

YANKEE ATOMIC ELECTRIC COMPANY



1671 Worcester Road, Framingham, Massachusetts 01701

March 7, 1988
FYR 88-31

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

References: (a) License No. DPR-3 (Docket No. 50-29)
(b) USNRC Compliance Bulletin 87-02, dated November 6, 1987
(c) Letter, YAEAC to USNRC (FYR 88-06), "Response to NRC
Compliance Bulletin 87-02," dated January 11, 1988

Subject: Additional Information for Response to Compliance Bulletin 87-02

Dear Sir:

In Reference (c), Yankee Atomic Electric Company's (YAEAC's) response to Reference (b), we stated that we would provide the following additional information for Action Items 5 and 6 by March 11, 1988. The information to be provided is as follows: (a) results of proof load testing and safety significance and limits of application of out-of-tolerance nuts (Action Item 5); (b) results of testing of additional fasteners from the vendor who supplied the out-of-tolerance nuts (Action Item 5); and (c) procedure revision for procurement, receipt inspection, and testing based on the results of testing done for Reference (b) (Action Item 6). This letter provides the three items of information.

(a) Out-of-Tolerance Nuts

In Reference (c), one safety-related nut was identified as not meeting the requirements of ASTM A194 (Sample No. YR-87-02-16SR-N). The nut was found to have a carbon content less than the minimum required.

Since carbon content will primarily affect strength, proof load testing has been done for two nuts (Sample Nos. YR-87-02-27SR-N and YR-87-02-28SR-N) selected from the same heat number as the out-of-tolerance nut identified in Reference (c). Data for these nuts are contained in Attachment 1.

Proof load testing was performed in accordance with ASTM A370, Supplement III, Paragraph S14.1. Proof loads were obtained from

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Table 3 of ASTM A194. Additionally, chemical and hardness testing of the nuts was performed in accordance with ASTM A370.

Test Results: The two nuts met all the chemical and hardness requirements of ASTM A194 with the exception of carbon content. In both cases, the carbon content was less than the minimum required (.32 and .31 versus .40 \pm .03 minimum).

A proof load of 9,170 lbs as required by Table 3 of ASTM A194 was applied to each nut. Both nuts were able to resist the proof load with no stripping of the threads observed. Test results are summarized in Table 1 of Attachment 2.

Safety Significance and Limits of Application: Based on the results of the proof load tests, the 5/16-18 nuts with low carbon content will be able to develop the full strength of any 5/16-18 fastener appropriate for use with A194, Grade 2H, nuts. Therefore, the low carbon content of these nuts has no safety significance and places no limits on the use of these nuts.

(b) Additional Fastener Testing

In order to determine the extent of nonconforming fasteners from the vendor who supplied the out-of-tolerance 5/16-18 A194 2H nut, samples from additional lots supplied by the vendor were subject to testing (Sample Nos. YR-87-02-22SR-N, YR-87-02-24SR-N, YR-87-02-25SR-N, and YR-87-02-26SR-N). The four nuts were tested for chemical composition and hardness in accordance with ASTM Specification A194 2H. Specific fastener data is provided in Attachment 1.

Test Results: All four nuts met the chemical and hardness requirements of ASTM A194 2H. Actual test results are summarized in Attachment 2, Table 2.


(c) Action Item 6 - Further Actions

Based upon the results of the fastener testing and the review of current plant procedures, additional changes are being made to the receipt inspection process.

Plant Procedure AP-0212, "Control of Purchased Material, Equipment, and Services," is being revised to include random sampling and testing of safety-related fasteners to ensure compliance with the applicable material specification.


These measures will provide additional assurance that fasteners used in the plant meet the requisite specifications and requirements and that the operability of safety-related plant components is not affected.

Very truly yours,


J. DeVincentis
Vice President

Attachments

COMMONWEALTH OF MASSACHUSETTS)
MIDDLESEX COUNTY) ss)


Robert H. Groce Notary Public
My Commission Expires August 29, 1991

ATTACHMENT 1

Fastener Testing Data Sheet

Sample ID No.:

YR-87-02-22SR-N

Fastener Description:

1/4-20 Hex Nut

Stores QA Storage Location:

V8 Drawer 2

Material Specification as Documented by Licensee Records:

SA194, 2H

Head Marking (Specification and Manufacturer):

2H

Class/Procurement Level:

Safety Class Level B

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

Pressure Boundary

Vendor:

Commercial Fasteners
18-35 38th Street
Long Island City, NY 11105

QA Requirements Imposed on Vendor:

Provide C of C to Material Spec.

Licensee Representative:

Signature Jack Lethers / R.E. Dunfee Date 2/22/88

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

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

ATTACHMENT 1

Fastener Testing Data Sheet

Sample ID No.:

YR-87-02-24SR-N

Fastener Description:

1/4-20 Hex Nut

Stores QA Storage Location:

V8 Drawn 2

Material Specification as Documented by Licensee Records:

SA194, 2H

Head Marking (Specification and Manufacturer):

2H

Class/Procurement Level:

Safety Class Level B

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

Pressure Boundary

Vendor:

Commercial Fasteners
18-35 38th Street
Long Island City, NY 11105

QA Requirements Imposed on Vendor:

Provide C of C to Material Spec.

Licensee Representative:

Signature Nick L. Hunter / R.E. Dwyer Date 2/22/88

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

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

ATTACHMENT 1

Fastener Testing Data Sheet

Sample ID No.:

YR-87-02-25SR-N

Fastener Description:

3/8-16 Hex Nut

Stores QA Storage Location:

Top of V7

Material Specification as Documented by Licensee Records:

SA194, 2H

Head Marking (Specification and Manufacturer):

2H

Class/Procurement Level:

Safety Class Level B

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

Pressure Boundary

Vendor:

Commercial Fasteners
18-35 38th Street
Long Island City, NY 11105

QA Requirements Imposed on Vendor:

Provide C of C to Material Spec.

Licensee Representative:

Signature *John Lettich / R.E. Dunlop* Date 3/22/88

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

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

ATTACHMENT 1

Fastener Testing Data Sheet

Sample ID No.:

YP-87-02-2bSR-N

Fastener Description:

3/8-16 Hex Nut

Stores SA Storage Location:

Top of V7

Material Specification as Documented by Licensee Records:

SA194, 2H

Head Marking (Specification and Manufacturer):

2H

Class/Procurement Level:

Safety Class Level B

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

Pressure Boundary

Vendor:

Commercial Fasteners
18-35 38th Street
Long Island City, NY 11105

QA Requirements Imposed on Vendor:

Provide C of C to Material Spec.

Licensee Representative:

Signature Josh L. Hunter / J.E. Dwyer Date 2/22/88

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

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

ATTACHMENT 1

Fastener Testing Data Sheet

Sample ID No.:

YR-87-02-27SR-N

Fastener Description:

5/16-18 Heavy Hex Nut

Stores QA Storage Location:

V8 Drawer 3

Material Specification as Documented by Licensee Records:

SA194, 2H

Head Marking (Specification and Manufacturer):

2H

Class/Procurement Level:

Safety Class Level B

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

Pressure Boundary

Vendor:

Commercial Fasteners
18-35 38th Street
Long Island City, NY 11105

QA Requirements Imposed on Vendor:

Provide C of C to Material Spec.

Licensee Representative:

Signature North Lethbridge / R. S. Dwyer Date 2/22/88

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

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

ATTACHMENT 1

Fastener Testing Data Sheet

Sample ID No.:

YR-87-02-28SR-N

Fastener Description:

5/16-18 Heavy Hex Nut

Stores QA Storage Location:

VB Drawer 3

Material Specification as Documented by Licensee Records:

SA194, 2H

Head Marking (Specification and Manufacturer):

2H

Class/Procurement Level:

Safety Class Level B

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

Pressure Boundary

Vendor:

Commercial Fasteners
18-35 38th Street
Long Island City, NY 11105

QA Requirements Imposed on Vendor:

Provide C of C to Material Spec.

Licensee Representative:

Signature Nash Lethbridge / R.E. Dwyer Date 2/22/88

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

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

Attachment 2

Table 1

Out-of-Tolerance Nuts

<u>ID #</u>	<u>Mechanical Analysis</u>		<u>Chemical Analysis¹</u>							
	<u>HARDNESS</u>	<u>PROOF LOAD</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
YR-87-02-27SR-N	HRC-34.0	9,170 LB		*.32	.69	.007	.029	.27	.02	.06
YR-87-02-28SR-N	HRC-33.5	9,170 LB		*.31	.84	.008	.025	.26	.02	.07

Note: C-carbon; Mn-Manganese; P-Phosphorus; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr-Chromium
HRC-Rockwell C Hardness

* Minimum Carbon Content $.40 \pm .03$

Attachment 2

Table 1

Safety-Related Nuts

ID #	<u>Mechanical Analysis</u>		<u>Chemical Analysis¹</u>							
	<u>HARDNESS</u>	<u>PROOF LOAD</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>
YR-87-02-22SR-N	HRC-29.0			.37	.68	.025	.013	.27	.01	<.01
YR-87-02-28SR-N	HRC-29.5			.37	.68	.028	.013	.26	.01	<.01
YR-87-02-25SR-N	HRC-37.0			.47	.78	.014	.030	.27	.01	.03
YR-87-02-26SR-N	HRC-37.5			.46	.78	.015	.029	.27	.01	.04

Note: C-carbon; Mn-Manganese; P-Phosphorus; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr-Chromium
HRC-Rockwell C Hardness