



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

July 6, 2020

Mr. Richard W. Boyle, Chief
Sciences Branch
Division of Engineering and Research
Office of Hazardous Materials Safety
U.S. Department of Transportation
1200 New Jersey Ave., S.E.
Washington, D.C. 20590

**SUBJECT: APPLICATION FOR THE MODEL NO. GP-01 TRANSPORT PACKAGE –
SUPPLEMENTAL INFORMATION NEEDED**

Dear Mr. Boyle:

By letter dated May 11, 2020 (Agencywide Documents Access and Management System Accession No. ML20143A100), the U.S. Department of Transportation requested that the U.S. Nuclear Regulatory Commission (NRC) staff perform a review of the Japanese Approval Certificate Number J/2009/AF-96, Revision 1, Model No. GP-01 transport package, and make a recommendation concerning the revalidation of the package for import and export use. The NRC staff performed an acceptance review of your application to determine whether the application contains sufficient technical information in scope and depth to allow the NRC staff to complete a detailed technical review per the International Atomic Energy Agency (IAEA) Specific Safety Requirements No. 6 (SSR-6), "Regulations for the Safe Transport of Radioactive Material," 2012 Edition.

This letter is to advise you that based on our acceptance review, the application does not contain sufficient technical information. The information needed to continue our review is described in the enclosure to this letter as a request for supplemental information. The staff also included observations to allow you to start earlier on items having the potential to be asked at a later date. Responses to observations are not required for the staff to begin a detailed technical review. Observations are not the result of a detailed technical review and may be resolved once the staff begins a detailed review.

In order to start our technical review and keep this high priority case on schedule, this information should be provided within 3 weeks from the date of this letter. If the NRC receives your response in a timely manner, you should expect to receive a request for additional information, if necessary, in September 2020.

If you wish to discuss these issues in more detail prior to submitting your response, the staff is available for a public meeting. Please reference Docket No. 71-3098 and EPID L-2020-LLA-0107 in future correspondence related to this action.

If you have any questions regarding these matters, please contact me at 301-415-6999 or ngs@nrc.gov.

Sincerely,

Norma Garcia Santos, Project Manager
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No.: 71-3098
EPID L-2020-LLA-0107

Enclosure:
Request for Supplemental Information
and Observations

SUBJECT: APPLICATION FOR THE MODEL NO. GP-01 TRANSPORT PACKAGE –
SUPPLEMENTAL INFORMATION NEEDED

DOCUMENT DATE: July 6, 2020

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ADAMS Accession No.: ML20184A275

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DATE:	6/30/2020	7/1/2020	7/1/2020	7/1/2020	07/02/2020

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Request for Supplemental Information and Observations
U.S. Department of Transportation
French Approval Certificate Number J/2009/AF-96, Revision 1
Docket No. 71-3098
Model No. GP-01 Package

REQUEST FOR SUPPLEMENTAL INFORMATION

General

RSI-Gen-1 Provide the following information:

- 1) English translation of all figures and any other packaging design information provided as part of the application;
- 2) legible and translated versions of applicable tables and figures;
- 3) a revision or correction to the following Appendices to clearly state the material (e.g., UO₂) for which limits apply:
 - a. Appendix 1 to Chapter II-A, "Results of Prototype Drop Tests," item (5), page II-A.App1 – 2; and
 - b. Appendix 1 to Chapter II-B, "Results of Prototype Thermal Test," page II-B.App1-2.

Ensure that the information provided as part of this response is consistent with the contents of the application.

Some information in Document No. No. E-56661, Enclosure 2, of the application was provided in Japanese or French. Supporting design-basis information related to the application should be translated legibly, to English and provided as part of the application to allow the staff to perform an adequate safety review. Further, some figures, tables, and diagrams are not legible and/or are in Japanese. Some examples of these are as follows:

- 1) Equations on page Nos. II-A-14, II-A-17 -39, 43-46, 55, 59-62, II-B-14, II-B-22, II-B-34, II-B.App2-18, II-B.App2-19, II-D.App1-1, II-D.App2-2, and II-B-9.
- 2) Tables
 - a) Table II-A-13, "Results of Structural Analyses (1/2);"
 - b) Table II-B-6, "Heat Transfer Conditions," (normal conditions of transport);
- 3) Figures Nos. and titles (not legible or it is not translated to English)
 - a) II-A.App1-3, "Test Facility for Drop Tests;"
 - b) II-B-21, "History of Temperature Changes in Various Components of the Prototype;"
 - c) II-B-22, "History of Temperature Changes under Accident Conditions of Transport (entire package);"
 - d) II-B.App1-3, "Evolutions of Temperatures (1/2);"
 - e) II-B.App1-3, "Evolutions of Temperatures (2/2);"

Enclosure

- f) II-B.App2-3, "Evolutions of Temperatures (1/2);"
- g) II-B.App2-3, "Evolutions of Temperatures (2/2);"
- h) II-B.App2-15, "Results of Analysis for Integrating Thermal Test Results;"
- i) Flowchart of ORIGEN Code
- j) II-D-1, "Analytical Model of Package under Routine Conditions of Transport;"
- k) II-D-2, "Analytical Model for Shielding Analysis of Package under Normal Conditions of Transport;"
- l) II-E.App-1, "Survey Results: Pellet Diameter in 11ndamaged System;"
- m) II-B-6, "Flow of Analysis under Normal Conditions of Transport;"
- n) II-B-8, "Points Evaluated for Temperature is not completely readable;"
- o) II-B-20, "Flow of Analysis of Package under Accident Conditions of Transport not completely readable;"
- p) II-B-26, "Temperature Distribution in Package (immediately after thermal test; unit in K);"

This information is necessary to ensure compliance with the requirements in Paragraphs 607 to 618 of the IAEA SSR-6, "Regulations for the Safe Transport of Radioactive Material," 2012 Edition.

RSI-Cr-1

Provide an English translation of the last paragraph of Section II-E.4.2, "Entry of Water into the Package," of the safety analysis report and ensure the information in this section is complete.

The last paragraph in Section II-E.4.2 of the safety analysis report for the criticality evaluation appears to be in French. It also appears that a portion of the paragraph is missing; the last sentence looks like it ends in mid-sentence. An English version of the paragraph should be provided that includes the full paragraph text.

This information is necessary to ensure compliance with the requirements in Paragraphs 680 and 682 of the IAEA SSR-6, 2012 Edition.

RSI-Cr-2

Provide information about the acceptance tests and the acceptance criteria used to ensure that the as-fabricated packaging meets the package design approved in the Japanese certificate of competent authority.

The packaging should be fabricated to be consistent with the approved package design. Acceptance tests together with the tests' acceptance criteria are an important and integral part of this process. Acceptance tests should be provided that include dimensional and material property checks that ensure the as-fabricated packaging components will perform their functions (e.g., criticality control, structural, containment) consistent with the design.

This information is necessary to ensure compliance with the requirements in Paragraph 501 of the IAEA SSR-6, 2012 Edition.

OBSERVATIONS

OBS-Cr-1 Provide an analysis of the trends in the calculated versus the experimental k-effective for parameters in addition to pellet diameter that are relevant to criticality safety as part of the benchmark analysis.

Section II-E.5, "Benchmark Test," of the safety analysis report describes the benchmark analysis that was performed for the package. While the analysis looked at a significant number of experiments and did a trending analysis, the trending analysis is only based on a single parameter, the pellet diameter. There are other parameters of relevance to the criticality analysis for which trends should also be performed that also provide an indication of the code's and the analyst's ability to adequately evaluate the experiments' k-effective. These parameters include the following:

- enrichment,
- moderator-to-fissile material ratio, and
- the energy of the average lethargy causing fission (EALF).

Also, trending analyses should consider subsets of the selected experiments (e.g., trends for experiments with the same neutron absorbers in similar configurations and absorber concentrations to the Model No. GP-01 package without the inclusion of experiments with different absorber types or no absorbers). This way, potential trends in the benchmark analysis will not be hidden by experiments that are not relevant to the package analysis (based on dissimilarity to the package). If a trend exists, then the benchmark analysis should appropriately account for it. Appropriate information regarding the analyzed experiments should also be provided to support the trend analysis.

This information is necessary to ensure compliance with the requirements in Paragraphs 682, 684, and 685 of the IAEA SSR-6, 2012 Edition.