicate a deviation from the requirements.

Evaluation

The advantages of phosphorus in carbon steel are as follows:

1. increases fluidity (workability) - tends to make hot-rolling easier
2. increased sharpness of castings
3. increases strength, hardness, corrosion resistance, and electrical resistivity.

The disadvantage of phosphorus in carbon steel is that it makes steel cold short (less ductile at low temperatures). Generally, specifications for structural steel limit the phosphorus content to less than 0.05% (some allow up to 0.055%) to ensure adequate ductility. The slight deviation of phosphorus content would have a negligible effect on the fastener's ductility. The bolt's ability to perform its intended safety function was confirmed because the bolt passed mechanical property testing requirements. Therefore, this bolt is considered acceptable.

6. CPSES-NQN-01 and CPSES-NQN-07 are non-safety-related ASTM-A194 Grade 2H Nuts (1-1/8" diameter). The material specification requires a minimum carbon content of 0.38%. The test results for chemical composition showed a deviation for carbon content (0.37%) from the specification.

Evaluation

As carbon content increases in steel, ductility decreases and strength increases until a saturation point is reached at approximately 1-1.2 percent. When carbon content increases above the saturation point, strength will also start to decrease. The theoretical effect of having .37 percent instead of .38 percent carbon is more ductility and less strength. However, hardness test results indicate that mechanical strength requirements have been maintained. Therefore, the deviation in carbon content should have no effect on the nuts' ability to perform as required.

7. CPSES-NQN-05 and CPSES-NQN-08 are non-safety-related ASTM-A194 Grade 2H Nuts (2" and 1-3/8" diameter, respectively). The material specification requires a minimum value of 95 on Rockwell B scale for the 2" diameter nut and a minimum value of 24 on Rockwell C scale (which is greater than 100 in B scale) for the 1-3/8" diameter nut. Test results indicated a hardness value of 88 (Rockwell B scale) for the 2" nut and 95 (Rockwell B scale) for the 1-3/8" nut. Both of these nuts failed to meet the minimum required value as established by the material specification.

Evaluation

Both of these non safety-related nuts failed to meet the minimum required value as established by the material specification. However, since this material performs no safety related function and jeopardizes no safety related system, further evaluation of safety related impact is not required.



Item No. 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.

Response to Item No. 6

A comprehensive review of procedures was performed as part of our response to Item 1. This review concluded that internal controls for procurement, receipt inspection, storage and issuance of fasteners were adequate and in accordance with ANSI N45.2.13-1976, "Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants." As indicated in our responses the controls for safety-related fasteners are more stringent than those for non safety-related fasteners. This assures the integrity and operability of all safety-related systems, structures and components is maintained. The test results for safety-related fasteners indicated minor deviation from acceptance criteria, however, all of these safety-related fasteners were evaluated and found acceptable based on ASTM criteria.

Two non safety-related nuts deviated from test acceptance criteria and were evaluated as unacceptable by ASTM standards. However, these nuts perform no safety function and do not jeopardize safety related equipment. Therefore, no further actions are required.

ATTACHMENT 2

NRC COMPLIANCE BULLETIN 87-02  
TEST SPECIMENS

SAFETY RELATED FASTENERS

<u>ID #</u>			<u>FASTENER DESCRIPTION</u>
CPSES-QF-01	SA-193 B7	1/2 x 2	Capscrew (HT-PF33)
CPSES-QF-02	SA-193 B7	1 1/8 x 8	Stud (Impact Tested)
CPSES-QF-03	A-193 B8 Class 1	1/4 x 1 1/4	Hx Bolt
CPSES-QF-04	A-193 B8 Class 1	3/4 x 4	Hx Bolt
CPSES-QF-05	SAE-J429 Grade 2	1/4 x 20 x 2	Hx Bolt (electro-galvanized)
CPSES-QF-06	A-307 Grade A	5/16 x 1 1/2	Hx bolt (electro-galvanized)
CPSES-QF-07	SA-325 Type 1	1/2 x 4	Hx bolt
CPSES-QF-08	A-325 Type 3	1 1/4 x 3 1/4	Hx Bolt
CPSES-QF-09	A-325	1 1/4 x 3	Hx bolt
CPSES-QF-10	A-325 Type 3	7/8 x 3 1/2	Hx bolt
CPSES-QF-11	A-354 Grade B0	2 x 7 1/4	Hx bolt
CPSES-QF-12	A-490 Type 1	1 x 5	Hx bolt
CPSES-QF-13	A-490 Type 1	5/8 x 8	Hx bolt
CPSES-QF-14	A-320 Grade L7	1 x 52 1/2	Stud
CPSES-QF-15	A-307	5/16 x 4	Capscrew
CPSES-QF-16	A-307	1 x 3	Hx bolt
CPSES-QF-17	SA-193 B7	3/4 x 1 7/8	Capscrew
CPSES-QF-18	A-490	1 x 3 1/2	Hx bolt
CPSES-QF-19	A-325	3/4 x 3 1/2	Hx bolt
CPSES-QF-20	A-325 Type 1	1 1/2 x 4	Hx bolt
CPSES-QF-21	A-449	5/16 x 1 1/2	Hx bolt

**SAFETY PELATED NUTS**

<u>ID #</u>			<u>FASTENER DESCRIPTION</u>
CPSES-QN-01	A-194 Grade 2H	1 1/4	Hx nut
CPSES-QN-02	A-194 Grade 2H	1 1/4	Hx nut
CPSES-QN-03	A-194 Grade 7	2	Hx nut
CPSES-QN-04	A-194 Grade 2H	1 1/2	Hx nut
CPSES-QN-05	A-563 Grade C	3/4	Hx nut
CPSES-QN-06	A-563	5/8	Hx nut
CPSES-QN-07	A-563 Grade D	2	Hx nut
CPSES-QN-08	A-563 Grade C	1/2	H. nut
CPSES-QN-09	A-307 Grade A	1 1/8	Hx nut
CPSES-QN-10	A-540 Grade B23	2	Hx nut
CPSES-QN-11	A-325	5/8	Hx nut (A563 Grade C)
CPSES-QN-12	A-194 Grade 2H	3/8	Hx nut

**NON-SAFETY-RELATED FASTENERS**

CPSES-NQF-01	A-490	1 1/8 x 8 1/8	Hx bolt
CPSES-NQF-02	A-490	1 1/8 x 8 7/8	Hx bolt
CPSES-NQF-03	A-453 Grade 660	1 x 6 1/2	S. S. stud
CPSES-NQF-04	A-453 Grade 660	7/8 x 4 1/2	S. S. stud
CPSES-NQF-05	A-193 B7	1/2 x 1 1/2	Capscrew
CPSES-NQF-06	A-193 B7	3/4 x 4	Capscrew
CPSES-NQF-07	A-193 B7	7/8 x 4 1/8	Capscrew
CPSES-NQF-08	A-193 B7	1 x 3 3/8	Capscrew
CPSES-NQF-09	A-193 B7	1 x 3 5/8	Capscrew
CPSES-NQF-10	A-193 B7	1 x 5 7/8	Capscrew

**NON-SAFETY-RELATED NUTS**

<u>ID #</u>			<u>FASTENER DESCRIPTION</u>
CPSES-NQN-01	A-194 Grade 2H	1 1/8	Hx nut
CPSES-NQN-02	A-194 Grade 2H	1 3/8	Hx nut
CPSES-NQN-03	A-194 Grade 2H	1 1/2	Hx nut
CPSES-NQN-04	A-194 Grade 2H	1 3/4	Hx nut
CPSES-NQN-05	A-194 Grade 2H	2	Hx nut
CPSES-NQN-06	A-194 Grade 2H	2 1/4	Hx nut
CPSES-NQN-07	A-194 Grade 2H	1 1/8	Hx nut
CPSES-NQN-08	A-194 Grade 2H	1 3/8	Hx nut
CPSES-NQN-09	A-563 Grade C	1/2	Hx nut
CPSES-NQN-10	A-307	2	Hx nut (A563 Grade A)

Fastener Testing Data Sheet

\*Sample ID# CPSES-QF-01

Fastener Description:

SA-193 B7 1/2" x 2" Capscrew (Hc.-PF33)

Description of Sample Stock Location:

Whse A, Bin QC 10F

Material Specification as Documented by Licensee Records:

ASME-SA193 Grade B7

Head Marking (Specification and Manufacturer):

B7 -PF-33  
TB

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt, Houston, Texas

Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature                     E H Gant                    

Date           1/22/88          

\*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# CPSES-QF-02

Fastener Description:

SA-193 B7 1-1/8" x 8" Stud (Impact Tested) Heat Lot - K232

Description of Sample Stock Location:

Whse A, RA 133D

Material Specification as Documented by Licensee Records:

ASME-SA193 Grade B7

Head Marking (Specification and Manufacturer):

K232

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Pressure Boundary

Vendor:

Texas Bolt, Houston, Texas. Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature EH Gant

Date 1/21/88

\*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# CPSES-QF-03

Fastener Description:

A193 B8 Class 1 1/4" x 1-1/4" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin G47

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B8 Class 1

Head Marking (Specification and Manufacturer):

TB  
~  
B8

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products Corp., Middleburg Heights, Ohio --  
Mfg.: Texas Bolt Co., Houston, Texas

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

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

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

Note: Two (2) extra bolts were sampled and sent to SWL on 12/21/87 to serve as backups due to the difficulty of obtaining a machined sample of such a small bolt for testing.



Fastener Testing Data Sheet

\*Sample ID# CPSES-QF-04

Fastener Description:

A193 B8 3/4" x 4" Hex Bolt, Class 1

Description of Sample Stock Location:

Whse A, Bin H32

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B8 Class 1

Head Marking (Specification and Manufacturer):

B8  
TG

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt Co., Houston, Texas  
Mfg.: Texas Bolt Co.

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date

1/22/88

\*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# CPSES-QF-05

Fastener Description:

SAE-J429 Grade 2 1/4" x 20 x 2" Hex Bolt (electrogalvanized)

Description of Sample Stock Location:

Electrical Whse BR3

Material Specification as Documented by Licensee Records:

SAE-J429 Grade 2

Head Marking (Specification and Manufacturer):



\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Unistrut Texas, Fort Worth, Texas

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant Date 1/22/88

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

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

Note: Two (2) extra bolts were sampled and sent to SWL on 12/21/87 to serve as backups due to the difficulty of obtaining a machined sample of such a small bolt for testing.

Fastener Testing Data Sheet

\*Sample ID\* CPSES-QF-06

Fastener Description:

A307 Grade A 5/16" x 1-1/2" Hex Bolt (electrogalvanized)

Description of Sample Stock Location:

Whse A, RA 131B

Material Specification as Documented by Licensee Records:

ASTM-A307 Grade A

Head Marking (Specification and Manufacturer):

BIS

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Precision Nuclear Products, Inc., Austin, Texas  
Mfg.: Bethlehem Steel Corp., Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature EH Gant Date 1/22/88

\*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# CPSES-QF-07

Fastener Description:

SA-325 Type 1 1/2"x4" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin A29

Material Specification as Documented by Licensee Records:

ASME-SA325 Type 1

Head Marking (Specification and Manufacturer):

T|G  
/A325\

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt Co., Houston, Texas

Mfg.: Texas Bolt Co.

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QF-08

Fastener Description:

A325 Type 3 1-1/4" x 3-1/4" Hex Bolt Mt. Code - ET

Description of Sample Stock Location:

Whse A, RA 102D

Material Specification as Documented by Licensee Records:

ASTM-A325 Type 3

Head Marking (Specification and Manufacturer):

BIS  
w/ 2MS

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Southern Bolt & Fastener Corp., Shreveport, Louisiana  
Mfg.: Bethlehem Steel Corp., Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-QF-09

Fastener Description:

A325 1-1/4" x 3" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin E21

Material Specification as Documented by Licensee Records:

ASTM-A325

Head Marking (Specification and Manufacturer):

T/B

/A325\

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt, Houston, Texas

Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Cant

Signature

EH Cant

Date

1/22/88

\*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# CPSES-QF-10

Fastener Description:

A325 Type 3 7/8" x 3-1/2" Hex Bolt

Description of Sample Stock Location:

Whse A, RA 102B

Material Specification as Documented by Licensee Records:

ASTM-A325 Type 3

Head Marking (Specification and Manufacturer):



\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Southern Bolt & Fastener Corp., Shreveport, Louisiana

Mfg.: Bethlehem Steel Corp., Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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\* CPSES-QF-11

Fastener Description:

A354 Grade BD 2" x 7-1/4" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin F21

Material Specification as Documented by Licensee Records:

ASTM-A354 Grade BD

Head Marking (Specification and Manufacturer):

T/B  
BD-8069211  
B/O

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt Co., Houston, Texas  
Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:.....

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature EH Gant Date 1/22/88

\*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\* CPSES-QF-12

Fastener Description:

A490 Type 1 1" x 5" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin H17

Material Specification as Documented by Licensee Records:

ASTM A490 Type 1

Head Marking (Specification and Manufacturer):

C  
A-490<sup>F</sup>  
S

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products Corp., Middleburg Heights, Ohio  
Mfg.: Cardinal Fastener & Specialty Co., Inc., Bedford Heights, Ohio

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-QF-13

Fastener Description:

A490 Type 1 5/8" x 8" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin H35

Material Specification as Documented by Licensee Records:

ASTM-A490 Type 1

Head Marking (Specification and Manufacturer):

A490  
OC9  
TB

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Gulf Alloy Inc., Houston, Texas

Mfg.: Texas Bolt, Houston, Texas

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QF-14

Fastener Description:

A320 Grade L7 1" x 52-1/2" Stud

Description of Sample Stock Location:

Whse A, RA 118D

Material Specification as Documented by Licensee Records:

ASTM-A320 Grade L7

Head Marking (Specification and Manufacturer):

U44  
L7

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Acimet Mfg. Division, Cleveland, Ohio  
Mfg.: Acimet Mfg.

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant Date 1/22/88

\*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\* CPSES-QF-15

Fastener Description:

A307 5/16" X 4" Hex Capscrew

Description of Sample Stock Location:

Whse A, Bin G29

Material Specification as Documented by Licensee Records:

ASTM-A307

Head Marking (Specification and Manufacturer):

None

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Mid Cities Supply Co., Grand Prairie, Texas

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant Date 1/22/88

\*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: CPSE: P-16

Fastener Description:

A307 1" x 3" Hex Bolt

Description of Sample Stock Location:

Whse A, RA 105P

Material Specification as Documented by Licensee Records:

ASTM A307

Head Marking (Specification and Manufacturer):

TB

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt Co., Houston, Texas

Mfg.: Texas Bolt Co.

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QF-17

Fastener Description:

SA193 B7 3/4" X 1-7/8 Capscrew

Description of Sample Stock Location:

Whse A, Bin 10B

Material Specification as Documented by Licensee Records:

ASME-SA193 Grade B7

Head Marking (Specification and Manufacturer):

V B7 T38

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Acimet Manufacturing, Cleveland, Ohio

Mfg.: Acimet

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Cant

Signature

E H Cant

Date 1/22/88

\*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# CPSES-QF-18

Fastener Description:

A490 1" X 3-1/2" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin D16

Material Specification as Documented by Licensee Records:

ASTM-A490

Head Marking (Specification and Manufacturer):

A 490  
C

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

NPS Industries, Austin, Texas  
Mfg.: Cardinal Industrial Products Corp., Las Vegas, Nevada

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QF-19

Fastener Description:

A325 3/4" x 3-1/2" Hex Bolt

Description of Sample Stock Location:

Whse A, Bin D13

Material Specification as Documented by Licensee Records:

ASTM-A325

Head Marking (Specification and Manufacturer):

A 325

A

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

NPSI, Austin, Texas

Mfg.: Vulcan Rivet & Bolt Corp., Birmingham, Alabama

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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\* CPSES-QF-20

Fastener Description:

A325 Type 1 1-1/2" x 4" Hex Bolt

Description of Sample Stock Location:

Whse A, RA 103D

Material Specification as Documented by Licensee Records:

ASTM-A325 Type 1

Head Marking (Specification and Manufacturer):

A  
325 A

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Acimet Mfg., Cleveland, Ohio  
Mfg.: Acimet Mfg.

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QF-21

Fastener Description:

A449 5/16" X 1-1/2" Hex Bolt

Description of Sample Stock Location:

Electrical Whse, BB

Material Specification as Documented by Licensee Records:

ASTM-A449

Head Marking (Specification and Manufacturer):



\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Gulf Alloy Inc., Houston, Texas

Mfg.: Cardinal Industrial Products, Las Vegas, Nevada

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date

1/22/88

\*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# CPSES-QN-01

Fastener Description:

A194 Grade 2H 1-1/4" Hex Nut

Description of Sample Stock Location:

Whse A, Bin D-21

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2HCH

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

NPSI, Austin, Texas

Mfg.: Cardinal Industrial Products, Las Vegas, Nevada - -

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QN-02

Fastener Description:

A194 Grade 2H 1-1/4" Hex Nut

Description of Sample Stock Location:

Whse A, Bin H9

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2H  
T

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt, Houston, Texas

Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-QN-03

Fastener Description:

A194 Grade 7 2" Hex Nut

Description of Sample Stock Location:

Whse A, Bin D20

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 7

Head Marking (Specification and Manufacturer):

03 <sup>C</sup><sub>7</sub> 11537NB

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

NPSI, Austin, Texas

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-QN-04

Fastener Description:

A194 Grade 2H 1-1/2" Hex Nut

Description of Sample Stock Location:

Whse A, Bin H27

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2HT

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt, Houston, Texas  
Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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\* CPSES-QN-05

Fastener Description:

A563 Grade C 3/4" Hex Nut

Description of Sample Stock Location:

Whse A, Bin E31

Material Specification as Documented by Licensee Records:

ASTM-A563 Grade C

Head Marking (Specification and Manufacturer):

(BIS)

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products, Inc., Middleburg-Heights, Ohio  
Mfg.: Bethlehem Steel Corp., Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date

1/22/88

\*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# CPSES-QN-06

Fastener Description:

A563 5/8" Hex Nut

Description of Sample Stock Location:

Whse A, Bin G46

Material Specification as Documented by Licensee Records:

ASTM-A563

Head Marking (Specification and Manufacturer):

NONE

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products Corp., Middleburg Heights, Ohio  
Mfg.: Decker Manufacturing Corp., Albion, Michigan

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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\* CPSES-QN-07

Fastener Description:

A563 Grade D 2" Hex Nut

Description of Sample Stock Location:

Whse A, Bin F23

Material Specification as Documented by Licensee Records:

ASTM-A563 Grade D

Head Marking (Specification and Manufacturer):

2HT  
6010190

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Texas Bolt Co., Houston, Texas

Mfg.: Texas Bolt

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date

1/22/88

\*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# CPSES-QN-08

Fastener Description:

A563 Grade C 1/2" Hex Nut

Description of Sample Stock Location:

Whse A, Bin E25

Material Specification as Documented by Licensee Records:

ASTM-A563 Grade C

Head Marking (Specification and Manufacturer):

(BTS)

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products Corp., Middleburg Heights, Ohio.  
Mfg.: Bethlehem Steel Corp., Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-QN-09

Fastener Description:

A307 Grade A 1-1/8" Hex Nut (A563 Grade A)

Description of Sample Stock Location:

Whse A, RA 102D

Material Specification as Documented by Licensee Records:

ASTM-A307 Grade A

Head Marking (Specification and Manufacturer):

Q

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

MSI Nuclear, Salt Lake City, Utah

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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\* CPSES-QN-10

Fastener Description:

A540 Grade B23 Class 4 2" Hex Nut

Description of Sample Stock Location:

Whse A, RA 106D

Material Specification as Documented by Licensee Records:

ASTM-A540 Grade B23 Class 4

Head Marking (Specification and Manufacturer):

268°

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Bostrom-Bergen Metal Products, Oakland, California  
Mfg.: Schmitt Steel Inc., Portland, Oregon

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-QN-11

Fastener Description:

A325 5/8" Hex Nut (A563 Grade C)

Description of Sample Stock Location:

Whse A, RA 106D

Material Specification as Documented by Licensee Records:

ASTM-A325

Head Marking (Specification and Manufacturer):

(BIS)

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Acimet Mfg., Cleveland, Ohio  
Mfg.: Bethlehem Steel, Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature EH Gant

Date 1/22/88

\*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# CPSES-QN-12

Fastener Description:

A194 Grade 2H 3/8" Hex Nut

Description of Sample Stock Location:

Whse A, Bin D6

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2HT

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products Corp., Middleburg Heights, Ohio  
Mfg.: Texas Bolt, Houston, Texas

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-NQF-01

Fastener Description:

A490 1-1/8" x 8-1/8" Hex Bolt

Description of Sample Stock Location:

Whse A, RA 77C Bay 2

Material Specification as Documented by Licensee Records:

ASTM-A490

Head Marking (Specification and Manufacturer):

A490  
CFS

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages. CFS headmarking indicates manufacturer is Cardinal Fastener and Specialty Co., Inc.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature EH Gant Date 1/22/88

\*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# CPSES-NQF-02

Fastener Description:

A490 1-1/8" x 3-7/8" Hex Bolt

Description of Sample Stock Location:

Whse A, RA 77C Bay 2

Material Specification as Documented by Licensee Records:

ASTM-A490

Head Marking (Specification and Manufacturer):

A490  
CFS

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data package. CFS headmarking indicates manufacturer is Cardinal Fastener and Specialty Co., Inc.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature EH Gant Date 1/22/88

\*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# CPSES-NQF-03

Fastener Description:

A-453 Grade 660 1" x 6-1/2" S.S. Stud

Description of Sample Stock Location:

Whse C, Bin 195

Material Specification as Documented by Licensee Records:

ASTM-A453 Grade 660

Head Marking (Specification and Manufacturer):

A  
660 Δ

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature E H Gant Date 1/22/88

\*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# CPSES-NQF-04

Fastener Description:

A453 Grade 660 7/8" x 4-1/2" S.S. Stud

Description of Sample Stock Location:

Whse C, Bin 175

Material Specification as Documented by Licensee Records:

ASTM-A453 Grade 660

Head Marking (Specification and Manufacturer):

F660

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety related fasteners are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature EHGant

Date 1/22/88

\*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# CPSES-NQF-05

Fastener Description:

A193 B7 1/2" x 1-1/2" Capscrew

Description of Sample Stock Location:

Whse A, RA 132C

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B7

Head Marking (Specification and Manufacturer):

TB  
B7

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages. TB headmarking indicates that manufacturer is Texas Bolt Co.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature EH Gant

Date 1/22/88

\*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# CPSES-NQF-06

Fastener Description:

A193 B7 3/4" x 4" Capscrew

Description of Sample Stock Location:

Whse A, RA 132C

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B7

Head Marking (Specification and Manufacturer):

TB  
B7

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages. TB headmarking indicates that manufacturer is Texas Bolt Co.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature EH Gant Date 1/22/88

\*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# CPSES-NQF-07

Fastener Description:

A193 B7 7/8" x 4-1/8" Capscrew

Description of Sample Stock Location:

Whse A, RA 132C

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B7

Head Marking (Specification and Manufacturer):

B7

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature E H Gant Date 1/22/88

\*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# CPSES-NQF-08

Fastener Description:

A193 B7 1" x 2-3/8" Capscrew

Description of Sample Stock Location:

Whse A, RA 132C

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B7

Head Marking (Specification and Manufacturer):

B7

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages.

QA Requirements Imposed on Vendor: - - - - -

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature           E H Gant          

Date           1/22/88          

\*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# CPSES-NQF-09

Fastener Description:

A193 B7 1" x 3-5/8" Capscrew

Description of Sample Stock Location:

Whse A, RA 132C

Material Specification as Documented by Licensee Records:

ASTM-A193 Grade B7

Head Marking (Specification and Manufacturer):

B7

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-NQF-10

Fastener Description:

A193 B7 1" x 5-7/8" Capscrew

Description of Sample Stock Location:

Whse A, RA 132C

Material Specification as Documented by Licensee Records:

ASTM-A193 B7

Head Marking (Specification and Manufacturer):

B7

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety fasteners are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-NQN-01

Fastener Description:

A194 Grade 2H 1-1/8" Hex Nut

Description of Sample Stock Location:

Whse A, RA 16C

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2HT

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature E H Gant

Date 1/22/88

\*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# CPSES-NQN-02

Fastener Description:

A194 Grade 2H 1-3/8" Hex Nut

Description of Sample Stock Location:

Whse A, RA 16C

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

H  
2H

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature E H Gant Date 1/22/88

\*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\* CPSES-NQN-03

Fastener Description:

A194 Grade 2H 1-1/2" Hex Nut

Description of Sample Stock Location:

Whse A, RA 16C

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2H  
U

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor: .....

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature                     E H Gant                    

Date           1/22/88          

\*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\* CPSES-NQN-04

Fastener Description:

A194 Grade 2H 1-3/4" Hex Nut

Description of Sample Stock Location:

Whse A, RA 16C

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

S

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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\* CPSES-NQN-05

Fastener Description:

A194 Grade 2H 2" Hex Nut

Description of Sample Stock Location:

Whse A RA 16C

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2H

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data sheets.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature E. H. Gant Date 1/22/88

\*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# CPSES-NQN-06

Fastener Description:

A194 Grade 2H 2-1/4" Hex Nut

Description of Sample Stock Location:

Whse A, RA 16C

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

H T 2

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-NQN-07

Fastener Description:

A194 Grade 2H 1-1/8" Hex Nut

Description of Sample Stock Location:

Whse A, Center Aisle Box 10

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2H  
T

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-NQN-08

Fastener Description:

A194 Grade 2H 1-3/8" Hex Nut

Description of Sample Stock Location:

Whse A, Center Aisle Box 10

Material Specification as Documented by Licensee Records:

ASTM-A194 Grade 2H

Head Marking (Specification and Manufacturer):

2H  
83

\*\*Class/Procurement Level:

Non-Safety Related

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

Structural

Vendor:

Individual non-safety nuts are not traceable to vendor data packages.

QA Requirements Imposed on Vendor:

Material shall conform to material type, grade, and specification.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date 1/22/88

\*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# CPSES-NQN-09

Fastener Description:

A563 Grade C 1/2" Hex Nut

Description of Sample Stock Location:

Whse A, Bin E25

Material Specification as Documented by Licensee Records:

— ASTM-A194 Grade C

Head Marking (Specification and Manufacturer):

(3TS)

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

Nova Machine Products Corp., Middleburg Heights, Ohio  
Mfg.: Bethlehem Steel Corp., Lebanon, Pennsylvania

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

Date

1/22/88

\*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# CPSES-NQN-10

Fastener Description:

A307 2" Hex Nut (A563 Grade A)

Description of Sample Stock Location:

Whse A, RA 105C

Material Specification as Documented by Licensee Records:

ASTM-A307 Grade A

Head Marking (Specification and Manufacturer):

Q

\*\*Class/Procurement Level:

Nuclear Safety Related

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

Structural

Vendor:

MSI Nuclear, Salt Lake City, Utah

QA Requirements Imposed on Vendor:

Materials shall be produced in accordance with the vendor/subcontractor's written Quality Assurance Program conforming to the requirements of ANSI N45.2 and 10CFR50, Appendix B or ASME Section III (NCA-3800 or NCA-4000), subject to verification by Purchaser's Quality Assurance Department.

Licensee Representative:

E. H. Gant

Signature

E H Gant

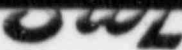
Date 1/22/88

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

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

ATTACHMENT 3

SAFETY-RELATED FASTENER TEST RESULTS



Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services  
222 Cavalcade St. • P.O. Box 8788, Houston, Texas 77248 • 713/892-8151

**Attention:** Mr. Eddie H. Gant  
Texas Utilities Electric Company  
Comanche Peak Steam Electric Station  
Off FM 56, 5 Miles Northwest of Glen Rose  
Glen Rose, Texas 76043

Report No: 47260-2  
File No: 2-8487-01  
Date: 12/23/87  
P.O. No: CPF-14524-S  
REVISION 1-01/13/88  
RDK

**Project:** Mechanical and Chemical Evaluation of Safety Related Fasteners and Nuts,  
**Re:** NRC Bulletin 87-02

**PROJECT INFORMATION**

**Material:** Fasteners and Nuts as Described in Table 1  
**Identification:** As Specified by Table 1 - Tags, Bags and Test Articles Returned  
**Date Received:** December 17, 1987  
**Specifications:** As Listed Below  
**Test Equipment:** Satec S/N 1195, Clark S/N 77D9, Instron S/N TTKE#4, Siemens S/N SRS200, Leco S/N IR-12  
**Technician:** Albert Perez, Bob Yount  
**Date of Test:** December 18-21, 1987  
**Procedure:** ASTM A 370

**TEST RESULTS**

Specifications that were used for reference are as follows:

**Safety Related Fasteners**

ASME SA 193-86      ASTM A 325-86a      ASTM A 449-86  
ASTM A 193-86      ASTM A 490-85  
SAE J 429g      ASTM A 320-85a  
ASTM A 307-86a      ASTM A 354-86

**Safety Related Nuts**

ASTM A 194-85a      ASTM A 540-84a  
ASTM A 563-84      ASTM A 325-86a  
ASTM A 307-86a

The results for the fasteners and nuts appear in Table 2 and Table 3, respectively.

**COMPLIANCE STATEMENT:**

All safety related fasteners and nuts meet requirements except for CPSES-QF-11 (hardness), QF-12 (hardness and UTS), QF-18 (UTS), and QF-20 (0.2% YS).

All tests/analyses of materials for this order were done in accordance with the Quality program Rev. 4, dated 07/15/83 reviewed and approved by Texas Utilities Generating Company on September 26, 1985.

Mr. Daniel N. Hanna Jr., P.E. / Quality Assurance Manager

SOUTHWESTERN LABORATORIES

Reviewed By

tda

TABLE 1. IDENTIFICATION OF SAFETY RELATED FASTENERS &amp; NUTS

NRC COMPLIANCE BULLETIN 87-02  
TEST SPECIMENS

## SAFETY RELATED FASTENERS

<u>ID #</u>			<u>FASTENER DESCRIPTION</u>
CPSES-QF-01	SA-193 B7	1/2 x 2	Capcrew (HT-PF33)
CPSES-QF-02	SA-193 B7	1 1/8 x 8	Stud (Impact Tested)
CPSES-QF-03	A-193 B8 Class 1	1/4 x 1 1/4	Hx bolt
CPSES-QF-04	A-193 B8 Class 1	3/4 x 4	Hx bolt
CPSES-QF-05	SAE-J429 Grade 2	1/4 x 20 x 2	Hx bolt electro-galvanized
CPSES-QF-06	A-307 Grade A	5/16 x 1 1/2	Hx bolt electro-galvanized
CPSES-QF-07	SA-325 Type 1	1/2 x 4	Hx bolt
CPSES-QF-08	A-325 Type 3	1 1/4 x 3 1/4	Hx bolt
CPSES-QF-09	A-325	1 1/4 x 3	Hx bolt
CPSES-QF-10	A-325 Type 3	7/8 x 3 1/2	Hx bolt
CPSES-QF-11	A-354 Grade BD	2 x 7 1/4	Hx bolt
CPSES-QF-12	A-490 Type 1	1 x 5	Hx bolt
CPSES-QF-13	A-490 Type 1	5/8 x 8	Hx bolt
CPSES-QF-14	A-320 Grade L7	1 x 52 1/2	Stud
CPSES-QF-15	A-307	5/16 x 4	Hx bolt
CPSES-QF-16	A-307	1 x 3	Hx bolt
CPSES-QF-17	SA-193 B7	3/4 x 1 7/8	Capcrew
CPSES-QF-18	A-490	1 x 3 1/2	Hx bolt
CPSES-QF-19	A-325 Type 1	3/4 x 3 1/2	Hx bolt
CPSES-QF-20	A-325	1 1/2 x 4	Hx bolt
CPSES-QF-21	A-449	5/16 x 1 1/2	Hx bolt

## SAFETY RELATED NUTS

CPSES-QN-01	A-194 Grade 2H	1 1/4	Hx nut
CPSES-QN-02	A-194 Grade 2H	1 1/4	Hx nut
CPSES-QN-03	A-194 Grade 7	2	Hx nut
CPSES-QN-04	A-194 Grade 2H	1 1/2	Hx nut
CPSES-QN-05	A-563 Grade C	3/4	Hx nut

<u>ID #</u>			<u>FASTNER DESCRIPTION</u>
CPSES-QN-06	A-563	5/8	Hx nut
CPSES-QN-07	A-563 Grade D	2	Hx nut
CPSES-QN-08	A-563 Grade C	1/2	Hx nut
CPSES-QN-09	A-307 Grade A	1 1/8	Hx nut (ASTM A 563, Grade A)
CPSES-QN-10	A-540	2	Hx nut
CPSES-QN-11	A-325	5/8	Hx nut (ASTM A 563, Grade C)
CPSES-QN-12	A-194 Grade 2H	3/8	Hx nut

**NON-SAFETY-RELATED FASTENERS**

<del>CPSES-NQF-01</del>	<del>A-490</del>	<del>1 1/8 x 8 1/8</del>	<del>Hx bolt</del>
<del>CPSES-NQF-02</del>	<del>A-490</del>	<del>1 1/8 x 8 7/8</del>	<del>Hx bolt</del>
<del>CPSES-NQF-03</del>	<del>A-453 Grade 660</del>	<del>1 x 6 1/2</del>	<del>S. S. stud</del>
<del>CPSES-NQF-04</del>	<del>A-453 Grade 660</del>	<del>7/8 x 4 1/2</del>	<del>S. S. stud</del>
<del>CPSES-NQF-05</del>	<del>A-193 B7</del>	<del>1/2 x 1 1/2</del>	<del>Capscrew</del>
<del>CPSES-NQF-06</del>	<del>A-193 B7</del>	<del>3/4 x 4</del>	<del>Capscrew</del>
<del>CPSES-NQF-07</del>	<del>A-193 B7</del>	<del>7/8 x 4 1/8</del>	<del>Capscrew</del>
<del>CPSES-NQF-08</del>	<del>A-193 B7</del>	<del>1 x 2 3/8</del>	<del>Capscrew</del>
<del>CPSES-NQF-09</del>	<del>A-193 B7</del>	<del>1 x 3 5/8</del>	<del>Capscrew</del>
<del>CPSES-NQF-10</del>	<del>A-193 B7</del>	<del>1 x 5 7/8</del>	<del>Capscrew</del>

**NON-SAFETY-RELATED NUTS**

<del>CPSES-NQN-01</del>	<del>A-194 Grade 2H</del>	<del>1 1/8</del>	<del>Hx nut</del>
<del>CPSES-NQN-02</del>	<del>A-194 Grade 2H</del>	<del>1 3/8</del>	<del>Hx nut</del>
<del>CPSES-NQN-03</del>	<del>A-194 Grade 2H</del>	<del>1 1/2</del>	<del>Hx nut</del>
<del>CPSES-NQN-04</del>	<del>A-194 Grade 2H</del>	<del>1 3/4</del>	<del>Hx nut</del>
<del>CPSES-NQN-05</del>	<del>A-194 Grade 2H</del>	<del>2</del>	<del>Hx nut</del>
<del>CPSES-NQN-06</del>	<del>A-194 Grade 2H</del>	<del>2 1/4</del>	<del>Hx nut</del>
<del>CPSES-NQN-07</del>	<del>A-194 Grade 2H</del>	<del>1 1/8</del>	<del>Hx nut</del>
<del>CPSES-NQN-08</del>	<del>A-194 Grade 2H</del>	<del>1 3/8</del>	<del>Hx nut</del>
<del>CPSES-NQN-09</del>	<del>A-563 Grade C</del>	<del>1/2</del>	<del>Hx nut</del>
<del>CPSES-NQN-10</del>	<del>A-307</del>	<del>2</del>	<del>Hx nut (ASTM A 563, Grade A)</del>

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

Page 1 of Table 2

Data Summary

<u>ID</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis</u> <sup>1</sup>							
	<u>Hardness</u>	<u>UTS</u>	<u>0.7% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
CPSES-QF										
-01	Not Required (N/R)	153,200	136,300	0.38	0.92	0.011	0.025	0.28	0.20	1.0
-02	N/R	125,000	106,600	0.38	0.81	0.012	0.028	0.16	0.13	0.8
-03	92,94,93 HRB Avg.- 93 HRB	94,200	50,000	0.08	0.87	0.023	0.018	0.45	----	18.5
-04	90,90,88 HRB Avg.- 89 HRB	106,700	64,300	0.05	0.61	0.015	0.011	0.74	0.34	18.5
-05	97,96,97 HRB Avg.- 97 HRB	113,000 w/Wedge	Proof Load Method 1-OK	0.16	----	0.014	0.035	----	----	----

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

<sup>1</sup>The 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.



TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

Page 2 of Table 2

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>			Full Size CVN Impact Value, ftlbs		Lateral Exp, Mils		2Shear Cr
	Hardness	UTS	0.7% YS	ENI	Tcvn Mn	P	S	SI	No	
CPSES-QF										
-01	-----			0	----		-----	-----		----
-02	-----			0.16	32°F		94, 93, 87	55, 56, 50		60%
-03	-----			8.95	----		-----	-----		----
-04	-----			8.34	----		-----	-----		----
-05	-----				----		-----	-----		----

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

<sup>1</sup>The 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.

Swt Report No. 47260-2  
 Texas Utilities P.O. No. CPF-14524-S  
 REVISION 1-01/13/88 *ROK*

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

Page 3 of Table 2

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.7% YS	C	Mn	P	S	Si	Mo	Cr
CPSES-QF										
-06	97,97,98 HRB Avg. - 97 HRB	103,000	Proof Load Method I-OK	0.22	----	0.009	0.018	----	----	----
-07	34,32,30 HRC Avg. - 32 HRC	167,000	Proof Load Method I-OK	0.43	0.95	0.013	0.018	----	----	----
-08	31,30,31 HRC Avg. - 31 HRC	134,100	117,800	0.26	0.98	0.007	0.014	0.24	<0.01	0.59
-09	30,31,31 HRC Avg. - 31 HRC	130,700	88,500	0.50	0.86	0.017	0.030	0.29	0.02	0.10
-10	28,28,29 HRC Avg. - 28 HRC	139,400	Proof Load Method I-OK	0.24	1.08	0.014	0.023	0.33	<0.01	0.55

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

<sup>1</sup>The 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.

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

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Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.2% YS	% Cu	% Mn	% P	% Ti	% S	% Mo	% Cr
CPSES-QF										
-06	-----									
-07	-----									
-08	-----			0.20	0.28	<0.01	<0.01			
-09	-----			0.04	0.10	0.01	<0.01	0.0007		
-10	-----			0.22	0.28	<0.01	<0.01			

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

<sup>1</sup>The 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.

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

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Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.7% YS	C	Mn	P	S	Si	Mo	Cr
CPSES-QF										
-11	33,32*,32*HRC Avg.- 32* HRC	154,600	137,300	0.46	----	0.007	0.023	----	----	----
-12	32*,33,33 HRC Avg.- 33 HRC	178,700*	Proof Load Method I-OK	0.42	0.96	0.022	0.035	0.22	0.19	0.90
-13	34,34,36 HRC Avg.- 35 HRC	164,600	Proof Load Method I-OK	0.48	0.92	0.014	0.008	0.19	0.21	0.90
-14	N/A	137,600	117,800	0.36	0.80	0.023	0.016	0.24	0.18	0.94
-15	99,99,99 HRB Avg.- 99 HRB	99,100 Wedge	N/A	----	----	0.016	0.040	----	----	----

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

<sup>1</sup>The 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.



TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

Page 6 of Table 2

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>			Full Size CVN Impact Value, ftlbs		Lateral Exp. Mils		Shear
	Hardness	UTS	0.2% YS	C	Mn	PXX	XX	XX	XX	
CPSES-QF										
-11	-----		-----	-----	-----	-----	-----	-----	-----	-----
-12	-----		-----	0.09	-----	-----	-----	-----	-----	-----
-13	-----		-----	0.03	-----	-----	-----	-----	-----	-----
-14	-----		-----	0.24	32°F	86, 86, 88		57, 50, 57		60
-15	-----		-----	-----	-----	-----	-----	-----	-----	-----

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

<sup>1</sup>The 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.

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

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Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.7% YS	C	Mn	P	S	Si	Mo	Cr
CPSSES-QF										
-16	99,98,97 HRB Avg.- 98 HRB	94,100 w/Wedge	N/R	-----	-----	0.016	0.017	-----	-----	-----
-17	N/R	147,600	131,600	0.39	0.85	0.007	0.027	0.23	0.17	0.91
-18	35,33,33 HRC Avg.- 34 HRC	193,700*	Proof Load Method I-OK	0.40	0.94	0.011	0.011	0.18	0.18	0.96
-19	30,29,31 HRC Avg.- 30 HRC	155,600	Proof Load Method I-OK	0.39	0.82	0.014	0.047	0.25	<0.01	0.02
-20	21,22,22 HRC Avg.- 22 HRC	117,700	78,100*	0.42	0.88	0.013	0.031	0.22	<0.01	<0.01
-21	24,23,24 HRC Avg.- 24 HRC	145,700	Proof Load Method I-OK	0.34	0.79	0.022	0.015	0.22	-----	-----

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

<sup>1</sup>The 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.

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED FASTENERS

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Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.7% YS	C	Mn	P	S	Si	Mo	Cr
CPSES-QF										
-16				----	----	----	----			
-17				----	----	----	----			
-18				0.22	----	----	----			
-19				0.03	0.02	<0.01	<0.01			
-20				0.02	0.02	<0.01	<0.01			
-21				----	----	----	----			

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

<sup>1</sup>The 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.

TABLE 3. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED NUTS

Page 1 of Table 3

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo	Cr
CPSES-QN										
-01	31,29,29 HRC Avg.- 30 HRC	N/R	N/R	0.43	----	0.023	0.011	----	----	----
-02	36,37,36 HRC Avg.- 36 HRC	N/R	N/R	0.46	----	0.008	0.017	----	----	----
-03	28,28,29 HRC Avg.- 28 HRC	N/R	N/R	0.45	0.73	0.014	0.012	0.29	0.15	1.15
-04	26,28,26 HRC Avg.- 27 HRC	N/R	N/R	0.45	----	0.014	0.005	----	----	----
-05	94,93,92 HRB Avg.- 93 HRB	N/R	N/R	0.13	----	0.012	0.11	----	----	----
-06	86,88,89 HRB Avg.- 88 HRB	N/R	N/R	0.07	0.43	0.006	0.003	----	----	----

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

<sup>1</sup>The 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.



TABLE 3. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED NUTS

Page 2 of Table 3

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo	Cr
CPSES-QN										
-07	26,27,27 HRC Avg.- 27 HRC	N/R	N/R	0.48	0.87	0.013	0.011	----	----	----
-08	97,97,98 HRB Avg.- 97 HRB	N/R	N/R	0.25	----	0.012	0.023	----	----	----
-09	93,91,92 HRB Avg.- 92 HRB	N/R	N/R	0.08	----	0.070	0.26	----	----	----
-10	32,32,30 HRC Avg.- 31 HRC	N/R	N/R	0.44	0.81	0.006	0.021	0.23	0.21	0.86
-11	86,87,86 HRB Avg.- 86 HRB	N/R	N/R	0.22	0.43	0.007	0.023	----	----	----
-12	34,34,34 HRC Avg.- 34 HRC	N/R	N/R	0.52	----	0.019	<0.005	----	----	----

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

<sup>1</sup>The 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.

TABLE 3. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON SAFETY RELATED NUTS

Page 3 of Table 3

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>							
	Hardness	UTS	0.7% YS	% Ni	Mn	P	S	Si	Mo	Cr
CPSSES-QN										
-07	-----	-----	-----	-----						
-08	-----	-----	-----	-----						
-09	-----	-----	-----	-----						
-10	-----	-----	-----	1.78						
-11	-----	-----	-----	-----						
-12	-----	-----	-----	-----						

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

<sup>1</sup>The 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 4

NON-SAFETY-RELATED FASTENER TEST RESULTS

*Materials, environmental and geotechnical engineering, nondestructive, metallurgical and analytical services*  
222 Cavalcade St. • P.O. Box 8788, Houston, Texas 77248 • 713/892-9151

**Attention:** Mr. Eddie H. Gant  
Texas Utilities Electric Company  
Comanche Peak Steam Electric Station  
Off FM 36, 5 Miles Northwest of Glen Rose  
Glen Rose, Texas 76043

Report No: 47260-1  
File No: 2-8487-01  
Date: 12/23/87  
P.O. No: CPF-35104

**Project:** Hardness and Chemical Evaluation of Non-Safety Related Fasteners and Nuts.  
Re: NRC Bulletin 87-02

**PROJECT INFORMATION**

<b>Material:</b>	Fasteners and Nuts as Described in Table 1		
<b>Identification:</b>	As Specified by Table 1 - Tags, Bags and Test Articles Returned		
<b>Date Received:</b>	December 17, 1987	<b>Technician:</b>	Albert Perez, Bob Yount
<b>Specifications:</b>	As Listed Below	<b>Date of Test:</b>	December 19-23, 1987
<b>Test Equipment:</b>	Clark Hardness Machine	<b>Procedure:</b>	ASTM A 370
	S/N 77D9, Siemess S/N		
	SRS200 Leco S/N IR-12		

**TEST RESULTS**

Specifications that were used for reference are as follows:

**Non-Safety Related Fasteners**

- ASTM A 490-85
- ASTM A 453-86
- ASTM A 193-86

**Non-Safety Related Nuts**

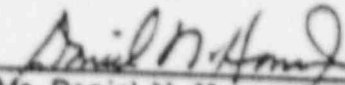
- ASTM A 194-85a
- ASTM A 563-84
- ASTM A 307-86a

The results for the fasteners and nuts appear in Table 2 and Table 3, respectively.

**COMPLIANCE STATEMENT:**

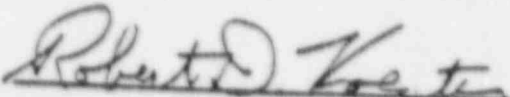
All non-safety related fasteners and nuts met requirements except for CPSES-NQF-09 (P%), NQN-01 (C%), NQN-05 (hardness), NQN-07 (C%) and NQN-08 (hardness) which are denoted with an asterik on Tables 2 and 3.

All tests/analysis of materials for this order were done in accordance with the Quality program Rev. 4, dated 07/15/83 reviewed and approved by Texas Utilities Generating Company on September 26, 1987.

  
Mr. Daniel N. Hanna Jr., P.E. / Quality Assurance Manager

**SOUTHWESTERN LABORATORIES**

  
Reviewed By



tda

<u>ID #</u>			<u>FASTNER DESCRIPTION</u>
<del>CPSES-QN-06</del>	<del>A-563</del>	<del>3/8</del>	<del>Hx nut</del>
<del>CPSES-QN-07</del>	<del>A-563 Grade D</del>	<del>2</del>	<del>Hx nut</del>
<del>CPSES-QN-08</del>	<del>A-563 Grade C</del>	<del>1/2</del>	<del>Hx nut</del>
<del>CPSES-QN-09</del>	<del>A-307</del>	<del>1 1/8</del>	<del>Hx nut</del>
<del>CPSES-QN-10</del>	<del>A-540</del>	<del>2</del>	<del>Hx nut</del>
<del>CPSES-QN-11</del>	<del>A-325</del>	<del>5/8</del>	<del>Hx nut</del>
<del>CPSES-QN-12</del>	<del>A-563 Grade C</del>	<del>3/8</del>	<del>Hx nut</del>

**NON-SAFETY-RELATED FASTENERS**

CPSES-NQF-01	A-490	1 1/8 x 8 1/8	Hx bolt
CPSES-NQF-02	A-490	1 1/8 x 8 7/8	Hx bolt
CPSES-NQF-03	A-453 Grade 660	1 x 6 1/2	S. S. stud
CPSES-NQF-04	A-453 Grade 660	7/8 x 4 1/2	S. S. stud
CPSES-NQF-05	A-193 B7	1/2 x 1 1/2	Capscrew
CPSES-NQF-06	A-193 B7	3/4 x 4	Capscrew
CPSES-NQF-07	A-193 B7	7/8 x 4 1/8	Capscrew
CPSES-NQF-08	A-193 B7	1 x 2 3/8	Capscrew
CPSES-NQF-09	A-193 B7	1 x 3 5/8	Capscrew
CPSES-NQF-10	A-193 B7	1 x 5 7/8	Capscrew

**NON-SAFETY-RELATED NUTS**

CPSES-NQN-01	A-194 Grade 2H	1 1/8	Hx nut
CPSES-NQN-02	A-194 Grade 2H	1 3/8	Hx nut
CPSES-NQN-03	A-194 Grade 2H	1 1/2	Hx nut
CPSES-NQN-04	A-194 Grade 2H	1 3/4	Hx nut
CPSES-NQN-05	A-194 Grade 2H	2	Hx nut
CPSES-NQN-06	A-194 Grade 2H	2 1/4	Hx nut
CPSES-NQN-07	A-194 Grade 2H	1 1/8	Hx nut
CPSES-NQN-08	A-194 Grade 2H	1 3/8	Hx nut
CPSES-NQN-09	A-563 Grade C	1/2	Hx nut
CPSES-NQN-10	A-307	2	Hx nut (ASTM A 563, Grade A)

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON NON-SAFETY RELATED FASTENERS

Page 1 of Table 2

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>						
	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo
CPSES-NQF									
-01	36,36,34 HRC Avg.- 35 HRC	N/R	N/R	0.42	0.89	0.013	0.022	0.29	0.16
-02	35,34,36 HRC Avg.- 35 HRC	N/R	N/R	0.41	0.90	0.016	0.023	0.31	0.17
-03	34,33,34 HRC Avg.- 34 HRC	N/R	N/R	0.04	1.17	0.011	0.008	0.50	1.31
-04	35,35,35 HRC Avg.- 35 HRC	N/R	N/R	0.05	0.34	0.011	<0.005	0.40	1.20
-05	30,31,31 HRC Avg.- 31 HRC	N/R	N/R	0.44	0.83	0.038	0.034	0.23	0.15

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

<sup>1</sup>The 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.

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON NON-SAFETY RELATED FASTENERS

Page 2 of Table 2

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>						
	Hardness	UTS	0.2% YS	CNI	Mn Cr	RTI	SiAl	S% V	Max B
CPSES-NQF									
-01	-----			0.10 <sub>1</sub>	0.88	----	----	----	----
-02	-----			0.07	0.86	----	----	----	----
-03	-----			25.06	13.33	2.33	0.18	0.09	0.007
-04	-----			25.06	14.56	2.22	0.29	0.18	0.003
-05	-----			0.09	0.95	----	----	----	----

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

<sup>1</sup>The 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.



TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON NON-SAFETY RELATED FASTENERS

Page 3 of Table 2

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>						
	Hardness	UTS	C, % YS	C	Mn	P	S	Si	Mo
CPSES-NQF									
-06	31,28,27 HRC Avg. - 29 HRC	N/R	N/R	0.42	0.81	0.009	0.004	0.23	0.21
-07	39,37,38 HRC Avg. - 38 HRC	N/R	N/R	0.39	0.86	0.009	0.006	0.29	0.18
-08	36,35,37 HRC Avg. - 36 HRC	N/R	N/R	0.40	0.83	0.028	0.035	0.24	0.17
-09	34,34,35 HRC Avg. - 34 HRC	N/R	N/R	0.40	0.80	0.048*	0.036	0.29	0.15
-10	34,36,35 HRC Avg. - 35 HRC	N/R	N/R	0.40	0.83	0.017	0.026	0.26	0.15

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

<sup>1</sup>The 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.

TABLE 2. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON NON-SAFETY RELATED FASTENERS

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Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>						
	Hardness	UTS	0.2% YS	CNI	MN Cr	P	S	SI	MO
CPSES-NQF									
-06	-----			0.12	0.88				
-07	-----			0.13	1.09				
-08	-----			0.16	0.95				
-09	-----			0.11	0.86				
-10	-----			0.12	0.88				

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

<sup>1</sup>The 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.

TABLE 3. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON NON-SAFETY RELATED NUTS

Page 1 of Table 3

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>						
	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo
CPSES-NQN									
-01	25,26,27 HRC Avg.- 26 HRC	N/R	N/R	0.37*	----	0.013	0.012		
-02	32,32,32 HRC Avg.- 32 HRC	N/R	N/R	0.45	----	0.013	0.008		
-03	29,29,29 HRC Avg.- 29 HRC	N/R	N/R	0.45	----	0.017	0.029		
-04	28,29,29 HRC Avg.- 29 HRC	N/R	N/R	0.44	----	0.019	0.029		
-05	88*,88*,87* HRB Avg.- 88* HRB	N/R	N/R	0.38	----	0.020	0.027		

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

<sup>1</sup>The 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.

TABLE 3. RESULTS OF MECHANICAL AND CHEMICAL TESTS ON NON-SAFETY RELATED NUTS

Page 2 of Table 3

Data Summary

ID#	Mechanical Analysis		Chemical Analysis <sup>1</sup>						
	Hardness	UTS	0.2% YS	C	Mn	P	S	Si	Mo
CPSSES-NQN									
-06	35,34,35 HRC Avg. - 35 HRC	N/R	N/R	0.47	----	0.020	0.005		
-07	26,26,26 HRC Avg. - 26 HRC	N/R	N/R	0.37*	----	0.014	0.012		
-08	95*,96*,95* HRB Avg. - 95* HRB	N/R	N/R	0.40	----	0.010	0.026		
-09	83,83,85 HRB Avg. - 84 HRB	N/R	N/R	0.12	----	0.005	0.006		
-10	83,83,80 HRB Avg. - 82 HRB	N/R	N/R	0.16	----	0.015	0.007		

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

<sup>1</sup>The 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.