



CHARLES CENTER • P. O. BOX 1475 • BALTIMORE, MARYLAND 21203

JOSEPH A. TIERNAN
VICE PRESIDENT
NUCLEAR ENERGY

January 29, 1988

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Fastener Testing

REFERENCE: (a) NRC Compliance Bulletin No. 87-02: Fastener Testing to Determine
Conformance with Applicable Material Specifications

Gentlemen:

The attachments that follow provide the information you requested from us in NRC Compliance Bulletin No. 87-02 (Reference a).

Attachment (1) provides the supporting information for each tested fastener in the format you gave us in Attachment 1 of the bulletin. We added a few fields such as, "Mech. No." and "Purchase Order No." to aid us in tracking the fasteners.

Attachment (2) contains the test results in several tables that are comparable to the format you gave us in Attachment 2 of the bulletin. Table No. 5 of Attachment (2) lists properties found out-of-specification along with an evaluation of the safety significance.

Attachment (3) describes our receipt inspection practices and our internal controls for fasteners.

8802100109 880129
PDR ADOCK 05000317
Q PDR

IE11
11

We hope the information we provide will aid you in your investigation. If we can provide you with additional information on fasteners used at Calvert Cliffs, do not hesitate to contact us.

Very truly yours,

JATiernan

STATE OF MARYLAND :
: TO WIT:
COUNTY OF CALVERT :

I hereby certify that on the 29th day of January, 1988, before me, the subscriber, a Notary Public of the State of Maryland in and for County of Calvert, personally appeared Joseph A. Tiernan, being duly sworn, and states that he is Vice President of the Baltimore Gas and Electric Company, a corporation of the State of Maryland; that he provides the foregoing response for the purposes therein set forth; that the statements made are true and correct to the best of his knowledge, information, and belief; and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal:

Donna L. McCready
Notary Public

My Commission Expires:

July 1, 1990
Date

JAT/WPM/dlm

Attachments

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
R. A. Capra, NRC
S. A. McNeil, NRC
W. T. Russell, NRC
D. C. Trimble, NRC

ATTACHMENT (1)

FASTENER TESTING DATA SHEETS

NOTE: Explanation of classification system used for "Class/Procurement Level" in data sheets that follow:

BG&C Spec. XXX, Part 21 Applies - Purchase controlled by a specification package that invoked the requirements of 10 CFR 21 on suppliers.

Commercial Quality (Safety Related) - Method of purchase used when a commercial quality item is adequate for a particular safety-related purpose and has the necessary safety-related characteristics. Special requirements are not specified and a formal QA Program is not required.

Commercial Quality - Same as above, but for non-safety related purchases.

Catalog Purchase - Method of purchase that may be used to obtain mass-produced safety-related items that can be selected from a sales catalog, bill of materials, drawing, etc.

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-A(F)

Mech No.: 75-P32

SRI Tag No.: 495980-E

Fastener Description: Rod, Ail Thread, 1-3/8" x 6 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #3, 31N36A2

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



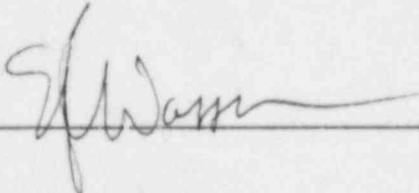
Class/Procurement Level: BG&E Spec. 546 Rev. 0 Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Ave., Anaheim CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/21/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-A(N)

Mech No.: 75-P13

SRI Tag No.: 490253-E

Fastener Description: Nut, 1-3/8" x 6 TPI

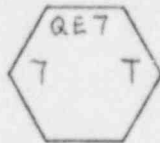
Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #2, 21D056C

Material Specification as Documented by Licensee Records: SA 194 Gr 2H

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature

A handwritten signature in cursive script, appearing to read 'J. W. ...', written over a horizontal line.

Date

1/22/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-B(F)

Mech No.: 75-P33

SRI Tag No.: 495970-E

Fastener Description: Rod, All Thread, 1-1/2" x 6 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #3, 31N34A1

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



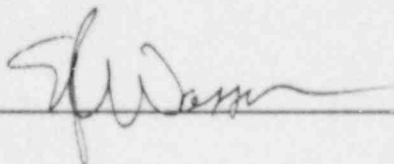
Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-B(N)

Mech No.: 75-P14

SRI Tag No.: 495874-E

Fastener Description: Nut, 1-1/2" x 6 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #2, 21DO44B

Material Specification as Documented by Licensee Records: SA 194 Gr 2H

Head Marking:



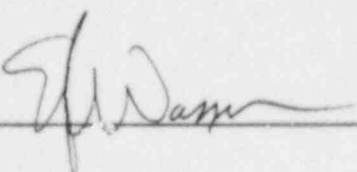
Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. La Brea Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/2/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-C(F)

Mech No.: 75-P26

SRI Tag No.: 476391-E

Fastener Description: Rod, All Thread, 3/4" x 10 TPI x 6' long

Purchase Order No. 03133 GX

Date: 08-18-87

Description of Sample Stock Location: Warehouse #3, 31N36H1

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



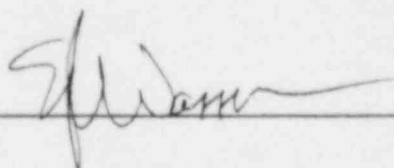
Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-C(N)

Mech No.: 75-P16

SRI Tag No.: 479701-B (typical)

Fastener Description: Nut, Heavy Hex, 3/4" x 10 TPI

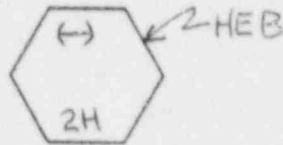
Purchase Order No. 07225 GX

Date: 11-13-87

Description of Sample Stock Location: Warehouse #2, 21D055H

Material Specification as Documented by Licensee Records: SA 194 Gr 2H

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature

A handwritten signature in cursive script, appearing to read "E. J. [unclear]".

Date

A handwritten date "1/22/88" written in cursive script.

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-D(F)

Mech No.: 75-P27

SRI Tag No.: 495925-E

Fastener Description: Rod, All Thread, 7/8" x 9 TPI x 6' long

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #3, 31N36F2

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



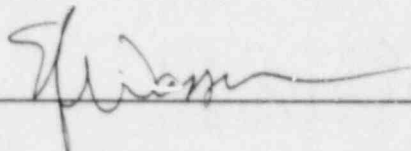
Class/Procurement Level: BG&E Spec. 546 Rcv. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/21/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-D(N)

Mech No.: 75-P08

SRI Tag No.: 495887-E

Fastener Description: Nut, 7/8" x 9 TPI

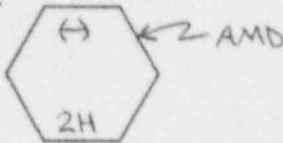
Purchase Order No. 00370 GX

Date: 05-21-87

Description of Sample Stock Location: Warehouse #2, 21D057B

Material Specification as Documented by Licensee Records: SA 194 Gr 2H

Head Marking:



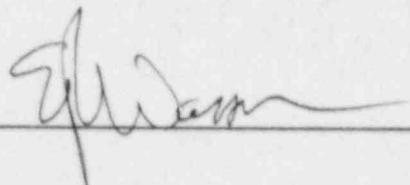
Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-E(F)

Mech No.: 75-P28

SRI Tag No.: 495933-E

Fastener Description: Rod, All Thread, 1" x 8 TPI x 6' long

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #3, 31N36G1

Material Specification as Documented by Licensee Records: ASME SA 193 Gr B7

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 1. Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature

Date

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-E(N)

Mech No.: 75-P09

SRI Tag No.: 495042-E

Fastener Description: Nut, 1" x 8 TPI

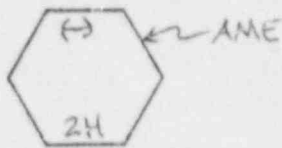
Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #2, 21D056C

Material Specification as Documented by Licensee Records: SA 194 Gr 2H

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/24/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CKNPP-F(F)

Mech No.: 75-P29

SRI Tag No.: 495814-E

Fastener Description: Rod, All Thread, 1-1/8" x 7 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #3, 31N36D1

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature

A handwritten signature in dark ink, appearing to be 'Ed Warr', written over a horizontal line.

Date

1/22/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-F(N)

Mech No.: 75-P10

SRI Tag No.: 495887-E

Fastener Description: Nut, 1-1/8" x 7 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #2, 21D052C

Material Specification as Documented by Licensee Records: SA 194 Gr 7

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (1)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-G(F)

Mech No.: 75-P30

SRI Tag No.: 481141-E

Fastener Description: Rod, All Thread, 1-1/4" x 7 TPI

Purchase Order No. 07225 GX

Date: 11-13-87

Description of Sample Stock Location: Warehouse #3, 31N36C1

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/2/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-G(N)

Mech No.: 75-P11

SRI Tag No.: 500282-E

Fastener Description: Nut, Heavy Hex, 1-1/4" x 7 TPI

Purchase Order No. 07225 EX

Date: 11-13-87

Description of Sample Stock Location: Warehouse #2, 21DO55H

Material Specification as Documented by Licensee Records: SA 194 Gr 2H

Head Marking:



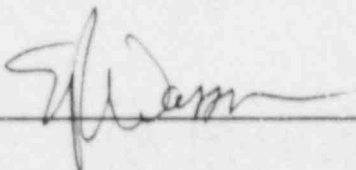
Class/Procurement Level: BG&E Spec. 546 Rev. 1, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-H(F)

Mech No.: 75-P31

SRI Tag No.: 495841-E

Fastener Description: Rod, All Thread, 1-1/4" x 8 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #3, 31N34C2

Material Specification as Documented by Licensee Records: SA 193 Gr B7

Head Marking:



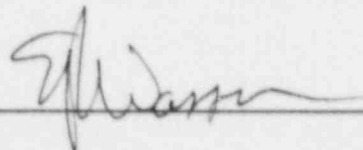
Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature 

Date 1/2/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-H(N)

Mech No.: 75-P12

SRI Tag No.: 491428-E

Fastener Description: Nut, 1-1/4" x 8 TPI

Purchase Order No. 97894 GX

Date: 05-05-87

Description of Sample Stock Location: Warehouse #2, 21D054F

Material Specification as Documented by Licensee Records: SA 194 Gr 7

Head Marking:



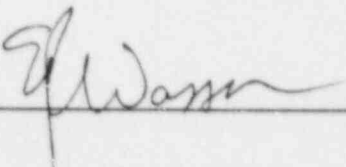
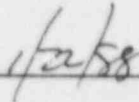
Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: General Plant Use

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ANSI N45.2, ASME Section III

Licensee Representative:

Signature  Date 

ATTACHMENT (1)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-I(F)

Mech No.: 90-509

SRI Tag No.: 0299-A

Fastener Description: Stud, 3/4" x 6' long, Atlas Job No. 1747

Purchase Order No. 68172D

Date: 09-29-72

Description of Sample Stock Location: Warehouse #2, 21G050E

Material Specification as Documented by Licensee Records: SA 193 Gr B6, Type 410

Head Marking:



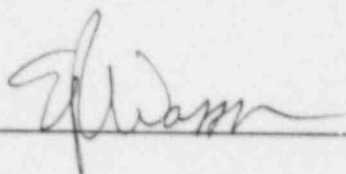
Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: Tube Sheet to Flange for Spent Fuel Pool Heat Exchangers

Vendor: Atlas Industrial Manufacturing Company, 81 Somerset Place, Clifton, NJ 97012

QA Requirements Imposed on Vendor: Nuclear Certification required CMTR from Hackensack Bolt and Nut Company in file

Licensee Representative:

Signature  Date 1/2/58

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-I(N)

Mech No.: 90-509

SRI Tag No.: 0299-A

Fastener Description: Nut, Hex, 3/4", Atlas Job No. 1747

Purchase Order No. 68172D

Date: 09-29-72

Description of Sample Stock Location: Warehouse #2, 21G050E

Material Specification as Documented by Licensee Records: SA 194 Gr 6F, Type 416

Head Marking:



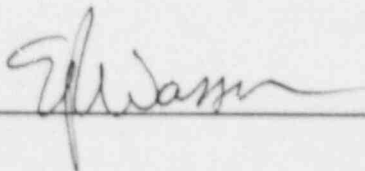
Class/Procurement Level: BG&E Spec. 546 Rev. 0, Part 21 Applies

General Plant Application: Tube Sheet to Flange for Spent Fuel Pool Heat Exchangers

Vendor: Atlas Industrial Manufacturing Company, 81 Somerset Place, Clifton, NJ 97012

QA Requirements Imposed on Vendor: Nuclear Certification required CMTR from Hackensack Bolt and Nut Company in file

Licensee Representative:

Signature 

Date 1/22/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-J(F)

Mech No.: 59-X51

SRI Tag No.: 486626-E

Fastener Description: Capscrew, Hex Head, 1-1/2" x 8 TPI x 11" long

Purchase Order No. 93117 MX

Date: 12-22-86

Description of Sample Stock Location: Warehouse #2, 21E047B

Material Specification as Documented by Licensee Records: SA 540 Grade B23, Class 4

Head Marking:



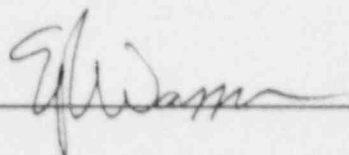
Class/Procurement Level: BG&E Spec. 444 Rev. 0, Part 21 Applies

General Plant Application: RCP Vapor Seal, Seal Flange Bolting

Vendor: A&G Engineering Co., 4640 E. LaPalma Avenue, Anaheim, CA 92807

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B, ASME Section III

Licensee Representative:

Signature  Date 1/2/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-K(F)

Mech No.: 72-297

SRI Tag No.: 380854-E (typical)

Fastener Description: Rod, All Thread, 3/4" x 10 TPI

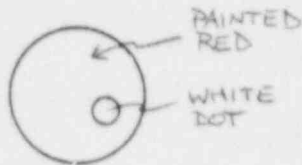
Purchase Order No. 80336 GX

Date: 02-06-86

Description of Sample Stock Location: Warehouse #3, 31P0346

Material Specification as Documented by Licensee Records: A 193 Gr B7

Head Marking:



Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Delso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature

Date

1/24/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-K(N)

Mech No.: 78-397

SRI Tag No.: 412914-E (typical)

Fastener Description: Nut, Hex, 3/4" x 10 TPI, Plated Finish, Heavy Series

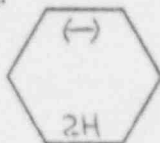
Purchase Order No. 74864GX

Date: 10-14-85

Description of Sample Stock Location: Warehouse #2, 24F083D

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

Head Marking:



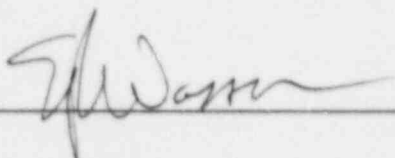
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: Kenneth G. Lilly Fasteners, P. O. Box 6005, Newark, DE 19711

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/2/88

ATTACHMENT (1)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-L(F)

Mech No.: 59-X05

SRI Tag No.: 485100-E

Fastener Description: Bolt, 7/8" x 9 TPI x 3"

Purchase Order No. 80255 GX

Date: 03-04-86

Description of Sample Stock Location: Warehouse #2, 21G061A

Material Specification as Documented by Licensee Records: A 193 Gr B7

Head Marking:



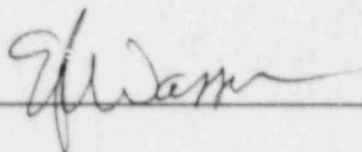
Class/Procurement Level: Commerical Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: Mil-Spec Fasteners, Route 30, Box 59A, Hampstead, MD 21074

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/24/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-L(N)

Mech No.: 78-398

SRI Tag No.: 412915-E (typical)

Fastener Description: Nut, Hex, 7/8" x 9 TPI, Plated Finish, Heavy Series

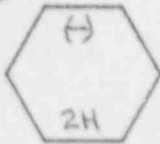
Purchase Order No. 74864 GX

Date: 10-14-85

Description of Sample Stock Location: Warehouse #2, 21G024B

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

Head Marking:



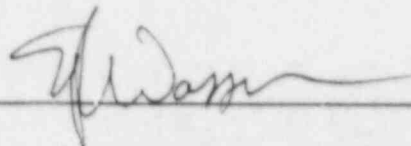
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: Kenneth G. Lilly Fasteners, P. O. Box 6005, Newark, DE 19711

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-M(F)

Mech No.: 59-X06

SRI Tag No.: 488557-E

Fastener Description: Bolt, Heavy Hex Head, 1" x 8 TPI x 4-1/2" long, Plated Finish

Purchase Order No. 94194 GX

Date: 01-19-87

Description of Sample Stock Location: Warehouse #2, 21G066A

Material Specification as Documented by Licensee Records: A 193 Gr B7

Head Marking:



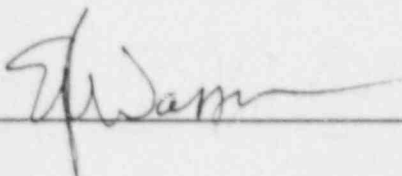
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/21/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-M(N)

Mech No.: 72-334

SRI Tag No.: 412910-E (typical)

Fastener Description: Nut, Hex, 1" x 8 TPI, Plated Finish

Purchase Order No. 74864 GX

Date: 10-14-85

Description of Sample Stock Location: Warehouse #2, 21D049D

Material Specification as Documented by Licensee Records: A 563 Gr A

Head Marking: None

Class/Procurement Level: Commercial Quality (Safety Related)

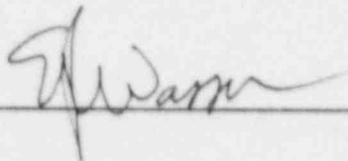
General Plant Application: General Plant Use

Vendor: Kenneth G. Lilly Fasteners, P. O. Box 6005, Newark, DE 19711

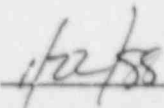
QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature



Date



ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-N(F)

Mech No.: 72-298

SRI Tag No.: 470621-E

Fastener Description: Rod, All Thread, 7/8" x 9 TPI

Purchase Order No. 01750 GX

Date: 06-25-87

Description of Sample Stock Location: Warehouse #3, 31P034F

Material Specification as Documented by Licensee Records: A 193 Gr B7

Head Marking: None

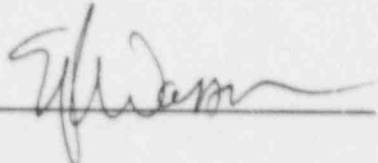
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-N(N)

Mech No.: 72-333

SRI Tag No.: N/A

Fastener Description: Nut, Hex, 7/8" x 9 TPI, Plated Finish

Purchase Order No. 95481 GX

Date: 03-06-87

Description of Sample Stock Location: Warehouse #2, 21H026D

Material Specification as Documented by Licensee Records: A 563 Gr A

Head Marking: None

Class/Procurement Level: Commercial Quality (Safety Related)

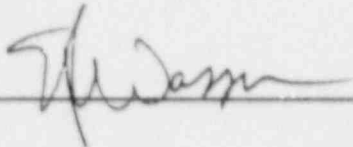
General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature



Date

1/22/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-O(F)

Mech No.: 75-E42

SRI Tag No.: 429918-E

Fastener Description: Stud, Casing, 7/8" x 9 TPI x 3-1/4", Terry P/N 13477

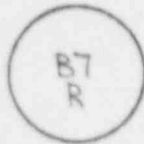
Purchase Order No. 77246 MX

Date: 11-20-85

Description of Sample Stock Location: Warehouse #2, 21E038H

Material Specification as Documented by Licensee Records: A 193 Gr B7

Head Marking:



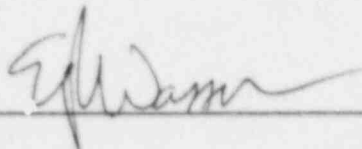
Class/Procurement Level: Catalog Purchase (Safety Related)

General Plant Application: Auxiliary Feedwater Pumps

Vendor: Terry Turbine Corporation, Lamberton, Road, P. O. Box 555, Windsor, CT 06095

QA Requirements Imposed on Vendor: 10 CFR 50 Appendix B

Licensee Representative:

Signature  Date 1/2/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CKNPP-Q(N)

Mech No.: 78-398

SRI Tag No.: 412915-E (typical)

Fastener Description: Nut, Hex, 7/8" x 9 TPI, Plated Finish, Heavy Series

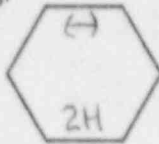
Purchase Order No. 74864 GX

Date: 10-14-85

Description of Sample Stock Location: Warehouse #2, 21G024B

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

Head Marking:



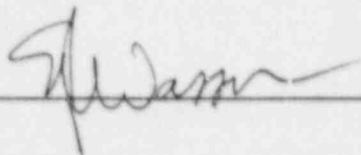
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: Kenneth G. Lilly Fasteners, P. O. Box 6005, Newark, DE 19711

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-P(F)

Mech No.: 72-120

SRI Tag No.: 439731-E (typical)

Fastener Description: Capscrew, Hex, 5/8" x 18 TPI x 2-1/2" long, Plated Finish

Purchase Order No. 81904 GX

Date: 04-11-86

Description of Sample Stock Location: Warehouse #2, 21D050A

Material Specification as Documented by Licensee Records: S.A.E. Grade 5, High Carbon Steel, Heat Treated

Head Marking:



Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: Kenneth G. Lilly Fasteners, P. O. Box 6005, Newark, DE 19711

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature

A handwritten signature in dark ink, appearing to be 'J. W. ...', written over a horizontal line.

Date

A handwritten date '1/22/88' in dark ink, written over a horizontal line.

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-P(N)

Mech No.: 78-F65

SRI Tag No.: 427200-E

Fastener Description: Nut, Hex, 5/8" x 18 TPI, Plated Finished, Double Chamfer

Purchase Order No. 80255 GX

Date: 03-04-86

Description of Sample Stock Location: Warehouse #2, 21D061G

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

Head Marking:



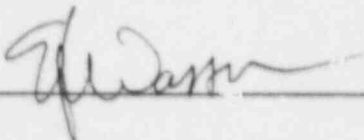
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: Mil-Spec Fasteners, Rt. 30, Box 59A, Hampstead, MD 21074

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)
FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-Q(F)

Mech No.: 75-E59

SRI Tag No.: 421428-E

Fastener Description: Bolt, Hex Head, 1-1/4" x 7 UNC x 9" long

Purchase Order No. 67871 GX

Date: 05-03-85

Description of Sample Stock Location: Warehouse #2, 21D063B

Material Specification as Documented by Licensee Records: A 325, Type 1

Head Marking:



Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: Reactor Coolant Pump Motor Hold Down

Vendor: A&A Bolt and Screw, 9800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature 

Date 1/22/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-Q(N)

Mech No.: 78-401

SRI Tag No.: 473520-E (typical)

Fastener Description: Nut, Hex, 1-1/4" x 7 TPI, Plated Finish, Heavy Series

Purchase Order No. 93724 GX

Date: 01-28-87

Description of Sample Stock Location: Warehouse #2, 24F081D

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

Head Marking:



Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, Md 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-R(F)

Mech No.: 80-178

SRI Tag No.: N/A

Fastener Description: Bolt, Heavy Hex Head, 1-1/2" x 6 TPI x 8", Heat Treated,
Semi-Finished

Purchase Order No. 97876 GX

Date: 04-21-87

Description of Sample Stock Location: Warehouse #3, 34U073A

Material Specification as Documented by Licensee Records: A 325, Type 3, Weathering Steel

Head Marking:



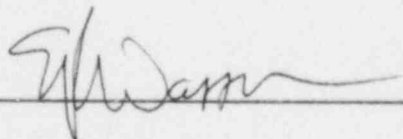
Class/Procurement Level: Non Safety Related

General Plant Application: Sea Wall Baffles

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 4/22/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-R(N)

Mech No.: 80-177

SRI Tag No.: N/A

Fastener Description: Nut, Heavy Hex, 1-1/2" x 6 TPI, Single Chamfer with Washer Face

Purchase Order No. N/A

Date: N/A

Description of Sample Stock Location: Warehouse #3, 34U073A

Material Specification as Documented by Licensee Records: A 325, Type 3

Head Marking:



Class/Procurement Level: Non-Safety Related

General Plant Application: Sea Wall Baffles

Vendor: N/A

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-S(F)

Mech No.: 59-980

SRI Tag No.: 289077-E

Fastener Description: Bolt, 1" x 4-3/4"

Purchase Order No. 24426 GX

Date: 07-28-82

Description of Sample Stock Location: Warehouse #2, 22J025E

Material Specification as Documented by Licensee Records: A 490

Head Marking:



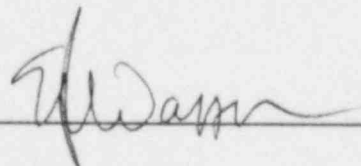
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: Unit 2 Neutron Shield Platform

Vendor: C. S. Metals Service, Inc.

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-S(N)

Mech No.: 59-980

SRI Tag No.: 289077-E

Fastener Description: Nut, Heavy Hex, 1"

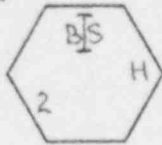
Purchase Order No. 24426 GX

Date: 07-28-82

Description of Sample Stock Location: Warehouse #2, 22J025E

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

Head Marking:



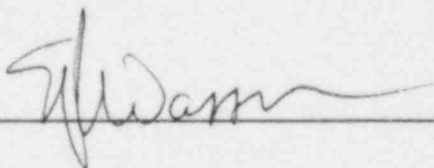
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: Unit 2 Neutron Shield Platform

Vendor: C. S. Metals Service, Inc.

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/22/88

ATTACHMENT (1)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-T(F)

Mech No.: 78-A31

SRI Tag No.: 470622-E (typical)

Fastener Description: Capscrew, Hex Head, 1-1/4" x 7 TPI x 4" long, Plated Finish

Purchase Order No. 01750 GX

Date: 06-25-87

Description of Sample Stock Location: Warehouse #2, 21D040C

Material Specification as Documented by Licensee Records: A 307 Gr B

Head Marking:



Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature

A handwritten signature in black ink, appearing to read 'J. W. Wam', written over a horizontal line.

Date

A handwritten date '1/22/88' in black ink, written over a horizontal line.

ATTACHMENT (I)

FASTENER TESTING DATA SHEET

Sample ID No. CCNPP-T(N)

Mech No.: 78-401

SRI Tag No.: 473520-E (typical)

Fastener Description: Nut, Hex, 1-1/4" x 7 TPI, Plated Finish, Heavy Series

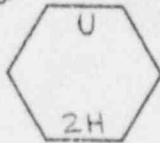
Purchase Order No. 93724 GX

Date: 01-28-87

Description of Sample Stock Location: Warehouse #2, 24F081D

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

Head Marking:



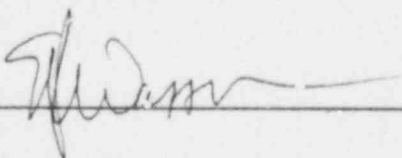
Class/Procurement Level: Commercial Quality (Safety Related)

General Plant Application: General Plant Use

Vendor: A&A Bolt and Screw, 8800 Kelso Drive, Baltimore, MD 21221

QA Requirements Imposed on Vendor: Commercial Item

Licensee Representative:

Signature  Date 1/28/88

ATTACHMENT (2)

DATA SUMMARY

TABLE NO. 1: Specification Requirements for all Fasteners Tested

TABLE NO. 2: Chemical Analysis Data for Safety Related Fasteners (Fastener Items A to J)

TABLE NO. 3: Mechanical Property Data for Safety Related Fasteners

TABLE NO. 4: Chemistry and Hardness Data for Non-Safety Related Parts (Items K to T)

TABLE NO. 5: Specification Deviations

TABLE NO. 1: SPECIFICATION REQUIREMENTS FOR FASTENERS TESTED

Spec.	Elemental Weight Percent									UTS/YS (KSi)	% Elong.	Hard- ness	Parts
	C	Mn	P (Max)	S (Max)	Si	Cr	Mo	Ni	Cu				
Al93 Grade B7	0.35- 0.51	0.61- 1.14	0.045	0.045	0.13- 0.37	0.70- 1.25	0.13- 0.27	-	-	125 105	16	24 HRC Min (1)	A,B,C,D,E, F,G,H,K,L, M,N,O(F)
Al94 Grade 7	0.35- 0.51	0.61 1.14	0.045	0.045	0.13 0.37	0.70 1.25	0.13 0.27	-	-	-	-	24-38 HRC	A,B,F,G,H(N)
Al94 Grade 2H	0.37 min	-	0.048	0.058	-	-	-	-	-	-	-	24-38 HRC	C,D,E,K,L, O,P,Q,S,T(N)
Al93 Grade B6	0.14 max	1.21 max	0.07	0.140 min	1.05 max	11.85 14.15	-	-	-	110 85	15	-	I(F) (2)
Al94 Grade B6	0.14 max	1.21 max	0.07	0.140 min.	1.05 max	11.85 14.15	-	-	-	-	-	24-38 HRC	I(N) (2)
A540 Grade B23 Class IV	0.35- 0.46	0.56- 0.99	0.03	0.03	0.13- 0.37	0.60- 1.0	0.18- 0.32	1.5 2.05	-	135 120	13	25-34 HRC	J(F)
A563 Grade A	0.58 max	-	0.13	-	-	-	-	-	-	-	-	32 HRC max	M,N(N)
A325 Type 1	0.27 min	0.47 min	0.048	0.058	-	-	-	-	-	-	-	24-35 HRC	Q(F)
SAE J429 Grade 5	0.28- 0.55	-	0.048	0.058	-	-	-	-	-	-	-	25-34 HRC	P(F)
A563 Grade C3 Class N	-	-	0.07 0.155	0.055	0.15 0.75	0.25 1.3	-	1.03 max	0.22 0.58	-	-	78HRB 38HRC	R(N)
A325 Type 3 Class A	0.31 0.42	0.86 1.24	0.045	0.055	0.13 0.37	0.42 0.68	-	0.22 0.48	0.22 0.48	-	-	19-31 HRC	R(F)
A490 Type 1	0.28 0.50	- -	0.045	0.045	-	-	-	-	-	-	-	33-38 HRC	S(F)
A307 Grade B	-	-	0.04	0.05	-	-	-	-	-	-	-	69-95 HRB	T(F)

Note: (1) Specification has an ultimate tensile strength requirement of 125 Ksi but no hardness requirements. BG&E assigned the above requirements based on Hardness/UTS correlations for hardenable alloy steels in the 8th edition Metals Handbook Volume No. 1 and hardness requirements for Al94 Grade 7 nuts which have the same Chemistry and heat treatment requirements.

(2) 1969 ASTM Specification; All other specifications are from 1983 ASME Section II or ASTM.

TABLE NO. 2: CHEMICAL ANALYSIS DATA FOR SAFETY RELATED PARTS

Part ID	Elemental Weight Percent							
	C	Mn	P	S	Si	Cr	Mo	Ni
A (N)	0.425	0.807	0.012	0.024	0.195	0.985	0.16	NA
A (F)	0.408	0.845	0.025	0.030	0.185	0.946	0.21	NA
B (N)	0.385	0.901	0.012	0.020	0.225	1.039	0.16	NA
B (F)	0.377	0.799	0.025	0.020	0.231	0.973	0.18	NA
C (N)	0.407	NA	0.014	0.021	NA	NA	NA	NA
C (F)	0.388	0.775	0.025	0.018	0.183	1.007	0.20	NA
D (N)	0.443	NA	0.026	0.014	NA	NA	NA	NA
D (F)	0.389	0.781	0.025	0.024	0.215	1.023	0.21	NA
E (N)	0.430	NA	0.022	0.019	NA	NA	NA	NA
E (F)	0.404	0.819	0.015	0.012	0.193	1.034	0.21	NA
F (N)	0.381	0.868	0.009	0.018	0.186	0.937	0.17	NA
F (F)	0.352	0.726	0.011	0.024	0.199	0.941	0.16	NA
G (N)	0.386	1.077	0.011	0.028	0.201	1.054	0.17	NA
G (F)	0.356	0.870	0.017	0.013	0.195	1.073	0.19	NA
H (N)	0.387	0.935	0.011	0.010	0.193	0.979	0.19	NA
H (F)	0.360	0.864	0.018	0.014	0.209	1.059	0.20	NA
I (N)	0.092	0.481	0.012	0.245	0.509	12.265	NA	NA
I (F)	0.092	0.506	0.025	0.298	0.332	13.810	NA	NA
J (F)	0.394	0.700	0.012	0.014	0.224	0.727	0.21	1.963

TABLE NO. 3: MECHANICAL PROPERTY DATA FOR SAFETY RELATED PARTS

Part ID	Hardness (HRC)	UTS (Ksi)	0.2% YS (Ksi)	% Elong.	Impact Strength @ 65°F (ft/lbs)	Lateral Expansion @ 65°F (10 ⁻³ in.)
A (N)	31.0	NA	NA	NA	NA	NA
A (F)	30.3	138.4	123.7	21.0	92	54
B (N)	26.3	NA	NA	NA	NA	NA
B (F)	28.5	131.6	112.2	21.0	48	36
C (N)	25.9	NA	NA	NA	NA	NA
C (F)	25.9	136.7	122.4	21.0	NA	NA
D (N)	26.8	NA	NA	NA	NA	NA
D (F)	27.0	135.8	119.2	22.0	NA	NA
E (N)	27.1	NA	NA	NA	NA	NA
E (F)	26.9	138.5	122.4	19.5	NA	NA
F (N)	26.6	NA	NA	NA	NA	NA
F (F)	26.9	135.1	118.0	19.5	60	38
G (N)	27.2	NA	NA	NA	NA	NA
G (F)	26.2	141.8	127.0	20.0	54	36
H (N)	26.4	NA	NA	NA	NA	NA
H (F)	28.2	140.0	122.5	21.0	63	45
I (N)	93.5 HRB	NA	NA	NA	NA	NA
I (F)	77.9 HRB	86.0	53.8	26.5	NA	NA
J (F)	33.4	147.2	134.7	19.5	63	37

TABLE NO. 4: CHEMISTRY AND HARDNESS DATA FOR NON-SAFETY RELATED PARTS

Part ID	Elemental Weight Percent								Hardness HRC
	C	Mn	P	S	Si	Cr	Mo	Ni/Cu	
K (N)	0.429	NA	0.016	0.016	NA	NA	NA	NA	27.6
K (F)	0.407	0.898	0.020	0.015	0.243	1.013	0.21	NA	25.5
L (N)	0.427	NA	0.020	0.013	NA	NA	NA	NA	27.4
L (F)	0.356	0.814	0.018	0.009	0.155	0.867	0.15	NA	30.1
M (N)	0.151	NA	0.015	0.009	NA	NA	NA	NA	76.0 HRB
M (F)	0.390	0.772	0.008	0.019	0.133	0.759	0.11	NA	25.9
N (N)	0.110	NA	0.017	0.011	NA	NA	NA	NA	92.7 HRB
N (F)	0.372	0.705	0.016	0.012	0.199	1.042	0.14	NA	25.5
O (N)	0.424	NA	0.020	0.013	NA	NA	NA	NA	27.2
O (F)	0.396	0.935	0.009	0.016	0.155	1.030	0.17	NA	24.8
P (N)	0.422	NA	0.013	0.011	NA	NA	NA	NA	25.8
P (F)	0.316	0.827	0.012	0.009	0.184	NA	NA	NA	25.0
Q (N)	0.425	NA	0.022	0.021	NA	NA	NA	NA	28.3
Q (F)	0.404	0.768	0.005	0.025	NA	NA	NA	NA	25.5
R (N)	0.113	0.742	0.063	0.012	0.225	0.840	NA	0.449/ 0.344	26.3
R (F)	0.310	1.021	0.013	0.022	0.183	0.473	NA	0.319/ 0.383	27.8
S (N)	0.467	NA	0.011	0.015	NA	NA	NA	NA	28.9
S (F)	0.408	0.803	0.011	0.013	NA	0.911	0.18	NA	30.3
T (N)	0.422	NA	0.022	0.022	NA	NA	NA	NA	29.1
T (F)	NA	NA	0.018	0.041	NA	NA	NA	NA	73.6 HRB

TABLE NO. 5: SPECIFICATION DEVIATIONS

Part	Specification	Specification Requirements	Reported	Deviation	Comments
I(F)	A 193 Grade B6	110 Ksi UTS 85 Ksi 0.2% YS	86.0 Ksi 53.8 Ksi	-24.0 Ksi -31.2 Ksi	See Note (a)
I(N)	A 194 Grade 6	24-38 HRC	93.5 HRB	Off Scale	See Note (a)
S(F)	A 490 Type 1	33-38 HRC	30.3 HRC	-2.7 HRC	See Note (b)
M(F)	A 193 Grade B7	0.13-0.27% Mo	0.11% Mo	-0.02% Mo	See Note (c)
R(N)	A 563 Grade C3	0.07-0.155% P	0.063% P	-0.007% P	See Note (c)

Notes:

- (a) The as found strength of the nut and stud is adequate to meet all design dead-weight, pressure, seismic and gasket seating loads.
- (b) This hardness deviation is considered minor and will result in less than a 10% reduction of the tensile strength from the specification requirements. In fact the tensile strength may have been within the specification requirements but there was not enough sample remaining to test. Based on our experience fasteners with tensile properties within 10% of the specification are adequate to ensure structural integrity.
- (c) This chemistry deviation is minor and does not adversely affect any of the applicable material properties. The hardness test indicates the strength is within the specification requirements.

ATTACHMENT (3)

RECEIPT INSPECTION AND INTERNAL CONTROLS

Characteristics Currently Examined During Receipt Inspection of Fasteners:

- 1.) Marking requirements for grade, manufacturer's identification, and heat code, as applicable.
- 2.) Review of material test report and certificate of conformance for compliance with the purchase order and material specification.
- 3.) Visual and dimensional examination, as required.

Internal Controls:

Fasteners are stored in the Calvert Cliffs warehouse, outside the plant protected area, and are issued from stock on an as-requested basis in support of maintenance activities. Fasteners are stored by quality level, type, size, material grade, and installation location. A material stock description is maintained on a computer database for each item in stock. The warehouse is a controlled-access area and is subject to quality assurance audits.

Fasteners are withdrawn from the warehouse via a store order form which must specify the particular equipment or system the fasteners will be used in. The completed store order forms are subject to quality assurance audits.

The need to withdraw fasteners from stock is identified during the planning process for each maintenance order. A maintenance planner reviews each request for maintenance and initiates a maintenance order providing instructions for completing the work. The maintenance order also specifies any replacement fasteners by quality level, grade and stock number, as appropriate. These fasteners are ordered from the warehouse and are transferred to a controlled-access staging area inside the plant. A limited quantity of commonly used fasteners are maintained in this staging area. Prior to working a maintenance order, mechanics pick up the necessary materials, including fasteners, from the staging area. The mechanics are instructed to check the stock number of the material received against the stock number specified on the maintenance order and to visually check for material grade markings. Safety-related maintenance work is subject to observation and inspection by quality control personnel.