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Dominion

July 22, 2004

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

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Docket No.: 50-336
License No.: DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION, UNIT 2
10 CFR 50.55A RELIEF REQUEST RR-89-51
USE OF ANNULLED CODE CASE N-2
REQUIREMENTS FOR CORROSION-RESISTING STEEL, STEEL BARS, AND SHAPES, SECTION III

Pursuant to 10 CFR 50.55a(a)(3)(i), Dominion Nuclear Connecticut, Inc. (DNC), requests approval to use an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Code, Section III, 1998 Edition with the 2000 Addenda, for the material requirements associated with the replacement of the Control Element Drive Mechanism (CEDM) housings as described in Attachment 1. These replacement housings are to be made of modified Type 403 stainless steel that will be fabricated to the requirements of ASME Code Case N-2 (Previously 1334-3), "Requirements For Corrosion-Resisting Steel, Steel Bars, and Shapes, Section III," provided in Attachment 2. DNC considers this alternative to provide an acceptable level of quality and safety and therefore meets the necessary requirements for approval under 10 CFR 50.55a(a)(3)(i).

The current ASME Code requirements for supplying a modified Type 403 stainless steel needed for a CEDM housing are in Code Case N-4-11 which is listed as an approved Section III Code Case in U. S. NRC Regulatory Guide 1.84, Rev. 32, June 2003. DNC recently determined that the material currently being used for fabrication of the CEDM housings does not meet the requirements of Code Case N-4-11. However, the material is able to meet the requirements of annulled Code Case N-2. Code Case N-2 is currently listed in Table 3, "Annulled Unconditionally Approved Section III Code Cases," in the U. S. NRC Regulatory Guide 1.84, Rev. 32, June 2003.

To support reactor pressure vessel head (RPVH) replacement at the next refueling outage, fabrication of the CEDM housings, which has been in progress for several months, will continue. In parallel, DNC has continued efforts to procure CEDM materials that meet the requirements of Code Case N-4-11. Due to the lead time required for CEDM fabrication, outage resource planning, and securing commitments for replacement power due to the extended outage required for RPVH replacement, DNC requests NRC complete its review of this application by August 12, 2004.

In a telephone conversation between Mr. Scott Wahl of the NRC and Mr. David Dodson of DNC on July 22, 2004, the need and schedule for this relief request were discussed.

If you should have any questions regarding this submittal, please contact Mr. Paul R. Willoughby at (804) 273-3572.

Very truly yours,

Leslie N. Hartz
Vice President – Nuclear Engineering

Attachment 1 Request RR-89-51, Use Of Annulled Code Case N-2
Attachment 2 ASME Code Case N-2 (1334-3), Requirements For Corrosion-Resisting Steel, Steel Bars, and Shapes, Section III

Commitments contained within this letter: None

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ATTACHMENT 1

**USE OF ANNULLED CODE CASE N-2,
REQUIREMENTS FOR CORROSION-RESISTING STEEL,
STEEL BARS, AND SHAPES, SECTION III**

RELIEF REQUEST RR-89-51

**DOMINION NUCLEAR CONNECTICUT, INC. (DNC)
MILLSTONE POWER STATION, UNIT 2**

Relief Request RR-89-51, Use Of Annulled Code Case N-2, Requirements For Corrosion-Resisting Steel, Steel Bars, and Shapes, Section III

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Relief Request RR-89-51, Use Of Annulled Code Case N-2, Requirements For Corrosion-Resisting Steel, Steel Bars, and Shapes, Section III

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

- Alternative Provides Acceptable Level of Quality and Safety -

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class: 1

System: Reactor Coolant System (RCS)

The 69 magnetic jack assembly Control Element Drive Mechanism (CEDM) housings at Millstone Power Station, Unit 2 (MPS 2) were originally fabricated in accordance with the American Society of Mechanical Engineers (ASME) Code Case 1337 (now Code Case N-4-11) and made of modified Type 403 stainless steel. These housings are pressure retaining, installed on nozzles in the Reactor Pressure Vessel Head (RPVH), and encased in a non-pressure retaining shroud cover with bolted coil stacks that surround the drive mechanisms for the insertion and withdrawal of control rods for startup, operation, and shutdown of the reactor. A typical CEDM housing is shown in Figure 1. The specific component of the CEDM to which this request applies is identified on Figure 1 as the Motor Assembly Pressure Housing.

2.0 APPLICABLE CODE EDITION AND ADDENDA:

MPS 2 is currently in the third 10-year inservice inspection (ISI) interval, which started on April 1, 1999. The 1989 Edition of Section XI with No Addenda applies to the ISI program and the 1998 Edition of Section XI with No Addenda is used as the primary ASME Code Edition for Section XI Repair/Replacement program activities. The original RPVH and CEDM housings met Section III, 1968 Edition through the Summer 1969 Addenda with Code Case 1337 used for the modified Type 403 stainless steel CEDM housing material. The replacement RPVH and CEDM housings will meet Section III, 1998 Edition with the 2000 Addenda and annulled Code Case N-2 for the modified Type 403 stainless steel housing material subject to the approval of this request.

3.0 APPLICABLE CODE REQUIREMENTS:

CEDM housings need to exhibit certain material (i.e., strength and magnetic) properties that are not contained within the standard requirements for Type 403 stainless steel. Because of the evolution of incorporating American Society for Testing and Materials (ASTM) specifications into Section II material specifications and the reduced need for CEDM material after early RPVH fabrication in the 1960s and 1970s, these requirements were never incorporated into Section II and thus Section III has no specified requirements at this time for this material. The only NRC approved Code requirements that exist today for supplying a modified Type 403 stainless steel needed for a CEDM housing are in Code Case N-4-11 which is listed as an approved Section III Code Case in U. S. NRC Regulatory Guide 1.84, Rev. 32, June 2003.

4.0 REASON FOR REQUEST:

DNC is submitting this request to allow the use of an Annulled Unconditionally Approved Section III Code Case, Code Case N-2, "Requirements for Corrosion-Resistant Steel, Steel Bars, and Shapes, Section III," shown in Attachment 2, for the following reasons:

- There are no other NRC approved requirements other than Code Case N-4-11 to supply this material and only a limited number of suppliers are available that can meet the requirements of Code Case N-4-11.
- Code Case N-2, although annulled, is unconditionally approved by the NRC and has always provided an acceptable level of quality and safety and continues to do so for plants that have used this Code Case for their RPVH CEDM housings.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

The alternative in this request is to allow the use of annulled Code Case N-2 for the material requirements of the replacement CEDM housings at MPS 2. Modified Type 403 stainless steel material was used in the original design and fabrication of CEDM housings for Combustion Engineering Type Pressurized Water Reactors with two Section III Code Cases. Code Case 1334 (now Code Case N-2) and its revisions permitted use of modified Type 403 stainless steel in the annealed (40 ksi yield strength, 70 ksi tensile strength) and heat treated (80 ksi yield strength, 100 ksi tensile strength) conditions. Code Case 1337 (now N-4-11) and its revisions also permitted use of modified Type 403 stainless steel in the annealed (40 ksi yield strength, 70 ksi tensile strength) and heat treated (90 ksi yield strength, 110 ksi tensile strength) conditions. Code Cases 1334 and 1337 were originally approved on February 26, 1964. When the Nuclear Code Cases were renumbered in the 1977 Edition, these two Code Cases became Code Case N-2 (Previously 1334-3) and Code Case N-4-11 (Previously 1337-11), respectively.

Code Case N-4-11 is still an active Section III Code Case and is listed as an acceptable Code Case in Regulatory Guide 1.84. Code Case N-2 was annulled in January 1981 in Supplement 4 of the 1980 Edition of the ASME Code. Most of the materials covered by Code Case N-2 were incorporated into Section III. However, the design stress intensity and material property values for the heat treated condition of modified Type 403 stainless steel in Code Case N-2 were never incorporated into Section III. Code Case N-2 (1334-3) is identified in Regulatory Guide 1.84 as an Annulled Unconditionally Approved Section III Code Case.

The ASME is currently in the process of revising Code Case N-4-11 to add the heat treated condition of modified Type 403 stainless steel that was previously covered by the annulled Code Case N-2, but that revision may not be available to support the MPS 2 RPVH replacement schedule. The proposed Code Case revision adds the heat treatment and mechanical property requirements and design stress intensity values for heat treated modified Type 403 stainless steel that are defined in Code Case N-2. In the background statement for the proposed change ASME indicates that reinstating this second heat treatment condition will permit plants to design and build replacement CEDMs with the same requirements as the original components. Providing the second heat treated condition for the modified Type 403 stainless steel also provides an option to plants to select a more readily available material for the CEDM housings, provided all other design requirements are met.

The original MPS 2 CEDMs were fabricated using Code Case 1337 (now Code Case N-4-11) with a process that involved fabricating a CEDM housing by piercing a forging into a tubular housing shaped product form. There are limited suppliers at this time to provide this material. However, annulled Code Case N-2 can be used to supply the material requirements for the CEDM housings subject to the approval of this request in support of the upcoming MPS 2 spring 2005 RPVH replacement project. This Code Case will permit production of the CEDMs by forging a solid piece of material and machining that material into a tubular housing shaped product form that will meet the heat treated conditions described above as the proposed revision to Code Case N-4-11. Although, the ASME has annulled Code Case N-2, it has been used for several other existing RPVH CEDM housings in earlier revisions as follows:

- ANO2 Code Case 1334-2
- PALO VERDE 2 Code Case 1334-3
- ST. LUCIE 1 Code Case 1334-2
- ST. LUCIE 2 Code Case 1334-3
- WATERFORD 3 Code Case 1334-2

Therefore, this request to use the existing Annulled Unconditionally Approved Section III Code Case N-2 meets the 10 CFR 50.55a(a)(3)(i) requirement as an alternative that provides an acceptable level of quality and safety.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Since this request centers on the replacement of the MPS 2 RPVH specific to the material requirements for the replacement CEDM housings, it is intended that approval of this request will apply for the life of the CEDM housings.

7.0 PRECEDENTS:

A search of the documents within ADAMS has identified no precedents for the approval to use an Annulled Unconditionally Approved Section III Code Case. However, ASME has provided a Code Interpretation as follows:

Interpretation:	III-1-83-223
Subject:	Section III, Division 1, NA-1140/NCA-1140 Use of Code Editions, Addenda, and Cases (All Editions)
Date Issued:	May 7, 1984
File:	NI84-035, III-1

Question: May an organization utilize a Code Case, with the approval of the Owner and the jurisdictional authorities, after the annulment date of the Code Case?

Reply: Yes, provided the annulment date of the Code Case is later than the Code of Record date for the plant.

DNC understands the NRC position on use of Code Interpretations, but this interpretation is shown to identify the ASME's support for this type of request. This interpretation indicates that although no precedent has been found related to this request that, subject to the Staff's approval, this would be an acceptable alternative to the ASME.

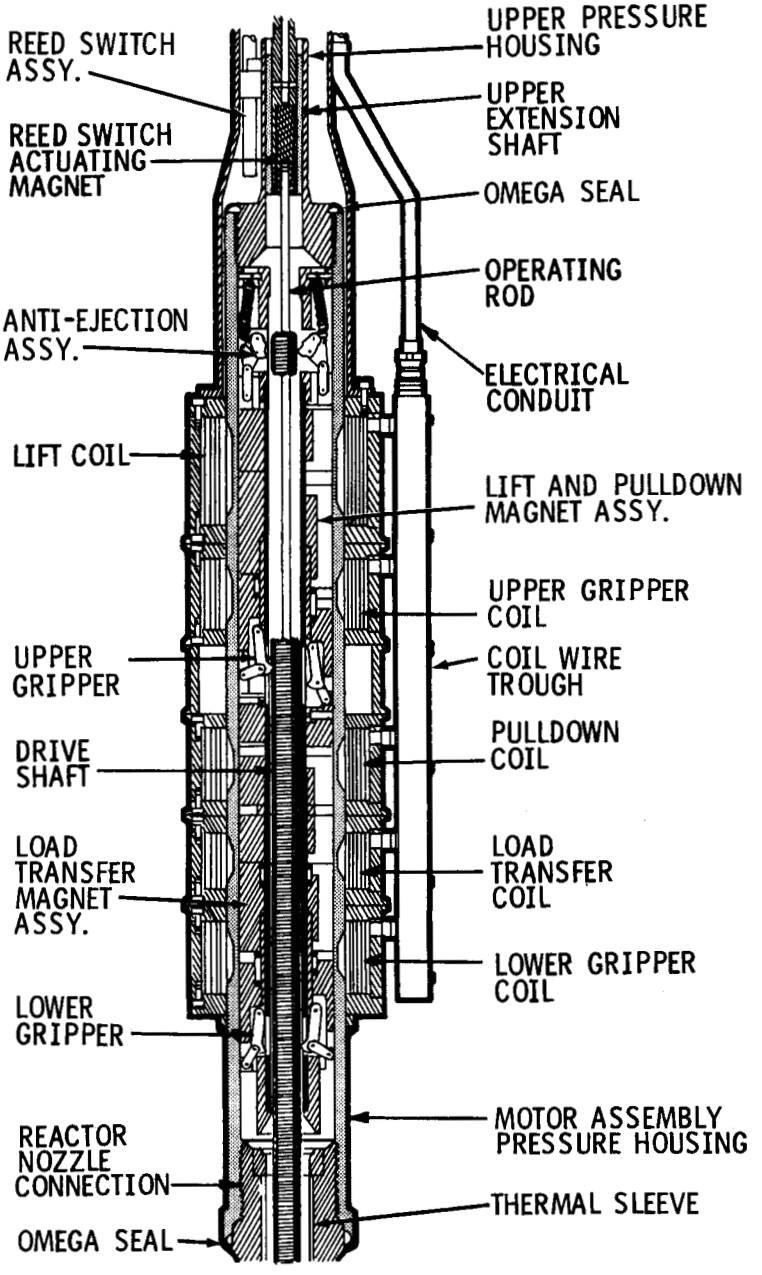

FIGURE 1: TYPICAL CONTROL ELEMENT DRIVE HOUSING

ATTACHMENT 2

ASME CODE CASE N-2 (1334-3),
"REQUIREMENTS FOR CORROSION-RESISTING
STEEL, STEEL BARS, AND SHAPES, SECTION III"

DOMINION NUCLEAR CONNECTICUT, INC. (DNC)
MILLSTONE POWER STATION, UNIT 2

CASE N-2 (1334-3)

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Meeting of November 3, 1978
Approved by Council, January 8, 1979

This Case shall expire on January 8, 1982 unless previously annulled or reaffirmed.

Case N-2 (1334-3)
Requirements for Corrosion-Resisting Steel Steel Bars and Shapes
Section III

Inquiry: May corrosion-resisting steel bars and shapes conforming to the requirements of ASTM Specification A276-73 and A582-71 be used in the construction of Class 1 and Class CS components in accordance with Section III, and what requirements apply to these materials?

Reply: It is the opinion of the Committee that corrosion resisting steel bars and shapes conforming to the Specifications and of the types listed below may be used for Section III Class 1 and Class CS components and the following specified special requirements apply in addition to the requirements for forgings and bars specified in Section III.

(1) *Acceptable Types:*

Austenitic Grades	Ferritic Grades
ASTM A276-73 Type 309s	ASTM A276-73, Types 403, 405 and 410 normalized and tempered, and Type 414. ASTM A582-71, Type 416 Se

(2) Bars may be used in only the following conditions of heat treatment:

(a) The austenitic grades shall receive a carbide solution treatment which shall consist of holding the bars for a sufficient length of time at a temperature at which the chromium carbides will go into solution and then cooling in still air or a liquid medium at a rate sufficient to prevent reprecipitation.

(b) The ferritic grades shall be annealed or normalized and tempered at 1250 F minimum.

(3) Mechanical properties of the A276-73 Types shall conform to requirements shown in Table 8 of A276-73 for the annealed or normalized and tempered conditions of the respective grades. Mechanical properties of Type 416 Se shall conform to the following specified minimum values:

	Annealed	Norm. & Tpd.
Tensile strength, ksi	70.0	100.0
Yield strength, ksi (0.2% offset)	40.0	80.0
Elongation in 2 in. percent	20	15
Reduction of area, percent	45	45

(4) At least one tension test at room temperature shall be made from each heat in each heat treatment charge, with testing procedure in accordance with SA-370.

(5) A check analysis may be made by the purchaser from representative bar samples. The chemical composition thus determined shall conform to the requirements specified in Table 2 of A276-73 or Table 1 of A582-71 as applicable.

(6) These materials shall receive the following P-No. classifications in QW-422 of Section IX.

P-6	P-7	P-8
403	405	309S
414		
416 Se		

(7) Design stress intensity values are listed in Table I for austenitic stainless steel grades, and in Table II for ferritic stainless steel grades and values of yield strength are listed in Table III of this case.

(8) The material shall be identified by this Case Number.

CASE (continued)
N-2
(1334-3)

Table I

Design Stress Intensity, psi[b]

Temperature F	309S[a]
Up to 100	20,000
200	20,000
300	20,000
400	20,000
500	20,000
600	19,300
650	18,800
700	18,300
750	18,000
800	17,500

NOTES:

a. Specified minimum tensile strength: 75,000 psi
Specified minimum yield strength at 0.2% offset; 30,000 psi.

b. For strain limiting factors refer to Table I-3.0

Table II

Design Stress Intensity, psi

	Annealed		Normalized and Tempered	
Temperature F	405[a]	403, 416 Se	403, 410[b], 416Se	414[c]
Up to 100	16,700	23,300	33,300	38,300
200	15,900	23,300	33,300	38,300
300	15,400	23,300	33,300	38,300
400	14,900	22,800	32,500	37,400
500	14,500	22,000	31,400	36,100
600	14,000	21,200	30,600	34,900
650	13,900	20,900	29,900	34,400
700	13,700	20,700	29,500	33,900
750	13,600	19,900	28,500	32,800
800	13,400	19,000	27,100	31,200

CASE (continued)
N-2
(1334-3)

NOTES:

a. Specified minimum tensile strength: 60,000 psi.
Specified minimum yield strength: 25,000 psi.

b. Specified minimum tensile strength: 100,000 psi;
Specified minimum yield strength: 80,000 psi.

c. Specified minimum tensile strength: 115,000 psi;
Specified minimum yield strength: 90,000 psi.

Table III
Values of Yield Strength

Material Type	Spec. Min. Yield, psi	100	200	300	400	500	600	650	700
309S	30,000	30,000	27,050	25,350	23,850	22,550	21,350	20,850	20,350
405[1]	25,000	25,000	23,800	23,050	22,300	21,700	21,050	20,800	20,550
403[1] 416[1]Se	40,000	40,000	38,100	36,850	35,650	34,700	33,650	33,250	32,900
403,410[2] 416[2]Se	80,000	80,000	76,250	73,750	71,350	69,450	67,350	66,550	65,800
414[2]	90,000	90,000	85,750	83,000	80,300	78,100	75,750	74,850	74,050

Material Type	750	800	850	900	950	1000
309S	20,000	19,450	19,000	18,600	18,150	17,900
405[1]	20,400	20,150	19,750	19,100	18,100	16,950
403[1], 416[1]Se	32,700	32,200	31,600	30,600	29,000	27,150
403[2],410[2] 416[2]Se	65,450	64,450	63,200	61,200	58,050	54,300
414[2]	73,400	72,500	71,100	68,850	65,300	61,100

[1]Annealed

[2]Tempered