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Subject: **Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD**

The purpose of this letter is to request NRC approval of an alternative to certain requirements in 10 CFR 50.55a as related to the edition and addenda of the ASME Boiler and Pressure Vessel Code (the "Code"), Section III. Specifically, on January 30, 2009, the ASME BPV Standards Committee approved Code Case N-782, "Use of Code Editions, Addenda, and Cases – Section III Division 1." The NRC has not yet referenced Code Case N-782 in Regulatory Guide 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III." Therefore, GEH is seeking NRC approval on an individual basis.

Enclosure 1 of this letter, "Request for Alternative to ASME Code, Section III, NCA-1140 Requirements" provides the formal GEH request. Enclosure 2 of this letter submits markups to the ESBWR DCD, Tier 2, Chapters 1 and 5, Revision 6, to add the ASME Boiler and Pressure Vessel Code Case N-782 by reference. These markups affect DCD Tier 2 Subsections 1.9.2 and 1.9.5, and Tables 1.9-21 and 5.2-1; and will be incorporated into the DCD, Revision 7.

If you have any questions or require additional information, please contact me.

Sincerely,

Richard E. Kingston

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Vice President, ESBWR Licensing

Enclosures:

1. Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD - Request for Alternative to ASME Code, Section III, NCA-1140 Requirements

2. Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD – DCD Markups

cc:	AE Cubbage	USNRC (with enclosures)
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	eDRF Section	0000-0114-5911

Enclosure 1

MFN 10-081

Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD

Request for Alternative to ASME Code, Section III, NCA-1140 Requirements

Request for Alternative to ASME Code, Section III, NCA-1140 Requirements

In accordance with the provisions in 10 CFR § 50.55a, paragraphs (a)(3)(i) and (a)(3)(ii), GEH requests NRC approval of an alternative to certain requirements in 10 CFR 50.55a as related to the edition and addenda of the ASME Boiler and Pressure Vessel Code (the "Code"), Section III. Specifically, on January 30, 2009, the ASME BPV Standards Committee approved Code Case N-782, "Use of Code Editions, Addenda, and Cases." The NRC has not yet referenced Code Case N-782 in Regulatory Guide 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III." Therefore, GEH is seeking NRC approval on an individual basis.

This request is necessary due to a potential conflict that may arise between the requirements in 10 CFR 50.55a and the requirements in 10 CFR §§ 52.63 and 52.83. By approving this alternative request, the NRC will be assuring that this potential regulatory conflict does not occur in future combined license applications that may reference the ESBWR design certification rule, once it is finalized. The details are provided below.

Background

The ESBWR design certification is based on the following ASME Code, Section III, editions and addenda, as excerpted from Table 1.9-22 of Tier 2 of the ESBWR Design Control Document, Revision 6. Bracketed, italicized information denoted with an asterisk designates Tier 2* information.

Code or Standard Number	**Year**	**Title**
[*BPVC Sec III*]*	[*2004*]*	[*BPVC Section III, Rules for Construction of Nuclear Facility Components* *Division 1: NCA, NE* *Division 2: CC, NCA* *Code for Concrete Containments*]*
[*BPVC Sec III*]*	[*2001 including Addenda through 2003*]*	[*BPVC Section III, Rules for Construction of Nuclear Facility Components* *Division 1: NB, NC, ND, NF, NG* *Weld Leg Dimensions: The 1989 Edition, with no Addenda, is used when applying paragraph NB-3683.4(c)(1), or applying Footnote 11 to Figure NC-3673.2(b)-1, or applying Figure ND-3673.2(b)-1 to weld leg dimensioning.*

Code or Standard Number	Year	Title
		Seismic Design of Piping: The 1992 Edition with 1993 Addenda is used when applying Articles NB-3200, NB–3600, NC–3600, and ND–3600 (Class 1, 2, 3 Piping and Components) for seismic design of piping in lieu of later ASME Code, Section III, editions and addenda. *Note: All limitations and modifications specified in 10 CFR 50.55a(b)(1) are met.*]*

Applicable Regulatory Requirements

NRC regulations in 10 CFR 50.55a specify the following:

10 CFR § 50.55a, Codes and Standards

Each construction permit for a utilization facility is subject to the following conditions in addition to those specified in § 50.55. Each combined license for a utilization facility is subject to the following conditions in addition to those specified in § 50.55, except that each combined license for a boiling or pressurized water-cooled nuclear power facility is subject to the conditions in paragraphs (f) and (g) of this section, but only after the Commission makes the finding under § 52.103(g) of this chapter. Each operating license for a boiling or pressurized water-cooled nuclear power facility is subject to the conditions in paragraphs (f) and (g) of this section in addition to those specified in § 50.55. Each manufacturing license, standard design approval, and standard design certification application under part 52 of this chapter is subject to the conditions in paragraphs (a), (b)(1), (b)(4), (c), (d), (e), (f)(3), and (g)(3) of this section.

(a)(1) Structures, systems, and components must be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function to be performed.

(2) Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME Boiler and Pressure Vessel Code specified in paragraphs (b), (c), (d), (e), (f), and (g) of this section. Protection systems of nuclear power reactors of all types must meet the requirements specified in paragraph (h) of this section.

(3) Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation, or Director, Office of New Reactors, as appropriate. The applicant shall demonstrate that:

(i) The proposed alternatives would provide an acceptable level of quality and safety, or

(ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

…

(c) *Reactor coolant pressure boundary*. (1) Components which are part of the reactor coolant pressure boundary must meet the requirements for Class 1 components in Section III [4, 5] of the ASME Boiler and Pressure Vessel Code, except as provided in paragraphs (c)(2), (c)(3), and (c)(4) of this section.

(2) Components which are connected to the reactor coolant system and are part of the reactor coolant pressure boundary as defined in § 50.2 need not meet the requirements of paragraph (c)(1) of this section, *Provided*:

(i) In the event of postulated failure of the component during normal reactor operation, the reactor can be shut down and cooled down in an orderly manner, assuming makeup is provided by the reactor coolant makeup system; or

(ii) The component is or can be isolated from the reactor coolant system by two valves in series (both closed, both open, or one closed and the other open). Each open valve must be capable of automatic actuation and, assuming the other valve is open, its closure time must be such that, in the event of postulated failure of the component during normal reactor operation, each valve remains operable and the reactor can be shut down and cooled down in an orderly manner, assuming makeup is provided by the reactor coolant makeup system only.

(3) The Code edition, addenda, and optional ASME Code cases to be applied to components of the reactor coolant pressure boundary must be determined by the provisions of paragraph NCA-1140, Subsection NCA of Section III of the ASME Boiler and Pressure Vessel Code, but--

(i) the edition and addenda applied to a component must be those which are incorporated by reference in paragraph (b)(1) of this section,

(ii) the ASME Code provisions applied to the pressure vessel may be dated no earlier than the Summer 1972 Addenda of the 1971 edition,

(iii) the ASME Code provisions applied to piping, pumps, and valves may be dated no earlier than the Winter 1972 Addenda of the 1971 edition, and

(iv) The optional Code cases applied to a component must be those listed in NRC Regulatory Guide 1.84 that is incorporated by reference in paragraph (b) of this section.

(d) *Quality Group B components*. (1) For a nuclear power plant whose application for a construction permit under this part, or a combined license or manufacturing license under part 52 of this chapter is docketed after May 14, 1984, or for an application for a standard design approval or a standard design certification docketed after May 14, 1984, components classified Quality Group B [9] must meet the requirements for Class 2 Components in Section III of the ASME Boiler and Pressure Vessel Code.

(2) The Code edition, addenda, and optional ASME Code cases to be applied to the systems and components identified in paragraph (d)(1) of this section must be determined by the rules of paragraph NCA-1140, Subsection NCA of Section III of the ASME Boiler and Pressure Vessel Code, but--

(i) the edition and addenda must be those which are incorporated by reference in paragraph (b)(1) of this section,

(ii) the ASME Code provisions applied to the systems and

(iii) components may be dated no earlier than the 1980 Edition, and The optional Code cases must be those listed in the NRC Regulatory Guide 1.84 that is incorporated by reference in paragraph (b) of this section.

(e) *Quality Group C components*. (1) For a nuclear power plant whose application for a construction permit under this part, or a combined license or manufacturing license under part 52 of this chapter is docketed after May 14, 1984, or for an application for a standard design approval or a standard design certification docketed after May 14, 1984, components classified Quality Group C [9] must meet the requirements for Class 3 components in Section III of the ASME Boiler and Pressure Vessel Code.

(2) The Code edition, addenda, and optional ASME Code cases to be applied to the systems and components identified in paragraph (e)(1) of this section must be determined by the rules of paragraph NCA-1140, subsection NCA of Section III of the ASME Boiler and Pressure Vessel Code, but--

(i) the edition and addenda must be those which are incorporated by reference in paragraph (b)(1) of this section,

(ii) the ASME Code provisions applied to the systems and

(iii) components may be dated no earlier than the 1980 Edition, and The optional Code cases must be those listed in NRC Regulatory Guide 1.84 that is incorporated by reference in paragraph (b) of this section.

…

Notes:

[4] USAS and ASME Code addenda issued prior to the Winter 1977 Addenda are considered to be "in effect" or "effective" 6 months after their date of issuance *and* after they are incorporated by reference in paragraph (b) of this section. Addenda to the ASME Code issued after the Summer 1977 Addenda are considered to be "in effect" or "effective" after the date of publication of the addenda *and* after they are incorporated by reference in paragraph (b) of this section.

[5] For ASME Code Editions and Addenda issued prior to the Winter 1977 Addenda, the Code Edition and Addenda applicable to the component is governed by the order or contract date for the component, not the contract date for the nuclear energy system. For the Winter 1977 Addenda and subsequent editions and addenda the method for determining the applicable Code editions and addenda is contained in Paragraph NCA 1140 of Section III of the ASME Code.

…

[9] Guidance for quality group classifications of components which are to be included in the safety analysis reports pursuant to § 50.34(a) and § 50.34(b) may be found in Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radiological-Waste-Containing Components of Nuclear Power Plants," and in Section 3.2.2 of NUREG-0800, "Standard Review Plan for Review of Safety Analysis Reports for Nuclear Power Plants."

<u>ASME BPV Code Provisions, Section III, NCA-1140 (through 2004 Edition)</u>

NCA-1140, Use of Code Editions, Addenda, and Cases

(a)(1) Under the rules of this Section, the Owner or his designee shall establish the Code Edition and Addenda to be included in the Design Specifications. All items of a nuclear power plant may be constructed to a single Code Edition and Addenda, or each item may be constructed to individually specified Code Editions and Addenda.

(2) In no case shall the Code Edition and Addenda dates established in the Design Specifications be earlier than:

(a) 3 years prior to the date that the nuclear power plant construction permit application is docketed; or

(b) the latest edition and addenda endorsed by the regulatory authority having jurisdiction at the plant site at the time the construction permit application is docketed.

ASME BPV Code, Section III, Code Case N-782

On January 30, 2009, the ASME BPV Standards Committee approved Code Case N-782, "Use of Code Editions, Addenda, and Cases." The code case provides the following:

Inquiry: What Code Editions, Addenda, and Cases may be used as an alternative to NCA-1140(a)(2)(a) and NCA-1140(a)(2)(b)?

Reply: It is the opinion of the Committee that as an alternative to NCA-1140(a)(2)(a) and NCA-1140(a)(2)(b), the following requirements may be used:

(a) The Edition and Addenda endorsed for a design certified or licensed by the regulatory authority.

(b) This Case number shall be recorded on the documentation for the item.

Issue

Under the provisions of 10 CFR Part 52, the NRC may approve a standard design certification, which may be referenced in a Combined License Application. The design certification, which is issued as an Appendix to 10 CFR Part 52 and is a rule, has finality in the Combined License Application proceeding and beyond according to the provisions in 10 CFR §§ 52.63 and 52.83. In order for a Combined License Application to meet the requirements of 10 CFR § 50.55a (see above) and ASME BPV Code, Section III, NCA-1140, it may be required to depart from the finality of a standard design certification. However, the ASME BPV Standards Committee has indicated its intent to support the finality of a design certification through its approval of Code Case N-782, quoted above. NRC approval of Code Case N-782 would ensure consistency between its regulations in 10 CFR Part 52 and the ASME BPV Code, Section III, for code editions and addenda used for future design specifications.

Under the provisions of 10 CFR § 50.55a(a)(3), the NRC may approve alternatives to the requirements in paragraphs (c), (d), and (e). The applicant must demonstrate:

> (i) The proposed alternatives would provide an acceptable level of quality and safety, or
>
> (ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

GEH requests that the NRC approve the application of Code Case N-782 to the ESBWR standard design certification, upon issuance, so that future Combined License applicants and holders may use the ASME Code, Section III, editions and addenda according to the certified design. The basis for this request is that the proposed alternative provides an acceptable level of quality and safety, and that strict compliance with the specified requirements of NCA-1140 would result in a hardship without a compensating increase in the level of quality and safety. The factors supporting this conclusion are as follows:

<u>10 CFR § 50.55a(a)(3)(i):</u> The ASME BPV Standards Committee has identified an alternative that is deemed acceptable for the case of a design that is certified by the regulatory authority. Although the ESBWR design is not yet certified, if the NRC does eventually certify the design, there will be a reference to the ASME BPV Code, Section III, contained in the certified design documents (see above). To ensure that the certified design maintains finality throughout the duration of the certification period (both original and renewal periods), and to support the policy of maintaining standardization, Code Case N-782 should be included in the certification of the design as an acceptable alternative. This approach provides an acceptable level of quality and safety, because the NRC considers the quality and safety of the ASME BPV Code editions and addenda at the time of certification of the design to be at an acceptable level. In addition, if the NRC has concerns about that level of quality and safety in the future, it may impose additional requirements on the design certification and the plants or applications that may be referencing it according to the provisions in 10 CFR § 52.63.

<u>10 CFR § 50.55a(a)(3)(ii):</u> In 1987, the Commission established a policy statement on standardization of nuclear power plant designs. 52 Fed. Reg. 34884 (Sept. 15, 1987). In its policy, the Commission discussed that standardization of nuclear power plant designs is an important initiative that can significantly enhance the safety, reliability and availability of nuclear plants. It goes on to state that:

> A regulatory framework which provides for certification of reference designs by means of rulemaking will alleviate the need to reconsider design issues in individual license proceedings on future license applications which reference the certified designs.

Without NRC approval of Code Case N-782, future Combined License applicants will suffer a hardship without a compensating increase in the level of quality and safety by being required to seek a departure from the certified design. This result is contrary to

the Commission policy statement and the intent and framework of 10 CFR Part 52 because it introduces regulatory risk into the licensing process for nuclear power plants that are otherwise supporting the Commission policy of standardization. This is a hardship that should not be imposed on future applicants referencing the ESBWR design certification, once the NRC approves it in a final rulemaking. Imposing such requirements does not provide an increase in quality and safety, as using the alternative will provide an acceptable level of quality and safety.

Conclusion

GEH requests that the NRC acknowledge approval of Code Case N-782 in its Safety Evaluation Report for the ESBWR design certification. The ESBWR Design Control Document (DCD), Tier 2, is revised to reflect application of Code Case N-782, as shown in the marked-up pages (Enclosure 2), which will be incorporated into Revision 7 of the DCD.

Enclosure 2

MFN 10-081

Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD

DCD Markups

Affects DCD Tier 2:

1. Subsection 1.9.2
2. Subsection 1.9.5
3. Table 1.9-21
4. Table 5.2-1

1.9 CONFORMANCE WITH STANDARD REVIEW PLAN AND APPLICABILITY OF CODES AND STANDARDS

1.9.1 Conformance with Standard Review Plan

This subsection provides the information required by 10 CFR 52.47(a)(9) showing conformance with the Standard Review Plan (SRP). The summary of differences from requirements in each SRP section is presented on a section by section basis in Tables 1.9-1 through 1.9-19. If no difference is indicated, the ESBWR design does not deviate from the requirements in the SRP section. For SRP sections where there are deviations, a reference location is provided for additional information.

1.9.2 Applicability to Regulatory Criteria

Standard Review Plans, Branch Technical Positions, Regulatory Guides and Industrial Codes and Standards, which are applicable to the ESBWR design, are provided in Tables 1.9-20, 1.9-21 and 1.9-22. Applicable revisions are also shown. The applicability column of Tables 1.9-20 and 1.9-21 refers to whether or not the requirement is applicable during Design Certification of the ESBWR. Standard Review Plans, Branch Technical Positions, and Regulatory Guides that apply only during detailed design, construction, fabrication and erection are indicated by a dash in the applicability column and a comment.

In order to simplify the licensing process for future COL applicants, the ESBWR incorporates ASME Code Case N-782 (Reference 1.9-3) by reference. This Code Case endorses the use of the Edition and Addenda of ASME Boiler and Pressure Vessel Code Section III, Division 1, that was applied during Design Certification as an alternative to the requirements of Code paragraphs NCA-1140(a)(2)(a) and NCA-1140(a)(2)(b). Reference 1.9-4 provides additional justification for application of this Code Case to the ESBWR

1.9.3 Applicability of Experience Information

Table 1.9-23 lists NUREGs that have been included as references in the ESBWR DCD. Appendix 1C addresses applicability of US NRC Generic Letters and Bulletins.

1.9.4 COL Information

1.9-1-A SRP Deviations (deleted)

1.9-2-A Experience Information (deleted)

1.9-3-A SRP and Regulatory Guide Applicability

COL applicant will address the applicability of SRPs and Regulatory Guides that refer to "BSP" or "COL" in the Comments column. (Tables 1.9-20 and 1.9-21)

1.9.5 References

1.9-1 Electric Power Research Institute, “Advanced Light Water Reactor Utility Requirements Document,” Revision 6, May 1997.

1.9-2 GE Nuclear Energy; “GE Nuclear Energy Quality Assurance Program Description,” NEDO-11209-04a, Class I (non-proprietary), Revision 8, March 31, 1989.

1.9-3 American Society of Mechanical Engineers, "Use of Code Editions, Addenda and Cases – Section III, Division 1," Case N-782, Approved January 30, 2009.

1.9-4 Letter, Richard E. Kingston (GEH) to USNRC, "Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD," MFN 10-081, March 12, 2010.

Table 1.9-21

NRC Regulatory Guides Applicability to ESBWR

RG No.	Regulatory Guide Title	Appl. Rev.	Issued Date	ESBWR Appli-cable?	Comments
1.76	Design Basis Tornado for Nuclear Power Plants	0	04/1974	Yes	URD optimization – see Table 1.9-21a
1.77	Assumptions Used for Evaluating a Control Rod Ejection Accident for Pressurized Water Reactors	0	05/1974	No	PWR Only. Superseded by RG 1.183 for new plants.
1.78	Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release	1	12/2001	~~Yes~~	COL
1.79	Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors	1	09/1975	No	PWR only
1.81	Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants	1	01/1975	No	ESBWR is a single unit plant
1.82	Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident	3	11/2003	No	No ECCS pumps in ESBWR
1.83	Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes	1	07/1975	No	PWR only
1.84	Design, Fabrication and Materials Code Case Acceptability, ASME Section III	33	08/2005	Yes	Code Case N-782 is also applied as noted in Subsection 1.9.2 and Table 5.2-1.

Table 5.2-1

Reactor Coolant Pressure Boundary Components (Applicable Code Cases)

Number	Title	Applicable Equipment	Remarks
N-782	Use of Code Editions, Addenda, and Cases – Section III, Division I	All	See letter from Richard E. Kingston (GEH) to USNRC, "Request for Addition of ASME Boiler and Pressure Vessel Code Case N-782 to ESBWR DCD," MFN 10-081, dated March 12, 2010.
OMN-13	Requirements for Extending Snubber Inservice Visual Examination Interval at LWR Power Plants	Pipe Supports	Accepted per RG 1.192 Refer to Subsection 3.9.3.7.1