PHILADELPHIA ELECTRIC COMPANY

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(215) 841-5001

JOSEPH W. GALLAGHER VICE PRESIDENT NUCLEAR SERVICES February 17, 1988

Docket No. 352

353

Mr. William T. Russell Administrator, Region I U. S. Nuclear Regulatory Commission Attn: Document Control Desk Washington, DC 20555

Subject: Limerick Generating Station Units 1 & 2

NRC Compliance Bulletin 87-02

Fastener Testing to Determine Conformance With Applicable Material Specification

Dear Mr. Russell:

The subject Bulletin required that licensees 1) review their 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 their facilities meet required mechanical and chemical specification requirements.

To perform these functions, the Bulletin delineated six actions to be taken by the licensees. These actions are repeated along with Philadelphia Electric Company response to each of these actions.

Action 1:

Describe a) the characteristics currently examined during receipt inspection of fasteners (i.e. head markings for grade and manufacture 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:

Quality controlled material at Limerick can be purchased in three ways: by Bechtel Construction for equipment installations on Unit 2, with the possibility of subsequent

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transfer to Unit 1; by the station for use in maintenance of existing plant equipment on Unit 1; or by PECo Engineering/Construction for installing plant modifications on Unit 1.

The majority of fasteners used for Limerick Generating Station Units 1 and 2 were, and will continue to be, obtained through Bechtel Construction and receipt inspected by Bechtel Quality Control. Fasteners used on Unit 1 since commercial operation have been procured by the station, including regular transfers from Unit 2 Bechtel warehouse stock. Bechtel Field Construction Procedure CP-F-2, "Receipt Inspection, Storage and Withdrawal of Materials/Equipment" provides instructions for the receipt storage, and issuance of material.

Following is a summary of the receipt inspection requirements imposed on the Bechtel Quality Control Inspectors by Section 5.0 and Appendix A of CP-F-2. The Bechtel inspection consists of sampling the fasteners and verifying that the manufacturer markings match the certification and purchase orders, and that the size and physical configuration match the certification. In addition, the appropriate documents are reviewed to ensure compliance with specified mechanical and chemical requirements if required by the purchase order. The entire lot of fasteners are put on "QC Hold" until this review is completed. The receipt inspection and supplemental documentation is required to verify conformance to purchase order requirements.

For items transferred from Unit 2 to Unit 1, Section 5.0 of Station Administrative Procedure A-27.4, "Administrative Procedure for Receipt Inspection of Quality Assured Items", instructs the Station Quality Control Inspector to review the "Certificate of Conformance" for completeness and accuracy, and verify that the transferred material is what is described in the transfer documents.

For fasteners purchased as safety-related for Limerick Unit 1, Station Quality Control is responsible for performing a documented receipt inspection on every item purchased for storeroom stock. Station Administration Procedure A-27.4, provides the method for control of Quality Assured spare or replacement parts during the receipt inspection process.

A summary of the receipt inspection requirements imposed on the Station Quality Control Inspectors by Section 5.0 of A-27.4 for Q-Listed material follows. These are general requirements for receipt inspected material and additional requirements may be described by the purchasing documents.

 Visual inspection of entire shipment for shipping damage, such as: fire damage; high temperature exposure; environmental damage; environmenta? exposure; tie down failure; and container failure.

- Visual inspection of individual items, including: markings and identification in accordance with purchase order requirements; and physical damage.
- Verification that the documentation supplied by the vendor (including Certificate of Conformance) is complete and conforms to the purchase order requirements.
- Additional review/inspection as required to assure conformance with purchase order requirements.

A receipt inspection requirement sheet (Appendix A) documents the receipt inspection, and lists nonconformances (including resolution of nonconformances). Each Requirement Sheet is unique to an item which is identified by material product code.

Materials for plant modifications are procured by Engineering or Construction in accordance with the design specification of the particular modification. Engineering and Research Department Procedure 7.1 (ERDP 7.1) "Procedure for Receipt, Inspection and Storage of Materials and Equipment" ensures that all Quality listed materials are received, receipt inspected, stored and maintained during storage in a prescribed manner. A summary of the receipt inspection requirements imposed on the Construction Quality Control Inspectors by Section 6.1.3 of RDP 7.1 for Q-Listed material follows. These are general requirements for receipt inspected material, and additional requirements may be described by the purchasing documents.

- Visual inspection of entire shipment for shipping damage, including: fire; excessive exposure; environmental damage; and container failure.
- Visual inspection of items, including: markings and identification; coatings and preservatives; cleanliness; protective covers and seals and physical damage.
- 3. Verification that documentation supplied by the vendor conforms to the purchase order requirements, including: Drawings; Mill Certification; Certificates of Compliance; Certificates of Conformance, and Certificates of Cleanliness.
- Additional review/inspection as required to assure conformance with purchase order requirements, including: physical properties; dimensions; and workmanship.
- Statistical sampling methods based on MIL-STD-105D criteria are acceptable for groups of similar items

(including: nuts, bolts, washers, etc.). These methods allow a visual inspection sample size proportional to the lot or batch size, from a normal visual inspection rate of 3 samples for lots containing 9 to 15 items, to a normal visual inspection rate of 200 samples for lots containing 3201 to 1000 items. Increased inspection rates up to 100% may be required.

A receipt inspection and storage report M-20640 (Appendix B) documents the required inspection, lists deficiencies and/or corrective action, identifies completed corrective action, and indicates storage requirements.

After acceptance, safety-related material is tagged and placed in appropriate storage locations segregated from nonsafety-related material within the storeroom in accordance with CP-F-2, A-27.4, or ERDP 7.1. Items within the storeroom are maintained by PECo stores personnel and items in the warehouse are maintained by Bechtel personnel until issuance.

Items which do not pass the receipt inspection are placed in "QC Hold" until corrective actions are taken. These actions include obtaining missing documentation, repair, rework, engineering evaluation, or rejection. Corrective action is documented in either Section 8.0 of report M-20640 for Unit 1 modifications, or Station Administrative Procedure F27-8 "Administrative Procedure for Receipt Inspection Deficiencies" for Unit 1 spare or replacement parts, or Bechtel Field Construction Procedure CP-D-1 "Procedure for Processing of Nonconformance Reports (NCR)" for Unit 2 material.

When the station or Engineering/Construction requires the installation or replacement of safety related fasteners, correct usage is controlled by (1) procedures which identify the item by description and/or material code number and/or part number, and (2) Quality Control Inspections which verify that the correct parts are installed in accordance with applicable procedures and assure proper parts traceability.

Receipt inspection, storage, and issuance of non-safety related fasteners is accomplished through the use of station Stores Division Administration Procedures (SDA) for Unit 1, and CP-F-2 for Unit 2. Following Stores Division or Bechtel Construction receipt acceptance, the non-safety related material is tagged and physically segregated from the safety related material during storage.

In addition, material purchased through Bechtel Construction has been subjected to a random sampling program of testing since 1978. This testing is performed under the direction of PECo Quality Control and was established to assure the conformance of material (including fasteners and nuts) with mechanical and chemical specification requirements. Samples are

evaluated individually and specifically for the applicable requirements and deficiencies analyzed and dispositioned accordingly.

Action 2:

Select a minimum sample of ten (10) non-safety related fasteners (studs, bolts, and/or cap screws), and ten (10) safety related fasteners (studs, bolts and/or cap screws) from current, in use, stock. The sample is to be obtained by the licensee with the participation of an NRC inspector. Fasteners procured to meet the following chemical and mechanical properties are of interest: A-193 grades B7, B8, and B-16; SAE J429 grades 5 and 8; A-449; A-325 Types 1, 2, or 3; A-354 grades BB, BC, BD; A-490; A-320 LTM; A-307; A-563; or equivalent.

LGS 1 & 2 Action 2 Response:

For Unit 1, a testing sample of 10 non-safety related and 11 safety related fasteners (studs, bolts, and/or cap screws) was selected from current in-use, storeroom stock. The sample selection was performed by station Quality Control and Engineering Maintenance, with the participation of the NRC site inspector. The selection was performed by reviewing Purchase Order Equipment Parts Lists to establish high usage items, and comparing the fastener types and grades requested in the Compliance Bulletin with the high usage items. When fasteners procured to the specifications of interest were found to be available from multiple suppliers/manufactures, the test sample was selected to represent the range of possible sources. The samples of fasteners are identified in the attachments.

For Unit 2, a testing sample of 15 non-safety related and 10 safety related fasteners was selected from current, inuse, warehouse stock. The test sample was determined by a committee comprised of Bechtel Construction Engineering, Project Engineering, Quality Control, Quality Assurance, Quality Engineering, and PECo Quality Assurance and Construction Engineering, and included participation of the NRC site inspector. The selection was performed by cross referencing the fastener types and grades requested in the Compliance Bulletin of material purchased for the Unit 2 warehouse, material stored in the warehouse, and an engineering evaluation of material installed in the plant.

Action 3:

For the selected sample of fasteners in action 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.

LGS 1 and 2 Action 3 Response:

A testing sample of 10 non-safety related nuts (including 2 cap screw/nut combinations) and 9 safety related nuts was selected from current storeroom stock for Unit 1, and 11 non-safety related and 12 safety related nuts were selected from current warehouse stock for Unit 2, to correspond with the fasteners selected for the test sample in Action 2. As requested in the Compliance Bulletin, a cross section of A-194 nuts was selected from the available material types and grades. The selection process was similar to that of Action 2 above.

Action 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 properties as required by the fastener's specification, grade, and class. Each sample shall be tagged with the sample's ID number.

LGS 1 and 2 Action 4 Response:

The testing of Limerick Unit 1 samples was performed by Laboratory Testing, Inc. of Dublin, Pennsylvania. Laboratory Testing has been approved to perform testing of safety related material as evidenced by inclusion on PECo's Evaluated Supplier List. The testing of Limerick Unit 2 samples was performed by Bethforge Laboratories. This laboratory has been approved to perform testing of safety related materials and is included on the Project Approved Vendor List. A portion of the Limerick Unit 2 testing samples was also forwarded to Laboratory Testing, Inc. due to failure of the Baldwin Tensile Testing Machine at Bethforge. All testing was performed in accordance with the requirements of the fasteners/nuts specification, grade, and class. The chemical content evaluation for all fastener and nut samples was performed by Spectrochemical Analysis. Wet Chemical Analysis was used when out of specification chemistry measurements dictated confirmation by retesting. The ultimate tensile strength testing of each safety related fastener was performed using a Baldwin Tensile Testing Machine at Laboratory Testing. The hardness testing of each non-safety related fastener and all nuts was performed using the Rockwell test method. The tests required by Compliance Bulletin 87-02 were supplemented by the following tests, including: hardness tests performed on each safety related fastener; proof load tests performed on each nut; and a full range of mechanical tests supplementing the ultimate tensile strength test, including yield strength, % elongation, and area reduction performed on each safety related and non-safety related fastener. Upon removal from the storeroom/warehouse for testing, each test sample was tagged with a unique identification number to ensure traceability.

Action 5:

The results of all tests, together with supporting information, are to be reported to the NRC utilizing the format shown in Attachments 1 and of the NRC Bulletin. Include the names and addresses of suppliers and manufactures of safety-related fasteners and to the extend 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:

The results of this testing are summarized in Appendix C. The Testing Laboratory reports are attached in Appendix D. The names and addresses of suppliers and manufactures of safety related fasteners, and to the extent possible, non-safety related fasteners have been included. Those test samples which did not meet specification requirements have been evaluated by PECo for safety significance, including consideration of the most limiting application. A comprehensive summary of these evaluations is included as Appendix E. The testing results from LGS Unit are attached in a different format than the Bulletin requested. This format was discussed with the NRC technical contact for the Bulletin and found acceptable.

Action 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:

Based on the testing results, we conclude that the receipt inspection process is sufficiently regulated and controlled to assure traceability, conformance to material specification requirements, and appropriate issuance for fasteners. However, we are reviewing purchasing practices for possible improvements to assure that fasteners used in the plant meet the requisite specification requirements, including increased sampling. Evaluations of the test results indicate that the operability of safety related plant components has not

been compromised, even considering the most limiting application of fasteners which tested out-of-specification.

Very truly yours,

Ju Ballagha

cc: Addressee

E. M. Kelly, Senior Resident Inspector

COMMONWEALTH OF PENNSYLVANIA :

SS.

COUNTY OF PHILADELPHIA

J W. Gallagher, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company, and that he has read the foregoing response to the NRC Compliance Bulletin 87-02 and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

Subscribed and sworn to before me this /7 day of February, 1988

Notary Public

PATRICIA & JONES Notary Public, Phila., Phila. Co. rsion Expires Oct 13, 1990

A-27.4, Revision 4
Figure 1, Sheet 1 of 2
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CBW/jmv

		ASE ORDER NUM		
		PT INSPECTION REVISION 0 IAL RECEIVED	- DATE 07/29/86	
Q.C.	I.R		WHS. RECEIVE	R NO
	Visually insp	ect the shipp	ing container and the following at nter the date in	d visually inspect tributes, circle
		INSPECTI	ON CRITERIA:	
1.1	EVIDENCE OF E PACKING MATER	XPOSURE TO HI IAL OR ITEM M	GH TEMPERATURE -	
	SAT.	UNSAT.	INITIALS	DATE
1.2	EVIDENCE OF E RUSTED, OR ST DURING TRANSI	AINED CONTAIN	SURE - WEATHER-B	EATEN, FRAYED, ROLONGED EXPOSURE
	SAT.	UNSAT.	INITIALS	DATE
1.3	CONDITIONS, D	IRTY AREAS, C	OR SALT FILM ON P	R OIL MARKS, DAMP ACKING MATERIAL OR
	SAT.	UNSAT.	INITIALS	DATE
1.4	MILLIAMEN CUITE	THE MITTE AN	URE - SHIFTED, BR D WORN MATERIAL C ING AND TIE DOWN	ROKEN, LOOSE, OR UNDER TIL3 DURING SHIPMENT.
	N/A SAT.	UNSAT.	INITIALS	DATE
1.5	CONTAINERS IN	IDICATING IMP	G - SPLINTERED, 1 ROPER HANDLING.	
	SAT.	UNSAT.	INITIALS	DATE
1.6	IDENTIFICATION MARKING IS IN	ON AND MARKIN N ACCORDANCE	G - VERIFY IDENT	IFICATION AND DER REQUIREMENTS.
	SAT.	UNSAT.	INITIALS	DATE
1.7	CRACKED, MIS	SING, DEFORME	GE - PARTS OF IT D, OR MISALIGNED ABLE EXTERNAL AN DENTS, SCRATCHES	D INTERNAL AREAS
			INITIALS	

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A-27.4, Revision 4
Figure 1, Sheet 2 of 2
Page 11 of 16
CBW/jmv

1.8	Verify receipt and proper completion of the following documents:
	Philadelphia Electric Company Certificate of Conformance or equivalent.
1.9	Documentation is:CompleteIncomplete
	(If documentation is incomplete identify the missing documents below).
	INITIALS DATE
1.10	HOLD TAG REQUIREDYESNO INITIALS
	HOLD TAG NUMBER
	INSPECTORS COMMENTS: (USE ADDITIONAL SHEETS AS REQUIRED)
	SHEETS ATTACHED
	어제 하나 이 나는 내가 있었다. 그 아이는 내가 있다.
	INSPECTOR'S SIGNATURE DATE
1.11	When all aspects of the inspection are satisfactory and the received item is to be placed in the storeroom, enter the item into the Storage Maintenance Program, if applicable.

APPENDIX B M-20640 Rev. 3/87 (Sheet 1 of 5) DOCTYPE 516 ERDP EXHIBIT 7.1-1

RECEIPT INSPECTION AND STORAGE REPORT

[] O- Listed			
[] Fire Protection [] RADWASTE (Reg. Guide 1.143)			
Other			
1.0 Date of Receipt Inspection			
Material Description (Include Quantity, Item Number of Item, Serial Number, and Heat Code).	r of Procurement Docume	ent. Brief Description	
SEE ATTACHED SHEET			
30 Procurement document which forms the basis of th			
S.O. or P.O. No. or Letter No.			
Vendor			
Vendor's order number (if known)			
4.0 QA documents required from vendor per procureme	ent document.		
	REQUIRED	EVIDENCE OF PE.Co. F	RECEIPT & APPROVAL
	NO YES	NOT RECEIVED (DATE)	
4.1 Drawings			
4.2 Mill Certification			
4.3 Certificate of Compliance			
4.4 Certificate of Conformance			
		17 Brand, 18 Brand.	
4.5 Certificate of Cleanliness			
4.6			
4.7			
4.8			

5.0 Identification: State specifically how the material received was identified as being the same as the specified in the above documents.

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FROP E	xHIB.	T 7.1-	1		

60 STANDARD MATERIAL RECEIPT CHECKLIST

61 Shipping damage inspection, any evidence of:

YES	NO			
		FIRE		
			SIVE EXPOSURE — Weather beaten, rust, water stains	
			DNMENTAL DAMAGE — Water or oil marks, salt film mold, mildew, dirt, moisture	
			WN FAILURE — Shifted, broken, loose or twisted shipping ties, rub marks	
		ROUGH	HANDLING — Splintered, torn, crushed containers, review impact recorders	
			Inspected By: C.D. QC Insp. Date	
2 Item	Inspe	ction		
(3×t)	202	NOT NOT		
Ť	79.41			
SI	7	J-O4B		
WIT 4 OH-OES	SH	A		
Ť	A	D-III		
300	Ç	-		
Y	KNO-OR>			
	Y		- COLUMN 1 120 (COLUMN 1	
			Special packing/Shipping requirements as specified in LTR/SPEC/PO. #	
-	-	-	Special identification and marking as specified in LTR/SPEC/PO.	
		1	Paragraph	
	-	_	Coatings and precervatives present as specified in LTR/SPEC/RO. #	
			Paragraph	
			Inert gas blanket pressure within acceptable limits as specified in LTR/SPEC/PO. *	
			Parugraph	
			Desiccant not saturated as specified in UTR/SPEC/PO. #	
		1	Paragraph	
			Cleanliness as specified in LTR/SPEC/PO. #	
	-	-		
	1.3		Protective covers and seals intact	
	-	+	No physical damage (No broken, cracked, deformed, misaligned or missing parts; Rotating	
			parts turn without binding; No detrimental gouges, dents, scratches, burns).	
			Inspected By:	
			C.D. QC Insp. Date	

M-20640 3/87 (Sheet 3 of 5) ERDP EXHIBIT 7.1-1

8.2.2 8.2.3	C.D. QC Insp. Evidence of P.E.Co. receipt and appro-	Date val of all required doctumentation is received. Date Removed Hold Tag Date Date	Date (Copy Atrache	8)
8.2.2 8.2.3	C.D. OC Insp. Evidence of P.E.Co. receipt and appro- C.D. OC Insp. C.D. OC Insp.	Date val of all required doctumentation is receive Date Removed Hold Tag Date	Date (Copy Atrache	x)
8.2.2 8.2.3	C.D. OC Insp. Evidence of P.E.Co. receipt and appro- C.D. OC Insp. C.D. OC Insp.	Date val of all required doctumentation is receive Date Removed Hold Tag Date	Date (Copy Atrache	8)
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8.2.2	C.D. QC Insp. Evidence of P.E.Co. receipt and appro-	Date val of all required documentation is receive Date Removed Hold Tag	Date (Copy Atrache	kd)
8.2.2	C.D. QC Insp. Evidence of P.E.Co. receipt and appro-	Date val of all required occumentation is receive	Date (Copy Atrache	x)
8.2.2	Install "as is" as authorized by	Date	Date (Copy Atrache	10
8.2.2	Install "as is" as authorized by	Date	Date (Copy Atrache	rd)
			Date	1 (1)
			Date	ka)
			Artached Hold Tag	
			and approval of all required documentation is	not receive
		C.D. OC Insp.	Date	
8.1 ACC	EPTANCE: Inspection is satisfactory and	evidence of P.E.Co. receipt and approval of	fall required documentation is received.	
	US: C.D. QC Inspector to sign and date			
		C.D. QC Insp.	Date	
	Inspected By:	C.D. OC Insp.		
	Sampling Oyserr (see that the sample of the			
	sampling system (EXHIBIT 7.1-II) utilized	17 [) Yes [] No		
Eng. ^a Was	neering Work Letter Revision No	David		
in pe	sulation, etc. — per ANSI N 45.2.2, Para enformed and documented at the source		be waived if a similar inspection was	

M-20640 3/87 (Snee 4 of 5) EROP EXHIBIT 7.1-1

_		
8.3.2.1	Deficiency has been resolved, follow-up inspection is satisfactory, and material	is conditionally acceptable (See PART 8.2
	C.D. OC Insp.	Date
8.3.2.2	Deficiency has been corrected, follow-up receipt inspection is satisfactory, and required documentation is received.	evidence of P.E.Co. receipt and approval
	C.D. OC Insp.	Date
	Removed "Hold Tag"	
	Deficiency can not be corrected and material is rejected for installation	
8.3.2.3		
8.3.2.3	C.D. OC Insp.	Date
8.3.2.3	C.D. QC Insp. 8.3.2.3.1 Reacon	
8.3.2.3		
8.3.2.3	8.3.2.3.1 Reacon	

M-20640 3/87 (Sheet 5 of 5 ERDP EXHIBIT 7.1-1	57
9.U STORAGE	

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	Level D - Outdoors)				
	STORAGE LEVEL: A	B (С	D	
State any special storage inst	ructions or requirements per ERDP 7.1,	SECTION 6.3			
					minutes material to a number.
Material assigned to Stores D	iv. For storage in accordance with appl	icable Stores Div. pi	rocedun	es under the	PE.Co. STOREROOM
ITEM NO.	DESCRIPTION	ON		Will	CODE NUMBER
		7+			
		1 2 2 4 1 -			
STORAGE STATUS					
Material is on QC hold and h	as been assigned to Stores Div. for se	gregated storage in	a contr	rolled storage	area for unacceptable
material until the reason for (IC hold is resolved.				
		00			Date:
		QC insp.			
Material is acceptable and ha Stores Div. procedures. TH	is been assigned to Stones Div. for sto IS RI & S. IS COMPLETE.	rage and subsequer	nt issue	in accordance	ce with applicable
					Uate:
	CO	OC Insp.			
	the second second second second field !	omes for installation	n. THIS	RI & S IS CC	MP FTE
Material is acceptable and ha	is been released to construction need t		and the same of th		
Material is acceptable and ha	is been released to construction need t				Date:

APPENDIX C

Fastener Testing Data Sheet

*Sample ID# LGS 1-1-0

Fastener Description: Bonnet Stud (9/16" x 3 5/8")

Description of Sample Stock Location: Bin 1-E374-Al

P.O. LS 221285 Code 114 43072

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

Head Marking (Specification and Manufacturer):

B7 Sthr. end

**Class/Procurement Level: Quality Assured

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

Vendor: Velan Valve

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Panaggar Date 1/14/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS-1-1-Q

ASTM A-193 GR B7

Attachment ?

Data Summary

Mechanical	Analysis	Chemi	cal Analys	is ¹					
Hardness	urs	0.2x YS	<u>c</u>	Ha	<u> </u>	5	.51	Мо	
RC 29		111,445 psi	0.404	0.85	0.038	0.927	0.22	1.05	0.18

HIS-ultimate tensile strength; YS-yield strength; C-carbon; Mg Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Ldcnum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of the attendance shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-1-Q

Fastener Description: Bonnet Nut (9/16")

Description of Sample Stock Location:

Bin 1-E381-A3

Code 114-43073

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Velan Valve

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature In Panager Date 1/1/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-1-Q

· A 194 GR 2H

Attachment ?

Data Summary

Mechanical	Analysis	Chemical Analysis							Cr
113 rdness	512	0.24 YS	<u> </u>	Hn	P	5	Si .	Do.	
RC 33			0.457		0.021	0.015			

HIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

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

Attachment 1 '

Fastener Testing Data Sheet

*Sample ID# LGS 1-2-Q

Fastener Description: Cap Screw (7/16")

Description of Sample Stock Location: Bin 1-E332-A3 P.O. LS296595

Code 114-38050

Material Specification as Documented by Licensee Records: J429 GR 8

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Colt Industries

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature Ih Pongal Date 1/14/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS-1-2-Q

. J429 GR 8

Attachment ?

Data Summary

Mechanica	1 Analysis	Chemical Analysis 1							fr.
Hardness	urs	0.24 YS	<u>C</u>	Ha	_P		.51	Мо	
RC 34	14,700 psi		0,328		0.013	0.014			

1855-ultimate tensile strength; YS-yield strength; C-carbon; Hn Macganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of tration shall be noted with an asterisk.

Attachmint 1

Control of the control of the state of the control of the control

Fastener Testing Data Sheet

*Sample 10# LGS 1-3-Q

Fastener Description:

Suction Head Stud (5/8" x 2 1/2")

Description of Sample Stock Location:

Bin 1-E319-H1

P.O. Code 114-46394

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Ingersoll Rand

QA Requirements imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Pragger &

Date 1/14/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-3-Q

A-193 GR B7

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sisl					Cr.
Hardness	UTS	0.24 YS	_ <u>c</u> _	Ha	_ P		Si	. No	
RC 30		134,693	0.445	0.94	0.016	0.021	0.23	0.19	1.05

#15-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of that on shall be noted with an asterisk.

Fasterer Testing Data Sheet

Sample ID LGS 1-3-Q

Fastener Description: Suction Head Nut (5/8")

2.5

Description of Sample Stock Location:

Bin 1-E319-I1

I they are the set of the second of the second of the second of the second of

P.O. Code 114-46396

Material Specification as Documented by Licensee Records: A-194 GR 7

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Ingersoll Rand

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Comme

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-3-Q

A 194 GR 7

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sis ¹					
113 r dness	UTS	0.2% YS	<u>C</u>	Ha	_ P		Si	Мо	Cr
RC 32			0.372	0.89	0.011	0.020	0.30	0.23	1.06

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

shall conform to those reported in the applicable material specification. Properties found out of materials shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-4-0

Fastener Description: Bonnet Stud (3/4" x 4 1/4")

Description of Sample Stock Location:

Bin 1-E317-B3

P.O.

114-42272 Code

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Velan Valve

QA Requirements Imposed on Vendor: YES ; C of C required

Licensee Representative:

Signature Ih Pm

Date 1/1/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-4-Q

A-193 GR B7

Attachment ?

Data Summary

Pechanica	al Analysis	Che	emical Analys	is ¹					Cr.
Hardness	UTS	0.21 YS	<u>C</u>	tta	P	<u>\$</u>	21	ŀα	
RC 18	105,156	psi*91,001 p	osi*0.388	0.87	0.019	0.017	0.24	0.16	1.06

- * 91,001 psi is less than the required yield strength of 105,000 psi
- ** 105,156 psi is less than the required tensile strength of 125,000 psi

UTS-ultimate tensile strength; YS-yield strength; C-carbon; Hn-Manganese; P-Phosphorous; S-Sulfer; Si-Silicon; La Jenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

Sample ID LGS 1-4-Q

Fastener Description:

Bonnet Nut

(3/4")

Description of Sample Stock Location:

Bin 1-E322-B1 P.O. LS221285

Code 114-42273

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level:

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

Vendor:

Valan Valve

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Program Date 1/11/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-4-Q

A 194 GR 2H

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	s is 1					
Hardness	urs	0.94 YS		.ttn	P	_ 5	.51	Но	
RC 30			0.499		0.019	0.031			

ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Littenum; Cr - Chronium.

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-5-Q

Fastener Description: Bonnet Stud (3/4" x 5")

Description of Sample Stock Location:

Bin 1-E80-B1
P.O. LS297413

Code 114-26565

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

Head Marking (Specification and Manufacturer):

BTR

**Class/Procurement Level: Quality Assured

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

Vendor: Anchor Darling

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Pragged Date 1/14/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-5-0

A-193 GR B7

Attachment ?

Data Summary

Mechanica	1 Analysis	Chemical Analy	sis¹					6.
Hardness	urs	0.24 A2 C	_Hn	P		<u>Si</u> .	. No	
RC 31	137,904 ps	i 125,834 psi 0.396	0.89	0.019	0.026	0.27	0.23	0.92

UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of the attendance of the state of the st

Fastener Testing Data Sheet

*Sample ID# LGS 1-5-Q

Fastener Description:

Bonnet Nut (3/4")

Description of Sample Stock Location:

Bin 1-E132-C3 P.O. LS297413

Code 114-26566

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Anchor Darling

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

John Pmany

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-5-Q

. A 194 GR 2H

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sis1					Cr
Hardness	urs	0.2% YS	_ <u>c</u> _	Hn	P	5	.54	Ma	
RC 29			0.432		0.026	0.014			

uls-ultimate tensile strength; YS-yield strength; C-carbon; Hn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Laboum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-6-Q

Fastener Description: Stage Casing Stud (7/8" x 4 3/4")

Description of Sample Stock Location:

Bin

P.O. LS225514 114-46385 Code

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Ingersoll Rand

OA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Promogra

Date 1/1/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-6-Q

A 193 GR B7

Attachment ?

Data Summary

rechanteal Analy	chi Chi	emical Analys	is					
Hardness UTS	0.27 YS	<u>c</u>	Ha	_P	5	Si	Pla	
RC 33 144,517	psi 130,116	psi 0.385	0.88	0.013	0.023	0.25	0.14	1.01

udS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Jenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of stion shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS-1-6-Q

Fastener Description: Stage Casing Nut

(7/8")

Description of Sample Stock Location:

Bin P.O.

Code

Material Specification as Documented by Licensee Records: A-194 GR 7

Head Marking (Specification and Manufacturer): 18 300

**Class/Procurement Level: Quality Assured

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

Vendor:

Ingersoll Rand

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature In Pman

Date 1/11/88

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

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

LGS-1-6-0

A-194 GR 7

Attachment ?

Data Summary

Pechanical	Analysis	Che	mical Analy	sis1					Cr.
Hardness	UTS	0.2% YS	_ <u>c</u> _	Hn	P		21	Po	
RC 34			0.375	0.90	0.010	0.017	0.26	0.23	0.94

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

the state of the s

Fastener Testing Data Sheet

*Sample ID# LGS 1-7-Q

Fastener Description: Cap Screw (3/4" x 2")

Description of Sample Stock Location: Bin 1-E332-B2 P.O. LS296595

Code 114-38065

Material Specification as Documented by Licensee Records: J-429 GR 5

Head Marking (Specification and Manufacturer):

(15-)

**Class/Procurement Level: Quality Assured

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

Vendor: Colt Industries

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Programs

Date Virles

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-7-0

J 429 GR 5

Attachment ?

Data Summary

Mechanical Analysis CI			mical Analy	5151					Cr
Hardness	<u>nr2</u>	0.21 YS	<u> </u>	Ha	P		- 51	No	
RC 37*			0.355		0.027	0.021			

Dis-ultimate tensile strength; YS-yield strength; C-carbon; Hn Manganese; P Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of materials hall be noted with an asterisk.

^{*} RC 37 is outside the SAE J429 Grade 5 limits of RC25-RC34

Fastener Testing Data Sheet

*Sample ID# LGS 1-7-0

Fastener Description: Nut (5/8") UNF

Description of Sample Stock Location: Bin 1-E333-B3

P.O. L\$296595 Code 114-38125

Material Specification as Documented by Licensee Records: Fed. Spec. QQZ325, Typ 2.
Class 2 (per Colt Ind.)

Head Marking (Specification and Manufacturer):

To - No morkings

**Class/Procurement Level: Qaulity Assured

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

Vendor:

Colt Industries

QA Requirements Imposed on Vendor: Yes; C. of C. required

Licensee Representative:

Signature John Command Date 4/1/89

*The sample ID# shall have a prefix that contains the lice-see facility initials.

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

LGS 1-7-Q

A 563 GR B

Attachment ?

Basa Summary

Pechanical	Analysis	Che	mical Analy	515					
nardness	urs	0.5% AZ	_£_	Ha	P	5	-51	Мо	Cr
RB 92			0.070						

MIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Adenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of the stall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-8-Q

Fastener Description: Bonnet Stud (1" x 5")

Description of Sample Stock Location:

Bin 1-E132-C4
P.O. LS297413

Code 114-22959

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

Head Marking (Specification and Manufacturer):

87 R HAD

**Class/Procurement Level: Quality Assured

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

Vendor: Anchor Darling

QA Requirements Imposed on Vendor: Yes ; CMTR required

Licensee Representative:

Signature John Pmany Date 4/4/88

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

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

Required Testing: Chemical & Mechanical Analysis

A 193 GR B7

Attachment ?

Data Summary

Pechanic	Chemica	1 Analysis						Cr	
Hardness	<u>u15</u>	0.2% YS	<u>C</u>	Mn	ľ		51	Mo	
RC 32	120,515 pši	* 94,239 psi	0.380	0.85	0.012	0.021	0.41 wet	0.21	1.04

*0.41 percent Si is above the required maximum 0.37 percent

**94,239 psi is less than the required 105,000 psi yield strength

***120,515 psi is less than the required 125,000 psi tensile strength

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of materials shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-8-Q

Fastener Description: Bonnet Nut (1")

Description of Sample Stock Location:

Bin 1-E80-C3 P.O. LS297413

Code 114-22960

Material Specification as Documented by Licensee Records: A-193 GR 2H

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Anchor Darling

QA Requirements Imposed on Vendor: Yes ; CMTR required

Licensee Representative:

Signature John Pmagna Date dista

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

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

LGS 1-8-0

A-194 GR 2H

Attachment ?

Data Summary

Pechanical	Analysis	Che	mical Analy	sis1				
Hardness	<u>u15</u>	0.71 45	<u> </u>	tin	P	 51	Ма	Cr
RC 27			0.463		0.029	0.018		

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; telenom; Cr - Chromium.

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

Fastener Testing Data Sheet

*Sample ID# LGS 1-9-Q

Fastener Description: Bonnet Stud (1 1/4" x 5 1/4")

Description of Sample Stock Location:

Bin P.O.

Code

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

Heed Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor:

Anchor Darling

OA Requirements Imposed on Vendor: Yes ; CMTR required

Licensee Representative:

Signature Och Pman

Date 1/11/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-9-Q

A-193 GR B7

Attachment ?

Data Summary

rechanic	al Analysis	Cher	Chemical Analysis 1				Ç.	Mo	Cr
Hardness	<u>u12</u>	0.9x YS	<u> </u>	.Hn	P	<u>s</u>	Si	Мо	
RC 28	128,120 p	si 109,271	psi 0.409	0.91	0.028	0.026	0.22	0.16	0.90

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

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

Fastener Testing Data Sheet

*Sample ID# LGS 1-9-0

Fastener Description: Bonnet Nut (1 1/4")

Description of Sample Stock Location: Bin

P.O. 114-22984 Code

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Quality Assured

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

Vendor: Anchor Darling

QA Requirements imposed on Vendor: Yes ; CMTR required

Licensee Representative:

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

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

LGS 1-9-0

. A 194 GR 2H

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sis1					6.5
Hardness	UTS	0.2x YS	_c_	Hn	_ P		Si	Ho	_cr_
RC 29			0.457		0.012	0.022			

#IS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Lodenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of materials shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-10-Q

Fastener Description: Bonnet Stud (5/8" x 3 5/8")

Description of Sample Stock Location:

Bin 1-E351-F2
P.O. LS296619

Code 114-33540

Material Specification as Documented by Licensee Records: A-564 GR 630

Head Marking (Specification and Manufacturer):

630 V 55

**Class/Procurement Level: Quality Assured

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

Vendor:

Velan Valve

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Smagger Date 4/14/88

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

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

Required Testing: Chemical & Mechanical Analysis

A 564 GR 630

Attachment ?

Data Summary

Mechanic	al Analysis	Chei	nical Analy	sis			*:		Cr
Mardness	urs	0.27 YS	_ <u>c</u>	_ttn	. P	<u>2</u>		<u> Po</u>	
нв 342	137,048 ps	i 131,526	0.032	0.58	0.023	0.007	0.58		16.37

Ni	Cu	Columbium and Tantalum
4.39	3.45	0.259

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; L-Jenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of materials hall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-10-Q

Fastener Description: Bonnet Nut (5/8")

Description of Sample Stock Location:

1-E364-A1 Bin

P.O. LS296619 Code 114-33541

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

Head Marking (Specification and Manufacturer):

50

**Class/Procurement Level: Quality Assured

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

Vendor:

Velan Valve

QA Requirements Imposed on Vendor: Yes ; C of C required

Licensee Representative:

Signature John Pmanne

Date 1/14/88

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

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

LGS-1-10-Q

A 194 GR 8M

Attachment ?

Data Summary

Mechanical	Analysis	Che	Chemical Analysis ¹				Mo	Cr	Ni
Pardness	<u>urs</u>	0.27 YS	_ <u>c</u>	Ha	Р.		Mo		NI
RB 81			0.027	1.42	0.036	0.041 wet 0.42	2.124	16.08	10.18

* 0.041 percent silicon is greater than the maximum allowable percent silicon (0.030%)

uts-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Jacon; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of materials shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-11-Q

Fastener Description: Stud, MSRV (1 $3/8" \times 10"$)

Description of Sample Stock Location: Bin 1-E200-A2 P.O. GS279702-38

Material Specification as Documented by Licensee Records: A-193 GR B16

Head Marking (Specification and Manufacturer):

816 Run

**Class/Procurement Level: Quality Assured

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

Vendor: Target Rock

QA Requirements Imposed on Vendor: Yes ; CMTR required

Licensee Representative:

Signature John my Date 1/11/88

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

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

Required Testing: Chemical & Mechanical Analysis

LGS 1-11-Q

. A-193 GR B16

Attachment ?

Data Summary

Mechanical Analysis Chemi			mical Analys	Analysis 1				Mo	r.,
Hardness	urs	0.2x xs	<u> </u>	- Mri	<u>P</u>	S	Si	Mo	<u> </u>
RC 31	131,912 ps	si 121,765	psi 0,419	0.54	0.017	0.020	0.32	0.60	1.11 0.326

uts-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Idenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of section shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-1-N

Fastener Description: Bonnet Stud Assm. (Stud) (1/2" x 2-3/4")

Description of Sample Stock Location: Bin 1-G198-D3
Code 114-20506

Material Specification as Documented by Licensee Records:

A-193 GR B7

Head Marking (Specification and Manufacturer):

8 7

**Class/Procurement Level:

Non-O

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

Vendor: Crane Co.

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Praggas Date 1/11/88

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

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

LGS 1-1-N

A 193 GR B7

Attachment ?

Data Summary

Mechanical Analysis			mical Analy	sis¹					Cv.
Hardness	<u>v 1 v</u>	0.9% YS	_ <u>C</u>	<u>Ha</u>	P		Si	<u> </u>	
RC 30			0.363	0.88	0.013	0.025	0.23	0.18	0.94

uts-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; LJenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of station shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-1-N

Fastener Description: Bonnet Nut (1/2")

Description of Sample Stock Location: Bin 1-G198-D3 Code 114-20506

Material Specification as Documented by Licensee Records:

A-194 GR 2H

Head Marking (Specification and Manufacturer):

**Class/Procurement Level:

Non-O

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

Vendor: Crane Co.

OA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Pragal Date 1/1/88

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

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

LGS 1-1-N

A 194 GR 2H

Attachment ?

Data Summary

Pechanical	Analysis	Láe	mical Analy	s i s¹			_51		
Hardness	dness UTS	0.27 YS	_ <u>c</u>	. Hn	_ P			Мо	.cr
RC 31			0.451		0.018	0.027			

OTS-ultimate tensile strength; YS-yield strength; C-carbon; Hn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; ot Jenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of materials shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-2-N

Fastener Description: Cap Screw w/ Nut (9/16" x 4")

Description of Sample Stock Location: Bin 1-B72-C2 Code 194-57087

Material Specification as Documented by Licensee Records: J429 GRS

Head Marking (Specification and Manufacturer):

/_

**Class/Procurement Level: Non-Q

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

Vendor: Various

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature Jhomman

_____ Date _//4/88

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

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

LGS 1-2-N

J429 GR5

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sisl			Si.		Cr
Hardness	urs	0.2x YS	_ <u>c</u> _	<u>Ho</u>	P	S		Mo	
RC 34			0.355		0.011	0.022			

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of materials hall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# \.GS 1-3-N

Fastener Description: Bonnet Stud (5/8" x 3-3/8")

Description of Sample Stock Location:

Bin 1-A308-C1

Code 114-23363

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

Head Marking (Specification and Manufacturer):

B 7

**Class/Procurement Level: Non-Q

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

Vendor:

Pacific Valve

OA Requirements Imposed on Vendor:

No

Licensee Representative:

Signature John Cmagnes.

Date 1/14/88

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

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

LGS 1-3-N

A 193 GR B7

Attachment ?

Data Summary

Mechanical Analysis Ch			mical Analy	sis					Cr
Hardness	urs	0.22 YS	<u> </u>	<u>ttn</u>	<u> </u>		. 21	No.	
RC 31			0.397	0.90	0.019	0.018	0.26	0.15	1.06

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-3-N

Fastener Description: Bonnet Nut (5/8")

Description of Sample Stock Location:

Bin 1A289-B4 Code 114-23364

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

Head Marking (Specification and Manufacturer):

3

**Class/Procurement Level: Non-Q

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

Vendor: Pacific Valve

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature

John Por July

Date 1/14/88

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

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

LGS 1-3-N

A 194 GR 2H

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sis1				
Hardness	urs	0.9x YS	<u> </u>	Ma	_ P	<u>S</u>	 No	Cr_
RC 29			0.446		0.034	0.030		

uls-ultimate tensile strength; YS-yield strength; C-carbon; Hn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Ladenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of the attendance of the state of the st

Fastener Testing Data Sheet

*Sample ID# LGS 1-4-N

Fastener Description: Bonnet Stud (5/8" x 3-5/8")

Description of Sample Stock Location: Bin 1-B18-C1 Code 114-33166

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Non-Q

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

Vendor: Velan Valve

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Programe Date 1/14/88

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

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

Required Testing: Chemica. Analysis & Hardness

LGS 1-4-N

A 193 GR B7

Attachment ?

Data Summary

Mechanical	Che	mical Analy	sis					Cr.	
Hardness	uts	0.2x YS	<u> </u>	Hn	P		.51	Mo	
RC 33			0.399	0.93	0.021	0.029	0.36	0.19	1.03

UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; T. Ldenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of the attendance of the state of the st

Fastener Testing Data Sheet

*Sample ID# LGS 1-4-N

Fastener Description: Bonnet Nut (5/8")

Description of Sample Stock Location: Bin 1-B18-E1 Code 114-33167

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Non-Q

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

Vendor: Velan Valve

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature Jenny

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

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

LGS 1-4-N

A-194 GR 2H

Attachment ?

Data Summary

Mechanical Analysis Chem			mical Analy	sis ¹					
Hardness	urs	0.97 YS	_c_	<u>Ha</u>	Р	- 5	St	Po	1.5
RC 39			0.462	0.022		0.037			

UTS-ultimate tensile strength; YS-yield strength; C-carbon; Hn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

Shall conform to those reported in the applicable material specification. Properties found out of the stall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-5-N

Fastener Description: Cap Screw (5/8" x 3")

Description of Sample Stock Location: Bin 1-D42-C2 Code 114-25077

1

Material Specification as Documented by Licensee Records: A-307 GR B

Head Marking (Specification and Manufacturer):

2 Morking

**Class/Procurement Level: Non-Q

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

Yendor: Joy Mfg. Co.

OA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Paris Date 1/14/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-5-N

A 307 GR B

Attachment ?

Data Summary

Pechanical Analysis

Chemical Analysis

UTS 0.27 YS C The P S Si No Cr

RB 94

0.014 0.026

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

shall conform to those reported in the applicable material specification. Properties found out of reation shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-5-N

Fastener Description: Nut (5/8")

Description of Sample Stock Location: Bin 1-D42-C1

Code 114-25078

Material Specification as Documented by Licensee Records: A-307 GR B

Head Marking (Specification and Manufacturer):

**Class/Procurement Level:

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

Vendor: Joy Mfg. Co.

OA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Pmysel Date 1/14/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-5-N

A 563 GR B

Attach. at ?

Data Summary

Pechanical	Analysis	Che	mical Analy	rs is 1					
Hardness	urs	0.2x YS	<u>c</u>	.ttn	P	_5	Si	Mo	Cr
RB 93			0.097						

BIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Lidenum; Cr - Chromium.

issents listed apply to ASTM A193-87 or SA193-87 material. The elements to be reported for other materials shall conform to those reported in the applicable material specification. Properties found out of the station shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-6-N

Fastener Description: Bonnet Stud (3/4" x 3-1/4")

Description of Sample Stock Location: Bin 1-D44-C5 Code 114-27413

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

Head Marking (Specification and Manufacturer):

856

**Class/Procurement Level: Non-Q

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

Yendor: Tudor Technology, Inc.

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Pmagna

Date 1/14/08

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

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

Required Testing: Chemical Analysis & Hardness

LGS-1-6-N

Attachment 2

A193 GR B7

Data Summary

rechanica!	Analysis	Che	mical Analy	sisl					Co
Hardness	<u>ut s</u>	0.2x YS	_ <u>c</u> _	Mn	<u>_P</u> _		_si	Mo	_Cr
KC 33			0.449	0.99	0.030	0.024	0.28	0.23	1.05

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

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

Fastener Testing Data Sheet

*Sample ID# LGS 1-6-N

Fastener Description: Bonnet Nut (3/4"_

Description of Sample Stock Location:

Bin 1D44-B4 Code 114-27414

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Non-O

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

Yendor: Tudor Technology, Inc.

OA Requirements Imposed on Vendor:

Licensee Representative:

Signature John Program Dave 1/14/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-6-N

A-194 GR 2H

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	5151					Cr
Hardness	UTS	0.21 YS	_ <u>c</u> _	tla	Р	<u>.</u> <u>\$</u>	.Si	Mo	
RC 27			0.466		0.011	0.021			

DIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Idenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-7-N

Fastener Description: Cap Screw w/ Nut

Description of Sample Stock Location: Bin 2-D7-A2 Code 194-57110

Material Specification as Documented by Licensee Records: J429 GR5

Head Marking (Specification and Manufacturer):

S

**Class/Procurement Level: Non-Q

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

Vendor: Various

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Praysal Date 1/14/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-7-N J429 GR 5

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	s is 1					Ce
Hardness	urs	0.2x YS	_ <u>c</u> _	Hn	P	<u> </u>	-21	Mo	
RC 31			0.329		0.014	0.015			

UIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; LJenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of materials be also shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS-1-8-N

Fastener Description: Bolt (3/4" x 3-1/4")

1-A256-A2 Description of Sample Stock Location: Bin Code 114-41618

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

Head Marking (Specification and Manufacturer): 48>

**Class/Procurement Level: Non-O

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

Vendor: Graver Water Company

OA Requirements Imposed on Vendor: NO

Licensee Representative:

Signature John Praggan Date 1/14/88

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

**If applicable, please provide an explanation for your classification system. Required Testing: Chemical Analysis & Hardness

LGS-1-8-N A 193 GR B7

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	s is 1					
il) rdness	<u>urs</u>	0.9% YS	_ <u>c</u>	-Mn	P		51	No	Cr
RC 30			0.406	0.93	0.027	0.012	0.31	0.16	0.96

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn Hanganese; P-Phosphorous; S-Sulfur; Si-Silicon;

the state of the s

Fastener Testing Data Sheet

*Sample ID# LGS 1-8-N

Fastener Description: Nut (3/4")

Description of Sample Stock Location:

Bin 1-A256-A2 Code 114-41618

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Non-O

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

Vendor: Graver Water Co.

OA Requirements Imposed on Vendor:

Licensee Representative:

Signature Johnsmann Date 1/1/88

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

**If applicable, please provide an explanation for your classification system. Required Testing: Chenmical Analysis & Hardness

LGS-1-8-N A 194 2H

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	rs is 1					Cr
Hardness	UTS	0.22 YS	_ <u>c</u> _	Ha	<u>P</u>	<u>s</u> s	21	Mo	
RC 27			0.409		0.015	0.027			

HIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of stion shall be noted with an asterisk.

Fastener Testing Data Sheet

*Sample ID# LGS 1-9-N

Fastener Description: Bonnet Stud 1" x 5-3/4"

Description of Sample Stock Location: Bin 1-H252-E1 Code 114-29982

Material Specification as Documented by Licensee Records: A-193 GR B6

Head Marking (Specification and Manufacturer):

4.193 0

**Class/Procurement Level: Non-Q

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

Vendor: Byron Jackson

QA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Maggin Date 1/14/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-9-N A 193 GR B6

Attachment ?

Data Summary

Mechanical.	Analysis	Che	mical Analy	sis ¹					
Hardness	UTS	0.9x YS	C	.Mn	_P		51	. Но	Cr.
RC 23			0.118	0.45	0.011	0.005	0.34		12.61

uls-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-9-N

Fastener Description: Bonnet Nut (i")

Description of Sample Stock Location: Bin 1-H279-C5 Code 114-29987

Material Specification as Documented by Licensee Records: A-194 GR6

Head Marking (Specification and Manufacturer): 50

**Class/Procurement Level: Non-Q

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

Vendor: Byron Jackson

OA Requirements Imposed on Vendor: No

Licensee Representative:

Signature Johnson

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

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

Required Testing: Chemical Analysis & Hardness

LGS-1-9-N A 194 GR6

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sis1					
Hardness	UTS	0.2% YS	_ <u>c</u>	Ha	Р		Si	Mo	
RC 26			0.119	0.75	0.015	0.016	0.34		11.84

uls-ultimate tensile strength; YS-yield strength; C-carbon; La Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Jenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-10-N

Fastener Description: Bonnet Stud (1-3/8" x 9-1/2")

Description of Sample Stock Location: Bin 1-D176-A2
Code 114-23541

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

Head Marking (Specification and Manufacturer):

BTM

**Class/Procurement Level: Non-Q

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

Vendor: Pacific Valve

OA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Praggas Date 1/4/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS 1-10-N A 193 GR B7

Attachment ?

Data Summary

Mechanical	Analysis	Che	mical Analy	sis					
Hardness	UTS	0.2x YS		Ilin	P	5	Si	Мо	25
RC 17			0.410	0.80	0.026	0.018	0.26	0.19	1.00

UIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn Manganese; P-Phosphorous; S-Sulfur; Si-Silicon;

shall conform to those reported in the applicable material specification. Properties found out of

Fastener Testing Data Sheet

*Sample ID# LGS 1-10-N

Fastener Description: Bonnet Nut (1-3/8")

Description of Sample Stock Location: Bin 1-D39-D1 Code 114-23540

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

Head Marking (Specification and Manufacturer):

**Class/Procurement Level: Non-O

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

Vendor: Pacific Valve

OA Requirements Imposed on Vendor: No

Licensee Representative:

Signature John Pmagna Date 1/1/88

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

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

Required Testing: Chemical Analysis & Hardness

LGS-1-10-N

- A 194 GR 2H

Attachment ?

Data Summary

Pechanical.	Analysis	Che	mical Analy	sis					
Hardness	uts	0.2x YS	_ <u>c</u> _	Ma	P		<u></u>	No	Cr.
RC 24			0.451		0.019	0.025			

UIS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Udenum; Cr - Chromium.

shall conform to those reported in the applicable material specification. Properties found out of

TEST DATA FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: /- 22-88

MP

FASTENER TESTING DATA SHEET

LGS2- 01

PASTENER DESCRIPTION: 1'4" x 11" STUD (STOCK CODE: Y530760472-2)

DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED BIN, LABELLED SIOCK CODE

MATERIAL SPECIFICATION: ASME SA-193 GRADE B7

HEAD MARKING: "B7" (BARDE), "DLH" (HEATE), " H" (MFG), " D" (PAWE CLASS)

CLASS / PROCUREMENT LEVEL: PPING CLASS 2, GLISTED, ASME, PERMANENT PLANT

PLANT APPLICATION: HIGH SAFETY PLANT APPLICATION / PIPING

VENDOR: A & G ENGINEERING CO. II, INC. (SUBRIER) (MFG): HAMANAKA NOT MFG. CO.

H640 EAST LA PALMA AVE. HIMEST, JAPAN

ANAHEIM, CA.

CA REQUIREMENTS IMPOSED ON VENDOR: SQ LEVEL A, ASME III W/NA-3700-NCA-3800, 10CFA 21 INVOKED

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
	137 Kai	118 851	21.0	61.0

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
.40	.86	,020	,009	,28	,22	1.04

ADDITIONAL TESTING: Impact @ +30°F - 3 TESTS - FT/LBS % FJB LAF EXP.

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: ASPANSES 6.4.PISCHELLI date: 2.10.88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

w

FASTENER TESTING DATA SHEET

LGS2- 02

DESCRIPTI	ON OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELLED BIN
MATERIAL	SPECIFICATION: 5A-194 CRAVE Y, ASME
EAD MAS	SPECIFICATION: 5A-194 CRAVE T, ASME KING: "T" (MF6), "T" (GRADE), "LN39" (HEATNO.), " @" (DIDING CLASS)
LASS / P	ROCUREMENT LEVEL: PIPING CLASS 2, Q-LISTED, ASME, PERMANENT PLANT
	PLICATION: HIGH SAFETY PLANT APPLICATION / PIPING
ENDOR:	TEXAS BOLT COMPANY
	3233 W.11 BT.
72-124	HUUSTON, TEXAS 77001
	REMENTS IMPOSED ON VENDOR: 50 LEVEL A, ASME III, WITH NA-3700/NCA 3 800,

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
267 HB	*	*	*	*

CHEMICAL ANALYSIS

l	C	Mn	P	S	Si	Mo	Cr
	.43	,94	.008	. 018	.24	,17	.96

ADDITIONAL TESTING:	* NOTE:	TEST LABORATORY WABLE TO COMPLETE TESTING OF	
		THIS SPECIMEN DUE TO TEST APPARATUS FAILURE,	
		SEE LG52-02D	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:

signature: AAPANISTO C.A. PISCITELLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE 1.22-88

FASTENER TESTING DATA SHEET

LGS2-OZD

DESCRIPT	TION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATET LABELED BIN
MATERIA	SPECIFICATION: ASME SA-194 GRADE 7
HEAD MA	RKING: "T" (MF6), "T" (GRADE), "LN39" (HEAT NO.)
CLASS /	PROCUREMENT LEVEL: PIPING CLASS 2, QLISTED, ASME, PERMINENT PLANT
DI ANT A	PPLICATION: HIGH SAFETY PLANT APPLICATION / PIPING
LEWINI WI	PEICHTION.
VENDOR:	TEXAS BOLT COMPANY
VENDOR:	TEXAS BOLT COMPANY 3233 W. 11TH ST.
	3233 W. 11 5T. HOUSTON TEXAS 77001
	TEXAS BOLT COMPANY 3233 W. 11TH ST. HOUSTON, TEXAS 77001 IREMENTS IMPOSED ON VENDOR: SQ LEVEL A, ASMETIT, W/NA-3700/NCA-3800,

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	JU.T.S.	10.2% Y.S.	%E.L.	% R.A.
26 RC	-	-	-	-

CHEMICAL ANALYSIS

1	С	Mn	P	S	Si	Mo	Cr
	.484	.98	.013	,022	.25	.19	1.05

ADDITIONAL TESTING:	PROOF LOAD	TEST!	LOAO -	175,000 LBS
				SATISFACTORY WITH NO FAILURES

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: AA AMELLO GAPINITELLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.88

FASTENER TESTING DATA SHEET

LGS2-03

DESCRIPTIO	N OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED L'BELEU BIN
MATERIAL	PECIFICATION: ASME SA-193 GRADE BY
HEAD MARK	(ING: "C" (MFG.), "B7" (GAADE), "H2" (HEATNO.), " D" (PIPING CLASS)
CLASS / PR	OCUREMENT LEVEL: ASME PIDING CLASS-1, Q-LISTED, PERMANENT PLANT
N ANT ADD	ICATION: HIGH SAFELY PLANT APPLICATION / PIPING
PLANT APP	ICATION: HIGH SAFERY PLANT APPLICATION / PIPING
	CARDINAL INDUSTRIAL PRODUCTS 3873 WEST OQUENDO
	CARDINAL INDUSTRIAL PRODUCTS

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
-		151,000		

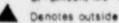
CHEMICAL ANALYSIS

С	Mn	P	S	Si	Mo	Cr
.4/	.96	.010	.021	. 22	.16	.99

SEE ACR 12853

ADDITIONAL TESTING:	IMPACT @	0° F :	62	FT/L85	100% FIB	.043" LAT: EXP	
100						. 038" "	
			74	"	100 % "	.045" "	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: AS AND CAPSORTLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02 TEST DATA SOUPCE MATERIAL CONTROL GROUP DATE: 2/2/88 FASTENER TESTING DATA SHEET FASTENER DESCRIPTION: 1" x 5" STUD (STOCK CODE : Y5307600 ZZ-1) DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE SEGREGATED LABELED BIN MATERIAL SPECIFICATION: ASME SA-193 GRADE BY HEAD MARKING: "C" (MFG), "BY" (GRADE), "H2" (HEAT NO.), " " (PIPING CLASS CLASS I PROCUREMENT LEVEL: ASME PIPING CLASS-1 Q LISTED PERMANENT PLANT PLANT APPLICATION: HIGH SAFETY PLANT APPLICATION / PIPING CANDINAL INDUSTRIAL PRODUCTS VENDOR: __ 3873 WESTOOVENDO LAS VECAS. NEV. DA REQUIREMENTS IMPOSED ON VENDOR: 50 LEVEL A, ASMEIII, WITH NA-3700/NCA-3800 10 CFR 21 INVOKED DATA SUMMARY CHEMICAL ANALYSIS MECHANICAL ANALYSIS C | Mn | P | S | SI | Mo | Cr HARDNESS | U.T.S. | 0.2% Y.S. | %E.L. |% R.A. .463 .95 .018 .028 .25 .17 .98 153,246 147,206 13,2 55,4 3/RC SEE NCR # | 2853 ADDITIONAL TESTING NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area. Denotes outside specification tolerance.

signature: Al PLANTIN GAPISEITELLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22 88

MAP

FASTENER TESTING DATA SHEET

LGS2-04

DESCRIPTIO	ON OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
	SPECIFICATION: ASME SA-194 GRADE 2H
HEAD HAD	KING: "C" (MFG), "2H" (GRADE), "HI9" (HEAT NO.), " (PIPANC CLASS)
CLASS / DR	OCUREMENT LEVEL: ASME, PIPING CLASS-1, Q-LISTED, PERMANENT PLANT
PLANT APP	LICATION: HIGH SAFETY PLANT APPLICATION / PIPING
VENDOR: _	CARDINAL INDUSTRIA PRODUCTS
	3813 W. DQUENDO
	LAS VECAS, NEV.
	EMENTS IMPOSED ON VENDOR: 50 LEVEL A, ASME III, WITH NA-3700/NCA-3800 AND

DATA SUMMARY

MECHANICAL ANALYSIS

	HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
and the same	278 нв	*	*	*	*

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr
.38	-	.016	.016	-	1 -	-

SEE NCR # 12853

ADDITIONAL TESTING: * NOTE: TEST LABORATORY WABLE TO COMPLETE TESTING OF THIS SPECIMEN DUE TO TEST APPARATUS FAILURE, SEE LGS2. 04D

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

signature: AA PAULE C.A. ASCMELLI date: 210.88

TEST DATA FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOUNCE MATERIAL CONTROL GROUP

DATE: 1-22-88

FASTENER TESTING DATA SHEET

LGS2- 040

DESCRIPTION	OF SAMPLE STOCK LOCATION: WA	AREHOUSE	DEGRE	EGATED L	ABELEV	BIN	
MATERIAL SE	PECIFICATION: ASM & SA-194 GR	*HIQ" (44	ear in)	"0"/0	011/4 01 45	()	
	CUREMENT LEVEL: ASME PIPING						
	CATION: HIGH SAFETY PLANT AL						
VENDOR:	CARDINAL INDUSTRIAL PROVICE	3					
	3873 W. DQUENCO						
	MENTS IMPOSED ON VENDOR: 5Q	-	Nu-		T		w
AND JOCF							
	R 21 MYOKED						
	DATA	SUMMA	\RY				
MECHANI	DATA CAL ANALYSIS	SUMMA	RY	MICAL A	NALYSI:	\$	
MECHANI HARDNES	DATA CAL ANALYSIS S U.T.S. 0.2% Y.S. %E.L.	SUMMA	CHE	MICAL A	NALYSIS S		
MECHANI	DATA CAL ANALYSIS S U.T.S. 0.2% Y.S. %E.L.	SUMMA	RY	MICAL A	NALYSIS S	\$	
MECHANI HARDNES 29 AC	DATA CAL ANALYSIS SS U.T.S. 0.2% Y.S. %E.L. ESTING: PROOF LONG TEST: L	SUMMA	CHEN CHEN CHEN 106,0	MICAL A Mn P 032	NALYSIS S SI .025 -	Mo Cr	
MECHANI HARDNES 29 AC	DATA CAL ANALYSIS SS U.T.S. 0.2% Y.S. %E.L. ESTING: PROOF LONG TEST: L	SUMMA .[% R.A] -	CHEN CHEN CHEN 106,0	MICAL A Mn P 032	NALYSIS S SI .025 -	Mo Cr	

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE MATERIAL CONTROL GROUP

DATE: 1-22-88

NO

FASTENER TESTING DATA SHEET

LGS2- 05

DESCRIPTION	ON OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL	SPECIFICATION: ASME SA 193 GRACE BIG
HEAD MAR	KING: "T" (MFC) "BI6" (GRADE) "LN20" (HEAT NO.)
CL 400 / PE	ROCUREMENT LEVEL: ASME, PIPING CLASS - 3, (ANSI B31.1), QLISTED, PERMILENT
DI AUT AND	PLICATION: PIPING, SAFETY APPLICATION
PLANT APP	CICATION THE PROPERTY OF THE P
VENDOR:	TEYAS BOUT CO.
	P.O. 80x 1211
	HOUSTON, TX
	REMENTS IMPOSED ON VENDOR: 6Q LEVEL A, ASME III (ANSI BBI.I), WITH
	O INCA 3800 AND IOCFR 21 INVOKED.

DATA SUMMARY

MEC	CHANI	CAL	ANAL	LYSIS
-or manimum		AND REAL PROPERTY.	THE OWNER OF TAXABLE PARTY.	SOURCE STORY OF THE OWNER.

HAPDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
	126000	126000	16.0	58.0

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr	
.42	.64	.012	,019	.28	,50	1.04	

SEE NCR #/2853

ADDITIONAL TESTING:	IMPACT TESTED @ + 30 F	87 FT/LB	100 % FIB	.057" LAT. EXP.
		86 "	100 "	.056" "
		83 "	100 "	. 055"

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, St-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



A Denotes outside specification tolerance.

LICENSEE	REPRESENTATIVE			-	
	As / Sour	CA PISCITELY	date: 240-88		
signature:,	TENEDOW.	WA. FISCITECH	date:	-	

TEST DATA FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE MATERIAL CONTROL GROUP

DATE: 2/2/88

FASTENER TESTING DATA SHEET

LGS2-05=

DESCRIPT	ON OF SAMPLE STOCK LOCATION: WAREHOUSE, SECREGATED LABELED BIN
MATERIAL	SPECIFICATION: ASME SA-193 GRADE BIG
	"T" (MFG) "B16" (GRADE) "LNDO" (HEAT NO.)
CLASS / P	ROCUREMENT LEVEL: ASME, PIPING CLASS- 3, (ANSI B31.1), Q-LISTED PERMANEN PLICATION: PIPING, SAFETY APPLICATION
VENDOR:	TEXAS BOLT CO.
	P.O. Box 1211
THE RESERVE	HOUSTON TX
QA RÈQUI	REMENTS IMPOSED ON VENDOR: 50 LEVEL A, ASME III (ANSI BBI.I), WITH

DATA SUMMARY

MECHANICAL ANALYSIS

L	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
	29 RC	139,909	119,526	15.2	55.4

CHEMICAL ANALYSIS

C	1	Mn	P	S	SI	Мо	Cr
-	_						:.01

SEE NCR # 12853

ADD	ITIONAL TESTING:					
NOTE	E: U.T.SUltimate Ten	sile Strength; Y.SYello	d Strength; C-Ca	roon: Mn-Mangane R.AReduction in	se; P-Phosphorous; ! Area.	s-Sultur,

SI-Silloon: Mo-Molybdenur

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE

signature: ANAMON G.A. PISCITELLI Date: 7-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE MATERIAL CONTROL GROUP

DATE:

1-22-88

all

FASTENER TESTING DATA SHEET

LGS2- 06

	WAREHMEE LEGIERATED LARETED RIN
	ON: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL SPECIFICATION: ASME SA-	44 GAAUE 3
HEAD MARKING: "T"(MFG), "3" (GRA	OE), LN21 (HEAT NO.)
CLASS / PROCUREMENT LEVEL: ASME	PIPING CLASS - 3 (ANST B31.1), Q-LISTED PERMANENT
PLANT APPLICATION: PIPING SAFETY	
	MI C W C C C C C C C C C C C C C C C C C
PLANT APPLICATION:	
VENDOR: TEXAS BOLT CO. P.O. Box 1211	
VENDOR: TEXAS BOLT CO. PO.BOX 1211 HOUDTON, TX	SQLEVEL A, ASME TIL (ANSI B31.1) WITH

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
313 HB	*	*	*	*

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr
.2/	.73	.014	.002	.28	.50	4.78

ADDITIONAL TESTING:	* NOTE:	TEST LABORATORY UNABLE TO COMPLETE TESTING OF	
		THIS SPECIMEN DUE TO TEST APPARATUS FAILURE,	
Tyrre.		SEE LG52-06D	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongetion; R.A.-Reduction in Area.

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE	E	
signature: ANSIM	B.A. PISCITELLI	date: 2-/0-98

TEST DATA FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02 SOURCE MATERIAL CONTROL GROUP DATE 1-22-88

FASTENER TESTING DATA SHEET

LGS2-06D

	ION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABOLED BIN
DESCRIPT	SPECIFICATION: ASME SA-194 CRACE 3
MATERIAL	RKING: "T" (MFG), "3" (GRADE), "LN 21" (HEAT NO.)
CLASS / P	ROCUREMENT LEVEL: ASME, PIPING CLASS . 3, (ANSI B31.1), Q-LISTED, PERMANANT PLANT PLANT
VENDOR:	TEXAS BOLT CO.
· citooiii	P.O. Box 1211
	HOUSTON, TX
DA RÉQUI	REMENTS IMPOSED ON VENDOR: SQ LEVEZ A ASME III (ANSI 1831.1), WITH O /WCA 3800 INVOXED, INCLUDING 10CFA21

MECHANICAL	ANALYSIS
- I will be a second to the se	The second second second

H	ARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
Г	35 AC	-	-	-	-

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr
.135	.59	,009	,002	,26	.53	5.80

ADDITIONAL TESTING	PROOF LOAD TE		TEST:	1040-175,000185	
					RESULT - SATISFACTIKY WITH NO FAILURES

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE Signature: 44 A CHENT S.A. PISCHELH DATE: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

MAD

FASTENER TESTING DATA SHEET

LGS2-07

	WAREHOUSE	SECRECATED LARGED RIN.
DESCRIPTI	ON OF SAMPLE STOCK LOCATION: WAREHOUSE,	Concerned indeed and
IATERIAL	SPECIFICATION: ASME SA-193 GRADE BY KING: " H" (MFG) "BT" (GRADE) "CDM"	(HEAT CODE) " O" (PIPING CLASS)
EAD MAR	ROCUREMENT LEVEL: ASME, Q-LISTED PIPIN	6 CLASS - I PERMANENT PLANT
LASS / PI	TOCUREMENT LEVEL.	,
ANT ADS	DUCATION HIGH SAFETY PLANT APPLICATION ,	PIPING
PLANT APP	PLICATION: HIGH SAFETY PLANT APPLICATION ,	PIPING
	A AND G ENGINEERING CO. (SUPPLIER) 4840 LA PALMA AVE.	(MFG): HAMANAKA NUT MFG. CO HIMEJI, JAPAN
	A AND G ENGINEERING CO. (SUPPLIER)	(MFG): HAMANAKA NUT MFG. CO
VENDOR:	A AND G ENGINEERING CO. (SUPPLIER) 4840 LA PALMA AVE.	(MFG): HAMANAKA NUT MFG. CO HIMEJI, JAPAN

DATA SUMMARY

MECHANICAL ANALYSIS

	HARDNESS	U.T.S.	0.2% Y.S.	%E.L. % R.	
The second second	-	138 000	120000	21.0	62.0

CHEMICAL ANALYSIS

	C	Mn	P	S	SI	Mo	Cr
100	.4/	.92	.024	.028	.29	.22	1.07

ADDITIONAL TESTING	IMPACT TEST @	+30°F	100	FT/LBS	100	% F1B	. 055"	LAT. EXP
ADDITIONAL TESTING			79	H	100	14	.045"	"
			91	f1	100	/1	.058	1/

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

		4	٠	
	3	A	h	
á	d			ĸ

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE: _

signature: Ad PANILLO G.A. PISCITELLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

MP

FASTENER TESTING DATA SHEET

LGS2-08

FASTENER DESCRIPTION: 13/8" NUT (STOCK CODE : Y53	
DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGR.	EGATED LABELED BIN
LATERIAL SPECIFICATION ASME SA-194 GRADE 7	
HEAD MARKING: "H5" (MFG), "7" (GRADE) "SAE" (HEAT	NO.) " O" PIPING CLASS
CLASS / PROCUREMENT LEVEL: ASME Q-LISTED, CLASS /	PERMANENT PLANT
PLANT APPLICATION: HIGH SAFETY DUANT APPLICATION	PIPING
ENDOR: MATERIAL SUPPLIETE: ALLIED NUT & BOLT MATE	ERIAL MEG: JOH. SMIT
520 HERTZOG BLVO.	HOLLAND
KING OF PRUSSIA, PA	
DA REQUIREMENTS IMPOSED ON VENDOR: _ 50 LEVEL A , ASI	ME BECTION III, WITH

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	JU.T.S.	10.2% Y.S.	%E.L.	% R.A	
278 нв	*	*	*	*	

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Мо	Cr
		.013				

ADDITIONAL TESTING:	* NOTE: TEST LAB WABLE TO COMPLETE TESTING OF	
	THIS SPECIMEN DUE TO TESTING APPARATUS FAILURE	
	SEE LG52-08D	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:

signature: HA PARILLA G. A. PISCAELLI date: 2.10.88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22-88

FASTENER TESTING DATA SHEET

LGS2-08p

DESCRIPTION OF SAMPL	E STOCK LOCATION: WAREHOUSE, 5	EGREGATED LABELED BIN
MATERIAL SPECIFICATIO	N: ASME SA-194 GRAVE 7	
HEAD MARKING: "H5"	(MFG) "7" (GRADE) " 5AE" (HEAT)	NO.) " (PIPING CLASS)
CLASS / PROCUPENENT	LEVEL: ASME Q-LISTED, CLASS 1	PERMANENT PLANT
PLANT APPLICATION: H	IGH SAFETY PLANT APPLICATION / PIP	PING
VENDOR: MATERIAL SUP	QUER: ALLIED NOT & BOLT CO. MATE	TEM NEG: JOH. SMIT
	520 HERTZOG BLYD.	HOLLAND
	KING of PRUSSIA, PA	
DA REQUIREMENTS IMPO		ME SECTION III WITH NA-3700/NCA-3800

MECHANICAL ANAL	YSI	S
-----------------	-----	---

HARDNESS	U.T.S.	0.2% Y.S.	%E.L. % R.A.		
25 RC	-	-	-	-	

CHEMICAL ANALYSIS

С	Mn	P	S	SI	Mo	Cr
.418	.94	.017	.023	.30	.23	.97

ADDITIONAL	TESTING:	PROOF LOAD TEST!	LOAD - 215, 800 LBS	
			REULT - GATISFACTORY WITH NO FAILURES	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:

AN PLANTE C. A. PLENTELU date: 2.10.88

TEST DATA FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

MAP

FASTENER TESTING DATA SHEET

LG\$2-09

DESCRIPTI	N OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL	SPECIFICATION: ASTM A 325 TYPE /
HEAD HAS	(ING: "LE" (MFG), "A325" (MIAT'L)
CLACC / DI	OCUREMENT LEVEL: NON-ASME, Q-LISTED, PERMANENT PLANT
PLANT AP	ICATION: SAFETY PLANT APPLICATION / CIVIL
VENDOR:	LAKE ERIE GEREW
	13001 ATHENS AVE.
	CLEVELAND, OHIO
OA BÉOU	EMENTS IMPOSED ON VENDOR: 5Q LEVEL C, 10CFR 21 APPLICABLE
UA REGUI	EMENTS IMPOSED ON VENDON.

DATA SUMMARY

MECHANICAL ANALYSIS

-	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.	
-		-	-	-	-	

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
.35	1.12	.024	.011	-	-	-

ADDITIONAL	TESTING	WEDGE	TENSION TEST:	LOAD - 95,000 LBS,	FAILURE LOCATION: THREADS
				,	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:

signature: Astrolly G.A. PISCITELLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

MO

FASTENER TESTING DATA SHEET

LGS2-10

DESCRIPT	ION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL	SPECIFICATION: ASTM A 563 GRADE C
HEAD MAI	RKING: "C" (MEC), 3 RADIAL LINES LOACED 120°
CLASS / P	ROCUREMENT LEVEL: NOW-ASME, Q. SPET, PERMANENT PLANT
PLANT AP	PLICATION: HIGH SAFETY PLANT APPLICATION / CIVIL
VENDOR:	ALLIED NUT & BOLT
ventoon.	520 HERT206 BLVO.
	KING OF PAUSSIA, PA
-	REMENTS IMPOSED ON VENDOR: SQ LEVEL C, 10CFR 21 APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
257 HB	-		-	-

CHEMICAL ANALYSIS

1	C	Mn	P	S	SI	Mo	Cr
	,33	-	.021	-	-	-	-

ADDITIONAL	TESTING:	PROOF	LOAD	TEST:	LOAD-	87264	1285	/	PASS	
AUDITIONAL	I COLIMAN	-	-		-		-		-	7

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mc-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: Adultitu & A. PISCITE & LIdate: 2-10-88

2

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

NO

FASTENER TESTING DATA SHEET

LGS2-11

DESCRIPT	ION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEBRECATED LABELED BIN
MATER: AL	SPECIFICATION: ASTM A490
HEAD MA	RKING: "LE" (MFG), "A490" (MATERIAL)
LACC / D	ROCUREMENT LEVEL: NON ASME, Q-LISTED, PERMANENT PLANT
LW33 / L	NOCUMEMENT LEVEL.
. R. /2	WICH SAFETY DIANT APPLICATION / CIVIL
PLANT AD	PLICATION: HIGH SAFETY PLANT APPLICATION / CIVIL
PLANT AD	PLICATION: HIGH SAFETY PLANT APPLICATION / CIVIL
PLANT AD	PLICATION: HIGH SAFETY PLANT APPLICATION / CIVIL LAKE ERIE SCREW. 13001 ATHENS AVE.
PLANT AD	PLICATION: HIGH SAFETY PLANT APPLICATION / CIVIL LAKE ERIE SCREW

DATA SUMMARY

MECHANICAL ANALYSIS

	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
-	-	-	-	-	-

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr
.39	-	.018	.013	-	-	-

ADDITIONAL TESTING:	WEDGE TENSION TEST:	LOAD - 103,000 LBS	FAILURE LOCATION - THREADS
ADDITIONAL ILGINIA	Management of the Park of the		

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

L	IC	E	N	SE	5	9	E	P	R	E	S	E	N	T	A	T	14	E:
														1	7			-

signature:

AN PHOLILLY CA. PISCITEUI	dat

date: 210.88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

40

FASTENER TESTING DATA SHEET

LGS2-12

ESCRIPTION O	F SAMPLE STOCK LOC	ATION: WAREHO	USE, SEGREGATE	LABELED BIL	<u>/</u>
MATERIAL SPEC	IFICATION: ASTM	A194 GRADE 2H			
HEAD MARKING	"MF" (mF6.)	"2H" (GRADE)			
CLASS / PROCU	REMENT LEVEL: NON	ASME, Q'LISTE	D PERMANENT A	LANT	
DI ANT APPLICA	TION: HIGH SAFETY	PLANT APPLICATI	ON /CIVIL		
CANT AFFEIGA	THOR.				
VENDOR MEG	METALS FORMIN	VE CORP.			14 14 14 14 14
	775 INDIAN =	SPRINGS RO.		10.00	
	INDIANA, PA		F1 - 12 / 17 / 17 / 17 / 17 / 17 / 17 / 17 /		
			C, 10 CFR 21 A	DOURAGIE.	- V A

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% A.A.
267 HB	*	*	*	*

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
.45	-	.012	.037		-	-

ADDITIONAL TESTING: * NOTE: TEST LABURATORY UNABLE TO COMPLETE TESTING OF THIS SPECIMEN OUE TO TEST APPARATUS FAILURE, SEE LG52-12 D

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

-

Denotes outside specification toleranco.

LICENSEE REPRESENTATIVE:

signature: ASPANIA & A. PISCITCUI date: 2.10.88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22.88

MP

FASTENER TESTING DATA SHEET

LGS2- 12D

DESCRIPTION	OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
	CIFICATION: ASTM A194 BRADE 2H
HEAD MARKIN	G: "MF" (MFG) "2H" (GRADE)
1 ACC / DDOC	UREMENT LEVEL: NON-ASME, Q-LIBTED, PERMANENT PLANT
PLANT APPLIC	ATION: HIGH SAFETY APPLICATION / CIVIL
VENDOR: MF	C: METALS FORMING CORP.
	775 INDIAN SPRINGS RO.
	INDIANA, PA 15701
	ENTS IMPOSED ON VENDOR: SQ LEVEL C, 10 CFR 2.1 APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

1	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
	29RC	-	-	-	-

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
.488	-	.000	.032	-	-	-

ADDITIONAL TESTING:	PROOF LOAD TEST:	LOAD- 106,000 LBS	
		RESULT - SATISFACTORY WITH NO FAILURES	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

	ı,	A	L	
	d		ì	L

Denotes outside specification tolerance.

signature: ALPINELLI date: 2-10-88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22.88

MA

FASTENER TESTING DATA SHEET

LGS2-13

FASTENER DESCRIPTION: 11/2" NUT (STOCK CODE; Y531060106)
DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SECREGATED LABELED BIN MATERIAL SPECIFICATION: ASTM A. 194 GRADE 2H HEAD MARKING: "5" (MFG), "2H" (GRADE)
CLASS / PROCUREMENT LEVEL: NOW-ASME, NON-Q-LISTED, PERMANENT PLANT PLANT APPLICATION: NON-SAFETY RELATED GENERAL PLANT APPLICATION CIVIL-PIPING- HANGERS, PERMANENT PLANT
VENDOR: FASTENER BROKERAGE
QA REQUIREMENTS IMPOSED ON VENDOR: 3Q LEVEL D, 10CFR 21 NOT APPLICABLE
DATA SUMMARY

MECHANICAL ANALYSIS

	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
or other Designation of the last of the la	25748	*	*	*	*

CHEMICAL ANALYSIS

1	C	Mn	IP	S	SI	Mo	Cr
The same of	.47	-	.015	.027	-	-	-

ADDITIONAL TESTING	* NOTE ;	TEST LABORATORY UNABLE TO COMPLETE TESTING OF	
		THIS SPECIMEN DUE TO TEST APPARATUS FAILURE,	
		NOT THE SPECIMEN, SEE LG52-13 D.	

210.88

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongetion; R.A.-Reduction in Area.

•	
-	D4
-	n.e

notes outside specification tolerance.

LICEN	SEE	REPR	ESE	NTATIV	E:
				1	

eion eture:	AA	KALLLA	6A.	PUCITRU	date:
SIALISIALS!	mercana di manda di m				

SOURCE: MATERIAL CONTROL GROUP

DATE:

1.22.88

MAD

FASTENER TESTING DATA SHEET

LGS2- 13D

	SAMPLE S	TOCK LOCAT	ON: WAREHOUS	E, SEGREGA	ATED LABO	ELED BIN
MATERIAL SPEC	FICATION:	ASTM A	194 GRADE 2	4		
HEAD MARKING	5 (MFG) Z	SME, NON-Q.L	IATION OFTEN	MATEUT DI	auT
LASS / PROCUE	REMENT LE	VEL: NON-A	DATED AFVE	PAI DIANT A	APPLICATION	N/CIVIL-PIPING-
LANT APPLICAT		GERS	CHIED DENE	AL PERIOR I	T P EICH TO	/
VENDOR: F						
PENDON.						
A REQUIREMEN	NTS IMPOSE	D ON VENDO	R: SQ LEVEL	D. 10 CFR	21 NOT	APPLICABLE
			ATA SIIMM	ARY		
		D	ATA SUMM			
MECHANICA		YSIS		CHEMIC	AL ANAL	
		YSIS	ATA SUMM	CHEMIC.	PS	Si Mo Cr
		YSIS		CHEMIC.		Si Mo Cr
HARDNESS		YSIS		CHEMIC.	PS	Si Mo Cr
HARDNESS 31RC	U.T.S.	<u>YSIS</u> 0.2% Y.S.	%E.L. % R.A.	CHEMIC.	P S .011 .023	Si Mo Cr
HARDNESS 31RC	U.T.S.	<u>YSIS</u> 0.2% Y.S.	%E.L. % R.A.	CHEMIC.	P S .011 .023	Si Mo Cr
31RC	U.T.S.	<u>YSIS</u> 0.2% Y.S.	%E.L. % R.A. — — —	CHEMIC.	P S .011 .023	Si Mo Cr
31RC	U.T.S.	<u>YSIS</u> 0.2% Y.S.	%E.L. % R.A. — — —	CHEMIC. C Mn .456 -	P S .011 .023	Si Mo Cr
HARDNESS 3/RC DITIONAL TEST	U.T.S.	YSIS 10.2% Y.S. 	ST: LOAO - RESULT	CHEMIC. C Mn .456 — 245, 875 L - 34713FACTOR	P S .OII .023	SI MO Cr
HARDNESS 3/RC	U.T.S.	YSIS 10.2% Y.S. 	%E.L. % R.A. — — — ST: LOAO — RESULT	CHEMIC. C Mn .456 — 245, 875 L - 34713FACTOR	P S .OII .023	Si Mo Cr

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22.88

440

FASTENER TESTING DATA SHEET

LGS2- 14

DESCRIPT	ION OF SAMPLE STOCK LOCATION: WAREH	OUSE, SEGAEGATED LABELED CARTON
MATERIAL	SPECIFICATION: 4307 GRADE B	
HEAD MA	RKING: "5L" (MFG)	
1 455 / 5	PROCUREMENT LEVEL: NON-ASME, NON-	Q-LISTED PERMANENT PLANT
	DI CATION NON-SAFETY BELATED PLANT	TAPPLICATION, GENERAL USE / CIVIL, HVAC
LANT AP	HANGERS PIPING	
VENDOR:		UPPLIER) /MFG: ST. LOUIS SCREW & BOLT
VENDON.	520 HERTZOG BLVD.	6900 N. BRUAOWAY
		/- /
	KING OF PRUSSIA, PA	D, IOCFRZI NOT APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

1	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
Section Section	_	-	-	_	-

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
-	-	.015	.017	-	-	-

ADDITIONAL TESTINGS	WEDGE TENSION TEST:	LOAD-31,000#	FAILURE LOCATION : THREADS
AUDITIONAL TESTING.			

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelid Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

L	1	C	E	N	SE	E	R	E	P	R	E	S	ε	N	T	A	Т	IV	E	
														1	1					

signature: ______

KARAU GA. PISCINEUI

date: 2-1888

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22.88

MA

FASTENER TESTING DATA SHEET

LGS2- 15

	4" NUT (STOCK CODE; Y531069052)
DESCRIPTION OF SAMPLE STO	CK LOCATION: WAREHOUSE, SEGREGATED LABELED CARTON
HEAD MARKING: NONE	
CLASS / PROCUREMENT LEVE	L: NON-ASME, NON Q-LISTED, PERMANENT PLANT
PLANT APPLICATION: NON- 5%	FETY RELATED PLANT APPLICATION, SENERAL USE / CIVIL, HVAC,
	RS PIPING
VENDOR: ALLIED NUT & BO	
520 HERTZOG BU	0.
KING OF PAUSSIA	
QA REQUIREMENTS IMPOSED	ON VENDOR: 50 LEVEL D, 10CFR21 NOT APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

-	HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
	160 HB	*	*	*	*

CHEMICAL ANALYSIS

С	Mn	P	S	SI	Mo	Cr
.06	-	.015	-	-	-	

ADDITIONAL TESTING: * NOTE : TEST LABORATORY UNABLE TO COMPLETE TESTING OF SPECIMEN DUE TO TEST APPARATUS FAILURE, SEE LG52-15D

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: Allegia CA. PISEITELLI date: 2-10-88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22.88

44

FASTENER TESTING DATA SHEET

LGS? - 15D

DESCRIPTION O	F SAMPLE S	STOCK LOCAT	ION: WA	REHOUS	E, SE	GREC	ARE	DLA	BELL	eo c	ARTON
MATERIAL SPEC	IFICATION:	ASTM AS	63 TYPE	Ŧ A							
HEAD MARKING	NONE					2		-	2		
CLASS / PROCU	REMENT LE	VEL: NON-A	ASME,	NON-Q	LISTEL	, re	RMAI	VENT	HA	NT	
LANT APPLICA	TION: NON	1-SAFETY RE	ELATED	PLANT	APPLICA	AMON	GE	NERA	LUS	E	CIVIL
-	Married Street, Square, Square	C HANGER	PIPIN	16							
VENDOR: ALL							_				
	HERTZOO										
A RÉQUIREME	G OF PRU.	DIA, FA.		100	7	1005	20	1 414	TAD	OUT	OIF-
A REQUIREME	I TO THE COL										
A REQUIREME			ATA S		ARY						
MECHANICA	AL ANAL	<u>D</u>	ATA S	SUMMA	CHE	EMIC	AL /	ANAL	LYSIS	S	1.07.1
MECHANICA HARDNESS	AL ANAL	D	ATA S	SUMMA	CHE	Mn	AL /				Cr
1ECHANIC/	AL ANAL	<u>D</u>	ATA S	SUMMA	CHE	Mn	AL /	ANAL	LYSIS	S	Cr
MECHANICA HARDNESS	AL ANAL U.T.S. 	. <u>YSIS</u> 0.2% Y.S.	ATA S	SUMMA % R.A.	CHE C .088	Mn -	AL P	ANAI S -	LYSIS	S Mo	Cr -
MECHANICA HARDNESS 9488	AL ANAL U.T.S. 	. <u>YSIS</u> 0.2% Y.S.	ATA S	% R.A.I.	CHE C .088	Mn -	AL P	ANAI S -	LYSIS	S Mo	Cr -

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

PAR

FASTENER TESTING DATA SHEET

LGS2-16

DESCRIPTION OF SAMPLE STOCK L MATERIAL SPECIFICATION: <u>ASTM</u>	OCATION: WAREHOUSE, SEGREGATED LABELED CARTON
HEAD MARKING: "F" (MFG.)	"87" (GRADE)
CLASS / BROCHBENENT LEVEL: N	ON-ASME, NON-Q-LISTED, PERMANENT PLANT
DI ANT APPLICATION NON -SAFET	RELATED PLANT APPLICATION, GENERAL USE / CIVIL, HANGERS
PIPING	
VENDOR: FASSCO	
OA BEOLUBENENTS IMPOSED ON V	ENDOR: 50 LEVEL D, 10CFR21 NOT APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
-	148000	138000	20.0	56.0

CHEMICAL ANALYSIS

1	C	Mn	P	S	SI	Mo	Cr
-1							1.00

ADDITIONAL	TESTING:	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

LICENSEE ALPRESENTATIVE

signature: Al Putter 6.A. PISEITELLI date: 2-10 -88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.88

FASTENER TESTING DATA SHEET

LGS2-17

	ON: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL SPECIFICATION: ASTM A-19. HEAD MARKING: "J"(MFG), "2	H" (GRADE)
CLASS / PROCUREMENT LEVEL: NON-A	SME, Q. LISTED, PERMANENT PLANT
PLANT APPLICATION: SAFETY APPLICA	ATTION, CIVIL - FRICTION TYPE LOAD, PIPING
VENDOR:	
	SQ LEVEL C, 10 CFR21 APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
327 HB	*	*	*	*

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr
.43	-	.022	.020	-		-

ADDITIONAL TESTIN	a: * NOTE !	TEST	LABORATORY UNABLE TO COMPLETE TESTING OF
THE THIRD			SPECIMEN DUE TO TEST APPARATUS FAILURE.
		SEE	LB52-14D

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:

signature: ANDINIU C. A. PISCITELLI date: 2.10.88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

240

FASTENER TESTING DATA SHEET

LGS2- 17D

	CRIPTION: _	1 5/8" NUT	(51	TOCK COI	E; Y	53/0	0601	07	_			
DESCRIPTION O	F SAMPLE S	TOCK LOCATI	ON: WA	AREHOUSE	SEG	REGA	TED	LAIBE	LET	1311	V	
MATERIAL SPEC	IFICATION:	ASTM A-1	94 GAA	DE 2H								
HEAD MARKING	"J"(mFG) "2H	"(GRA	IOE)								
CLASS / PROCU	REMENT LE	VEL: NON-	45ME,	QLISTE	D, PE	RMA	NENT	Per	WT			
PLANT APPLICA	TION: SAI	ETY APPUC	ATTON,	CIVIL-F.	AICTTO!	VTYA	DEL	DAD	PI	PIN6		
VENDOR: MRG	: JACOB.	SEN MFG.	Co.								1	
	P.O. B											
QA RÉQUIREME	KENILL	WORTH , NE	WIER	354						1		
		D	ATA	SUMMA	ARY							
	AI ANAI	YSIS			CHE	MIC	AL A	NAL	YSIS	2		
MECHANIC	7 60 /7/7/7	-	1		400		-		-	1110		
MECHANICA HARDNESS		0.2% Y.S.	1 % E.L.	% A.A.	C	Mn	ρ	8	Si	Mo	Ci	
		0.2% Y.S.	%E.L.	% H.A.	.448			S .024			-	
	U.T.S.	-	-	-	311,50	- OLBS	.012	.024	-	-	-	

SOURCE MATERIAL CONTROL GROUP

DATE: 1.22.88

40

FASTENER TESTING DATA SHEET

LGS2-18

FASTENER DESC												
DESCRIPTION O	F SAMPLE S	TOCK LOCAT	ION: W	PART P	1	5/C C	1100	270				
MATERIAL SPEC	"BTS"	(MEG) "1	37"/	GRADE)								
CLASS / PROCU		VEL NON-A	ISME	NON Q-	ISTEL	o PET	RMAN	ENT	PLAN	IT		
PLANT APPLICA	TION: NON	SAFETY RE	PLATED	PLANT A	PPLICA	mon	GENE	TRAL	USE	leiv	IL, H	ANGER
VENDOR: MFG		EHEM STE		RP.								
		WON, PA										
DA RÉQUIREME	NTS IMPOSE	D ON VENDO	R: _5Q	LEVEL	D,	10 CF	R21.	NOT	APPL	ICAB	LE	
							-					
		ū	ATA	SUMMA	RY							
MECHANICA	AL ANAL	YSIS			CH	EMIC	AL A	NAL	YSIS			
			1461	1% R A I	10	l Mn	0	18 1	9	Mo	Cr	
HARDNESS	U.1.5.	10.270 1.0.	70 E.L.	10 11.71	_		-	-	-			

ADDITIONAL TESTING			

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

signature: ASPUNDE G.A. PISCITELLI date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

MP

FASTENER TESTING DATA SHEET

LGS2- 19

FASTENER	
DESCRIPTI	TION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL	SPECIFICATION: ASME SA-193 GRADE BT
HEAD HAS	RKING: "C" (MFG), "BY" (CRADE), "K4" (HEAT)
TEAU MAP	name.
	DOCUMENT INFO ASME Q. LISTED PIPING CLASS - 2 PERMANENT PLANT
	PROCUREMENT LEVEL: ASME, Q. LISTED PIPING CLASS - 2, PETEMANENT PLANT
	PROCUREMENT LEVEL: ASME, Q. LISTED, PIPING CLASS - 2, PEREMANENT PLANT PLICATION: SAFETY PLANT APPLICATION /PIPING
PLANT API	PLICATION: SAFETY PLANT APPLICATION PIPING
PLANT API	
VENDOR:	CARDINAL INDUSTRIAL PRODUCTS

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
	141,000	138,000	20.0	58.0

CHEMICAL ANALYSIS

A STATE OF THE PERSON NAMED IN	C	Mn	P	S	Si	Mo	Cr
	.40	.99	.025	.029	.25	.15	1.03

AUDITIONAL	IESIIMON,	-	-	 		 	
				 -	_	 	
						 	j

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:

signature: # A PISCITELLI date: 0-10-88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

RIP

FASTENER TESTING DATA SHEET

LGS2-20

FASTENER DESCRIPTION: 3/4" NUT (STOCK COL	
DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHO	USE, SEGREGATED LABELED BIN
MATERIAL SPECIFICATION: ASME SA-194 GRACE	
HEAD MARKING: "()" (MFG), "2H" (GRADE)	"HEB" (HEAT NO.)
CLASS / PROCUREMENT LEVEL: ASME, Q-LISTED,	PIPING CLASS- 2, PERMANENT PLANT
PLANT APPLICATION: SAFETY PLANT APPLICATION	/ / PIPING
VENDOR: MFG : HAMANAKA NUT MFG . CO. LTD.	SUPPLIER: A & G ENGINEERING CO:
HIMEJI, TAPAN	4640 E. LAPALMA A.E.
	ANAHEIM, CA
DA RÉQUIREMENTS IMPOSED ON VENDOR: 50 LEVE	EL A, ASME III, WITH NA-3700/NCA-3800

DATA SUMMARY

MECHANICAL ANALYSIS

-	HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
The second second	257 HB	*	*	*	*

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
.41	-	.015	.022	-		-

ADDITIONAL TESTING:	* NOTE: TES	T LABORATORY UNABLE TU COMPLETE TESTING OF
		S SPECIMEN DUE TO TEST APPARATUS FAILURE,
	SET	1G52-20D

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

	4	9	
-	a		
ø			

Denotes outside specification tolerance.

signature: ______ SANGEN GAL. PORTELL date: 2-10-88

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE MATERIAL CONTROL GROUP

DATE: 1-22.88

210

FASTENER TESTING DATA SHEET

LGS2- 20D

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.88

110

FASTENER TESTING DATA SHEET

LGS2-21

DESCRIPTION	OF SAMPLE STOCK LOCATION: WARE HOUSE, SEGREGATED LABELED CARTON
MATERIAL SPE	ECIFICATION: ASTM 4325 TYPE /
SEAD MARKIN	NG: " BIS" (MFG), "A325" (MATERIAL)
1 ACO / 0000	CUREMENT LEVEL: NON · ASME, NON · Q LISTED, PERMANENT PLANT
HANT ADDLIC	CATION: NON-SAFETY RELATED PLANT APPLICATION, GENERAL USE / CIVIL
LANT APPLIC	ATION.
ENDOR: M	FG: BETHLEHEMI STEEL CORP.
VENDOR: M	FG: BETHLEHEMI GTEER CORP.
VENDOR: M	FG: BETHLEHEM STEER CORP. 1 CUMBERLAND 4. LEBANON, PA

DATA SUMMARY

MECHANICAL ANALYSIS

1	HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
	267 HB	-	-	-	-

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Mo	Cr
.40	, 83	,012	,016	-	-	-

ADDITIONAL TESTING	-	 	_	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE

signature: As Piselle BA. PISCHELLI date: 2.10.88

SOURCE MATERIAL CONTROL GROUP

DATE: 1-22-88

210

FASTENER TESTING DATA SHEET

			Lida - Lima	150850100 1486	FO BIAL
				SEGREGATED LABEL	EU BIN
MATERIAL SPEC HEAD MARKING:	IFICATION:	(MEC)	563 TYPE C		
HEAD MARKING:		WAN A	15MF 0.115.2	O PERMANENT PLANT	
			T APPLICATION		
PLANT APPLICAT	TION:	FEIT FERN	, MAPELLA MON	7 01112	Acres de la Albanda
VENDOR: SUPP	LIER: A	LLIED NUT	É BOLT		
VEROOR.		20 HERFZO			
	K	ING OF PRUS	SIA, PA		
OA BÉQUIREMEN	UTS IMPOS	ED ON VENDO	B. SQ LEVEL	C, IOCFRAI APPLIC	ABLE
A REGUINEME!			DATA SUMMA	ARY	
i.		0	DATA SUMMA		SIS
MECHANICA	AL ANAL	D LYSIS		CHEMICAL ANALY	
MECHANICA	AL ANAL	D LYSIS	ATA SUMMA	CHEMICAL ANALY	
MECHANICA HARDNESS 182 HB	U.T.S.	2. YSIS 10.2% Y.S.	%E.L. % R.A	CHEMICAL ANALY C Mn P S .04004 -	SI MO Cr
MECHANICA HARDNESS 192 HB DITIONAL TEST	L ANAL U.T.S.	2. YSIS 10.2% Y.S.	%E.L. % R.A.	CHEMICAL ANALY	SI MO Cr

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

AND

FASTENER TESTING DATA SHEET

SCRIPTION OF SA	AMPLE S	TOCK LOCATI	ION: WAREHOUS	BE, BEGAEGATED LABELED BIN
AD MARKING:	" BT5 "	(MFG.)		
ASS / PROCURE	MENT LE	VEL: NON-A	SME, Q-LISTED	PERMANENT PLANT
ANT APPLICATIO	N: 5AF	ETY PLANT	APPLICATION,	ELECTRICAL I INSTRUMENTATION
ENDOR: BETHLE			P (MFG)	
1 Cum				
LEBANI				
REQUIREMENTS	IMPOSE	D ON VENDO	A: DQ LEVEL	C, 10CFR21 APPLICABLE
			ATA SIIMMA	ARY.
FOULANION	****		ATA SUMMA	
ECHANICAL		YSIS		CHEMICAL ANALYSIS
		YSIS		CHEMICAL ANALYSIS C Mn P S S Mo Cr
		YSIS		CHEMICAL ANALYSIS
ECHANICAL HARDNESS U.		YSIS		CHEMICAL ANALYSIS C Mn P S S Mo Cr
HARDNESS U.	.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A.	CHEMICAL ANALYSIS C Mn P S SI Mo Cr .012 .030 - - -
HARDNESS U.	.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A. 	CHEMICAL ANALYSIS C Mn P S SI Mo Cr .012 .030 - - - AD - 15, 350 LBS
HARDNESS U.	.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A. 	CHEMICAL ANALYSIS C Mn P S SI Mo Cr .012 .030 - - -
HARDNESS U.	.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A. 	CHEMICAL ANALYSIS C Mn P S SI Mo Cr .012 .030 - - - AD - 15, 350 LBS
HARDNESS U.	Tansile	YSIS 10.2% Y.S. - GE TENSION	WE.L. % R.A.	CHEMICAL ANALYSIS C Mn P S SI Mo Cr 012 .030 AD - 15, 350 LBS LURE LOCATION; THREADS STRIPPED
HARDNESS U.	T.S. WEX	YSIS 10.2% Y.S. - Strength; Y.S. num; Cr-Chrom	WE.L. % R.A. — — — — — — — — — — — — — — — — — — —	CHEMICAL ANALYSIS C Mn P S SI Mo Cr 012 .030 AD - 15, 350 LBS LURE LOCATION; THREADS STRIPPED

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22.88

110

FASTENER TESTING DATA SHEET

ESCRIPTION O			(1)4	1 REHNUSE	SECA	RECA	PED .	LABI	TA	BI	N
ATERIAL SPEC	F SAMPLE S	ASTM AS	63 TV	OF A	, 000	1000					
EAD MARKING			///						Yaki.		
LASS / PROCU	BENENTIE	VEL. NON-A	SME.	Q.LISTE	D PE	RMA	NENT	PLA	NT		
LANT APPLICA	TION: SAF	ETY PLANT	APPLIC	ATION, E	ELECTA	KAL	/IN	STRU	MEA	ITAN	oN
ENDOR: ALL	IED NUT &	BOLT									
	O HERTZO										
	IG OF PRUS										
A REQUIREME	NTS IMPOSE	D ON VENDO	R: _56	LEVEL	C, 10	CFA	121.	4,0PC	ICAB	LE	
		D	ATA	SUMMA	ARY						
MECHAN!CA		YSIS			CHE	-	AL A			Total Control	1.00
HARDNESS		YSIS			CHE	Mn	P	S		S Mo	Cr
		YSIS			CHE	Mn	1.6	S		Total Control	Or
HARDNESS	U.T.S.	<u>YSIS</u> 0.2% Y.S.	% E.L.	LOAD	CHE C .06	Mn -	.013	S	3	Mo -	-
HARDNESS 96 HRB	U.T.S.	<u>YSIS</u> 0.2% Y.S.	% E.L.	% R.A.	CHE C .06	Mn -	.013	S	3	Mo -	-
HARDNESS 96 HRB DITIONAL TEST TE: U.T.SUILLE SI-SIIICON:	TING: PRO	YSIS 0.2% Y.S. -	%E.L.	LOAD RESULT	CHE C . 06	Mn - 350	P.013	WITH	Si -	MO -	- IRE

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.38

440

FASTENER TESTING DATA SHEET

DESCRIPTION O	F SAMPLE S	STOCK LOCATI	BOLT (S			BELED BI	W
MATERIAL SPEC	DIFICATION:	ASTM AT	BOT GRADE B			kan in	
HEAD MARKING	"5"(m	FG.)					
CLASS / PROCU	REMENT LE	VEL: NON-A	ASME, Q-LISTER	PERMAN	IENT PLAN	VT	
PLANT APPLICA	TICN: SAF	ETY RELATE	ED PLANT APA	UCATION /	FLECTRIC	AL, INSTR	OMENTATION
VENDOR: PA	1 FASTEN	ERS (SUP	aee)				F-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
	RLEYSVILL						
			40 1042	0 10000	21 400110	40:15	
QA REQUIREME	NTS IMPOSE	ED ON VENDO	A: SQ LEVEL	C, TOCKA	al ANPLICA	7828	
							-
			ATA SUMMA	VBV			
		D	ATA SUMMA				
MECHANICA		YSIS		CHEMIC	CAL ANAL		
		YSIS	ATA SUMMA	CHEMIC C Mn	PS	Si Mo	Cr
		YSIS		CHEMIC C Mn		Si Mo	Cr _
		YSIS		CHEMIC C Mn	PS	Si Mo	Cr _
HARDNESS	U.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A.	CHEMIC C Mn	P S .017	Si Mo	Cr
HARDNESS	U.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A. — — —	CHEMIC C Mn - -	P S .017	Si Mo	Cr
HARDNESS	U.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A. — — —	CHEMIC C Mn	P S .017	Si Mo	Cr
HARDNESS	U.T.S.	YS!S 0.2% Y.S. 	*E.L. % R.A.	CHEMIC C Mn 	P S .017	Si Mo 	
HARDNESS	IU.T.S.	YS!S 0.2% Y.S.	*E.L. % R.A.	CHEMIC C Mn 	P S .017 .017 .015 .017 .015 .017	Si Mo 	
HARDNESS ADDITIONAL TEST	TING: WED	YS!S 0.2% Y.S.	*E.L. % R.A.	CHEMIC C Mn 	P S .017 .017 .015 .017 .015 .017	Si Mo 	

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

MO

FASTENER TESTING DATA SHEET

LGS2-26

	1/2" x 21/2" STUD (STOCK CODE; 4530760002)
DESCRIPTION OF SAMPLE S	STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
MATERIAL SPECIFICATION:	ASTM A193 GRADE B7
HEAD MARKING: "T"	MFG), "87" (CAAOE)
CLASS / PROCUREMENT LE	EVEL: NON- ASME, NON-Q-LISTED, PERMANENT PLANT
PLANT APPLICATION: NON	SAFETY RELATED APPLICATION, CENERAL USE / PIPING, CIVIL, HANGERS
Town Por	00
VENDOR: TEXAS BOLT	TO.
STATE AND DESCRIPTION OF THE PARTY OF THE PA	
HOUSTON, TX	
QA REQUIREMENTS IMPOSE	ED ON VENDOR: SQ LEVEL D, 10CFR21 NOT APPLICABLE
× 1000	
	DATA SUMMARY
MECHANICAL ANAL	
MECHANICAL ANAL	

ADDITIONAL TESTING:

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.I. - Elongation; R.A. - Reduction in Area.



Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE

signature: _ fallester 6. A. PISCITELLI date: 2-10.88

SOURCE MATERIAL CONTROL GROUP

DATE: 1- 22-88

300

FASTENER TESTING DATA SHEET

DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN MATERIAL SPECIFICATION: ASTM AIGH-GRADE 2H HEAD MARKING: "HN" (MFG), "2H" (GRADE) CLASS I PROCURENENT LEVEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT PLANT APPLICATION: NON SAFETY RELATED APPLICATION, GENERALUSE PIPING, CIVIL, HANG VENDOR: SUPPLIES: LAMAN-LOESCHE 302 MOURE ST. PHILA. PA. CA REQUIREMENTS IMPOSED ON VENDOR: SQ LEVEL D, IOCFR 21 NOT APPLICABLE DATA SUMMARY MECHANICAL ANALYSIS CHEMICAL ANALYSIS		TENER DESCRIPTION: 1/2" NUT (STOCK CODE: Y531060002)
MATERIAL SPECIFICATION: ASTM A194-GRADE 2H HEAD MARKING: "HN" (MFG), "2H" (GRADE) CLASS I PROCURENENT LEVEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT PLANT APPLICATION: NON SAFETY RELATED APPLICATION, GENERAL USE PIPING, CIVIL, HANG VENDOR: SUPPCIEE: LAMAN-LOESCHE 302 MOURE ST. PHILA. PA. DA REQUIREMENTS IMPOSED ON VENDOR: 50 LEVEL D, 10CFR 21 NOT APPLICABLE DATA SUMMARY		CRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
DATA SUMMARY		ERIAL SPECIFICATION: ASTM A194-GRADE 2H
PLANT APPLICATION: NON SAFETY RELATED ADPLICATION, GENERALUSE FIPING, CIVIL, HANG VENDOR: SUPPLIES: LAMAN-LOESCHE 302 MICHAE ST. PHILA. PA DATA SUMMARY DATA SUMMARY		D MARKING: "HN" (MFG), "ZH" (GRAVE)
VENDOR: SUPPCIEE! LAMAN-LOESCHE 302 MOURE ST. PHILA. PA: DA REQUIREMENTS IMPOSED ON VENDOR: SQ LEVEL D, 10CFR 21 NOT APPLICABLE DATA SUMMARY		SSIPROCURENENT LEVEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT
DATA SUMMARY	GERS	NT APPLICATION: NON SAFETY RELATED ADPLICATION, GENERALUSE / PIPING, CIVIL, HANGEN
PHILA. PA. DATA SUMMARY		
DATA SUMMARY		
DATA SUMMARY		PHILA. PA.
TALIOTO TALIOTO		DATA SUMMARY CHANICAL ANALYSIS CHEMICAL ANALYSIS
HARDNESS U.T.S. 0.0% Y.S. %E.L. % R.A. C Mn P S SI Mo Cr	7	
215 HB 1.40 - 1.010 1.043	-	215 HB 1.40 - 1.010 1.043
DETIONAL TESTING: DITIONAL TESTING: OTE: U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Su		
SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area.	Sulfur,	U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfun SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area.

TEST DATA FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02 DATE: SOURCE MATERIAL CONTROL GROUP 2/2/88 FASTENER TESTING DATA SHEET LGS2- 27E FASTENER DESCRIPTION: 1/2" NUT (STOCK CODE : Y531060002) DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN MATERIAL SPECIFICATION: ASTM A194 GRADE 2H HEAD MARKING: "T" (MFG), "2H" (GRADE) CLASS I PROCUREMENT LEVEL: NON-ASME, NON-QUISTED, PERMANENT PLANT PLANT APPLICATION: NON-SAFETY RELATED APPLICATION, GENERAL USE / PIPING, CIVIL, HANGERS VENDOR: SUPPLIER: LAMAN-LOESCHE 302 MODRE ST. PHILA PA DA HEQUIREMENTS IMPOSED ON VENDOR: 50 LEVEL D. 10 CFR 21 NOT APPLICABLE DATA SUMMARY CHEMICAL ANALYSIS MECHANICAL ANALYSIS Mn | P | S | SI | Mo HARDNESS | U.T.S. | 0.2% Y.S. | %E.L. | % R.A. C Cr .446 .022 .029 32 RC ADDITIONAL TESTING: PROOF LOAD TEST - LOAD: 24830 LBS RESULT! SATISFACTORY NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area. Denotes outside specification tolerance. LICENSEE REPRESENT signature: MA / CAPISCITECLI date: 2.10.88

3

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.88

MP

FASTENER TESTING DATA SHEET

DESCRIPTION OF	SAMPLE	STOCK LOCATI	ION: WAREHOUS	E, SEGREGATED LABELED BIN
MATERIAL SPEC	FICATION:	ASTM A	193 GRADE B	1
HEAD MARKING	"R" ()	mfs), "B"	(GRADE)	2
CLASS / PROCUE	REMENT L	EVEL: NON-A	SME, NON-W	LISTED, PERMANENT PLANT
PLANT APPLICAT	TION: NON	SAFETY RE	CATED APPLICA	TION, GENERAL USE / PIPING, CIVIL, HANGERS
VENDOR: SUPP	ULE: AL	LIEU NOT E	BONT CO.	
VENDOR:		O HERTZOG		
	KI	NG OF PRUSS	SIA PA	
OA REQUIRENE	ITS IMPOS	ED ON VENDO	B. SQ LEVEL	D, 10 CFR21 NOT APPLICABLE
			ATA SUMM	
		D		ARY
MECHANICA HARDNESS	L ANAL	<u>D</u>		CHEMICAL ANALYSIS
MECHANICA	L ANAL	<u>D</u>	ATA SUMM	CHEMICAL ANALYSIS
MECHANICA HARDNESS	L ANAL	<u>D</u>	ATA SUMM	CHEMICAL ANALYSIS C Mn P S S Mo Cr
MECHANICA HARDNESS	L ANAL	<u>D</u>	ATA SUMM	CHEMICAL ANALYSIS C Mn P S S Mo Cr
MECHANICA HARDNESS 278 HB	L ANAL	<u>D</u>	ATA SUMM	CHEMICAL ANALYSIS C Mn P S S Mo Cr
MECHANICA HARDNESS 278 HB	L ANAL	<u>D</u>	ATA SUMM	CHEMICAL ANALYSIS C Mn P S S Mo Cr
MECHANICA HARDNESS	L ANAL	<u>D</u>	ATA SUMM	CHEMICAL ANALYSIS C Mn P S S Mo Cr
MECHANICA HARDNESS 278 HB	L ANAL	YSIS 0.2% Y.S.	ATA SUMM. %E.L. % R.A.	CHEMICAL ANALYSIS C Mn P S S Mo Cr -40 .92 .009 .027 .23 .20 1.04 Carbon: Mn-Manganese: P-Phosphorous: S-Sulfur;
MECHANICA HARDNESS 278 HB	L ANAL	YSIS 0.2% Y.S.	ATA SUMM. %E.L. % R.A.	CHEMICAL ANALYSIS C Mn P S SI Mo Cr -40 .92 .009 .027 .23 .20 1.04

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE:

1.22.88

WD

FASTENER TESTING DATA SHEET

MATERIAL SPECIFICATION: ASTM AIGH GRADE 2H HEAD MARKING: "CO" (MFG) "2H" (GADE) CLASS I PROCUREMENT LEVEL: NON-ASME, NON-Q-LISTEQ, PERMAVENT PLANT PLANT APPLICATION: NON-SAFETY RELATED APPLICATION, GENERAL USE PIPING, CIVIL, HANGERS VENDOR: IN DETERMINATE DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A.I 3/3H8 — — — —	DESCRIPTION OF	F SAMPLE S	STOCK LOCATI	ON: WAREHOUS	E, SEGREGATED LABELED BIN
CLASS / PROCUREMENT LEVEL: NON-ASME, NON-Q-LISTED, PERMAUENT PLANT PLANT APPLICATION: NON-SAFETY RELATED APPLICATION, GENERAL USE PIPING, CIVIL, HANGERS VENDOR:	MATERIAL SPEC	IFICATION:	ASTM AI	94 GRADE 2H	
PLANT APPLICATION: NON-SAFETY RELATED APPLICATION, GENERAL USE PIPING, CIVIL, HANGERS VENDOR: _IN DETERMINATE GA RÉQUIREMENTS IMPOSED ON VENDOR: _SQ LEVEL D, IOCFROI NOT APPLICABLE DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB	HEAD MARKING		(MFG) 2	H (GRADE)	AND POPULATION DIALT
DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB - - - DOITIONAL TESTING: DESCRIPTION MONTH STREET TO STREET T	CLASS / PROCUE	REMENT LE	SAFETY RE	LATED APPLICAT	TON GENERAL USE /PIPING, CIVIL, HANGERS
DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr .43 021 .011 - - DDITIONAL TESTING: OTE: U.T.SUltimate Tensile Strength; Y.SYelid Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromlum; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.	PLANT APPLICA	TION: NOW			
DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S SI Mo Cr 3/3/18 - -	VENDOR: /N	DETERM	WATE		
DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB					
DATA SUMMARY MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB				(0)	D MATERIANT ADMINIST
MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB	QA REQUIREMEN	NTS IMPOS	CONSV NO DE	R: SQ LEVEL	D, TOCFRAT NOT APPLICABLE
MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB					
MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB					
MECHANICAL ANALYSIS HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 3/3 HB					
HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S Mo Cr 313 HB			D	ATA SUMMA	ARY
DDITIONAL TESTING: OTE: U.T.SUltimate Tensile Strength; Y.SYelid Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; St-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.	MECHANICA	AL ANAL	LYSIS		CHEMICAL ANALYSIS
DDITIONAL TESTING: DTE: U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.	HARDNESS	U.T.S.	0.2% Y.S.	%E.L. % R.A.	C Mn P S S Mo Cr
DTE: U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.	313 HB	-	-		.43021 .011
DTE: U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.					
DTE: U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.					
SI-Silicon; Mo-Molybdenum: Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance. CENSEE REFRESENTATIVE:		ING:			
SI-Silicon; Mo-Molybdenum: Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance. CENSEE REFRESENTATIVE:	DOITIONAL TEST				
SI-Silicon; Mo-Molybdenum: Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance. CENSEE REFRESENTATIVE:	DDITIONAL TEST				
Denotes outside specification tolerance. CENSEE REFRESENTATIVE:	DDITIONAL TEST				
CENSEE REFRESENTATIVE:	OTE: II T S - LINI	mate Tensile	Strength; Y.S.	-Yelld Strength; C-	Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; on; R.AReduction in Area.
	OTE: U.T.SUltin	Mo-Molybde	enum Cr-Chron	nium; E.LElongati	-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; on; R.AReduction in Area.
1.10.00 A DICHERY 2.14.00	OTE: U.T.SUltin	Mo-Molybde	enum Cr-Chron	nium; E.LElongati	-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; on; R.AReduction in Area.
THE THE PARTY OF T	DTE: U.T.SUltin SI-Silicon; M Denotes out	Mo-Molybde side specifi SENTATIVE:	enum Cr-Chronication tolerance	nium; E.LElongati e.	on; R.AReduction in Area.

SOURCE: MATERIAL CONTROL GROUP

DATE:

1-22-88

NO

FASTENER TESTING DATA SHEET

LGS2- 30

ESCRIPTION	OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN
AATERIAL SPE	ECIFICATION: ASTM A193 GRADE BT
EAD MARKIN	G. "J"(MFG), "87" (GRADE)
1 ACC / DDOC	UREMENT LEVEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT
LASS / PROC	ATION: NON- SAFETY RELATED APPLICATION, GENERAL USE / PIPING, CIVIL, HANGERS
LANT APPLIC	ATION: 400 SINCE THE PROPERTY OF THE PROPERTY
VENDOR: 5UR	PLIER: ALLIED NUT & BOLT
21100111	520 HERIZOG BLVO.
	KING OF PRUSSIA, PA
	ENTS IMPOSED ON VENDOR: 50 LEVEL D, 10CFR 21 NOT APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

1	HARD: ESS	JU.T.S.	10.2% Y.S.	%E.L.	% R.A.
	257 HB	_		-	-

CHEMICAL ANALYSIS

10	Mn	P	S	Si	Mo	Cr
,41	90	,019	,022	,22	.16	1.00

ADDITIONAL TI	ESTING:	
	A STATE OF THE PARTY OF	

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: _______ & .A. PISCIPELL date: 2-10 .88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

FASTENER TESTING DATA SHEET

DESCRIPTION OF			VAREHOUSE	SECRE	GAIED	LABELET	BIN	
MATERIAL SPECIF	SAMPLE STOCK	M A-194 64	MOE 2H					
HEAD MARKING:	"J" (MEG)	"2H" /6	RADE)					
CLASS / PROCUR	EMENT LEVEL:	NON ASM	E NON-Q	LIST F	ERMAN	ENT PLAN	VT	
PLANT APPLICATI	ON: NOW - 54F	ETY BELATED	APPLICAT	MON, CE	NERAL U	SE / PIDI	NG CIVIL,	HANGERS
VENDOR: 5000	IER : ALLIET	NUT & BO	ır					
	520 HE	RTZ06 BLVD						
y year		PRUSSIA, F						
DA RÉQUIREMEN	TS IMPOSED ON	VENDOR: _5	Q LEVEL	D, 100	FR21 N	OT APPLI	CABLE	
		5.474	01004	A D.V.				
MECHANICA	L ANALYSIS		SUMMA		MICAL	ANALY	SIS	
MECHANICA!				CHE				Cr
				CHE	Mn		Si Mo	Cr _
	U.T.S. 0.2			CHE	Mn	18 18	Si Mo	Cr _
HARDNESS 267 HB	U.T.S. 0.2	% Y.S. %E	L. % R.A.	CHE C .43	Mn P	0,013	Si Mo	Cr

FASTENER REVIEW PER NRC COMPLIANCE BUL.87-02

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

210

FASTENER TESTING DATA SHEET

LGS2- 32

	RIPTION: _	1 1/8" x 6" :	100	(570CK	CODE	, 15:	066	007	7)		
CRIPTION OF	CAMPLE	TOCK LOCATI	ON: WA	AREHOUSE	SEG.	REGAT	ED L	ABELE	0 8	IN	
FRIAL SPEC	IFICATION:	45TM 43	07 GRA	DE B						Jin	
D MARKING	"MD"	(mFG)									
SS / PROCUI	REMENT LE	VEL: NON-A	SME N	ron-Q-L	STED,	PERM	ANEN	T PL	ANT		
NT APPLICA	TION: NON	SAFETY REL	ATED A	PALKATIO	N, GE	VERAL	USE	1010	116,	HANE	SERS,
	HVA	C, PIPING									
NDOR: MFG	: MARY	AND BOLT	NUT	Co.							
		CUVINGTO									7 124
	the state of the s	MORE, MI									
RÉQUIREME	NTS IMPOSE	D ON VENDO	R: _30	LEVEL .	D, 100	CFR2	NOT	APP	LICA	BLE	
		D	ATA	SUMMA	ARY						
				7 7 7							
CHANICA					011	EMIC					

ADDITIONAL TESTING: ___

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelid Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: Alester & A. PISCITELLI date: 2-10-88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

MP

FASTENER TESTING DATA SHEET

FASTENER DESCRIPTION: 1 1/8" NUT (STOCK CODE; Y531069055) DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, BEGREGATED LABELED BIN
MATERIAL SPECIFICATION: ASTM A-194 GRADE 24
HEAD MARKING: "T" (MFG), "2H" (GRADE) " " (SEE # BELOW) CLASS / PROCUREMENT LEVEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT
PLANT APPLICATION: NON-SAFETY RELATED APPLICATION, GENERAL USE PIPING CIVIL, HANGERS
PLANT APPLICATION: NOW SAFETY RECEIVED AFFERTHEN, GENERALLY SAFETY
VENDOR: TEXAS BOLT CO. SUPPLIED ALLED NUT & BOLT CO.
3233 WEST 11th ST. SOO HERT206 BLVD.
HOUSTON, TX KING OF PRUSSIA, PA
** THIS IS AN ETCHED SYMBOL ON THE NUT TO DENOTE NON-Q STATUS. ETCHING PERFORMED BY BECHTEL UPON RECEIPT AND/OR ISSUE. DATA SUMMARY MECHANICAL ANALYSIS CHEMICAL ANALYSIS
HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S S MO CT
3274845015 .018
NOTE: U.T.SUltimate Tensile Strength; Y.SYeild Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.
ignature: date: 2.10.88

SOURCE MATERIAL CONTROL GROUP

DATE: 1.22.88

141

FASTENER TESTING DATA SHEET

FASTENER DESCRIPTION: 7/8" x 5 1/4" 5100 (STOCK CODE : Y530760020)
DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SECREGATED LABELED BIN MATERIAL SPECIFICATION: ASTM A193 GRADE B7 HEAD MARKING: "B" (MFG), "B7" (GRADE)
CLASS / PROCUREMENT LEVEL: NON - ASME, NON Q-LISTED, PERMANENT PLANT PLANT APPLICATION: NON-SAFETY RELATED APPLICATIONS, GENERAL USE / PIPING, CIVIL, HANGERS
VENDOR: INDETERMINATE
DA REQUIREMENTS IMPOSED ON VENDOR: 50 LEVEL D, 10CFR 21 NOT APRICABLE
DATA SUMMARY
MECHANICAL ANALYSIS CHEMICAL ANALYSIS
HARDNESS U.T.S. 0.2% Y.S. %E.L. % R.A. C Mn P S SI Mo Cr 25748 .40 .84 .016 .015 .22 .17 1.06
ADDITIONAL TESTING:
NOTE: U.T.SUltimate Tensile Strength; Y.SYelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.
signature:

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

200

FASTENER TESTING DATA SHEET

DESCRIPTION OF SAMPLE STOCK LOCATION: WAREHOUSE, SEGREGATED LABELED BIN	
MATERIAL SPECIFICATION: ASTM A-194 GRACE 2H	
HEAD MARKING: "J" (MFG), "2H" (GRADE)	-
CLASS I PROCUREMENT LEVEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT	-
PLANT APPLICATION: NON-SAFETY RELATED APPLICATIONS GENERAL USE PIPING, CIVIL, HANGER	,
VENDOR: SUPPLIER: FASTENER BYCKERAGE	
74 D 112502/115 1001115	
DA REQUIREMENTS IMPOSED ON VENDOR: SQ LEVEL D, 10CFR21 NOT APPLICABLE	
DATA SUMMARY	
MECHANICAL ANALYSIS CHEMICAL ANALYSIS	
HARDNESS U.T.S. 0.2% Y.S. % E.L. % R.A. C Mn P S SI Mo Cr	
267 48 1.44 - 1.015 .014	
201.00	
DOLTIONAL TECTING	
DDITIONAL TESTING:	
DTE: U.T.SUltimate Tensile Strength; Y.SYelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfu	in.
SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.LElongation; R.AReduction in Area. Denotes outside specification tolerance.	

SOURCE: MATERIAL CONTROL GROUP

DATE: 1-22-88

240

FASTENER TESTING DATA SHEET

			ON WAREHOU	5E 5E	CREC	ATED (ABELL	D BI	N.S
DESCRIPTION O	F SAMPLE	ASTM A3	BOT GRADE B	,	01120		7000		
MATERIAL SPEC	"TB	"(mFG)	or arree 2						
CLASS / PROCI	PEMENTI	EVEL: NON-	ASME, NOW-Q.	LISTED	PER	MANEN	PAR	r	
PLANT APPLICA	TION: NOX	SAFETY RE	APRICAN	ONS, G	ENET	RAL USE	-/c1	IL, H	ANGERS
CANT AFFERD	HVA	IC, PIPING				- /			
VENDOR: MF	G: TELAS	5 BOLT							e Southern
		on, Tx							
A REQUIREME	NTS IMPOS	ED ON VENDO	R: SQ LEVEL	D, 10	CFR:	21 NOT	APALIC	ABLE	
					_			_	
	/ T-(i,								
	7-11	D	ATA SUMMA	ARY					
			ATA SUMMA		EMIC	AL AN	ALYSI	S	
MECHANICA	AL ANAL	LYSIS		CHE		AL AN			Cr
MECHANICA HARDNESS	AL ANAL	LYSIS	ATA SUMMA	CHE	Mn	PS	Si		Cr
MECHANICA	AL ANAL	LYSIS		CHE	Mn		Si		Cr _
MECHANICA HARDNESS	AL ANAL	LYSIS		CHE	Mn	PS	Si		Cr
MECHANICA HARDNESS	AL ANAL	LYSIS		CHE	Mn	PS	Si		Cr _
MECHANICA HARDNESS 182 HB	AL ANAL	LYSIS		CHE	Mn	PS	Si		Cr -
MECHANICA HARDNESS	AL ANAL	LYSIS		CHE	Mn	PS	Si		Cr
MECHANICA HARDNESS 182 HB	AL ANAL	LYSIS		CHE	Mn	PS	Si		Cr _
MECHANICA HARDNESS 182 HB	AL ANAL U.T.S. TING:	10.2% Y.S.	%E.L. % R.A.	Carbon:	Mn —	P S	Si 20 -	Mo -	
MECHANICA HARDNESS 182 HB	AL ANAL U.T.S. TING:	10.2% Y.S.		Carbon:	Mn —	P S	Si 20 -	Mo -	
MECHANICA HARDNESS 182 HB	AL ANAL U.T.S. TING:	10.2% Y.S.	Yelid Strength; C-nlum; E.LElongation	Carbon:	Mn —	P S	Si 20 -	Mo -	

SOURCE: MATERIAL CONTROL GROUP

DATE

1.22.88

MA

FASTENER TESTING DATA SHEET

LGS2- 37

DESCRIPTION OF SAMPLE STOCK LOCATION: WAR	EHOUSE, SECREGATED LABELED BIN
MATERIAL SPECIFICATION: ASTM AS63 TY	OF C
HEAD MARKING: 3 RADIAL LINES SPACED (2 120°
CLASS / PROCUREMENT LEVEL: NON- ASME,	NON. Q. LISTED PERMANENT PLANT
PLANT APPLICATION: NON-SAFETY RELATED A.	POLICATIONS, GENERALUSE / CIVIL, HANGETES,
VENDOR: FASTENER BROKERAGE	
DA REQUIREMENTS IMPOSED ON VENDOR: 50	LEVEL D, IOCFRZI NOT APPLICABLE
DATA_S	UMMARY

HARDNE	SS JU.T.S.	10.2% Y.S	. % E.L.	1% R.A.
165 H	B -	-	-	-

C	Mn	P	S	Si	Mo	Cr
.04	-	.005	-	-	-	-

ADDITIONAL	TESTING:	 	 	 	
	-	 	 		

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon: Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: A PUSCIPELLI date: 2.10.88

SOURCE MATERIAL CONTROL GROUP

DATE: 1-22-88

140

FASTENER TESTING DATA SHEET

FASTENER DESC	RIPTION:	%"× 4" :	EQUARE HO. BOLT	(STOCK CODE: 4530660545)
DESCRIPTION OF	SAMPLE	STOCK LOCATI	ON: WAREHOUS	E, SECREGATED LABELED BIN
MATERIAL SPEC		CARBON	SIEEL	
HEAD MARKING		EVEL: NON-A	ISME, NON-Q-L	SMO
PLANT APPLICA	TION: NOA	1-SAFETY B	ELATED APPLICA	TON/PIPING
	1011			
VENDOR: VNI	KNOWN			
			10	0
QA REQUIREMEN	NTS IMPOS	ED ON VENDO	A: 30 LEVEL	D, IOCFRZI NOT APPLICABLE
		D	ATA SUMMA	ARY
MECHANICA	L ANA	LYSIS		CHEMICAL ANALYSIS
			%E.L. % R.A.	C Mn P S SI Mo Cr Ni Cu ;
165 HB	_			.17 .41 .021 .029 .01 .01 .01 .01 .01
ADDITIONAL TEST	ING:			
ADDITIONAL TEST				
NOTE: U.T.SUltin	nate Tensili	e Strength; Y.S.	-Yelld Strength; C-	Carbon: Mn-Manganese; P-Phosphorous; S-Sulfur,
				on; R.AReduction in Area.
Denotes out	side specifi	cation tolerance		
LICENSEE REPRES	ENTATIVE)	EU date: 2.0	

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.88

24

FASTENER TESTING DATA SHEET

				E, SEGREGATED LABETED BIN
MATERIAL SPEC	IFICATION:	ASTM AK	93 GRADE B8	
HEAD MARKING	"J"(MFG) "B	8" (GRACE)	
CLASS / PROCU	REMENT L	EVEL: NON-A	ASME, NON-G	LISTED, PERMANENT PLANT
PLANT APPLICA	TION: NON	- SAFETY RE	TARED APPLICAL	TON, GENERAL USE / PIPING, CIVIL, HANGERS
VENDOR: 5UP	OUER: AL	LIED NUT F	BOLT CO.	
VENDON.		O HERTZOG		
		NO OF PAUS		
OA BÉOLUBEME	THE RESIDENCE OF THE PERSON NAMED IN	CONTRACTOR OF THE PROPERTY OF THE PARTY OF T	THE RESIDENCE OF THE PERSON NAMED IN COLUMN 2 IS NOT THE OWNER.	D, 10CFR 21 NOT APPLICABLE
				. 6.7
		Ū	ATA SUMM	ARY
MECHANICA	AL ANAL		ATA SUMM	CHEMICAL ANALYSIS
MECHANICA HARDNESS		YSIS	ATA SUMM	
		YSIS		CHEMICAL ANALYSIS
HARDNESS		YSIS		CHEMICAL ANALYSIS C Mn P S SI Mo Cr N/2
HARDNESS		YSIS		CHEMICAL ANALYSIS C Mn P S SI Mo Cr N/2
HARDNESS 142 HB	U.T.S.	YSIS		CHEMICAL ANALYSIS C Mn P S SI Mo Cr N/2
HARDNESS	U.T.S.	YSIS		CHEMICAL ANALYSIS
HARDNESS 142 HB	U.T.S.	YSIS		CHEMICAL ANALYSIS C Mn P S SI Mo Cr N/2
HARDNESS 142 HB	U.T.S.	YSIS 0.2% Y.S.	%E.L. % R.A - -	CHEMICAL ANALYSIS C Mn P S SI Mo Cr Ni 1 1 1 1 1 1 1 1 1
HARDNESS 142 HB DITIONAL TEST	ING:	YSIS 0.2% Y.S.	%E.L. % R.A.	CHEMICAL ANALYSIS C Mn P S SI Mo Cr N/1 1 1 1 1 1 1 1 1 1
HARDNESS 142 HB DITIONAL TEST TE: U.T.SUINE SI-SIIICON; M	ING:	YSIS 0.2% Y.S.	Yelid Strength; Conlum; E.LElongati	CHEMICAL ANALYSIS C Mn P S SI Mo Cr Ni 1 1 1 1 1 1 1 1 1

SOURCE MATERIAL CONTROL GROUP

DATE: 1. 22-88

up

FASTENER TESTING DATA SHEET

LGS2- 40

PASIENER DES	CRIPTION:	5/8" NUT ((STOCH	(CODE '	Y5310603	3/8)			
DESCRIPTION O	F SAMPLE	STOCK LOCAT	ION: W	AREHOUS	E, SECREC	BATED L	ABELET	811	V
MATERIAL SPEC	FICATION	ASTM AL	94 GA.	ADE 8					
HEAD MARKING	. 8 (MFG), 8	S (GRA	ACE)	MATE POR	In LATEN		_	
CLASS / PROCU									
PLANT APPLICA	TION: NOA	1- SAFETY NE	ELAIEU	AFFLICA	TON - PIP	ING, MAI	VOERCS	,	
VENDOR: 30P	PLIEE:	ALLIED NUT	¿ Boi	7					
		520 HERTZO	of Bive	2.					
		KING OF PAUS							
QA REQUIREME	NTS IMPOS	ED ON VENDO	B. 50	LEVER	D. 10CFA	21 NOT	APPLIC	ABLE	
		D	ATA	SUMMA	\RY				
MECHANICA	IL ANA		ATA	SUMMA		CAL AN	ALYSI	s	
MECHANICA HARDNESS						CAL AN			Cr Ni
		LYSIS			CHEMIC C Mn	IP IS	SI	Mo	Cr Ni 17.24 8.65
HARDNESS		LYSIS			CHEMIC C Mn	IP IS	SI	Mo -	
HARDNESS 222 HB	U.T.S.	LYSIS			CHEMIC C Mn	IP IS	SI	Mo -	17.24 8.65
HARDNESS	U.T.S.	LYSIS			CHEMIC C Mn	IP IS	SI	Mo -	17.24 8.65
HARDNESS 222 HB	U.T.S.	LYSIS			CHEMIC C Mn	IP IS	SI	Mo -	17.24 8.65
DDITIONAL TEST	ING:	LYSIS 0.2% Y.S.	%E.L.	% R.A.	CHEMIC C Mn	P S	9 SI 01 , 3 /	Mo - SEE	17.24 8.65 NCR #12853
DDITIONAL TEST	ING:	e Strength; Y.S.	-Yelld S	% R.A.	CHEMIC C Mn	P S	9 SI 01 , 3 /	Mo - SEE	17.24 8.65 NCR #12853
DDITIONAL TEST	ING:	LYSIS 0.2% Y.S.	-Yelld S	% R.A.	CHEMIC C Mn	P S	9 SI 01 , 3 /	Mo - SEE	17.24 8.65 NCR #12853

SOURCE MATERIAL CONTROL GROUP

DATE: 2/2/88

FASTENER TESTING DATA SHEET

LGS2- 40E

DESCRIPTION OF SAMP	LE STOCK LOCATION: WAREHOUSE, SEERECATED LABELED BIN
MATERIAL SPECIFICATI	ON: ASTM A194 GRADE 8
HEAD MARKING: B	" (MFG), " S" (GRADE)
CLASS / PROCUREMEN	TLEVEL: NON- ASME, NON-QUSTED PERMANENT PLANT
PLANT APPLICATION:	NON-SAFETY RELATED APPLICATION PIPING - HANGERS
VENDOR: SUPPLIER	E: ALLIED NUT & BOLT
	520 HERTZOG BLVD.
	KING OF PRUSSIA, PA
OA RÉQUIREMENTS IM	POSED ON VENDOR: 50 LEVEL D, 10CFR 21 NOT APPLICABLE
REQUIREMENTS IM	POSED ON VENDOR: DA LEVEL LE, TOCHAST TOUT PRESENTATION

DATA SUMMARY

MECHANIC	AL MINAL	1313	
LHADDNESS	LILTS	10.2% Y.S.	1 % E.

MECHANICAL ANALYSIS

11	HARDNESS	U.T.S.	10.2% Y.S.	%E.L.	% R.A.
T	RB 103	-	-	-	-

CHEMICA	L ANALYSIS

C	Mn	P	S	Si	Mo	Cr	-Ni 1
.02	.82	.045	.007	.34	-	17.53	9.18

SEE NOR # 12853

ADDITIONAL TESTING: NOTE: THIS TEST SPECIMEN IS THE SAME FASTENER WHICH WAS SENT TO BETHFURGE LABORATORY (SEE LG52-40). THIS SPECIMEN IS A "REMNANT" OF THAT TEST.

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelid Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenura Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE:	
signature: ANRIANG A PISCHELL date	2-10-88
signature: Transfer G.A. Fractice date	27000

SOURCE: MATERIAL CONTROL GROUP

DATE: 1.22.88

FASTENER TESTING DATA SHEET

LGS2-41

ESCRIPTION OF	F SAMPLE	STOCK LOCAT	ION: WA	AREHOUS	E, SEG	REGI	4120	LABE	rer	CA	RTON
MATERIAL SPEC		ASTM AS	74								
HEAD MARKING			10.00			_		- 0			
CLASS / PROCU							MANE	WT PI	ins		
PLANT APPLICA	TION: NOW	-SAFETY REL	ATED PI	IPING AL	PCICATI	101					
VENDOR: FAST	TATE R	PAREMALE									
VENDOR:	ENER DI	IVAETOTOE									
THE PURE											
A RÉQUIREME			- 60	INFL S	D 100	FR	2/ NO	T A	PLIC	4811	-
A REQUIREME	NTS IMPOS	ED ON VENDO	R:	22,00	,					1000	
					-	-		_	_		-
			ΔΤΔ (SLIMMA	ARY.						
		Č	ATA S	SUMMA	ARY						
MECHANICA	AL ANA		ATA S	SUMMA		MIC	AL A	INAL	YSIS	2	
MECHANICA HARDNESS		LYSIS			CHE		. 5.		_	Mo	Cr
		LYSIS			CHE	Mn	. 5.	S	SI		Cr -
HARDNESS		LYSIS			CHE	Mn	P	S	SI		Or —
HARDNESS		LYSIS			CHE	Mn	P	S	SI		Cr -
HARDNESS 38 HRC	U.T.S.	LYSIS 0.2% Y.S.			CHE	Mn	P	S	SI		Or -
HARDNESS 38 HRC SEENCR 12853	U.T.S.	LYSIS 0.2% Y.S.			CHE	Mn	P	S	SI		Cr -
HARDNESS 38 HRC	U.T.S.	LYSIS 0.2% Y.S.			CHE	Mn	P	S	SI		Cr -
HARDNESS 38 HRC	U.T.S.	LYSIS 0.2% Y.S.			CHE	Mn	P	S	SI		Or -
HARDNESS 38 HRC SEENCR 12853 DITIONAL TEST	ING:	LYSIS 0.2% Y.S.	%E.L.	1% R.A.	CHE C , 33	Mn -	, 02/	.008	SI	Mo -	-
HARDNESS 38 HRC SEENCR 12853 DITIONAL TEST	ING:	LYSIS 0.2% Y.S.	-Yelld St	1% R.A.	CHE C , 33	Mn -	, 02/	.008	SI	Mo -	-

SOURCE MATERIAL CONTROL GROUP

DATE:

1.22.88

FASTENER TESTING DATA SHEET

LGS2-42

				(CODE : Y530760231)
ESCRIPTION O	SAMPLE S	TOCK LOCATI	ON: WAREHOUSE	, SECRECATED LABELED BIN
ATERIAL SPEC	IFICATION:	ASTM A-19:	" CARRE BT	
EAD MARKING	- K (N	1FG), 15 /	CORADE)	STED PERMANENT DIANT
LASS / PROCU	REMENT LE	VEL: NON- MS	TED ADDUCATION	N / PIPING, HANGERS
LANT APPLICA	TION: NOW	MIE! J NEW	ILP HIPTOTIO	friend, minden
111.0	1.112. 1	LIED NIT &	BOLT	
ENDOR SUPE	LIEK , MI	Harry and Str. L. L. S. L.		
ENDOR: 30PA	52	O HERTZOG	BLVO.	
	52 Ki	NG OF PRUS	BLVO.	D, IOCFR 21 NOT APPLICABLE
	52 Ki	NG OF PRUS	BLVO. ISIA, PA R: SQ LEVEZ	
	52 Ki	NG OF PRUS	BLVO.	
A RÉQUIREME	NTS IMPOSE	NG OF PRUS	BLVO. SIA, PA R: SQ LEVEZ ATA SUMM	CHEMICAL ANALYSIS
A RÉQUIREME	NTS IMPOSE	NG OF PRUS	ATA SUMM	ARY

SI-Silicon: Mo-Molybdenum: Cr-Chromium; E.L

Denotes outside specification tolerance.

LICENSEE REPRESENTATIVE

signature: AN AND C. A. PISCIPALI date: 2-10-88

SOURCE MATERIAL CONTROL GROUP

DATE: 1. 22.88



FASTENER TESTING DATA SHEET

LGS2-43

ESCRIPTION OF SAMPLE S	STOCK LOCATION: WAREHOUSE, SECREGATED LABELED BIN
ATERIAL SPECIFICATION:	ASTM A194 GRADE 2H
SEAD MARKING: "K"	MFG) "2H" (GRADE)
CLASS / PROCUREMENT LE	VEL: NON-ASME, NON-Q-LISTED, PERMANENT PLANT
PLANT APPLICATION: NOA	- SAFETY RELATED APPLICATIONS / PIPING, HANGERS
VENDOR: SUPPLIER! A	LLIED NUT & BOLT
5	20 HERTZOG BLVD.
	ING OF PRUBSIA, PA
DA REQUIREMENTS IMPOSE	ED ON VENDOR: SQ LEVEL D, 10 CFR31 NOT APPLICABLE

HANDNESS	U.1.0.	U.E. 1 101	THE REAL PROPERTY.	THE CHARGE	-	18111	-
30/HB	-	-	-	-	.48	-	, 1

С	Mn	P	S	Si	Мо	Cr
.48	-	,028	.022	-	-	

ADDITIONAL TEST	ING:

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum, Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.

Denotes outside specification tolerance.

signature: Addition & A. Piscinetti date: 2.10.88

SOURCE MATERIAL CONTROL GROUP

DATE: 1-22-88

100

FASTENER TESTING DATA SHEET

LGS2-44

	F SAMPLE STOCK LOCATION: WAREHOUSE, SEEREGATED LABELED BIN
MATERIAL SPEC	IFICATION: ASTM A- 193 GRACE BY
HEAD MARKING	"B" (MFG), "B7" (GRADE)
LASS / PROCU	REMENT LEVEL: NON- ASME, NON- QLISTED, PERMANENT PLANT
PLANT APPLICA	TION: NON SAFETY BELATED APPLICATION, PIPING HANGERS
VENDOR: 100	ETERMINATE.
	A CONTRACTOR OF THE PARTY OF TH

DATA SUMMARY

MECHANICAL ANALYSIS

L	HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
	289 HB	-	-	-	-

CHE	MICA	LAN	ALYSIS
-		-	101 010

С	Mn	P	S	Si	Mo	Cr
						1.05

Wholling is a secure	Management of the Park Street, Square,			-	
			entransa mellementeria di	A STATE OF THE OWNER,	-

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

ADDITIONAL TESTING

signature: AND C. A. PISCITELLI date: 2-10-88

SOURCE: MATERIAL CONTROL GROUP

DATE: 1. 22-88

24

FASTENER TESTING DATA SHEET

LGS2- 45

DESCRIPTION OF MATERIAL SPEC HEAD MARKING: CLASS / PROCUI	SAMPLE SIFICATION:	ASTM ATM	ON: WAREHOU 14 GRADE 2 H H" (GRADE) 15ME, NON-Q-1	DE: Y531060004) SE, SECREGATED LABELED BIN LISTED, PERMANENT PLANT ATION / PIPING, HANGERS
VENDOR: FAS				
QA RÉQUIREMEN	NTS IMPOSE			D, 10CFR21 NOT APPLICABLE
			ATA SUMMA	
MECHANICA HARDNESS			%E.L. % R.A	CHEMICAL ANALYSIS
30/48	-	-		.44013 .029
ADDITIONAL TEST	nate Tensile	Strenoth: Y.S.	-Yelld Strength: C	-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; on; R.AReduction in Area.
		cation tolerance		on, n.aneodetion in Aree.
LICENSEE REPRES	AGO	6. A. PISCITE	CU _date: 2-	10.88

SOURCE MATERIAL CONTROL GROUP

DATE: 1.22.88

FASTENER TESTING DATA SHEET

DESCRIPTION OF				E: E597561755)
	SAMPLE S	ASTM AS	SG3 TYPE A	E, SEGREGATED LABELED BIN
HEAD MARKING:				
CLASS / PROCUE	REMENT LE	VEL: NON-	ASME, Q.LIS	TEO, PERMANENT PLANT
PLANT APPLICAT	TION: SAF	ETY APPLI	CATION / EL	ECTRICAL - INSTRUMENTATION
VENDOR: ALL	IND NUT	- é Boir C	0.	
VENDOR:	HERTZO	6 BLVD.		
KIN	G OF Prus	551A, PA		
DA RÉQUIREMEN	NTS IMPOSI	ED ON VENDO	A: SQ LEVEL	C, 10CERTI APPLICABLE
an newomene				
			ATA SUMM	ARY
			ATA SUMM	
MECHANICA		.YSIS		CHEMICAL ANALYSIS
- CONTRACTOR OF THE PERSON NAMED IN COLUMN 1		.YSIS		CHEMICAL ANALYSIS
- CONTRACTOR OF THE PERSON NAMED IN COLUMN 1		.YSIS		CHEMICAL ANALYSIS
HARDNESS		.YSIS		CHEMICAL ANALYSIS
HARDNESS		.YSIS		CHEMICAL ANALYSIS
HARDNESS	U.T.S.	.YSIS		CHEMICAL ANALYSIS
HARDNESS 88 HRB	U.T.S.	.YSIS		CHEMICAL ANALYSIS
HARDNESS 88 HRB	U.T.S.	.YSIS		CHEMICAL ANALYSIS
HARDNESS BB HRB DDITIONAL TEST	ING:	YSIS 0.2% Y.S. 	%E.L. % R.A.	CHEMICAL ANALYSIS C Mn F S S Mo Cr .12016
HARDNESS BB HRB DITIONAL TEST OTE: U.T.SUitin SI-Silicon; N	ING:	YSIS 0.2% Y.S. 	-Yelld Strength; Cmlum; E.LElonga	CHEMICAL ANALYSIS C Mn F S S Mo Cr .12016

SOURCE MATERIAL CONTROL GROUP

DATE 1-22-88

FASTENER TESTING DATA SHEET

LGS2-49

DESCRIPT	SPECIFICATION: ASTM A 307 GRADE B
MATERIAL	SPECIFICATION: ASTM A 307 ERADE IS
HEAD MA	PROCUREMENT LEVEL: NON-ASME, Q-LISTED, PERMANENT PLANT
PLANT AP	PLICATION: SAFETY BELATED APPLICATION / ELECTRICAL - INSTRUMENTATION
VENDOR	ALLIED NUT & BOLT
	520 HERT206 BLVD.
	KING OF PAUSSIA, PA
	REMENTS IMPOSED ON VENDOR: 50 LEVEL C, 10CFR 21 APPLICABLE

DATA SUMMARY

MECHANICAL ANALYSIS

HARDNESS	U.T.S.	0.2% Y.S.	%E.L.	% R.A.
	-		-	-

CHEMICAL ANALYSIS

C	Mn	P	S	SI	Mo	Cr
-	-	.016	.010	-	-	-

ADDITIONAL TESTIA	TESTING:	WELGE TENSION TEST;	1040-10,925 185
			FAILURE LOCATION THREADS

NOTE: U.T.S.-Ultimate Tensile Strength; Y.S.-Yelld Strength; C-Carbon; Mn-Manganese; P-Phosphorous; S-Sulfur, SI-Silicon; Mo-Molybdenum; Cr-Chromium; E.L.-Elongation; R.A.-Reduction in Area.



Denotes outside specification tolerance.

signature: ASPANSE & A PISCITELLI date: 2.10.88

SOURCE MATERIAL CONTROL GROUP

DATE

1-22.88

Mil

FASTENER TESTING DATA SHEET

LGS2-50

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HARDNESS	U.T.S.	YSIS			CH	Mn	P	S S		Cr -
HARDNESS 97 HRB	U.T.S.	.YSIS 0.2% Y.S.	%E.L.	% R.A.	CH C .09	Mn -	.0/3	S S		Cr -
HARDNESS 97 HRB	U.T.S.	.YSIS 0.2% Y.S.	%E.L.	% R.A.	CH C .09	Mn -	.013 BS	S S	Mo	 -
HARDNESS	U.T.S.	.YSIS 0.2% Y.S.	%E.L.	% R.A.	CH C .09	Mn -	.013 BS	S S		 -
HARDNESS 97 HRB	U.T.S.	.YSIS 0.2% Y.S.	%E.L.	% R.A.	CH C .09	Mn -	.013 BS	S S	Mo	 -
HARDNESS	U.T.S.	YSIS 0.2% Y.S.	%E.L.	LOAE RESUL	CH C .09 - 96 T - 5,81	Mn - 44 L	BS TORY	S S S	MO	
HARDNESS 97 HRB	U.T.S. NG: PRO	YSIS 0.2% Y.S. 	%E.L.	LOAE RESUL	CH C .09 - 96 T - 5,81	Mn - 44 L	BS TORY	S S S	MO	

APPENDIX D

SOLD TO

Certificate of Conformance No. 29259

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/1/8 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO
Philadelphia Electric Company
P.O. Box 650
Valley Forge, PA 19482

ATTN: John Diletto

SHIPMENT

INVOICE DATE

SHIPMENT

LABORATORY TESTING INC.

2301 Market Street

Philadelphia, PA

P.O. Box 8699

CUST. P.O.

TS-271511-AN

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company

DESCRIPTION

19101

LAB REPORT NO.

TC-6841.1

15 pcs. Nuts - ASTM A-194

See attached sheet for breakdown

Reference: Charge No. 5412-0928

Metallurgy Lab Note No. 87-307 Limenit I

NRC Bulletin 87-02 Transaction No. 947002

- A. The above referenced Test Specimens were submitted to chemical content evaluation by Spectrochemical Analysis and Wet Chemical Analysis and (11) pieces were found to be in conformance to ASTM A-194, Grade 2H; (2) pieces were found to be in conformance to ASTM A-194, Grade 7; (1) piece was found NOT to be in conformance to ASTM A-194, Grade 8M; and (1) piece was found to be in conformance to ASTM A-194, Grade 6. See attached sheet for results.
- B. A Hardness test was performed on the above Test Specimens and (11) pieces were found to be in conformance to ASTM A-194, Grade 2H; (2) pieces were found to be in conformance to ASTM A-194, Grade 7; (1) piece was found to be in conformance to ASTM A-194, Grade 8M; and (1) piece was found to be in conformance to ASTM A-194, Grade 6. See attached sheet for results.
- C. A Proof Load tes' was performed on the above Test Specimens and (11) pieces were found to be in conformance to ASTM A-194, Grade 2H; (2) pieces were found to be in conformance to ASTM A-194, Grade 7; (1) piece was found to be in conformance to ASTM A-194, Grade 8M; and (1) piece was found to be in conformance to ASTM A-194, Grade 6. See attached sheet for results.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM.

A breakdown of pieces received is as follows:

1	pc.	9/16" - 12 Bonnet Nut, LGS-1 1-Q, Material Code #114-43073
1	pc.	5/8" - 11 Suction Head Nut, LGS-1 3-Q, Material Code #114-46396
1	pc.	3/4" - 10 Bonnet Nut, LGS-1 4-Q, Material Code #114-42273
1	pc.	7/8" - 9 Bonnet Nut, LGS-1 5-Q, Material Code #114-26566
1	pc.	7/8" - 9 Stag & Casing Nut, LGS-1 6-Q, Material Code #114-46387
1	pc.	1-1/8" - 8 Bonnet Nut, LGS-1 8-Q, Material Code #114-22960
1	pc.	1-1/4" - 7 Bonnet Nut, LGS-1 9-Q, Material Code #114-22984
1	pc.	5/8" - 11 Bonnet Nut, LGS-1 10-Q, Material Code #114-33541
1	pc.	1/2" - 13 Nut, LGS-1 1-N, Material Code #114-20506N
1	pc.	5/8" - 11 Bonnet Nut, LGS-1 3-N, Material Code #114-23364
1	pc.	5/8" - 11 Bonnet Nut, LGS-1 4-N, Material Code #114-33167
1	pc.	3/4" - 10 Bonnet Nut, LGS-1 6-N, Material Code #114-27414
1	pc.	3/4" - 10 Nut, LGS-1 8-N, Material Code #114-41618N
1	pc.	1" - 8 Bonnet Nut, LGS-1 9-N, Material Code #114-29987
1	pc.	1-3/8" - 8 Bonnet Nut, LGS-1 10-N, Material Code #114-23540

A. CHEMICAL ANALYSIS RESULTS:

ASTM A-194, GRADE 2H

SAMPLE NO.	CARBON	PHOSPHORUS	SULFUR
Required	0.40 minimum	0.040 maximum	0.050 maximum
114-23540	0.451	0.019	0.025
114-22960	0.463	0.029	0.018
114-22984	0.457	0.012	0.022
114-26566	0.432	0.026	0.014
114-20506N	0.451	0.018	0.027
114-27414	0.466	0.011	0.021
114-43073	0.457	0.021	0.015
114-33167	0.462	0.022	0.037
114-23364	0.446	0.034	0.030
114-42273	0.499	0.019	0.031
114-41618N	0.409	0.015	0.027

ASTM A-194, GRADE 7

ELEMENT	REQUIRED	SAMPLE #114-46396	SAMPLE #114-46387
Carbon	0.37 - 0.49	0.372	0.375
Manganese	0.65 - 1.10	0.89	0.90
Phosphorus	0.04 maximum	0.011	0.010
Sulfur	0.04 maximum	0.020	0.017
Silicon	0.15 - 0.35	0.30	0.26
Chromium	0.75 - 1.20	1.06	0.94
Molybdenum	0.15 - 0.25	0.23	0.23

Lab Report No. TC-6841.1 Page 3

ASTM A-194, GRADE 8M

ELEMENT	REQUIRED	SAMPLE #11433541
Carbon	0.08 maximum	0.027
Manganese	2.00 maximum	1.42
Phosphorus	0.045 maximum	0.036
Sulfur	0.030 maximum	*0.041 (by Wet Analysis)
Silicon	1.00 maximum	0.42
Nickel	10.00 - 14.00	10.18
Chromium	16.00 - 18.00	16.08
Molybdenum	2.00 - 3.00	2.124

^{*} Over Maximum Requirement.

ASTM A-194, GRADE 6

ELEMENT	REQUIRED	SAMPLE #114-29987
Carbon	0.15 maximum	0.119
Manganese	1.00 maximum	0.75
Phosphorus	0.040 maximum	0.015
Sulfur	0.030 maximum	0.016
Silicon	1.00 maximum	0.34
Chromium	11.50 - 13.50	11.84

B. HARDNESS TEST RESULTS:

ASTM A-194, GRADE 2H

REQUIRED: RC 24 - RC 38

#114-43073 - RC 33 / #114-42273 - RC 30 / #114-26566 - RC 29 #114-22960 - RC 27 / #114-22984 - RC 29 / #114-20506N - RC 31 #114-23364 - RC 29 / #114-33167 - RC 29 / #114-27414 - RC 27 #114-41618N - RC 27 / #114-23540 - RC 24

ASTM A-194, GRADE 7

REQUIRED: RC 24 - RC 38

#114-46396 - RC 32 / #114-46387 - RC 34

ASTM A-194, GRADE 8M

REQUIRED: RB 60 - RB 105

#114-33541 - RB 81

ASTM A-194, GRADE 6

REQUIRED: RC 20 - RC 28

#114-29987 - RC 26

C. PROOF LOAD TEST RESULTS:

ASTM A-194, GRADE 2H

Sample #114-43073 tested at 27,300# - Satisfactory with no failures. Sample #114-42273 tested at 50,100# - Satisfactory with no failures. Sample #114-26566 tested at 69,300# - Satisfactory with no failures. Sample #114-22960 tested at 118,500# - Satisfactory with no failures. Sample #114-22984 tested at 145,350# - Satisfactory with no failures. Sample #114-20506N tested at 21,280# - Satisfactory with no failures. Sample #114-23364 tested at 33,900# - Satisfactory with no failures. Sample #114-33167 tested at 33,900# - Satisfactory with no failures. Sample #114-27414 tested at 50,100# - Satisfactory with no failures. Sample #114-41618N tested at 50,100# - Satisfactory with no failures. Sample #114-23540 tested at 185,000# - Satisfactory with no failures.

ASTM A-194, GRADE 7

Sample #114-46396 tested at 33,900# - Satisfactory with no failures. Sample #114-46387 tested at 69,300# - Satisfactory with no failures.

ASTM A-194, GRADE 8M

Sample #114-33541 tested at 16,950# - Satisfactory with no failures.

ASTM A-194, GRADE 6

Sample #114-29987 tested at 81,810# - Satisfactory with no failures.

Certificate of Conformance No. 29259

YERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11% PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO Philadelphia Electric Company P.O. Box 650 Valley Forge, PA ATTN: John Diletto

SHIPMENT Complete

INTOICE DATE 1/8/88

DESCRIPTION

19101

LAB REPORT NO.

TC-6841.2

Studs - ASTM A-193 15 pcs.

LABORATORY TESTING INC.

2301 Market Street

Philadelphia, PA

P.O. Box 8699

CUST. P.O. TS-271511-AN

O. Box 249 Dublin, Pennsylvania 18917 SOLD TO

Philadelphia Electric Company

See attached sheet for breakdown

Reference: Charge No. 5412-0928

Metallurgy Lab Note No. 87-307

NRC Bulletin 87-02 Transaction No. 947002

- The above referenced Test Specimens were submitted to chemical content evaluation by Spectrochemical Analysis and Wet Chemical Analysis and (12) pieces were found to be in conformance to ASTM A-193, Grade B7; (1) piece was found NOT to be in conformance to ASTM A-193, Grade B7; (1) piece was found to be in conformance to ASTM A-193, Grade B6; and (1) piece was found to be in conformance to ASTM A-193, Grade Bl6. See attached sheet for results.
- A Hardness test was performed on the above Test Specimens in accordance with ASTM A-193, Grades B7, B6 and B16. See attached sher for results.
- C. A Tensile test was performed (per ASTM E-8/A-370) on the above Test Specimens and (10) pieces were found to be in conformance to ASTM A-193, Grade B7; (3) pieces were found NOT to be in conformance to ASTM A-193, Grade B7; (1) piece was found NOT to be in conformance to ASTM A-193, Grade B6; and (1) piece was found to be in conformance to ASTM A-193, Grade Bl6. See attached sheet for results.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM

SAMPLE

A breakdown of pieces received is as follows:

1 pc.	9/16 x 3-5/8" long Bonnet Stud, LGS-1 1-Q, Code #114-43072
1 pc.	5/8 x 2-1/2" long Suction Head Stud, IGS-1 3-Q, Code #114-46394
1 pc.	3/4 x 4-1/4" long Bonnet Stud, LGS-1 4-Q, Code #114-42272
1 pc.	3/4 x 5" long Bonnet Stud, LGS-1 5-Q, Code #114-26565
1 pc.	7/8 x 4-3/4" long Stage Casing Stud, LGS-1 6-Q, Code #114-46385
1 pc.	1 x 5" long Bonnet Stud, LGS-1 8-Q, Code #114-22959
1 pc.	1-1/4 x 5-1/4" long Bonnet Stud, LGS-1 9-Q, Code #114-22983
1 pc.	1-3/8 x 10" long MSRV Stud, LGS-1 11-0, Code #114-63000
1 pc.	1/2 x 2-3/4" long Bonnet Stud Assm., LGS-1 1-N, Code #114-20506B
1 pc.	5/8 x 3-3/8" long Bonnet Stud, LGS-1 3-N, Code #114-23363
1 pc.	5/8 x 3-5/8" long Bonnet Stud, LGS-1 4-N, Code #114-33166
1 pc.	3/4 x 3-1/4" long Bonnet Stud, LGS-1 6-N, Code #114-27413
1 pc.	3/4 x 3-1/4" long Bolt, LGS-1 8-N, Code #114-41618B
1 pc.	1 x 5-3/4" long Bonnet Stud, LGS-1 9-N, Code #114-29982
l pc.	1-3/8 x 9-1/2" long Bonnet Stud, LGS-1 10-N, Code #114-23541

A. CHEMICAL ANALYSIS RESULTS:

ASTM A-193, GRADE B7

SAMPLE SAMPLE

ELEMENT	REQUIRED	#114-26565	#114-20506B	#114-23363
Carbon	0.35 - 0.51	0.396	0.363	0.397
Manganese	0.61 - 1.14	0.89	0.88	0.90
Phosphorus	0.040 maximum	0.019	0.013	0.019
Sulfur	0.045 maximum	0.026	0.025	0.018
Silicon	0.13 - 0.37	0.27	0.23	0.26
Chromium	0.70 - 1.25	0.92	0.94	1.06
Molybdenum	0.13 - 0.27	0.23	0.18	0.15
	SAMPLE	SAMPLE	SAMPLE	SAMPLE
ELEMENT	#114-23541	#114-22959	#114-27413	#114-46394
Carbon	0.410	0.380	0.449	0.445
Manganese	0.80	0.85	0.99	0.94
Phosphorus	0.026	0.03.2	0.030	0.016
Sulfur	0.018	0.021	0.024	0.021
Silicon	0.26	*0.41 (wet)	0.28	0.23
Chromium	1.00	1.04	1.05	1.05
Molybdenum	0.19	0.21	0.23	0.19

^{*} Over Maximum Requirement.

ASTM A-193, GRADE B7 (Continued)

SAMPLE SAMPLE

ELEMENT	REQUIRED	#114-33166	#114-22983	
Carbon	0.35 - 0.51	0.399	0.409	
Manganese	0.61 - 1.14	0.93	0.91	
Phosphorus	0.040 maximum	0.021	0.028	
Sulfur	0.045 maximum	0.029	0.026	
Silicon	0.13 - 0.37	0.36	0.22	
Chromium	0.70 - 1.25	1.03	0.90	
Molybdenum	0.13 - 0.27	0.19	0.16	
	SAMPLE	SAMPLE	SAMPLE	SAMPLE
ELEMENT	#114-41618B	#114-46385	#114-43072	#114-42272
Carbon	0.406	0.385	0.404	0.388
Manganese	0.93	0.88	0.85	0.87
Phosphorus	0.027	0.013	0.038	0.019
Sulfur	0.012	0.023	0.027	0.017
Silicon	0.31	0.25	0.22	0.24
Chromium	0.96	1.01	1.05	1.06
Molybdenum	0.16	0.14	0.18	0.16

ASTM A-193, GRADE B6

ELEMENT.	REQUIRED	SAMPLE #114-29982
Carbon	0.16 maximum	0.118
Manganese	1.03 maximum	0.45
Phosphorus	0.045 maximum	0.011
Sulfur	0.035 maximum	0.005
Silicon	1.05 maximum	0.34
Chromium	11.35 - 13.65	12.61

ASTM A-193, GRADE B16

ELEMENT	REQUIRED	\$AMPLE #114-63000
Carbon	0.34 - 0.49	0.419
Manganese	0.42 - 0.73	0.54
Phosphorus	0.040 maximum	0.017
Sulfur	0.045 maximum	0.020
Silicon	0.13 - 0.37	0.32
Chromium	0.75 - 1.20	1.11
Molybdenum	0.47 - 0.68	0.60
Vanadium	0.22 - 0.38	0.326

B. HARDNESS RESULTS:

ASTM A-193, GRADE B7

NO REQUIREMENTS

#114-43072 -	- R	29	1	#114-46394 - RC 30	1	#114-42272 - RC 18
#114-26565 -	- RC	31	1	#114-46385 - RC 33	/	#114-22959 - RC 32
#114-22983 -	- RC	28	1	#114-20506B - RC 30	1	#114-23363 - RC 31
#114-33166 -	- R	33	1	#114-27413 - RC 33	1	#114-41618B - RC 30
#114-23541 -	- R	2 17				

ASTM A-193, GRADE B6

REQUIRED: None

#114-29982 - RC 23

ASTM A-193, GRADE B16

NO REQUIREMENTS

#114-63000 - RC 31

C. TENSILE TEST RESULTS:

ASTM A-193, GRADE B7

	TENSILE	(.2%) YIELD		REDUCTION
SAMPLE NO.	STRENGTH	STRENGTH	ELONGATION	OF AREA
Required	125,000 PSI	105,000 TSI	16%	50%
114-43072	131,024 PSI	111,445 PSI	23.2%	59.7%
114-46394	148,979 PSI	134,693 PSI	19.8%	56.9%
114-42272	*105,156 PSI	*91,001 PSI	25.7%	65.7%
114-26565	137,904 PSI	125,834 PSI	18.7%	58.3%
114-46385	144,517 PSI	130,116 PSI	20.3%	57.9%
114-22959	*120,515 PSI	*94,239 PSI	17.5%	51.4%
114-22983	128,120 PSI	109,271 PSI	22.0%	62.5%
114-20506B	145,408 PSI	134,693 PSI	19.8%	61.0%
114-23363	138,888 PSI	113,168 PSI	16.8%	50.0%
114-33166	137,368 PSI	125,263 PSI	19.0%	58.88
114-27413	144,927 PSI	133,022 PSI	20.7%	60.5%
114-41618B	134,057 PSI	122,153 PSI	19.8%	58.5%
114-23541	*104,932 PSI	*87,569 PSI	27.0%	66.0%
		* * * * * * * * * * * * * * * * * * * *		

^{*} Does not meet Specification Requirements.

Certificate of Conformance No.

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/2% PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

Valley Forge, PA

SHIP TO Philadelphia Electric Company P.O. Box 650

ATTN: John Diletto

CUST. P.O. TS-271511-AN

P.O. Box 8699

LABORATORY TESTING INC.

2301 Market Street

Philadelphia, PA

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company

LAB REPORT NO. TC-6841.3

19101

SHIPMENT Complete INVOICE DATE 1/8/88

DESCRIPTION

4 pcs.

SOLD TO

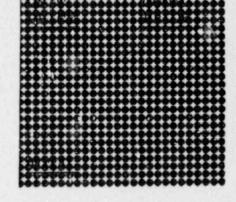
Hex Head Capscrews - SAE J429 See attached sheet for breakdown

Reference:

Charge No. 5412-0928

Metallurgy Lab Note No. 87-307

NRC Bulletin 87-02 Transaction No. 947002



- A. The above referenced Test Specimens were submitted to chemical content evaluation by Spectrochemical Analysis and (3) pieces were found to be in conformance to SAE J429, Grade 5; and (1) piece was found to be in conformance to SAE J429, Grade 8. See attached sheet for results.
- B. A Hardness test was performed on the above Test Specimens and (2) pieces were found to be in conformance to SAE J429, Grade 5; (1) piece was found NOT to be in conformance to SAE J429, Grade 5; and (1) piece was found to be in conformance to SAE J429, Grade 8. See attached sheet for results.
- C. An Axial Tensile test was performed on the above Test Specimens and (3) pieces were found to be in conformance to SAE J429, Grade 5 and (1) piece was found to be in conformance to SAE J429, Grade 8. See attached sheet for results.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM.

Lab Report No. TC-6841.2 Page 9

ASTM A-193, GRADE B6

	TENSILE	(.2%) YIELD		REDUCTION
SAMPLE NO.	STRENGTH	STRENGTH	ELONGATION	OF AREA
Required	110,000 PSI	85,000 PSI	15%	50%
114-29982	117,293 PSI	98,245 PSI	22.0%	64.5%

ASTM A-193, GRADE B16

	TENSILE	(.2%) YIELD		REDUCTION
SAMPLE NO.	STRENGTH	STRENGTH	ELONGATION	OF AREA
Required	125,000 PSI	105,000 PSI	18%	50%
114-63000	131,912 PSI	121,765 PSI	22.0%	62.1%

Lab Report No. TC-6841.3 Page 11

A breakdown of pieces received is as follows:

1	pc.	3/8" - 24 x 2" long Hex Head Capscrew, LGS-1 2-Q, Code #114-38050
1	pc.	5/8" - 18 x 2" long Hex Head Capscrew, LGS-1 7-Q, Code #114-38065
1	pc.	9/16" - 12 x 4" long Hex Head Capscrew, LGS-1 2-N, Code #194-57087
1	pc.	1" - 8 x 5" long Hex Head Capscrew, LGS-1 7-N, Code #194-57110

A. CHEMICAL ANALYSIS RESULTS:

SAE J429, GRADE 5

ELEMENT	REQUIRED	SAMPLE #114-38065	SAMPLE #194-57110	SAMPLE #114-57087
Carbon	0.28 - 7.55	0.355	0.329	0.355
Phosphorus	0.043 maximum	0.027	0.014	0.011
Sulfur	0.058 maximum	0.021	0.015	0.022

SAE J429, GRADE 8

		SAMPLE
ELEMENT	REQUIRED	#114-38050
Carbon	0.28 - 0.55	0,328
Phosphorus	0.040 maximum	0.013
Sulfur	0.045 maximum	0.014

B. HARDNESS TEST RESULTS:

SAE J429, GRADE 5

REQUIRED: RC 25 - RC 34

#114-38065 - *RC 37 / #194-57087 - RC 34 / #194-57110 - RC 31

SAE J429, GRADE 8

REQUIRED: RC 33 - RC 39

#114-38050 - RC 34

^{*} Does not meet Specification Requirements.

C. AXIAL TENSILE RESULTS:

SAE J429, GRADE 5

Sample #114-38065 tested at 30,700# minimum - 45,200# TF Sample #194-57087 tested at 21,800# minimum - 25,850# TF Sample #194-57110 tested at 72,700# minimum - 84,300# TF

SAE J429, GRADE 8

Sample #114-38050 tested at 13,200# minimum - 14,700# TF

SOLD TO

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/8 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO
Philadelphia Electric Company
P.O. Box 650
Valley Forge, PA 19482
ATTN: John Diletto

CUIDMENT

INVOICE DATE

SHIPMENT Complete

DESCRIPTION

19101

LAB REPORT NO.

TC-6841.4

2 pcs. Nuts - As

2301 Market Street

Philadelphia, PA

P.O. Box 8699

CUST. P.O.

TS-271511-AN

LABORATORY TESTING INC.

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company

Nuts - ASTM A-563

See attached sheet for breakdown

Reference: Charge No. 5412-0928

Metallurgy Lab Note No. 87-307

NRC Bulletin 87-02 Transaction No. 947002

- A. The above referenced Test Specimens were submitted to chemical content evaluation by Spectrochemical Analysis and (2) pieces were found to be in conformance to ASTM A-563, Grade B. See attached sheet for results.
- B. A Hardness test was performed on the above Test Specimens and (2) pieces were found to be in conformance to ASTM A-563, Grade B. See attached sheet for results.
- C. A Proof Load test was performed on the above Test Specimens and (2) pieces were found to be in conformance to ASTM A-563, Grade B. See attached sheet for results.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Lab Report No. TC-6841.4 Page 14

A breakdown of pieces received is as follows:

1 pc. 5/8" - 11 Nut, LGS-1 5-N, Material Code #114-25078 1 pc. 5/8" - 18 Nut, LGS-1 7-Q, Material Code #114-38125

A. CHEMICAL ANALYSIS RESULTS:

ASTM A-563, GRADE B

| SAMPLE | S

B. HARDNESS RESULTS:

ASTM A-563, GRADE B

REQUIRED: RB 69 - RC 32

Sample #114-25078 - RB 93 / Sample #114-38125 - RB 92

C. PROOF LOAD TEST RESULTS:

Sample #114-25078 tested at 20,340# - Satisfactory with no failures. Sample #114-38125 tested at 23,040# - Satisfactory with no failures.

SHIPMENT

Complete

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/9 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO Philadelphia Electric Company P.O. Box 650

Valley Forge, PA 19482 ATTN: John Diletto

2301 Market Street P.O. Box 8699 Philadelphia, PA 19101

Philadelphia Electric Company

LABORATORY TESTING INC.

P.O. Box 249 Dublin, Pennsylvania 18917

CUST. P.O. TS-271511-AN

SOLD TO

1 pc.

LAB REPORT NO. TC-687 1.5

DESCRIPTION

Hex Head Capscrew - ASTM A-307 See attached sheet for breakdown

Charge No. 5412-0928 Reference:

Metallurgy Lab Note No. 87-307

NRC Bulletin 87-02 Transaction No. 947002 1/8/88

INVOICE DATE

- referenced Test Specimen was submitted to chemical valuation by Spectrochemical Analysis and it was found to be as conformance to ASTM A-307, Grade B. See attached sheet for results.
- A Hardness test was performed on the above Test Specimen and it was found to be in conformance to ASTM A-307, Grade B. See attached sheet for results.
- C. A 10-degree Wedge Tensile test was performed on the above Test Specimen and it was found to be in conformance to ASTM A-307, Grade B. See attached sheet for results.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM.

.

Lab Report No. TC-6841.5 Page 16

A breakdown of pieces received is as follows:

1 pc. 5/8" - 11 x 3" long Hex Head Capscrew, LGS-1 5-N, Code #114-25077

A. CHEMICAL ANALYSIS RESULTS:

ASTM A-307, GRADE B

 ELEMENT
 REQUIRED
 SAMPLE #114-25077

 Phosphorus
 0.04 maximum
 0.014

 Sulfur
 0.05 maximum
 0.026

B. FARDNESS TEST RESULTS:

ASTM A-307, GRADE B

REQUIRED: RB 69 - RB 95 Sample #114-25077 - RB 94

C. WEDGE TENSILE TEST RESULTS:

ASTM A-307, GRADE B

#114-25077 tested at 13,550# minimum / 22,600# maximum - 19,000# TF

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/9 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO Philadelphia Electric Company P.O. Box 650 Valley Forge, PA

ATTN: John Diletto

CUST. P.O. TS-271511-AN

P.O. Box 8699

SOLD TO

LABORATORY TESTING INC.

2301 Market Street

Philadelphia, PA

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company

LAB REPORT NO. TC-6841.6

19101

SHIPMENT Complete INVOICE DATE 1/8/88

DESCRIPTION

1 pc.

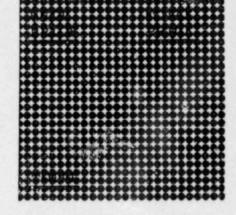
Bonnet Stud - ASTM A-564, Type 630 See attached sheet for breakdown

Reference:

Charge No. 5412-0928

Metallurgy Lab Note No. 87-307

NRC Bulletin 87-02 Transaction No. 947002



- The above referenced Test Specimen was submitted to chemical content evaluation by Spectrochemical Analysis and it was found to be in conformance to ASTM A-564, Type 630. See attached sheet for results.
- A Hardness test was performed on the above Test Specimen and it was found to be in conformance to ASTM A-564, Type 630. See attached sheet for results.
- C. A Tensile test was performed (per ASTM A-370/E-8) on the above Test Specimen in accordance with ASTM A-564, Type 630. See attached sheet for results.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

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Lab Report No. TC-6841.6 Page 18

A breakdown of pieces received is as follows:

1 pc. 5/8" x 3-5/8" long Bonnet Stud, LGS-1 10-Q, Code #114-33540

A. CHEMICAL ANALYSIS RESULTS:

ASTM A-564, TYPE 630

ELEMENT	REQUIRED	SAMPLE #114-33540
Carbon	0.07 maximum	0.032
Manganese	1.00 maximum	0.58
Phosphorus	0.040 maximum	0.023
Sulfur	0.030 maximum	0.007
Silicon	1.00 maximum	0.58
Nickel	3.00 - 5.00	4.39
Chromium	15.00 - 17.50	16.37
Copper	3.00 - 5.00	3.45
Columbium + Tantalum	0.15 - 0.45	0.259

B. HARDNESS TEST RESULTS:

ASTM A-564, TYPE 630

REQUIRED: HB 363 maximum

Sample #114-33540 - HB 342

C. TENSILE TEST RESULTS

ASTM A-564, TYPE 630

| SAMPLE #114-33540 | Tensile Strength | 137,048 PSI | 131,526 PSI | Elongation | 18.8% | Reduction of Area | 58.8%

SOLD TO

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/9 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO

Philadelphia Electric Company P.O. Box 650

1111 Old Eagle School Road Valley Forge, PA 19482

ATTN: John Diletto

SHIPMENT

INVOICE DATE 1/29/88

Complete

DESCRIPTION

Fastener Samples No. 88-327:

LABORATORY TESTING INC.

Philadelphia, PA 19101

2301 Market Street

P.O. Box 8699

CUST. P.O. TS271511-AN

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company

1 - 8 x 5" long Stud, ASTM A-193,

LAB REPORT NO.

TC-449.1

Grade B7, ID #LGS2-03E

Transaction #947005, Code #700-08595 Reference:

> Charge #401501-303 Met. Lab Note #88-327

The above referenced sample was submitted to chemical content evaluation by Spectrochemical Analysis and found to be in conformance to ASTM A-193, Grade B7. The results are as follows:

ELEMENT	REQUIRED	ACTUAL
Carbon	0.35 - 0.51	0.463
Manganese	0.61 - 1.14	0.95
Phosphorus	0.040 maximum	0.018
Sulfur	0.045 maximum	0.028
Silicon	0.13 - 0.37	0.25
Chromium	0.70 - 1.25	0.98
Molybdenum	0.13 - 0.27	0.17

A Tensile test was performed (per ASTM A-370/E-8) on the above Test Specimen and it was found NOT to be in conformance to ASTM A-193, Grade B7 per the following results:

ACTUAL REQUIRED 153,246 PSI Tensile Strength 125,000 PSI 147,206 PSI *13.2% Yield Strength (.2%) 105,000 PSI 16.0% Elongation 55.4% Reduction of Area 50.0%

*Under Minimum Requirement.

A Hardness test was performed on the above Test Specimen in accordance with ASTM A-193, Grade B7 and it was found to have a hardness of RC 31.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh

President

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM. CUSTOMER CORY.ORIGINAL

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/8 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

P.O. Box 249 Dublin, Pennsylvania 18917 SOLD TO

LABORATORY TESTING INC.

Philadelphia Electric Company 2301 Market Street P.O. Box 8699

Philadelphia, PA 19101

CUST. P.O. TS271511-AN LAB REPORT NO.

SHIP TO
Philadelphia Electric Company
P.O. Box 650
1111 Old Eagle School Road
Valley Forge, PA 19482
ATTN: John Diletto

SHIPMENT Complete

1/29/88

DESCRIPTION

Fastener Samples No. 88-327:

1 pc. 1-1/4 - 8 x 7-3/4" long Stud, ASTM A-193, Grade B-16, ID #LGS2-05E

Reference: Transaction #947005, Code #700-08595

Charge #401501-303 Met. Lab Note #88-327



A. The above referenced sample was submitted to chemical content evaluation by Spectrochemical Analysis and found to be in conformance to ASTM A-193, Grade Bl6. The results are as follows:

ELEMENT	REQUIRED	ACTUAL
Carbon	0.34 - 0.49	0.395
Manganese	0.42 - 0.73	0.63
Phosphorus	0.040 maximum	0.013
Sulfur	0.045 maximum	0.018
Silicon	0.13 - 0.37	0.34
Chromium	0.75 - 1.20	1.01
Molybdenum	0.47 - 0.68	0.58
Vanadium	0.22 - 0.38	0.265

B. A Tensile test was performed (per ASTM A-370/E-8) on the above Test Specimen and it was found NOT to be in conformance to ASTM A-193, Grade B16 per the following results:

REQUIRED	ACTUAL
125,000 PSI	139,909 PSI
105,000 PSI	119,526 PSI'
18.0%	*15.2%
50.0%	55.4%
	125,000 PSI 105,000 PSI 18.0%

*Under Minimum Requirement.

C. A Hardness test was performed on the above Test Specimen in accordance with ASTM A-193, Grade B16 and it was found to have a hardness of RC 29.

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

Fregraeuc

AUTHORIZED SIGNATURE

SOLD TO

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/8 PER MONTH AFTER 10 DAYS.

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

SHIP TO

Philadelphia Electric Company P.O. Box 650

1111 Old Eagle School Road Valley Forge, PA 19482

ATTN: John Diletto

SHIPMENT

Complete

INVOICE DATE 1/29/88

DESCRIPTION

Fastener Samples No. 88-327:

LABORATORY TESTING INC.

Philadelphia, PA 19101

2301 Market Street

P.O. 30x 8699

CUST. P.O.

TS271511-AN

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company

1/2 - 13 Nut, ASTM A-194, Grade 2H

LAB REPORT NO.

TC-449.3

ID #LGS2-27E

Reference: Transaction #947005, Code #700-08595

Charge #401501-303 Met. Lab Note #88-327



The above referenced sample was submitted to chemical content evaluation by Spectrochemical Analysis and found to be in conformance to ASTM A-194, Gride 2H. The results are as follows:

ELEMENT	REQUIRED	ACTUAL
Carbon	0.40 minimum	0.446
Phosphorus	0.040 maximum	0.022
Sulfur	0.050 maximum	0.029

- A Proof Load test at 24,830# was performed on the above Test В. Specimen and it was found to be in conformance to ASTM A-194, Grade 2H with no failures.
- C. A Hardness test was performed on the above Test Specimen and it was found to be in conformance to ASTM A-194, Grade 2H per the following results:

REQUIRED: RC 24 - RC 38 ACTUAL: RC 32

MERCURY CONTAMINATION - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh

Prasident

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM

TERMS: NET CASH - 10 DAYS

SERVICE CHARGE OF 11/% PER MONTH AFTER 10 DAYS.

Philadelphia Electric Company

1111 Old Eagle School Road

Valley Forge, PA 19482

SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

LABORATORY TESTING INC.

P.O. Box 249 Dublin, Pennsylvania 18917

Philadelphia Electric Company 2301 Market Street P.O. Box 8699 Philadelphia, PA 19101

CUST. P.O. TS271511-AN TC-449.4

LAB REPORT NO.

SHIPMENT Complete

SHIP TO

P.O. Box 650

ATTN: John Diletto INVOICE DATE 1/28/88

DESCRIPTION

Fastener Samples No. 88-327: 5/8 - 11 Nut, ASTM A-194, Grade 8 1 pc. ID #LGS2-40E

Transaction #947005, Code #700-08595 Reference:

Charge #401501-303 Met. Lab Note #88-327



The above referenced sample was submitted to chemical content evaluation by Spectrochemical Analysis and Wet Chemistry and found NOT to be in conformance to ASTM A-194, Grade 8. The results are as follows:

ELEMENT	REQUIRED	ACTUAL
Carbon	0.08 maximum	0.020
Manganese	2.00 maximum	0.82
Phosphorus	0.045 maximum	0.030
Sulfur	0.030 maximum	0.007
Silicon	1.00 maximum	0.34
Chromium	18.00 - 20.00	*17.53
Nickel	8.00 - 10.50	9.18

*Under Minimum Requirement.

Material is within the range of a FOR CUSTOMER INFORMATION ONLY: 304 Copper Grade.

A Hardness test was performed on the above Test Specimen and it was found to be in conformance to ASTM A-194, Grade 8 per the following results:

REQUIRED: RB 60 - RB 105 ACTUAL: RB 103

MERCURY CONTAMINATION . During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Robert W. McVaugh President

AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM

: 188-327

To: J. DILETTO
Fram: J. BRIGHTMAN

DATE: 12/28/87

SUBJECT. LIMERICE GENERATING STATION, UNIT Z

CONSTRUCTION DIVISION!

NRC COMPLIANCE BUZLETIN NO. 87-02

FASTMEN TESTING TO DETERMINE CONFERMANCE

WITH APPLICABLE MATERIAL SPECIFICATIONS.

PLBASE INITIATE THE TESTING IN ACCORDANCE WITH THE BULLETIN 87-02. BACH SAMPLE IS SEPRENTELY TAGGED WITH A UNLIVE NUMBER. RETURN TEST SAMPLES AND RESULTS TO LGS-2, JEFF BRUGHTMAN (X2841). CHARGE TO 401501-303.

J. A/ 3/2

Al93 Grade B7, Code #114-23541, non-A stud (Pacific Valve bolted bonnet valve application). Measured tensile strength of 104,932 psi vs. a required tensile strength of 125,000 psi (yield strength measurement are also below the specified requirements).

A193 Grade B7, Code #114-42272, Q stud (Velan Valve bolted bonnet valve application). Measured tensile strength of 105,156 psi vs. a required tensile strength of 125,000 psi (yield measurements are also below the specified requirements).

4) A194 Grade 8M, Code #114-33541, Q nut (Velan Valve bolted bonnet valve application). Measured sulfur content 0.041 vs. a maximum permissible sulfur content of 0.030.

5) SAE J429 Grade 5, Code #114-38065, Q cap screw (Colt Industried Diesel Generator applications). Measured hardness RC 37 vs. a permissible range of RC 25 - RC 34.

Of the 48 Limerick Unit 2 samples 6 did not meet their specified requirements. (Note: an additional 9 samples were retested due to failure of the Baldwin Tensile Testing machine).

- 1) SA 193 Grade B7, ID #LGS2-03, Q stud (Safety related piping application). Measured % elongation of 14% vs. a minimum permissible elongation of 16%.
- SA 193 Grade Bl6, ID #LGS2-05, Q stud (Safety related piping application). Measured % elongation of 16% vs. a minimum permissible elongation of 18%.
- 3) Al94 Grade 2H, ID #LGS2-27, non-Q nut (general plant applications). Measured hardness of 215 HB vx. a minimum permissible hardness of 248 HB.

NRC COMPLIANCE BULLETIN 87-02 RESPONSE APPENDIX E

- 4) Al94 Grade 8, ID #LGS-40, non-Q nut (general plant applications). Measured Chromium content of 17.24% vs. a minimum permissible Chromium content of 18%.
- 5) A574, ID #LGS2-41, non-Q cap screw (general plant application). Measured hardness of 38 HRC below permissible range.
- 6) SA-194 Grade 2H, ID #LGS2-04, A nut (Safety related piping applications). Measured Carbon content of 0.38 vs. a minimum permissible Carbon content of 0.4.

Discussion

Fasteners and/or nuts are routinely considered bulk items when purchased for Limerick Generating Station applications. As bulk commodities, the manufacturer's confirmation of chemical, mechanical, hardness characteristics, and physical properties, is performed on a sampling basis. Variables in acceptable raw material chemical composition, and variations in the manufacturing process allowed by the specific material grades and types results in deviations in the final product which may not conform to the specifications. The sampling requirements in bolting material specification allow a margin or likelihood of fasteners being out-of-specification. Therefore, products may meet all fabrication and quality control aspects of production and still not conform to final specification characteristics.

A specific evaluation was performed for each of the out of specification conditions observed on Limerick fasteners and nuts. Anomalies on safety related samples were documented on Non-conformance Reports (NR). These NR's are in the process of being dispositioned according to the following evaluations. Anomalies on non safety related samples were evaluated for restricted use, and verbal authorization was given to the station regarding the acceptability of the non-Q samples. Specific evaluation of each out-of-specification condition follow:

Evaluation

- Limerick Unit 1
- 1) A193 Grade B7, Code \$114-22959, Q stud for use in Anchor Darling bolted bonnet valve applications.

The chemical analysis indicated a higher than prescribed Silicon content. This has no effect on tensile strength and yield strength, or the specific application of these

studs on a valve body to bonnet, the ASME Code derives acceptable bolting stresses based on a percentage of the ultimate tensile strength of the material. The measured tensile strength of 120,515 assures the capability of the bolts to conform to the design requirements imposed by the ASME Code for bolted bonnet valves. Therefore, the test results assure the capability of the stud to accommodate the mechanical requirements of the intended application.

2&3) Al93 Grade B7, Code #'s 114-23541 and 42272, non-Q and Q studs applicable for use on bolted bonnet valve applications.

The tensile strength and yield strength test results indicate mechanical strengths below that required by material properties. For the specific application of these studs on a valve body to bonnet, the ASME Code derives acceptable bolting stresses based on a percentage of the ultimate tensile strength of the material. The measured tensile strengths of 104,932 psi and 105,156 psi assure the capability of the bolts to conform to the design requirements imposed by ASME (and also ANSI for non-A valves). Therefore, the test results assure the capability of the studs to accommodate the mechanical requirements of the intended application.

4) A194 Grade 8M, Code #114-33541, A nut for use on bolted bonnet valve applications.

The chemical analysis indicates a higher than prescribed sulfur content. Acceptable hardness and tensile test results confirm the adequacy of the nut to accommodate the mechanical requirements of Al94 Grade 8M nuts for A valve body to bonnet applications. Therefore, the sulfer content of the sample which is slightly higher than the maximum required does not prevent the nut from performing satisfactorily in its intended application.

5) SAE J429, Code #11438065, Q cap screw for use on the Emergency Diesel Generators.

The hardness test describing a higher than prescribed hardness indicates an increased tensile strength and lower toughness. Acceptable tensile tests confirm the mechanical strength of the cap screw. Additionally, the cap screws would not be subjected to loads which would be a concern for low toughness. Therefore, the adequacy of the cap screw to accommodate the mechanical requirements of SAE J429 is confirmed.

- Limerick Unit 2
- 1&2) SA 193 Grade B7 and B16, ID #'s LGS2-03 and LGS2-05, Q studs for safety related piping applications.

The measured elongation was below the minimum prescribed values by a small margin. This has no effect on bolt performance. Therefore, the adequacy of the studs to accommodate the mechanical requirements of SA103 Grades B7 and B16 is confirmed.

3) A194 Grade 2H, ID #LGS2-27, non-Q for general non-safety related plant applications.

The hardness test indicated a lower than prescribed hardness. Acceptable proof load tests confirm the mechanical strength of the nut. Therefore, the adequacy of the nut to accommodate the requirements of A194, Grade 2H for general non-safety related plant applications is confirmed.

4) Al94 Grade 8, ID #LGS2-40, non-Q nut for general nonsafety related plant applications.

The chemical analysis describing lower than prescribed chromium content may result in decreased corrosion resistance in strong acids. Acceptable hardness and proof load test results confirm the adequacy of the nut to accommodate the requirements of A194 Grade 8 nuts for general non-safety related plant applications. In typical applications, nuts are not subjected to corrosive process fluids. Therefore, the low Chromium content does not prevent the nut from satisfactory performance in general non-Q applications.

5) A574, ID #LGS2-41, non-Q cap screw for use in general non-safety related plant applications.

The hardness test indicated an average of 39 HRC against 38 HRC maximum required. This may be regarded as acceptable because it is within a probable error of +/-1 HRC. Additionally, Tensile strength and yield strength measurement confirm the mechanical strength of the cap screw. Therefore, the adequacy of the cap screw to accommodate the mechanical requirements of A574 cap screws for general non-safety related plant applications is confirmed.

SA194 Grade 2H, ID #LGS2-04, Q nut for safety related piping applications. The chemical analysis describing a lower than prescribed Carbon content may indicate decreased strength. A carbon content of 0.38% in a product analysis is deemed acceptable for a 0.40% requirement. The difference of 0.02% is within the product analysis tolerance. Due to failure of the Tensile Test machine during the proof load test, the mechanical strength of this particular nut is indeterminable. However, test sample LGS2-04D was selected for testing due to the indeterminate test results of LGS2-04 and was found to be within specifications for all measured characteristics.

16 . 1 . 1