UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 29, 2015

Mr. Donis Shaw
Licensing Manager
AREVA TN
7135 Minstrel Way, Suite 300
Columbia, MD 21045

SUBJECT: FIRST REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF RENEWAL APPLICATION FOR THE STANDARDIZED NUHOMS® SYSTEM (TAC NO. L24964)

Dear Mr. Shaw:

By letter dated November 4, 2014, AREVA, Inc. (AREVA) submitted an application for renewal to the U.S. Nuclear Regulatory Commission (NRC) for Certificate of Compliance (CoC) No. 1004.

The staff has determined that further information is needed to complete its technical review. The request for additional information (RAI) is in the enclosure. Your response should be provided by October 16, 2015. If you are unable to meet this deadline, please notify us in writing, at least one week in advance, of your new submittal date and the reasons for the delay. The staff will then assess the impact of the new submittal date and notify you of a revised schedule. We have developed an updated schedule, as follows. This schedule assumes a second round RAI. If no second RAI is necessary, the schedule may be accelerated.

ACTION	SCHEDULED DATE
Request for Additional Information #2	12/02/2015
Response to RAI #2	02/05/2016
Complete Safety Evaluation Report, Draft CoC, and Draft TS	04/20/2016

Please reference Docket No. 72-1004 and TAC No. L24964 in future correspondence related to this licensing action. If you have any questions, please contact me at (301) 415-7702.

Sincerely,

/RA/

B. Jennifer Davis, Senior Project Manager
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-1004
TAC No. L24964

Enclosures:
1. RAI #1 (non-proprietary)
2. RAI #1 (proprietary)

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Distribution:
MLombard AHsia DMarcano TAhn JNguyen Arigato JCuadrado
G:\SFST\Davis\TN CoC 1004 Renewal/RAI #1 and SER #1/RAI/RAI#1 for 1004 Renewal.doc
ADAMS Package No.: ML15210A777 Letter/Encl. 1: ML15211A007 Encl. 2: ML15211A009

OFC:	**SFM**	**SFM**	**SFM**	**SFM**	**SFM**	SFM	SFM
NAME:	JDavis	DDunn	RTorres	JWise	EGoldfeiz	JBorowsky	SEverard
DATE:	5/28 /2015	6/ 10 /2015	6/ 4 /2015	6/3 /2015	6/ 3 /2015	6/ 4 /2015	6/ 3 /2015
OFC	SFM	SFM	SFM	SFM	SFM		
NAME:	WWheatley	ACsontos	CAraguaz	Z Li for MRahimi	MSampson		
DATE:	6/ 5 /2015	6/24 /2015	6/19 /2015	6/ 27 /2015	7/29/2015		

TRANSNUCLEAR INC.

DOCKET NO. 72-1004

REQUEST FOR ADDITIONAL INFORMATION

RELATED TO RENEWAL OF THE

STANDARDIZED NUHOMS® SYSTEM

By letter dated November 4, 2014, AREVA Inc. (AREVA) submitted an application for renewal to the U.S. Nuclear Regulatory Commission (NRC) for Certificate of Compliance (CoC) No. 1004.

This request for additional information (RAI) identifies additional information needed by the NRC staff in connection with its review of the renewal application. The requested information is listed by topic (dry shielded canister (DSC), horizontal storage module (HSM), etc.) and/or page number in the application and associated documentation. Draft NUREG-1927, Rev. 1, "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel" (ML15068A303) was used by the staff in its review of the application.

Each individual RAI section describes information needed by the staff to complete its review of the application and to determine whether the applicant has demonstrated compliance with the regulatory requirements.

A. Dry Shielded Canisters (DSCs)

A.1 DSC RAIs

DSC-RAI-1: Provide clarification on the classification of the important to safety components for the 24PT2 DSC:

- Basket assembly spacer sleeves are not in Table 3.4-1 of the Updated Final Safety Analysis Report (UFSAR) (FSAR, Rev. 14 NUH-003, September 2014). However, the basket assembly spacer sleeves are identified in Drawing NUH-03-1070, Rev. 2 for the 24PT2S and Drawing NUH-03-1071, Rev. 1 for the 24PT2L. The basket assembly spacer sleeves identified as Safety Classification A item in Table 2A-1 of the CoC renewal application both the 24PT2S and the 24PT2L. Explain why the basket assembly spacer sleeves are not included in Table 3.4-1 of the FSAR, or make them consistent, as necessary.

- Neutron absorber sheets are not in Table 3.4-1 of the UFSAR. However, the neutron absorber sheets are identified in Drawing NUH-03-1070, Rev. 2 for the 24PT2S, and Drawing NUH-03-1071, Rev. 1 for the 24PT2L. The neutron absorber sheet identified as Safety Classification A item in Table 2A-1 of the CoC renewal application both the 24PT2S and the 24PT2L. Explain why the neutron absorber sheets are not included in Table 3.4-1 of the FSAR, or make them consistent, as necessary.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-2: Clarify the classification of the important to safety components for the 24PHB Long Cavity DSC:

- The top cap plate and liner and the bottom cap plate and liner for damaged fuel cell are not in Table 3.4-1 of the UFSAR. The top cap plate and liner and the bottom cap plate and liner are identified in Drawing NUH-HBU-1001-SAR, Rev. 0, and identified as Safety Classification A. The top cap plate and liner and the bottom cap plate and liner are included in Table 2A-1 of the CoC renewal application for the 24PHBS and the 24PHBL. Explain why the top cap plate and liner and the bottom cap plate and liner for damaged fuel cell are not included in Table 3.4-1 of the FSAR, or make them consistent, as necessary.

- The inner grapple ring support is not in Table 3.4-1 of the UFSAR. The inner grapple ring support is identified in Drawing NUH-HBU-1000-SAR, Rev. 3. The inner grapple ring support is identified as a Safety Classification A item in Table 2A-1 of the CoC Renewal Application for the 24PHBS and the 24PHBL. . Explain why the inner grapple ring support is not included in Table 3.4-1 of the FSAR, or make them consistent, as necessary.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-3: Clarify the classification of the important to safety components for the 32PT Dry Shielded Canister (DSC):

- The shear key is not in Table M.2-18 of the UFSAR. The shear key is included in Drawing NUH-32PT-1002-SAR, Rev. 5 as a Safety Classification B item. The shear key is also included in Table 2A-1 of the CoC Renewal Application as an important to safety component. Explain why the shear key is not included in Table 3.4-1 of the FSAR, or make them consistent, as necessary.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-4: Clarify the classification of the important to safety components for the 32PTH1 Dry Shielded Canister (DSC):

- Hardware including spacers and washers are not in Table U.2-19 of the UFSAR. Basket hardware items are included in Drawing NUH-32PTH1-1003-SAR, Rev. 2 and NUH-32PTH1-1004-SAR, Rev. 1 as not important to safety (NITS) but are included as a Category 2 item. These items are also included in Table 2A-1 of the CoC Renewal Application as NITS but included in the scope of the review as a category 2 item. Provide clarification, or edit for consistency, as appropriate.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-5: Provide additional information on the Aging Management Review Results for the 24P Dry Shielded Canister (DSC):

- Clarify whether the spacer discs listed in CoC renewal application Table 1A-9 also include the top spacer disc shown as Item #2 in drawing NUH-03-1020-SAR.

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1A-9. Drawing NUH-03-1023, Rev. 8, sheet 1 of 3, suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1A-9. Drawing NUH-03-1023, Rev. 8, sheet 1 of 3, suggests that the top side of the inner top cover plate is not in an inert gas environment.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-6: Provide additional information on the Aging Management Review Results for the 24P Long Cavity DSC:

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1A-10. Drawing NUH-03-1053, Rev. 5, sheet 1 of 3 suggests that the siphon and vent port cover plates are not in an inert gas environment. Correct typographical error on material type: 304v.

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1A-10. Drawing NUH-03-1063, Rev. 5, sheet 1 of 3 suggests that the top side of the inner top cover plate is not in an inert gas environment.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-7: Provide additional information on the Aging Management Review Results for the 24PT2 DSC:

- Clarify whether the support rod assembly with spacer sleeve in CoC renewal application Table 1C-12 includes all spacer sleeves shown in NUH-03-1070-SAR, Rev. 2, sheet 1 of 4.

- Clarify, and/or reconcile, the aging management review for the cylindrical shell listed in CoC renewal application Table 1C-12. The aging effect listed in Table 1C-12 only includes stress corrosion cracking. Drawing NUH-03-1070-SAR, Rev. 2, sheet 1 of 4, indicates the cylindrical shell is welded stainless steel. For other DSC cylindrical shells in the 1004 CoC renewal application, both the loss of material from localized corrosion and stress corrosion cracking are identified as aging effects requiring management.

- Clarify, and/or correct, the aging management review for the outer bottom cover plate listed in CoC renewal application Table 1C-12. The aging effect listed is stress corrosion cracking. Drawing NUH-03-1070-SAR, Rev. 2, sheet 1 of 4, indicates the outer bottom cover plate is welded stainless steel. For other DSC outer bottom cover plates in the 1004 CoC renewal application, the loss of material from localized corrosion is also identified as an aging effect requiring management.

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1C-12. Drawing NUH-03-1070-SAR, Rev. 2, sheet 4 of 4, suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1C-12. Drawing NUH-03-1070-SAR, Rev. 2, sheet 4 of 4, suggests that the top side of the inner top cover plate is not in an inert gas environment.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-8: Provide additional information on the Aging Management Review Results for the 52B DSC:

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1A-11. Drawing NUH-03-1031-SAR, Rev. 8, Sheet 1 of 3, suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1A-11. Drawing NUH-03-1031-SAR, Rev. 8, Sheet 1 of 3, suggests that the top side of the inner top cover plate is not in an inert gas environment.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-9: Provide additional information on the Aging Management Review Results for the 24PHB DSC:

- Clarify, and/or correct, the aging management review for the inner grapple ring support listed in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR, Rev. 3, sheet 3 of 6, indicates the inner grapple ring support is welded stainless steel in a sheltered environment. For other welded stainless steel DSC components in a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the bottom shield plug, forging types 1 and 2 in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR, Rev. 3, sheet 3 of 6, indicates the bottom shield plug, forging types 1 and 2 are welded stainless steel in a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify the operating environment for the top side of the top shield plug, forging types 1 and 2 in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR, Rev. 3, sheet 5 of 6, indicated the top side of the top shield plug, forging types 1 2 are not in an inert gas environment.

- Clarify the operating environment for the top shield plug plate in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR, Rev. 3, sheet 5 of 6, indicates the top side of the top shield plug plate is not in an inert gas environment.

- Clarify and/or correct the aging management review for the grapple ring of the 24PHB DSC. This grapple ring is not in the aging management review shown in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR Rev. 3, sheet 1 of 6 incorporates by reference drawings NH-03-1021-SAR and NUH-03-1051-SAR which

show that the grapple ring is welded stainless steel in a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the cylindrical shell of the 24PHB DSC. The cylindrical shell component is not in the aging management review shown in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR, Rev. 3, sheet 1 of 6, incorporates by reference drawings NUH-03-1021-SAR and NUH-03-1051-SAR which show that the cylindrical shell is welded stainless steel in a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the outer top cover plate of the 24PHB DSC. The outer top cover plate is not in the aging management review shown in CoC renewal application Table 1E-11. Drawing NUH-HBU-1000-SAR, Rev. 3, sheet 1 of 6, incorporates by reference drawings NUH-03-1023-SAR and NUH-03-1053-SAR which show that the outer top cover plate is welded stainless steel in a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-10: Provide additional information on the Aging Management Review Results for the 61BT DSC:

- Clarify the operating environment for the inner top cover plate in CoC renewal application Table 1C-13. Drawing NUH-61B-1060-SAR, Rev. 6, Sheet 2 of 2 suggests that the top side of the inner top cover plate is not in an inert gas environment.

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1C-13. Drawing NUH-61B-1060-SAR, Rev. 6, Sheet 2 of 2, suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify, and/or correct, the aging management review for the 61BT DSC test port plug in CoC renewal application Table 1C-13. Drawing NUH-61B-1060-SAR Rev. 6, Sheet 2 of 2 indicates that the test port plug is welded stainless steel in a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-11: Provide additional information on the Aging Management Review Results for the 32PT DSC:

- Clarify, and/or correct, the material for the 32PT DSC top shield plug in the aging management review shown in CoC renewal Application Table 1E-10. Drawing NUH-32PT-1001-SAR, Rev. 7, sheet 1 of 3, indicates 32PT DSC top shield plug may be A36 steel with an electroless-Ni coating, or Type 304 stainless steel. CoC renewal application Table 1E-10 implies that the Type 304 stainless steel version of the top shield plug has an electroless-Ni coating.

- Clarify, and/or correct, the aging management review for the 32PT DSC bottom shield plug outer casing in CoC renewal application Table 1E-10. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects. Drawing 32PT-1002-SAR, Rev. 5, sheet 2 of 2, indicates this part does not form part of the pressure boundary, but it is exposed to a sheltered environment. Because it is not part of the pressure boundary an AMP may not be required but it may be included as an indicator of localized corrosion of stress corrosion cracking initiation, as it could be more accessible than other external DSC welds.

- Clarify, and/or correct, the aging management review for the 32PT DSC alternative inner bottom cover plate in CoC renewal application Table 1E-10. Drawing 32PT-1002-SAR, Rev. 5, sheet 2 of 2, indicates the alternative inner bottom cover plate is part of the containment pressure boundary constructed of stainless steel and has a through thickness weld exposed to a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the 32PT DSC shear key in CoC renewal application Tables 1E-10 and 1H-24. Drawing 32PT-1002-SAR, Rev. 5, sheet 1 of 2, indicates the shear key is part welded stainless steel exposed to a sheltered environment. The shear key is not part of the pressure boundary but is needed to facilitate DSC removal and placement. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the 32PT DSC shell bottom in CoC renewal application Table 1E-10. Drawing 32PT-1002-SAR, Rev. 5, sheet 2 of 2, indicates the shell bottom is part of the containment pressure boundary constructed of stainless steel and has a through thickness weld exposed to a sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-12: Provide additional information on the Aging Management Review Results for the 24PTH DSC:

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1F-13. Drawing NUH24PTH-1001-SAR, Rev. 5, sheet 3 of 4, suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1F-13. Drawing NUH24PTH-1001-SAR, Rev. 5, sheet 3 of 4, suggests that the top side of the inner top cover plate is not in an inert gas environment.

- Clarify, and/or correct, the aging management review for the 24PTH shell assembly bottom forging in CoC renewal application Table 1F-13. Drawing NUH24PTH-1002-SAR lists 4 types of forgings (Items 7, 8, 14, and 15) all with a through thickness weld to the cylindrical shell that is exposed to the sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the 24PTHF basket assembly aluminum insert in CoC renewal application Table 1J-13. This item is listed as safety classification A, but the environment and the safety functions are listed as N/A in table 1J-13.

- Clarify, and/or correct, the aging management review for the 24PTH inner grapple ring support in CoC renewal application Table 1F-13. Based on Drawing NUH24PTH-1002-SAR, Rev. 2, sheet 2 of 3, the inner grapple ring support appears to be in sheltered environment and is welded 304 SS, however this items is missing from Table 1F-13. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-13: Provide additional information on the Aging Management Review Results for the 61BTH DSC:

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1H-20. Drawing NUH61BTH-2000-SAR, Rev. 2, Sheet 4 of 4, suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1H-20. Drawing NUH61BTH-2000-SAR, Rev. 2, Sheet 4 of 4, suggests that the inner top cover plate is not in an inert gas environment.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-14: Provide additional information on the Aging Management Review Results for the 32PTH1 DSC:

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1H-21. Drawing NUH32PTH1-1001-SAR, Rev. 2, Sheet 2 of

3, suggests that the top side of the inner top cover plate is not in an inert gas environment.

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1H-21. Drawing NUH32PTH1-1001-SAR Rev. 2, Sheet 2 of 3 suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify, and/or correct, the aging management review for the shell bottom, inner, in CoC renewal application Table 1H-21. Drawing NUH-32PTH1-1002-SAR, Rev. 1, sheet 2 of 2, item No. 4, shows the shell bottom, inner, has a through thickness weld to the cylindrical shell that is exposed to the sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Clarify, and/or correct, the aging management review for the shell bottom, recessed, in CoC renewal application Table 1H-21. Drawing NUH-32PTH1-1002-SAR, Rev. 1, sheet 2 of 2, item No. 8, shows that the shell bottom, recessed, has a through thickness weld to the cylindrical shell that is exposed to the sheltered environment. For other welded stainless steel DSC components exposed to a sheltered environment inside the HSM, the 1004 CoC renewal application aging management review identifies loss of material from localized corrosion and stress corrosion cracking as potential aging effects.

- Correct typographical error in the CoC renewal application Table 1H-21 for the transition rail nut material. Drawing NUH32PTH1-1003-SAR, Rev. 2, sheet 1 of 5, indicates that the transition rail nut should be ASME SA-194 Grade 8.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-15: Provide additional information on the Aging Management Review Results for the 69BTH DSC:

- Clarify the operating environment for the top side of the inner top cover plate in CoC renewal application Table 1J-15. Drawing NUH69BTH-72-1002, Rev. 0 suggests that the top side of the inner top cover plate is not in an inert gas environment.

- Clarify, and/or correct, the operating environment for the outer top cover plate in CoC renewal application Table 1J-15. Drawing NUH69BTH-72-1002, Rev. 0 suggests that outer top cover plate is in a sheltered environment, however, the environment listed in Table 1J-15 is "Inert Gas". CoC renewal application Table 1J-15 identifies that the 69BTH outer top cover plate is covered by an AMP.

- Clarify the operating environment for the siphon and vent port cover plates in CoC renewal application Table 1J-15. Drawing NUH69BTH-72-1002, Rev. 0 suggests that the siphon and vent port cover plates are not in an inert gas environment.

- Clarify the operating environment for the top side of the inner top cover plate for the alternate top closure in CoC renewal application Table 1J-15. Drawing NUH69BTH-72-1004, Rev. 0 suggests that the top side of the inner top cover plate on the alternate top closure is not in an inert gas environment.

- Clarify the operating environment for the siphon and vent port cover plates for the alternate top closure in CoC renewal application Table 1J-15. Drawing NUH69BTH-72-1004, Rev. 0 suggests that the siphon and vent port cover plates on the alternate top closure are not in an inert gas environment.

- Clarify the operating environment for the top shield plug outer plate on the alternate top closure in CoC renewal application Table 1J-15. Drawing NUH69BTH-72-1004, Rev. 0 suggests that the top shield plug outer plate on the alternate top closure is not in inert gas environment.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-16: Provide additional information on the Aging Management Review Results for the 37PTH DSC:

- Clarify if the shell bottom inner cover in CoC renewal application Table 1J-16 includes the shell bottom, recessed, shown as Item #8 Option 3 in Drawing NUH-37PTH-72-1003.

- Clarify, and/or correct, the operating environment for the 37PTH DSC test port plug listed in CoC renewal application Table 1J-16. Drawing NUH37PTH-72-1004, Rev. 0 indicates that the test port plug is in a sheltered environment, however, the environment listed in Table 1J16 is "Inert Gas". CoC renewal application Table 1J-16 indicates the 37PTH test port plug plate is covered by an AMP.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-17: Provide additional information on the assessment of the DSC Materials and Environments and specifically indicate if gamma radiation will be sufficient to alter the environment if deliquescence of deposited salts occurs. Specifically address whether the formation of oxidizing species such as H_2O_2 or HNO_3 are possible. If oxidizing species are expected, provide an evaluation of the effects of these species on pitting and stress corrosion cracking (SCC) susceptibility and propagation rates. See Section 3.4.1 of the application.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-18: Provide additional information on the assessment of galvanic corrosion in the Aging Effects/Mechanisms for the Dry Shielded Canisters during the Period of Extended Storage.

- Provide a definitive assessment of the potential for galvanic corrosion as a potential aging mechanism for the stainless steel DSC. CoC renewal application Section 3.5.4.2 does not provide a definitive conclusion regarding galvanic corrosion as a potential aging mechanism requiring management.

- Provide additional information on the information cited to support the lack of galvanic corrosion between stainless steels and graphite lubricants. The information provided in the CoC renewal application does not clearly identify examples of where graphite lubricants are used in contact with stainless steels in operating reactors, or if these operating experiences are under similar environmental conditions to the operating environment for the DSC. Note that valve packing material using graphite typically

includes either zinc (low temperatures only, to avoid molten zinc and liquid metal embrittlement), or phosphorous, as corrosion inhibitors. Although austenitic stainless steels are noted to be less susceptible than martensitic stainless steels often used in valve components, austenitic stainless will still be preferentially anodic when coupled to graphite.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-19: See enclosure 2.

DSC-RAI-20: See enclosure 2.

DSC-RAI-21: See enclosure 2.

DSC-RAI-22: Provide additional information to support the assessment that temporary attachments will not result in areas of sensitization and residual stresses that may lead to increased susceptibility to intergranular corrosion, and stress corrosion cracking. CoC renewal application Section 3.5.4.7 states that welding and grinding can result in temperatures above those needed for sensitization; however, the substrate would cool rapidly and deny the opportunity for sensitization to occur. In addition, CoC renewal application Section 3.5.4.7 also states that the residual tensile stresses from welding and grinding to remove temporary attachments would be confined to a very narrow near surface region of the DSC shell thickness and any cracking that initiated would be arrested at a shallow depth. No data is provided to support these assessments. According to time temperature sensitization diagrams for stainless steels, the time at temperature needed to induce sensitization is a function of the carbon content of the stainless steel, with standard grade 304 with up to 0.08 percent carbon a cooling rate of 300°C/min (5°C/second) would be necessary from 900 to 600°C to avoid any sensitization of stainless steel.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-23: Provide additional information to support the assessment in Sections 3.5.3 and 3.5.4.1 of the CoC renewal application that indicates elevated temperature exposure will not result in a change in mechanical properties requiring management in the period of extended operation for the welded stainless steel components including the DSC basket. The CoC renewal application indicates that the average helium temperature inside the DSC reaches 573°F [300°C] at the beginning of storage for the bounding heat load DSC, the 32PTH1 with an initial heat load of 40.8 kW. Bounding temperatures for the aluminum components in the basket are stated in the renewal application Section 3.5.4.3 to reach up to 680°F [360°C]. Elevated temperature exposures of austenitic stainless steel welds can result in a significant change in material properties. For example, NUREG/CR–6428 (Gavenda et a., 1996) shows that fracture toughness of austenitic stainless steel welds can be decreased by spinodal decomposition of the delta ferrite phase, and depending on temperature, G-phase can also be formed. Chandra et al. (2012) showed that the spinodal decomposition of 304L welds can occur at temperatures as low as 635°F [335°C] and significant hardening occurs at 752°F [400°C] in 500 hours.

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-24: Provide additional information to support the assessment in Section 3.5.3 of the CoC renewal application that states that elevated temperature exposure will not result in a change in mechanical properties requiring management in the period of extended operation for

the Al 6061 used in the DSC basket transition rails. The CoC holder provided an evaluation of creep for Al 6061 and Al 1100 in Section 3.5.4.3 of the CoC renewal application. However, it is known that both elevated temperature and neutron irradiation can affect the properties of Al 6061. Neutron effects are not observed until >10^{20} n/cm^2. Temperature affects the allowable stress for all tempers including T4, T451, T6, and T651, but especially for the T6 and the T651 tempers (ASME, 2013). In addition, ASME Section II, Part D, Table 1B requires that time dependent properties must be used for exposures above 350°F [177°C]. According to the CoC renewal application Section 3.5.4.3, the representative temperatures for the transition rails are between 470°F [243°C] to 390°F [199°C] for the time ranging from 0 to 10 years after loading. These temperatures will result in a significant decrease in mechanical properties according to the information provided in ORNL/TM-13049 (Farrell, 1995).

This information is required to demonstrate compliance with 10 CFR 72.240.

DSC-RAI-25: See enclosure 2.

DSC-RAI-26: See enclosure 2.

DSC-RAI-27: See enclosure 2.

A.2. References for Dry Shielded Canisters (DSCs) RAIs

American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Section II, “Materials Part D Properties (Customary),” The American Society of Mechanical Engineers 2013.

American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components.” The American Society of Mechanical Engineers, 2004.

K. Chandra, V. Kain, V.S. Raja, R. Tewari, and G.K. Dey, “Low temperature thermal ageing embrittlement of austenitic stainless steel welds and its electrochemical assessment,” Corrosion Science Vol 54, pp. 278–290, 2012.

A. Cook, N. Stevens, J. Duff, A. Mishelia, T. Leung, S. Lyon, J. Marrow, W. Ganther, I. Cole et al., “Atmospheric-Induced Stress Corrosion Cracking of Austenitic Stainless Steel Under Limited Chloride Supply,” 18th International Corrosion Congress, 2011.

K. Farrell, “Assessment of Aluminum Structural Materials for Service within the ANS Reflector Vessel,” ORNL/TM-13049, August 1995.

D. J. Gavenda, W. F. Michaud, T. M. Galvin, W. F. Burke, and O. K. Chopra, “Effects of Thermal Aging on Fracture Toughness and Charpy–Impact Strength of Stainless Steel Pipe Welds,” NUREG/CR–6428, ANL–95/47, Washington, DC: U.S. Nuclear Regulatory Commission, 1996.

H. Hayashibara, M. Mayuzumi, Y. Mizutani, and J-I, Tani, “Effects of temperature and humidity on atmospheric stress corrosion cracking of 304 stainless steel,” NACE International Corrosion 2008 Conference, Paper No 08492, 2008.

X. He, T.S. Mintz, R. Pabalan, L. Miller, G. Oberson, "Assessment of Stress Corrosion Cracking Susceptibility for Austenitic Stainless Steels Exposed to Atmospheric Chloride and Non-Chloride Salts," NUREG/CR-7170, ML14051A417, Washington, DC: U.S. NRC (2014).

NRC Information Notice 2012-20, "Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canister," U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards.

W.A. Nowinowski, Letter to the U.S. Nuclear Regulatory Commission on Outside Diameter Stress Corrosion Cracking Final White Paper, PWROG PA-MSC-0474, NRC October 14, 2010, ADAMS ML110400241.

K. Shirai, J. Tani, H. Takeda, M. Wataru, T. Saegusa, "SCC Evaluation Test of Multi-Purpose Canister," Water Reactor Fuel Performance Meeting, Paper T4-012, Sept. 11-14, 2011, Chengdu, China, (2011).

J. Tani, M. Mayuzumi, and N. Hara, "Initiation and Propagation of Stress Corrosion Cracking of Stainless Steel Canister for Concrete Cask Storage of Spent Nuclear Fuel," Corrosion, Vol. 65, No. 3, pp. 187-194, 2009.

M. Tokiwai, H. Kimura, H. Kusanagi, "The amount of chlorine contamination for prevention of stress corrosion cracking in sensitized type 304 stainless steel," Corrosion Science, Vol. 25 Issue 8–9, pp. 837–844, (1985).

K. Waldrop, "Initial Voluntary Canister Inspections," NRC Spent Fuel Management – REG CON 2014, NRC ADAMS ML14323A939, November 20, 2014.

M. Wataru, K. Shirai, J. Tani, H. Takeda, T. Segusa., "Sea Salt Deposition on Canister Surface of Concrete Cask," ISSF 2010 in CRIEPI, November 16, 2010. http://www.denken.or.jp/result/event/seminar/2010/issf/pdf/5-2_powerpoint.pdf

P. Wood, N.R. Smart, C.A. Powell, "Condition Monitoring of Radioactive Waste Packages: Experience with the 4 Metre Box," Corrosion 2005 paper 05596, Houston, TX: NACE International, 2005.

B. Horizontal Storage Modules (HSMs)

HSM-RAI-1: Revise Tables 1A-12, 1B-10, 1C-14 and 1H-28 to provide a one-to-one correlation with the subcomponents listed in Table 2B-1. Revise Tables 1F-14, 1G-18, 1H-30 and 1J-17 to provide a one-to-one correlation with the subcomponents listed in Table 2B-2. Revise Tables 1H-22, 1I-12 and 1J-17 to provide a one-to-one correlation with the subcomponents listed in Table 2B-3. Revise Tables 1F-15 and 1H-29 to provide a one-to-one correlation with the subcomponents listed in Table 2B-4.

Tables 2B-1 thru 2B-4 comprehensively identified subcomponents per HSM design bases drawings. However, the applicant aggregated subcomponents in the AMR result tables where the subcomponents are not identified per the scoping evaluation. The applicant is asked to revise the AMR result tables to provide a one-to-one correlation with the scoping evaluation tables. The correlation helps ensure that all subcomponents are accounted in the AMR process.

This information is required to ensure compliance with 72.240.

HSM-RAI-2: Provide drawing NUH-03-6017-03, Rev. 5B.

Table 2B-1 lists two subcomponents for the cask alignment target embedment, which reference drawing NUH-03-6017-03. The drawing is not in Appendix E.2 of the UFSAR, Rev. 14, nor referenced in Table 2E.2 of the renewal application. The applicant is asked to provide the relevant drawing for these subcomponents so the staff can complete the review.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI-3: Provide drawing NUH-07-2109-SAR.

Drawing NUH-03-6008-SAR, "Standardized NUHOMS® ISFSI Horizontal Storage Module ISFSI General Arrangement," references drawing NUH-07-2109-SAR, "CASK/HSM RESTRAINT SYSTEM". The referenced drawing is not in Appendix E.2 of the UFSAR, Rev. 14, nor referenced in Table 2E.2 of the renewal application. The applicant is asked to provide the referenced drawing so the staff can complete the review.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI 4: Clarify the intended function of subcomponents 1, 4 and 5 of Drawing NUH-03-6018-SAR. Reconcile the scoping evaluation for subcomponents 1-6 of Drawing NUH-03-6018-SAR with the more recent revision of the drawing incorporated in UFSAR, Rev. 14.

Subcomponents 1, 4 and 5, "Pipe Sleeve", "Angle" and "Studs" in Table 2B-1 are identified to mitigate cosmetic damage during handling and installation and therefore not within the scope of renewal. The drawing references specification NUH-03-114 for requirements of construction. The staff has not reviewed this specification and is unclear about the intended function of these items. The applicant is asked to provide additional clarification to justify the exclusion of these subcomponents.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI-5: Revise Table 2B-1 to include the material of construction for subcomponent 6 of drawing NUH-03-6018-SAR.

Table 2B-1 does not identify the material of construction of subcomponent 6, "Std Washer Ø1 1/8" of drawing NUH-03-6018-SAR. The subcomponent is identified to be within the scope of renewal. The staff requires the information to complete the review.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI-6: Clarify the intended function of subcomponents 10, 11 and 17 of drawing NUH-03-6024-SAR.

Subcomponents 10, 11 and 17, "Plate", "Pipe" and "Tube" are identified to not affect a safety function in the case of failure. The drawing references specification NUH-03-115 for requirements of construction. The staff has not reviewed this specification and is unclear about the intended function of these items. The applicant is asked to provide additional information to justify the exclusion of these subcomponents.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI-7: Revise Table 2B-1, "Scoping Evaluation for HSM 80 and HSM 102," to account for the following:

- Subcomponents 9 and 12 of Drawing NUH-03-6017-01-SAR
- Subcomponents 13, 14, 18, in Drawing NUH-03-6008-SAR

The listed subcomponents are not identified in Table 2B-1. Their exclusion from the scope of renewal has not been justified.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI-8: Justify the determination that the support structure steel of the HSM Model 80 will not be subject to aging effects.

The support structure steel in Table 1A-12 (page 1A-42) is identified to be constructed of ASTM A36 carbon steel and to provide structural support to the DSC. These subcomponents are subject to material loss due to general corrosion in a sheltered environment, as revealed by the lead inspection results from the Calvert Cliffs ISFSI. The inspections of two HSM modules revealed general corrosion of interior carbon steel surfaces and bolting hardware (Figure 8, ML12212A216). The applicant is asked to justify any determination to the contrary.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-9: Clarify the intended function of the canister axial retainer sleeve (ASTM A36 or ASTM A500 Grade B) identified in Tables 1A-12, 1B-10, 1C-14.

The subcomponent is identified in Tables 1A-12, 1B-10, 1C-14 as not important to safety, but it does not appear to be listed in Table 2B-1. The applicant is asked to reconcile the scoping evaluation with the aging management review for the HSM model 80 and model 102. The staff requires the information to complete the review.

This information is required to ensure compliance with 10 CFR 72.236(b) and 72.240.

HSM-RAI-10: Revise the following tables to address the aging effect of loss of material due to general and crevice corrosion for Category B steel embedments, or justify the determination that the aging effect is not applicable.

Table 1A-12 (HSM model 80):

- Cask docking ring assembly (rings, plates, studs, door clamps, door bolts, nuts, washers)
- Heat shield embedment assemblies (bolts, sleeve nuts)
- Cask restraint embedment assembly (rods, sleeve nuts, hexagonal nuts)
- Miscellaneous embedment assemblies (sleeve nuts)

Table 1F-14 (HSM model H):

- Main assembly embedments (for rail extension, door, attachment, cask restraint, shield wall, etc.)
- Main assembly (rear connection plate)

Table 1F-15 (HSM model 152):

- Threaded insert Dayton superior
- Tube steel
- Expanded coil insert Dayton superior
- Plate

Table 1I-12 (HSM model HS):

- Main assembly (roof attachment, #7 bar with threaded head)
- Main assembly (roof attachment, coupling nut)

The application does not justify why loss of material due to general and crevice corrosion is not an applicable aging effect for embedments in the concrete structure. The lead inspection results from the Calvert Cliffs ISFSI revealed general corrosion of interior carbon steel surfaces and bolting hardware (Figure 8, ML12212A216). Section 3.6.4.2, of the renewal application, states that corrosion of embedded steel can be an aging degradation mechanism for concrete structures. Section 3.6.4.2 further states that if the concrete is degraded by other mechanisms, which may reduce the protective cover of the steel, corrosion may occur at a significantly higher rate. The applicant is asked to clarify if the aging management program will rely on visual inspection of internal surfaces of the HSM to determine if the intended functions of embedments are compromised.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-11: Revise Table 1C-12 to address the design change incorporating the reinforced concrete shielded door.

Section 1C.1.4.3 of the renewal application identifies the changes incorporated in HSM model 102 relative to the earlier HSM model 80. One of the changes involved replacing the composite door with steel liners on all faces by a reinforced concrete shield door (with a steel liner on the inside only). This is confirmed by the scoping evaluation in Table 2B-1. However, the AMR in Table 1C-12 does not reflect the change. The applicant is asked to address the new subcomponent and potential aging effects in Table 1C-12. The staff requires the information to complete the review.

This information is required to ensure compliance with 10 CFR 72.236(d, e) and 72.240.

HSM-RAI-12: Justify the determination that the liner plates for the inlet and outlet vents of the HSM model 102 are not subject to the aging effect of loss of material due to general corrosion, or revise Table 1C-14 to address the aging effect and identify an aging management activity.

The liner plates of the inlet and outlet vents in Table 1C-14 are identified to be constructed of ASTM A36 carbon steel and to provide shielding. These subcomponents are subject to material loss due to general corrosion in an external environment. The applicant is asked to justify a determination to the contrary, or revise Table 1C-14 to address the aging effect and identify an aging management activity.

This information is required to ensure compliance with 10 CFR 72.236(d) and 72.240.

HSM-RAI-13: Revise Tables 1F-14 (HSM model H), 1F-15 (HSM model 152) and IH-29 (HSM Model 152) to address the aging effect of loss of material due to localized corrosion for the

support rail plate of the HSM-H and HSM-152 models, or justify the determination that these models are not subject to the aging effect.

The support rail plate in Tables 1F-14 (HSM model H), 1F-15 (HSM model 152) and IH-29 (HSM Model 152) is identified to be constructed of NITRONIC 60®/ UNS S21800 austenitic steel. The applicant further identified the plate as not important to safety, although failure would prevent fulfillment of an important to safety function (i.e., to provide structural support to the DSC). The plates are further identified to provide corrosion protection due to potential galvanic corrosion between the support structure and the DSC, and reduce friction during loading/unloading operations. The subcomponent is subject to loss of material due to localized corrosion in a sheltered environment, as was stated in Tables 1A-12 and 1H-22 for the HSM model 80 and HSM model HS, respectively. The application should justify any determination to the contrary for models HSM-H and HSM-152, or revise Tables 1F-14 (HSM model H), 1F-15 (HSM model 152) and IH-29 (HSM Model 152) to address aging effect and identify an aging management activity.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-14: Justify the determination that the alternate 2 side and top heat shield main assembly for the HSM-H model is not subject to aging effects, or revise Table 1G-18 and identify an aging management activity.

The alternate 2 side and top heat shield main assembly in Table 1G-18 is identified to be constructed of stainless steel and to provide shielding and heat transfer from the DSC. The subcomponent is subject to loss of material due to localized corrosion in a sheltered environment. The applicant is asked to justify a determination to the contrary, or revise the table and identify an aging management activity.

This information is required to ensure compliance with 10 CFR 72.236(f) and 72.240.

HSM-RAI-15: Provide a technical basis for the conclusion that tensile stresses in the HSM structural bolting are not sufficiently high to initiate stress corrosion cracking. Clarify if lubricants are used for the installation of structural bolting.

The applicant stated that bolting fabricated from high-strength (actual measured yield strength, Sy, ≥ 150 ksi) low-alloy steel (ASTM A193 Gr. B7) is susceptible to stress corrosion cracking. NUREG-1801 includes low-alloy structural bolting in the Structures Monitoring AMP (XI S.6), which also relies on preventive actions delineated in EPRI NP-5769, NP-5067 and TR-104213, to ensure proper installation torque and prevent cracking of high strength bolting. Design-bases drawings for the HSM models reference different revisions of the AISC steel construction manual. The 2010 revision of that manual, states that there is no minimum of maximum tension requirements for snug-tight bolts. It further states that the magnitude of the clamping force that exists in a snug-tightened joint is not a consideration and need not be verified. The applicant is asked provide a technical basis (valid analyses, references, fabrication specifications) that ensure that tensile stresses of low-alloy structural bolting are not sufficient to initiate stress corrosion cracking.

NUREG-1801 also states that operating experience and laboratory examinations show that the use of molybdenum disulfide (MoS_2) as a lubricant is a potential contributor to stress corrosion cracking (SCC), especially when applied to high strength bolting. The applicant is also asked to clarify if lubricants are used for the installation of structural bolting.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-16: Provide an evaluation for the disposition of the aging effect of change in materials properties due to elevated temperatures for aluminum, carbon steel and stainless steel subcomponents.

Section 3.6.4.3 identified the aging effect of change in materials properties due to elevated temperatures for aluminum, carbon steel and stainless steel subcomponents. However, Section 3.6.4.4 of the application did not provide a technical basis for disposition of the identified effect/mechanism.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-17: See enclosure 2.

HSM-RAI-18: Clarify how degradation of silicone sealants used during previous repairs will be addressed by the HSM Aging Management Program for External and Internal Surfaces.

Table 3.2-1, “Operating Experience Documentation of Potential Age-Related Degradation,” identifies operating experience (OE ID#3) of an advanced horizontal storage module (ASHM) where concrete was chipped to about 36” wide by 48” high from an event-driven crack. Although the event was not age-related, degradation of polymeric sealants may lead to ingress of water with further potential degradation due to freeze-thaw, leaching of $CaOH_2$, corrosion of the reinforcement and alkali-silica reaction. The disposition section states that potential degradation of the silicone sealant is an inspection attribute in the aging management review and monitoring inspections. However, the HSM Aging Management Program for External and Internal Surfaces does not include degradation of repair sealants.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-19: Revise the Aging Management Program to address aging effects of the below-grade section of the concrete pad, which was identified in Section 2.3.1 to be within the scope of renewal.

The applicant stated that the concrete pad is classified as not important to safety, as verified in Section 3.4.3 of the UFSAR, Rev. 14. The applicant determined that the pad is within the scope of renewal since its failure may impact the structural stability of the HSM, which is important to safety (Section 2.3.1 of the renewal application). However, the applicant excluded the below-grade section of the concrete pad from the aging management review (Sections 3.3.2 and 3.4.1 of the renewal application). The applicant further states in Section 6A.5.4 that aging management of the below grade portion (underground environment) of the ISFSI storage pad (e.g., groundwater chemistry sampling) is the general licensee’s responsibility and is not within the scope of the HSM AMP for External and Internal Surfaces. The applicant is asked to revise the aging management review and provide an aging management program to address potential degradation of the below-grade section of the pad structure. The staff notes that the responsibility of developing aging management activities (TLAAs or AMPs) resides in the CoC holder, as the applicant for the CoC renewal, and the owner of the storage cask design. General licensees are responsible for implementing AMPs. If there is an AMP that specifies that it is not applicable to certain users (e.g., if it is not applicable in certain climates or

environments), the general licensee can include the technical justification in its 10 CFR 72.212(b)(5) report for not implementing such an AMP.

This information is required to ensure compliance with 10 CFR 72.240.

HSM-RAI-20: Clarify in the HSM aging management review if aging effects from carbonation of concrete will be managed.

Carbon dioxide, present in the atmosphere, has been found to react with calcium hydroxide or other lime-bearing compounds in hardened concrete to produce a reduction in volume (i.e., shrinkage) and an increase in weight. Carbonation of concrete decreases the alkalinity of the hydrated cement paste in which the reinforcement bars are embedded (see NUREG/CR-7116). The increased pH, in conjunction with oxygen diffusion and the availability of pore water promotes rebar corrosion. The HSM AMP has identified corrosion of embedded steel for reinforced concrete as an aging mechanism, with carbonation as a causing factor. However, the HSM aging management review does not discuss carbonation leading to corrosion of the rebar. The applicant is asked to clarify the discussion in the HSM AMR.

This information is required to ensure compliance with 10 CFR 72.240.

C. Transfer Casks

TC-RAI-1: Justify the description of the transfer cask external environment as being “sheltered” in the AMR results tables, given that (1) there are no requirements for the transfer casks to be stored in a building or otherwise sheltered from precipitation and (2) casks leased by AREVA to several sites may spend a significant amount of time in use.

Section 6A.7.5.2, of the renewal application, states that the transfer casks should be stored in conditions that prevent exposure to precipitation or condensation. However, there is no requirement to do so in either the UFSAR or CoC.

Additional information, including operational data, is needed to support the position that transfer casks have not, and will not, spend a significant amount of time exposed to outdoor conditions. Absent such assurance, the AMR results tables should be revised to reflect the potential for prolonged exposure to outdoor conditions.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-2: Revise the AMR results tables for the transfer cask subcomponents that are either continuously or intermittently exposed to the liquid (water) neutron shield to include an AMR line item for that environment.

The AMR results tables for transfer casks with liquid neutron shielding (including the light neutron shield assembly for the OS197L TC) do not include AMR line items that evaluate aging for the shield-side environment. Some examples include:

- The structural shell of transfer casks, which is embedded against lead on one side and exposed to water shielding on the other. The AMR results in Table 1A-13 only include the “Embedded/Encased” environment.

- The neutron shield panel plates, which are exposed to water shielding on one side and the external environment on the other. The AMR results in Table 1A-13 only include the "Sheltered" (external) environment.
- The neutron shield panel support angles, which are exposed to water shielding. The AMR results in Table 1A-13 only include the "Embedded/Encased" environment.

This information is needed to demonstrate compliance with 10 CFR 72.236(d) and 72.240.

TC-RAI-3: Provide additional justification in Section 3.7.4.2 of the renewal application for why galvanic corrosion is not an aging effect requiring management for instances in which a carbon steel trunnion sleeve is in contact with a stainless steel structural shell and neutron shield panel, given that a liquid (water) neutron shield may be present to act as an electrolyte.

The Transfer Cask Aging Management Program recommends, but does not require, the use of demineralized water as the neutron shield. The AMP refers to the potential for chlorine and hard water deposits in municipal water to cause deterioration in the shield.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-4: Provide additional justification in Section 3.7.4.2 of the renewal application for why stress corrosion cracking is not an aging effect requiring management for the external stainless steel surfaces and fasteners of the transfer casks. Alternatively, revise the transfer cask AMR results and aging management program to include stress corrosion cracking as an aging effect.

Section 3.7.4.2 of the renewal application states that stainless steel transfer cask subcomponents are not susceptible to stress corrosion cracking because they are not exposed to temperatures above 30ºC (86ºF) for prolonged periods.

The staff noted that operating experience does not support the proposed 30ºC stress corrosion cracking threshold. In 2001, Koeberg Nuclear Power Station experienced externally-initiated through-wall stress corrosion cracking of stainless steel tanks that were maintaining water between 7 and 40ºC (NRC Information Notice 2012-20).

In addition, if a lower temperature threshold for SCC were to be justified, additional information is nevertheless required to support the position that the transfer casks are not exposed to conditions that may be conducive to stress corrosion cracking. The staff noted that the site-specific parameters permitted by the CoC include average daily ambient temperatures up to 100ºF (Section 1.1.1 of the TS, Amendments 0 through 10; Amendment 10 adds up to 106ºF for the 32PTH1 DSC, and Section 4.3.3.3 of the TS for Amendments 11-13).

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-5: Regarding the evaluation for the need to manage the aging of coatings on carbon steel transfer cask subcomponents:

a. Provide additional information to support Section 3.7.4.4 of the renewal application, in which coatings are described as not being credited for the prevention of aging effects (and thus not required to be managed). Alternatively, revise the transfer cask AMR and AMP to manage coating degradation.

Section 1.2.2 of the UFSAR, “Principal Design Criteria,” (NUH-003, Rev. 14), states “Given the corrosion resistant properties of materials and coatings used for construction…no limits on the range of acceptable external atmospheric conditions are required.” Section 1.2.2 continues: “All components are either stainless steel, are coated with inorganic coatings, or are galvanized. Hence, all metallic materials are protected against corrosion.”

Section 4.6 of the UFSAR, “Cathodic Protection,” (NUH-003, Rev. 6) justifies the lack of cathodic protection by stating “[a]ny carbon steel used in the transfer cask is protected from corrosion by suitable coatings”.

The NRC staff noted that coating degradation not only exposes metal surfaces to potentially corrosive external environments, but also may create particularly aggressive local conditions by trapping moisture between the coating and bare metal.

b. After the evaluation of part (a), if coatings remain as not being credited for the prevention of aging effects, revise the Transfer Cask Aging Management Program and its UFSAR Supplement to remove any references to coating inspection activities.

If coatings are not credited for managing loss of material, the references to coatings inspections in the Transfer Cask AMP may create uncertainty for the general licensee and regulator when the AMP is enacted.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-6: Justify why the Transfer Cask Aging Management Program does not include aging management activities for surfaces that are intermittently wetted with the neutron shield water.

Section 6A.7.5.1 of the renewal application states that “[i]f water is drained from the neutron shield at the end of each loading campaign…no inspection of the neutron shield is required.” Conversely, Section 3.7.4.2, of the application, states that carbon steel and stainless steel are susceptible to corrosion in periodically immersed environments. Also, the transfer cask AMR results tables cite loss of material as an aging effect for other cask surfaces that are intermittently wetted, such as the inner liner plate that is exposed to the demineralized water in the annulus between the TC and DSC during fuel loading.

Section 6A.7.5.2 recommends, but does not require, the use of demineralized water as the neutron shield. This section refers to the potential for chlorine and hard water deposits in municipal water to cause deterioration in the shield.

This information is needed to demonstrate compliance with 10 CFR 72.236(d) and 72.240.

TC-RAI-7: Revise the Transfer Cask Aging Management Program to include the specific acceptance criteria for the neutron shield water testing and provide the technical justification for how the parameters monitored and acceptance criteria for the water testing will be capable of detecting corrosion and providing for timely corrective actions.

The Transfer Cask AMP states that analyzing the neutron shield water for radioactivity, specific gravity, and fluid purity will provide evidence of corrosion of steel and stainless steel component in contact with the water. However, no details are provided regarding the specific acceptance criteria for those parameters. Also, no technical justification is provided to show that water

chemistry monitoring has sufficient sensitivity to detect corrosion in the neutron shield – in particular localized corrosion, such as pitting, that may have a very limited effect on the water chemistry. This information is needed to demonstrate the feasibility of this corrosion detection technique.

This information is needed to demonstrate compliance with 10 CFR 72.172, 72.236(d) and 72.240.

TC-RAI-8: Provide the technical basis for the use of annual VT-2 inspections to identify degradation of the transfer cask liquid neutron shield components prior to the loss of their structural and shielding intended functions.

The Transfer Cask Aging Management program includes the optional use of VT-2 leakage inspections to identify degradation of the liquid neutron shield jacket. Additional information is needed to support the position that leaks are a sufficient early indicator of degradation prior to challenging the jacket component intended functions (e.g., that potential degradation prior to a leak won't challenge the ability of the shield to maintain its structural function and that the timing of the inspections (once per year) is sufficient to identify leakage that could drain the jacket and prevent it from maintaining its shielding function).

The NRC staff noted that Section 4.5.1 of the UFSAR, "Routine Inspection," (NUH-003, Rev. 6) includes an activity to visually inspect the neutron shield jacket prior to each use of the transfer cask; however, the parameters monitored for this activity are not defined in the UFSAR and this activity is not credited in the aging management program.

This information is needed to demonstrate compliance with 10 CFR 72.236(d) and 72.240.

TC-RAI-9: Revise the Transfer Cask Aging Management Program and UFSAR Supplement to fully describe the extent of examination for the visual inspections of the surfaces of the casks (all), and the supplemental shielding (OS197L TC).

The Transfer Cask AMP and UFSAR do not fully describe the extent (coverage) of the visual inspections of some cask component surfaces. It is unclear to the staff (1) whether the visual inspections are to be conducted on 100 percent of the exterior surfaces and (2) whether the scope of these inspections is also extended to surfaces that are normally obstructed by the top cover assembly (e.g., cask cavity / inner liner plates). Also, although the inspection of the OS197L supplemental shielding is described in the AMP program description, it is not described in the AMP elements or UFSAR Supplement.

The AMR results for transfer cask inner liner plates state that these subcomponents are susceptible to loss of material and this aging effect is addressed with an aging management program. However, the Transfer Cask AMP does not provide specific direction for these components to be visually inspected for loss of material.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-10: Regarding the Transfer Cask Aging Management Program, justify the use of ASME Section XI VT-3 examinations, rather than VT-1, to detect wear on the transfer cask rails and pitting and crevice corrosion of the transfer cask external surfaces. In addition, reconcile the ASME reference for these inspections in Section 6A.7.5.4, which currently references the ASME paragraph for VT-1 (ASME Section XI IWA-2211).

ASME Section XI, Paragraphs IWA-2211 and 2213 describe the use of VT-1 examinations to evaluate the condition of a component (“discontinuities and imperfections on the surface of components, including such conditions as cracks, wear, and corrosion”) and VT-3 examinations to evaluate the general mechanical and structural condition of a component. The staff noted that the DSC External Surfaces Aging Management Program requires VT-1 examinations to detect pitting and crevice corrosion on weld seams, crevice locations, and locations that exhibit water staining and discoloration during VT-3 inspections.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-11: See enclosure 2.

TC-RAI-12: Revise the Transfer Cask Aging Management Program to describe the activities that are performed to manage the aging of fasteners.

The AMR results for several transfer cask fasteners state that the fasteners are susceptible to loss of material, which will be managed with an aging management program; however, the Transfer Cask Aging Management Program does not describe how the aging of fasteners will be managed.

The staff noted that Section 4.5.1 of the UFSAR describes routine transfer cask inspections that include visual inspection of all threaded parts and bolts. If these inspections are being credited for managing the effects of aging, these fastener inspections should be captured in all appropriate elements of the AMP.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-13: Reconcile the AMR results for the transfer cask “NSP Top and Bottom Support Ring” in Table 1A-13 and the Transfer Cask Aging Management Program, which differ with respect to whether cracking is an aging effect requiring management.

This information is needed to demonstrate compliance with 10 CFR 72.240.

TC-RAI-14: Regarding the annual visual and dye penetrant testing on transfer cask trunnion bearing surfaces and welds:

a) Describe how the Transfer Cask Aging Management Program will perform these examinations on surfaces that are obstructed by the transfer trailer supports.

b) Reconcile the frequency of these examinations, which are described as “at least once every five years or prior to the next fuel loading campaign” in Section 6A.7.5.3 and “at a frequency of once per year” in Section 6A.7.5.4 (and Table A-6) of the renewal application.

This information is needed to demonstrate compliance with 10 CFR 72.240.

D. Spent Fuel Assemblies (SFAs)

SFA-RAI-1: Revise Table 2D-1 to identify the materials of all assembly subcomponents within the scope of renewal. Revise Tables 2-2, 3-8 and 2D-1 to identify the cladding for all allowable

high burnup fuel (HBF) contents, for all amendments, including the specific type(s) of zirconium-based alloys (e.g., zircaloy-4, low-Sn zircaloy-4, M5®, and Zirlo™).

The scoping evaluation for the spent fuel assemblies as discussed in Section 2.3 and tabulated in Table 2D-1 does not identify the materials of construction of the subcomponents of the spent fuel assemblies. Tables 2-2, 3-8 and 2D-1 do not identify the specific type(s) of zirconium-based alloys for the various amendments. The applicant stated in Table 2D-1 that the AMR for the SFAs focuses primarily on the fuel rod cladding as it is considered the limiting component of the fuel assembly hardware. Section 6A.8.2.1 identifies cladding types loaded as zircaloy-2, zircaloy-4, and M-5, which cannot be verified in the scoping evaluation nor in the aging management review. The staff needs to corroborate that the applicant has properly identified the materials of construction of the spent fuel assemblies, and ensure that all cladding type(s) are covered by the proposed HBF aging management program. The information provided in the design bases is not specific (UFSAR, Rev. 14, Tables K.5-5, M.5-6, N.5-5, P.5-6, T.5-6, U.5-4, Y.5-5, and Z.5-4).

This information is needed to determine compliance with 10 CFR 72.236(d) and 72.240.

SFA-RAI-2: Revise the renewal application, Section 3.8.4, subsections "Cladding Considerations for the Transportation and Storage of Spent Fuel," and "Conclusions," to clarify that cladding creep is an active cladding degradation mechanism during the period of extended operation.

As currently written this section is not consistent with the primary conclusion of ISG-11, Rev. 3 that creep is the most likely breach degradation mechanism of cladding during storage. It also appears to draw the conclusion that the only cladding concerns during storage for high burnup fuel are hydride embrittlement and hydride reorientation.

This information is needed to determine compliance with 10 CFR 72.240.

E. Other Technical Disciplines

E.1 Shielding

SHIELD-RAI-1: Demonstrate that the 24PTH DSC with the B&W 15x15 Mark B design basis fuel is a bounding cask configuration for B-10 depletion calculation for all DSCs in the Standardized NUHOMS® system, , although the 24PTH DSC does not have the lowest boron content among the DSCs.

Section 3.5.4.5 and Appendix 3D of the application, summarize the results of the CoC holder's TLAA for Dry Shielded Canister Poison Plates Boron Depletion. The CoC holder indicated that for this evaluation, an MCNP5 model of a bounding fuel assembly and basket compartment was used. From the UFSAR, the B&W 155x15 Mark B is identified as the bounding fuel that produces the maximum neutron source per assembly and the basked used in the analyses was that for the 24PTH DSC. The CoC holder noted that although the boron content in the 24PTH is not the lowest boron content basket among the DSCs in the Standardized NUHOMS® System, using the 24PTH DSC as the bounding configuration is justified based on the combined consideration of neutron strength and boron content because the DSCs with lower boron contents also have fuel assemblies with about 10 times lower neutron source strengths. The CoC holder stated that the results presented demonstrate that minimal depletion occurs with the irradiation of poison plates. However, it is not clear how the B-10 loss with high boron

loading/high source cask will bound a low boron load/high source cask, though the staff does understand that a cask containing low source will consume less B-10.

The applicant should demonstrate that the calculation is bounding for all cases, including the one with lowest boron content, and provide supporting documents as appropriate.

This is required to evaluate compliance with 10 CFR 72.240.

SHIELD-RAI-2: See enclosure 2.

E.2 Structural

STRUCT-RAI-1: Provide the ANSYS input and output files for the structural evaluations of the DSC in Appendix 3N.

Appendix 3N is a bounding evaluation of the DSC with reduced shell thickness due to Chloride-Induced Stress Corrosion Cracking under normal and off normal conditions of storage during the renewal period. Modifications were made to the original input file to change the shell thickness as a means of simulating the CISCC conditions.

This information is required to show compliance with 10 CFR 72.240.

STRUCT-RAI-2: Provide a copy of the applicable portions ACI 209R-82 and any calculations required to justify the creep and shrinkage values presented for the concrete that comprises the HSM in Chapter 3 of the renewal application.

In Chapter 3 of the renewal application, values for creep and shrinkage are stated based on ACI 209R-82. The staff does not possess ACI 209R-82. Based on ACI 209R-92, the staff believes these values are the result of calculations involving concrete composition (fine aggregate percentage, cement content, air content, etc.), initial curing, the environment, the geometry of the HSM, the loading history and stress conditions that makes the predicted values non-trivial. The staff requires the reference and the calculations to verify the values presented by the applicant.

This information is required to show compliance with 10 CFR 72.240.

STRUCT-RAI-3: Justify the conservatism of the number of uses per year for the transfer casks as it applies to the fatigue analysis in Appendix 3B.

The applicant states that 24 uses per year is a conservative average for the transfer cask and uses this number to justify that the conditions of ASME B&PV Code Section III, Division 1 subsection NC-3219.2 are satisfied and that no fatigue evaluation is required. The staff believes the conservatism of this estimate could be verified using operational data for the various transfer casks over the last 20 years.

This information is required to show compliance with 10 CFR 72.240.

STRUCT-RAI-4: Justify why aging management for the seismic ties for the HSM-HS was not addressed.

An analysis of the seismic ties that connect adjacent HSM-HS systems together was performed in Appendix U of the UFSAR. Both tensile and shear loads were determined using ANSYS Finite Element software. A shear-tension interaction ratio of 0.96 resulted, which the applicant used as the qualification basis of the ties. Because these ties connect adjacent HSMs, they are somewhat exposed to the weather (i.e. not completely embedded) and are subject to loss of material as a result of corrosion. The applicant is asked to justify that this loss of material will not be significant enough to affect the tensile and shear stress capacities of the ties with a corresponding increase of the tensile-shear interaction ratio.

This information is required to show compliance with 10 CFR 72.240.

STRUCT-RAI-5: Provide the calculations for the axial stress and hoop stress values reported in Tables 3J-2 and 3J-3.

The applicant reports the values of the hoop stress and axial stress within the various fuel assemblies based on internal pressure, but does not provide the calculations for these values. If these values are scaled from stresses reported in the UFSAR, as is done for the bending stress in these tables, provide the tables in which the original stresses can be found along with the pressure associated with these stresses.

This information is required to show compliance with 10 CFR 72.240.

E.3 Thermal/Confinement

THERM/CONFINE-RAI-1: 1 Clarify the assumptions used in Appendix 3F.

a) Section 3F.2 mentions that a sensitivity analysis was performed to verify "suitability of each source term", but there was no mention whether this analysis resulted in bounding source terms when determining doses.
b) Clarify whether the 29 DSCs loaded in a single ISFSI is a bounding quantity for a dose analysis.
c) Explain the relevance of the assumed 100 m and 500 m distances from the DSC, considering that 10 CFR 72.104 and 10 CFR 72.106 refer to distances associated with the ISFSI controlled area boundary.
d) Specify the units of activity in Table 3F-1 and Table 3F-2.

This information is needed to determine compliance with 10 CFR 72.240.

THERM/CONFINE-RAI-2: Provide details and clarify the changes, if any, of the thermal models/analyses mentioned in Appendices 3G and 3C from those performed for the original/amended CoCs.

a) Appendices 3G and 3C provided results, but did not include inputs/details on the thermal models/analyses used and whether those models/analyses were the same as in previous amendment submittals. Currently, there is insufficient information to perform a review.
b) Provide explanations that show the assumptions, boundary conditions, and models would result in accurate, or bounding, values for determining minimum temperatures of components; recognizing that most thermal analyses in the UFSAR make assumptions that result in maximum component temperatures.

This information is needed to determine compliance with 10 CFR 72.240.

THERM/CONFINE-RAI-3: Clarify inputs found in Appendix K and confirm that the NUHOMS® 37PTH and 69BTH DSCs are the bounding DSC/fuel combination to be used when evaluating the impact of a breach of confinement during the period of extended operation.

a) In order to review the analysis in Appendix K, it is necessary to know if it represents a bounding evaluation when using input for NUHOMS® 37PTH and 69BTH.
b) Provide the details associated with the "releasable source", including release fractions, etc.
c) Explain the relevance, in the dose analysis, of the distances from the DSC considering that 10 CFR 72.104 and 10 CFR 72.106 refer to distances associated with the ISFSI controlled area boundary.
d) Explain the basis for the two hour exposure duration in the dose analysis.

This information is needed to determine compliance with 10 CFR 72.240.

THERM/CONFINE-RAI-4: Justify the choice of the inner top cover plate as the DSC component most affected by the stresses developed by the DSC internal pressure.

It is stated that Appendix L, Appendix M, and Appendix N are written to demonstrate the structural integrity of the confinement boundary, which consists of shell, top plate, bottom plate, welds, etc. However, there was no evaluation to show that the inner top cover plate is the critical component.

This information is needed to determine compliance with 10 CFR 72.240.

THERM/CONFINE-RAI-5: Provide, or specify the location of, the evaluation of the dose rate effects from 1% of ruptured fuel rods mentioned on page 3L-3.

Appendix 3L refers to a dose rate evaluation, but no evaluation is found in the appendix and therefore, a review cannot be performed.

This information is needed to determine compliance with 10 CFR 72.240.

THERM/CONFINE-RAI-6: Clarify the decay heat load and maximum cladding temperature values listed in Table 3L-2.

a) In order to review Table 3L-2, provide the decay heat curves for the referenced 61BTH, 32PT-S125 and 32PTH1-S DSCs. This information will help to confirm the very large drop in decay heat over the 20 year storage period for the 32PTH1-S DSC fuel.
b) Confirm that the 32PTH1-S DSC, which has the highest 20 year decay heat value, has the lowest maximum fuel cladding temperature.
c) Confirm that the unit of temperature is "deg F" for the profiles found in Figures 3L-1, 3L-2, and 3L-3.
d) Indicate the location in the UFSAR that describes the DSC model and material properties referred to on page 3L-3 and specify the changes in the model input.

This information is needed to determine compliance with 10 CFR 72.240.

THERM/CONFINE-RAI-7: Provide an analysis to show that helium is retained during the period of extended operation to ensure an inert environment within the canister.

The fuel assembly AMP refers to an inert atmosphere within the DSC. An inert atmosphere is necessary to prevent material degradation, however, an analysis to confirm the presence of an inert atmosphere was not provided.

This information is needed to determine compliance with 10 CFR 72.240.

F. General

GEN-RAI-1: Explain the rationale for including the 24PT2 DSC in the renewal application.

This DSC was added using the 72.48 process, and so does not appear in the TS, the CoC, or 10 CFR 72.214. This DSC cannot therefore be used by a general licensee under the provisions of Part 72; if used for a site specific license, it would need to be renewed under that license. (See Application, Table 1-1, Table 2-2, Section 3.3.1, etc.) Note that including it in the renewal application does not mean that it will be added to any of the above listed documents.

This information is needed to complete the review in accordance with 10 CFR 72.240.

GEN-RAI-2: Explain the rationale for including the HSM Model 152 in the renewal application.

This HSM was added using the 72.48 process, and so does not appear in the TS or the CoC. This HSM cannot therefore be used by a general licensee under the provisions of Part 72; if used for a site specific license, it would need to be renewed under that license. (See Application, Section 1.2.2.2, Table 1-1, Table 3.2-1, Section 3.3.2, etc.) Note that including it in the renewal application does not mean that it will be added to either of the above listed documents.

This information is needed to complete the review in accordance with 10 CFR 72.240.

GEN-RAI-3: Explain the rationale for including the HSM Model 202 in the renewal application.

This HSM was added using the 72.48 process, and so does not appear in the TS or the CoC. This HSM cannot therefore be used by a general licensee under the provisions of Part 72; if used for a site specific license, it would need to be renewed under that license. (See Application, Section 1.2.2.2, Table 1-1, Section 3.3.2, etc.) Note that including it in the renewal application does not mean that it will be added to either of the above listed documents.

This information is needed to complete the review in accordance with 10 CFR 72.240.

GEN-RAI-4: On April 7, 2000, the staff issued a letter to you (then Transnuclear West Inc.) enclosing the CoC for Amendment No. 1 to the Standardized NUHOMS® System (ML003704754). The letter stated that the "certificate [for Amendment No. 1] supersedes, in its entirety, Certificate of Compliance No. 1004, Amendment No. 0, dated January 23, 1995." In addition, the enclosed CoC states as condition 11, "General licensees will continue to use spent fuel storage casks manufactured under CoC No. 1004, Amendment No. 0, if the cask being used was fabricated before issuance of this amendment. All other casks must be manufactured in accordance with Amendment No. 1.

a. Are there any casks that were loaded under the original certificate that meet that certificate, and do not meet the requirements of the certificate for Amendment No. 1?
b. Given that the April 2000 letter stated that CoC for Amendment No. 1 supersedes the CoC for Amendment No. 0 (the original), please clarify whether your request includes renewing the original certificate, and if so, please explain why the original certificate should be renewed.

This information is needed to complete the review in accordance with 10 CFR 72.240.