



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

May 5, 2017

MEMORANDUM TO: Anthony Hsia, Deputy Director
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

FROM: Norma García Santos, Project Manager */RA/*
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUMMARY OF APRIL 12, 2017 MEETING WITH THE NATIONAL
NUCLEAR SECURITY ADMINISTRATION TO DISCUSS
REQUESTS FOR ADDITIONAL INFORMATION FOR THE
MODEL NO. 380-B TRANSPORTATION PACKAGE (DOCKET
NO. 71-9370)

Background.

On April 12, 2017, a phone call meeting was held in Rockville, Maryland, at the request of the National Nuclear Security Administration (NNSA) with the U.S. Nuclear Regulatory Commission (NRC) staff. The meeting was noticed on March 31, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17090A193) as an open meeting. Enclosure 1 includes the list of participants (in person and by phone) including AREVA Federal Services LLC (AREVA) that serves as NNSA's contractor for the design of the Model No. 380-B. The meeting handout can be found at ADAMS Accession No. ML17097A123.

Discussion.

The purpose of the meeting was to discuss and clarify the requests for additional information (RAIs) issued on March 16, 2017, for the Model No. 380-B transportation package. NNSA's contractor, AREVA, discussed questions and proposed approaches related to some of the RAIs submitted on March 16, 2017. Representatives from Los Alamos National Laboratory and Idaho National Laboratory also attended the meeting. The following items summarize the discussion.

Containment Evaluation

- Co-1(a) The staff asked how the applicant calculated the energy depositions used to estimate the volume of gas generated by radiolysis as well as pressure and temperature assumptions. The applicant mentioned that they could add a note to Table 5-6 to clarify that “Energy deposition is calculated in MCNP using an F6 tally.” The staff asked the applicant to submit the input and output files for the F6 tally. The applicant agreed to provide this information.
- Co-1 (c) The applicant discussed some of the assumptions used to calculate the minimum void volumes in Table 5-6 of the application. Besides the basis for calculating the energy depositions, the staff wanted to be able to independently verify the calculation of the gas volumes in Table 5-6. The staff asked the applicant to provide the temperature and pressure assumed to calculate the gas volume depicted in Table 5-6.
- Co-3 The staff pointed out that the leak testing requirements can be clarified if the applicant added a text like the one in the second bullet of slide No. 6 of the presentation into the safety analysis report (SAR). The applicant agreed to revise the SAR in order to clarify the leak testing requirements.

Thermal Evaluation

- Th-3 The applicant pointed out that the information requested by the staff was copyrighted material and that, for this reason, they did not want to include this type of information in the SAR. The applicant also mentioned that the information requested by the staff was available in the “Marks Standard Handbook for Mechanical Engineers” (a common reference). The staff mentioned that he understood the applicant’s rationale and that there was no need to provide the information requested in the SAR. For this RAI, the applicant would be responding to it as explained and discussed at the meeting.
- Th-4 The staff mentioned that Table 3.4-1 did not include the maximum and average temperatures for the impact limiter (which has a temperature limit of 1,500°F). In terms of the foam used in the impact limiters, the staff asked if the selected density of the foam of 16 pounds per cubic feet (lb/ft³) was an adequate assumption for the regulatory fire, since there are additional densities mentioned in Section 3.5.4, “‘Last-A-foam’ Response under HAC,” of the application, such as densities from 6.7 to 25.8 lb/ft³. The staff wanted to better understand the assumptions, as these pertained to the foam in the impact limiters and related to the HAC fire.
- The applicant mentioned the following:
- In terms of the temperatures in Table 3.4-1 of the application, the applicant used SINDA to calculate the average temperatures.
 - There was not specific allowable temperature of the foam in the SAR because, after the HAC fire, the foam may become ashes. Therefore, the applicant did not see the need to include a maximum allowable temperature of the foam in the SAR.
 - The foam densities included in the SAR are at room temperature.

- The 16 lb/ft³ foam density refers to the nominal density as manufactured.
- The properties of the foam at a 16 lb/ft³ density remain the same at 100°F and 130°F, based on manufacturer's data.
- In terms of the densities mentioned in Section 3.5.4 of the application, these were used to find the value used in the analysis. (The staff mentioned that the intent and use of this data was not clear in the application (SAR)).

After some discussion, the staff asked the applicant to:

- provide a demonstration and/or information (e.g., references) that the properties of the foam would not vary at 100°F, 130°F, and at very high temperatures experienced during the HAC fire, and
- to clearly describe ("tell the story") how the densities (13.6~18 pcf) in Section 3.5.4 of the application could be used for the HAC fire analysis or to derive information used in the fire analysis for the Model. No. 380-B.

Th-6 The applicant pointed out that it has used a solar absorptivity of 0.9 for many years. The staff mentioned that in the standard review plan, NUREG-1609, page 3-10, the guidance mentions "the package is subject to full insolation." This indicates using an absorptivity of 1.0. The applicant would go back to the analysis to determine if it needs to make changes.

Materials Evaluation

- M-1 The staff found that the proposed explanation provided by the applicant was adequate.
- M-2 The RAI made reference to NUREG/CR-5502, "Engineering Drawings for 10 CFR Part 71 Package Approvals." The staff mentioned that its understanding was that rather than specifying in the application drawings how the package would be manufactured, the applicant chose to explain the requirements for the weld and allow the manufacturer to develop details of the weld joint design and methods used for nondestructive examination to meet the weld performance and examination requirements for the package. The staff found the approach explained by the applicant to be acceptable.
- M-3 The applicant pointed out that Section 6.2.8 of AWS A2.7 (2007) includes the symbols used in the application. The staff mentioned that there is a joint in which the applicant would require performing volumetric non-destructive testing and results of the testing may depend on the geometry of the location in which the weld would be performed. The staff also mentioned that it was its understanding that the applicant would be leaving the decision about the adequacy of the weld to the manufacturer (based on the results of the required tests).
- M-4 The staff requested schematics of the contents, package clearances, and related information to the proposed content(s) of the package. The staff mentioned that the application did not include information about the contents and that current NRC's guidance suggest considering items such as chemical and physical form and location and configuration. The applicant agreed to:

- go through the list in the NRC guidance included in NUREG-1609, Section 1.5.2.3, "Contents," and Regulatory Guide 7.9, Section 1.2.2, "Contents" to address the staff's questions,
- provide a general schematic of the contents,
- provide bounding values (e.g., clearances, water content, sources, etc.) about the contents, since at this time the applicant considers the contents to be "generic."
- provide bounding values to address the potential for chemical, galvanic, or other reactions including the generation of flammable gasses.

- M-8 (and M-13) The staff appreciated the additional information provided by the applicant about the temperature of the bolts. The staff pointed out that the information provided in Table 2.2-3 of the application is limited to a maximum temperature of 700°F. Since the applicant mentioned that "the allowable temperature from Table Y-1" is 800°F for the closure bolt, the applicant should provide information (e.g., mechanical properties of the material including ultimate strength, elastic modulus and thermal expansion coefficient) for temperatures up to 800°F in Table 2.2-3 of the 380-B application. The applicant agreed to update the table as discussed.
- M-9 The staff understands that the applicant's explanation regarding the bolting analysis. In this regard, NUREG-1609 references NUREG/CR-6007, which the applicant was using. The staff reviewed and agreed with the analysis provided by the applicant indicating that the calculated values for allowable stress using the methodology in NUREG/CR-6007 is similar to the values calculated using the methodology in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Subsection NB. The staff found the analysis reasonable.
- M-11 The staff requested the materials properties for the ASTM B16 brass vent port plug as a function of temperature. The applicant pointed out a few items, including that Table 2.2-5 references the "basic yield and ultimate strengths." The staff clarified that the request was not about stresses, but about thermal expansion, since the vent port plug is part of the containment boundary and the main concern is breach of containment. The applicant agreed to provide data related to the material at elevated temperatures.
- M-12 The staff asked about the procedures and equipment used for ultrasonic testing of cast austenitic stainless steel. Per the applicant, several fabricators prefer forged material and the applicant asked if the RAI would be answered if they eliminate the use of cast materials. The staff also mentioned that part of RAI M-5 that addresses the use of cast austenitic stainless steel, RAI-M-14 that addresses allowable temperatures for the cast austenitic stainless steel as well as M-12 would go away if the applicant decides to specify forged material. The applicant would evaluate this option prior to submitting the final RAI response.

The applicant agreed to provide an estimate of the submittal of the RAI responses after discussing the outcome of this meeting with its contactors.

Docket No. 71-9370

CAC No. L25109

Enclosures:

1. Meeting Attendees
2. Meeting Agenda

SUBJECT: SUMMARY OF APRIL 12, 2017 MEETING WITH THE NATIONAL NUCLEAR SECURITY ADMINISTRATION TO DISCUSS REQUESTS FOR ADDITIONAL INFORMATION FOR THE MODEL NO. 380-B TRANSPORTATION PACKAGE (DOCKET NO. 71-9370): MAY 5, 2017

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ADAMS Package Accession No.: ML17125A024

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Meeting to Discuss Request for Additional Information Model No. 380-B

April 12, 2017
TWFN-3-C1
1:00 p.m. – 3:30 p.m.

Attendees List

Name	Organization
Chad E. Thompson	National Nuclear Security Administration (NNSA) NA-531
Temeka Taplin	NNSA NA-212
Robert Murphy	NNSA Los Alamos Field Office
Dave McCollum	Los Alamos National Laboratory (LANL)
Becky Coel-Roback	LANL
Christy Abeyta	LANL
Phil Noss	AREVA Federal Services LLC (AREVA)
Gannon Johnson	AREVA
Tom Criddle	AREVA
Ron Burnham	AREVA
John Zarling	Idaho National Laboratory (INL)
Harold Adkins	Pacific Northwest National Laboratory (PNNL)
Norma García Santos	NRC
Yaira Díaz Sanabria	NRC
Jimmy Chang	NRC
David Tang	NRC
Darrell Dunn	NRC
Marlone Davis	NRC

Agenda

April 12, 2017
1:00 P.M. – 3:30 P.M.
Location: TWFN-3-C1

Purpose:

Discuss and clarify requests for additional information for the Model No. 380-B transportation package (Docket No. 71-9370).

Outcome:

Clarify questions from the applicant regarding the requests for additional information issued on March 16, 2017, as part of the review of the application of the Model No. 380-B transportation package.

Process:

- | | |
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| 1. Opening Remarks | NRC\NNSA\AFS\LANL |
| 2. Introductions | All |
| 3. Questions related to RAIs: | AFS |
| • Containment: Co-1 and Co-3 | |
| • Materials: M-1, M-2, M-3, M-4, M-11, and M-12 | |
| • Thermal: Th-3, Th-4, and Th-6 | |
| 4. Schedule for submittal | AFS |
| 5. Schedule for Certificate – considering no additional RAIs | AFS |
| 6. Action items | All |
| 7. Questions | All |
| 8. Closing Remarks | NRC\ NNSA\AFS\LANL |
| 9. Adjourn | NRC |