



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

March 5, 2024

Richard W. Boyle
Radioactive Materials Branch
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, D.C. 20590

SUBJECT: APPLICATION FOR THE FRENCH CERTIFICATE OF COMPETENT
AUTHORITY F/410/B(U)-96 REVISION BI, MODEL NO. MANON PACKAGE –
REQUEST FOR ADDITIONAL INFORMATION, DOCKET NO. 71-3094

Dear Richard Boyle:

By letter dated April 6, 2023 (Agencywide Documents Access and Management System [ADAMS] Accession Number ML23251A205), the U.S. Department of Transportation requested that the U.S. Nuclear Regulatory Commission (NRC) staff perform a review of the Certificate of Competent Authority No. F/410/B(U)-96 Revision Bi, Model No. MANON. In your application you requested that the NRC provide a recommendation to revalidate the Model No. MANON package for import and export use.

In connection with our review, this letter is to advise you that the information needed to continue our review, described as a request for additional information, is in the enclosure to this letter. Addressing the request for additional information does not preclude the staff from issuing further requests for additional information during the detailed technical review of this application.

In order to complete our technical review on schedule, your response should be provided within 30 days of the date of this letter. If you have any questions regarding this matter, I may be contacted at (301) 415-5196 or at Nishka.Devaser@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Nishka Devaser".

Signed by Devaser, Nishka
on 03/05/24

Nishka Devaser, Project Manager
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-3094
EPID No. L-2023-DOT-0007

Enclosure:
Request for Additional Information

SUBJECT: APPLICATION FOR THE FRENCH CERTIFICATE OF COMPETENT
AUTHORITY F/410/B(U)-96 REVISION BI, MODEL NO. MANON PACKAGE –
REQUEST FOR ADDITIONAL INFORMATION, DOCKET NO. 71-3094
DATE: MARCH 5, 2024

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OFFICE	NMSS/DFM	NMSS/DFM	NMSS/DFM
NAME	NDevaser	SFigueroa	GZhao
DATE	3/01/2024	3/01/2024	3/01/2024
OFFICE	NMSS/DFM	NMSS/DFM	NMSS/DFM
NAME	JCarlson	TBoyce	YDiazSanabria
DATE	3/01/2024	03/04/2024	03/05/2024

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Request for Additional Information
Docket No. 71-3094
Model No. MANON Package
French Certificate F/410/B(U)-96, Revision BI

By letter dated April 6, 2023 (Agencywide Documents Access and Management System [ADAMS] Accession Number ML23251A205), the U.S. Department of Transportation requested that the U.S. Nuclear Regulatory Commission (NRC) staff perform a review of the Certificate of Competent Authority No. F/410/B(U)-96 Revision Bi, Model No. MANON. In your application you requested that the NRC provide a recommendation to revalidate the Model No. MANON package for import and export use.

This request for additional information identifies information needed by the NRC staff (the staff) in connection with its technical review of the Model No. MANON package application.

Structural Evaluation

RAI 2-1. Provide the details of how the numerical transition is achieved between the solid and shell elements of the finite element (FE) model.

In SAR section 6.1.1, "Mechanical Calculations External enclosure assembly for Non-removable Equipment," 8-node linear solid elements are used for 40 mm, or 30 mm stainless steel plates and 4-node linear shell elements are used for thinner steel plates. It is not clear that how the solid element nodes connect to the shell element nodes.

This information is needed to determine compliance with paragraphs 608 and 609 of IAEA SSR-6, 2012 Edition.

RAI 2-2. Provide the details of how the numerical transition is maintained between the rigid surface plate elements, representing the Marguerite Non-removable Equipment, and the bottom of the EDCE in the finite element (FE) model.

In SAR section 6.3.1, "Mechanical Calculations External enclosure assembly for Non-removable Equipment", the lower part of the EDCE is modelled by 4-node linear shell elements. This includes stainless steel plate ranging from 20 mm to 40 mm thick at various location in the lower EDCE. The Marguerite Non-removable Equipment is modelled by a circular rigid surface representing its contact surface with the plate with a thickness of 20 mm at the bottom of the EDCE. In the Figure 4 "lifting the EDCE - lower part model", the plate elements for both Marguerite Non-removable Equipment and bottom of EDCE are shown in the ANSYS snapshot. However, the links between these two parts, for purpose of transferring the equipment weight to the lower portion of the EDCE, are not clearly identified in the calculation.

A description of the links/elements or an explanation of how ANSYS application construct the links between the Non-removable Equipment and the lower portion of the EDCE is expected.

This information is needed to determine compliance with paragraphs 608 and 609 of IAEA SSR-6, 2012 Edition.

RAI 2-3. Clarify the definition of safety coefficient for the EDCE flange screws and EDCE closure plate screws.

In Table 1 of Chapter 04-01, "Study of strength under regulatory pressures", the safety coefficients for the EDCE flange screws and EDCE closure plate screws are listed to be 6.7 and >10, respectively. These safety factors are significantly higher than the values that were reported in the previous version of this section (Table 1 in Section 5.5.1.1 of Chapter 04-01 in DS-LME50291001-04-01 Rev B). The high safety factors appear to come from Table 14 in Chapter 04-03, which do not use property values (e.g., screw yield strength) in the calculations, but rather verifies that preloads are sufficient when compared with the calculated forces in the screwed connections. In the same Table 1, the EDCE safety coefficient is reflecting a ratio of actual stress vs. permissible stress. The usage of the safety coefficient between different items are different and not clearly presented.

This information is needed to determine compliance with paragraphs 608 and 609 of IAEA SSR-6, 2012 Edition.

RAI 2-4. Provide the details of how bolts over torque are prevented during installation.

In Table 13 of Chapter 04-03, the listed screw strength safety factors are in the range of 1.01 to 1.66. The bolt stress due to pretension is too close to the allowable bolt stress. A procedure to ensure the bolt stress are within the allowable and leave reasonable margin can't be found in the application package.

This information is needed to determine compliance with paragraphs 608 and 609 of IAEA SSR-6, 2012 edition.

RAI 2-5. Provide the reference of the accelerations applied to tie-down lug in route of transportation.

In Section 5.4.1 of Chapter 04-02, the listed accelerations for road and sea transportations in all three directions are extracted from Table IV.1 in Appendix IV of IAEA SSG-26, 2018 edition. However, the IAEA SSG reference listed in the entire package is refer to 2012 edition. In addition, in the Table IV.2 in Appendix IV of both SSG codes, the acceleration values for strength evaluations in US transportation are listed. It is not clear why the acceleration values for US transportation are not used in the application package.

This information is needed to determine compliance with paragraphs IV.17 of IAEA SSG-26, 2012 edition.

Materials Evaluation

RAI 7-1. Provide details regarding the materials properties and thermal performance of the LEGRIS bi-material gasket that is specified for the EDCE non-closing coupling.

As listed in Appendix 7 to SAR Chapter 03, "Description of the packaging", the material for the EDCE gasket that is used for "EDCE non-closing coupling leak-

tightness” (identifier 17) was changed from ethylene propylene diene (EPDM) rubber to a LEGRIS bi-material gasket that consists of zinc-plated steel with a nitrile butadiene rubber (NBR) seal. Section 10.6 of SAR Chapter 03 states that “all gaskets used with the EDCl, EDCE and SV69 lid are made of EPDM” and lists the properties (e.g., minimum and maximum temperature of use, thermal expansion) associated with EPDM elastomer O-rings; however, the EDCE non-closing gasket is no longer made of EPDM, and no material properties or thermal performance are provided for the new bi-material gasket. Section 8.2 of the thermal study contained in Chapter 04-07 states that the maximum temperature reached by the gaskets is 141°C. Temperature compatibility of the new seal specification using NBR was not specified.

This information is needed to determine compliance with paragraphs 659 and 666 of IAEA SSR-6, 2012 edition.

RAI 7-2. Provide methodology, acceptance criteria, and justification for the leak testing of the fusible plugs.

Section 6.3 of SAR Chapter 05-01, “Use and maintenance of the packaging”, states that leak testing of the fusible plugs in the casing and EDCE will be conducted during minor maintenance (every 3 years or 30 cycles). Additionally, fusible plug leak testing is mentioned in the table in Section 7 (page 20) of SAR Chapter 05-01 that provides details regarding commissioning and factory acceptance tests. This table mentions that leak testing will be carried out for the fusible plugs, but it does not contain specific information for how the leak testing will be conducted nor provide acceptance criteria to verify satisfactory performance.

This information is needed to determine compliance with paragraph 611 of IAEA SSR-6, 2012 edition.

Editorial

RAI-EDIT-1. Page layout and figure notations are not in the correct places and not readable. The page layouts need to be clean up for “Note on Mechanical Calculations Casing for SV34, SV69 and Non-Removable equipment, NC LME 50291001-01 ver. B” page # 39, 49, 67, 76, and 81 of 146.

RAI-EDIT-2. Table 13 in Section 6.5.3.1 of Chapter 04-03 has a row heading that indicates units of Newtons for maximum stress. This heading should be corrected to have appropriate units for the reported results.