AREVA

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U.S. Nuclear Regulatory Commission
Director, Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards
Attn: Document Control Desk
11555 Rockville Pike
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Rockville, MD 20852

Gentlemen:

Subject: **Report of Non-Compliance with Condition in Certificate of Compliance for the SP1, 2, and 3; Failure to comply with license drawing EMF-304,416 Rev. 14, Note 5.**

Attached please find information as required by 10 CFR 71.95(c) pursuant to shipments SP1, 2, and 3 containers to Taiwan during the period July 1998 to October 2016. A total of 44 shipments were made that were not compliant with the license drawing. The cause of this non-compliance and planned preventative actions are discussed in the attachment.

There is no safety significance related to this failure to comply in that the etha foam in the as shipped condition is bounded by the criticality safety analysis supporting the container license and the arrangement would not result in preferential flooding during hypothetical accident conditions.

If you have questions, please feel free to contact me at 509-375-8550.

Very truly yours,

T. J. Tate, Manager
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Event Information Required by 10 CFR 71.95(c)

(1) A brief abstract describing the major occurrences during the event, including all component or system failures that contributed to the event and significant corrective action taken or planned to prevent recurrence.

The model SP-1, SP-2 & SP-3 inner container license drawing EMF-304,416 Revision 14 Note 5 states: Closed cell polyethylene (CCP) optional arrangement: continuous or discontinuous strips. The continuous CCP strip has holes matching the holes in the metal. Discontinuous strips shall be 7 inches wide maximum (up to 12 strips). Discontinuous strips may be perforated.

The licensee AREVA Richland believed that the 7 inches wide maximum direction referred to the transverse direction of the inner container. On October 17, 2016, TN America LLC (the certificate holder for NRC COC 9217 Revision 23 for the Model Nos. SP-1, SP-2 and SP-3) informed AREVA Richland that the SP-1, SP-2, and SP-3 rod supported inner container configuration were in violation of the requirements of license drawing EMF-304,416 Revision 14 Note 5 in that the rod supported configurations have discontinuous foam pads in in excess of 7 inches wide, and that the width refers to the axial direction of the inner container and not the transverse direction.

Since July 21, 1998 AREVA Richland has been shipping SP-1, SP-2, and SP-3 packages to Taiwan (each normally loaded with two BWR fuel assemblies) with a CCP foam configuration that has discontinuous foam in excess of 7 inches in the axial direction which now appears to be violation of SP-1, SP-2, and SP-3 SAR drawing EMF-301,416 Revision 14 Note 5. NRC Certificate of Compliance 9248 Revision 23 for Model SP-1, SP-2, and SP-3 packagings paragraph 5(a)(3) states: "The packagings are fabricated and assembled in accordance with following Framatome ANP, Inc., and Siemens Nuclear Power Corporation/Advanced Nuclear Fuels Corporation Drawings Nos.: EMF-304,416, Rev. 14, EMF-306,272, Rev. 10, and EMF-309,141, Rev. 1." A nonconformance with a condition of the Certificate of Compliance in making a shipment is reportable under 10 CFR 71.95(a)(3).

For discussion of corrective actions resulting from this event, see discussion under (4), below.

(2) A clear, specific, narrative description of the event that occurred so that knowledgeable readers conversant with the requirements of Part 71, but not familiar with the design of the packaging, can understand the complete event. The narrative description must include the following specific information as appropriate for the particular event.

A narrative of the event was provided under (1), above. NRC Certificate of Compliance (COC) 9248 Revision 23 for the Model SP-1, SP-2, and SP-3 Condition 5(a)(3) requires that the packages are fabricated and assembled per the drawings listed in the COC. As stated above, the certificate holder determined that the rod supported fuel assembly shipments made from AREVA Richland to Taiwan were made in violation of COC 9248 due to having discontinuous solid CCP foam pads in excess of 7 inches in the axial direction.

(i) Status of components that were inoperable at the start of the event and that contributed to the event;

There were no components that were inoperable that contributed to the event.

(ii) Dates and approximate times of occurrences;

AREVA Richland conducted 44 rod supported BWR fuel assembly shipments to Taiwan in the SP-1/SP-2/SP-3 occurred from July 21, 1998 to September 12, 2016. There were total of 3199 SP-1/SP-2/SP-3 packages shipped (approximately 73 packages per shipment), with all but one package containing two BWR fuel assemblies. Each BWR fuel assembly contains approximately 177 kg uranium, the total amount of uranium shipped was 1,132,535 kg. From 1998 through 2000, there was one shipment a year. From 2001 through 2014 there were two to three shipments a year. There were no shipments in 2015 and in 2016 there has been one shipment on September 12, 2016 of 84 packages containing 168 fuel assemblies with a total of 29,730 kg uranium.

(iii) The cause of each component or system failure or personnel error, if known;

Drawing EMF-304,416 (as XN-NF-304, 416) dates back to 1982 when it was a license drawing for NRC COC 4986 for the Model RA-3. The polyethylene foam note was added to Revision 2 of the drawing. The note stated that discontinuous Ethafoam strips shall be 4 inches wide maximum, but the note did not clearly state what direction the 4 inch wide maximum dimension applied to, the axial or transverse direction of the container. There was no change to the foam note from Revision 2 (April 30, 1982 through Revision 8 (May 5, 1998) of SP-1 license drawing EMF-304,416. On May 19, 1998, EMF-304,416 R9 was issued that changed the note to read: "Discontinuous strips shall be 6 in. wide maximum." Revision 9 again failed to identify what direction (axial or transverse) the 6 inch wide limit applied to. The SP inner container perforated metal channels are approximately 6 inches on a side, with the width change in the foam note of EMF-304,416 from 4 to 6 inches it continued to be unclear what direction the term width applied to since the CCP pads in the SP-1 were essentially 6 inches wide in the transverse direction. Within a short period of time, AREVA Richland came to interpret (erroneously) that "width" in the foam note referred to the transverse direction of the packaging and not the axial direction of the packaging.

On August 21, 2003, the separate SP-1, SP-2 and SP-3 inner container license drawings were consolidated into one license drawing, EMF-304,416 Revision 14. The foam note was now Note 5 and it was revised to change the maximum foam width to 7 inches wide maximum, which is the maximum width of the perforated metal channels in the inner containers. Again AREVA Richland believed that the 7 inch width dimension referred to the packaging transverse direction and not the axial direction.

(iv) The failure mode, mechanism, and effect of each failed component, if known;

There were no failed components. The effect of using PPC foam pads in excess of 7 inches in the axial direction had no adverse effects on safety since the rod supported configuration still had adequate drainage to prevent differential flooding in an accident.

(v) A list of systems or secondary functions that were also affected for failures of components with multiple functions;

There were no secondary failures associated with this event.

(vi) The method of discovery of each component failure or procedural error.

The certificate owner discovered the problem with license drawing EMF-304,416 Revision 14 while reviewing the history of the drawing.

(vii) For each human performance-related root cause, a discussion of the causes and circumstances;

See Section iii above.

(viii) The manufacturer and model number (or other identification) of each component that failed during the event;

There were no failed components associated with the events.

(ix) For events during the use of a packaging, the quantities and chemical and physical forms(s) of the package contents;

In all but one case, each package contained two BWR fuel assemblies, with each fuel assembly containing approximately 177 kg U of solid UO_2 pellets with a maximum enrichment of 5.0 weight % U-235 and meeting the content requirements of COC 9248 Revision 23 Section 5(b)(1)(ix).

(3) An assessment of the safety consequences and implications of the event. This assessment must include the availability of other systems or components that could have performed the same function as the components and systems that failed during the event.

There were no safety consequences as a result of this event. The inner SP containers configured with discontinuous CCP foam still had adequate drainage to prevent differential flooding during an accident.

(4) A description of any corrective actions planned as a result of the event, including the means employed to repair any defects, actions taken to reduce the probability of similar events occurring in the future;

The inner container license drawing has been revised as 02-9264132-000 with Note 5 changed to allow CCP without holes that exceed 7 inches in width (in the axial direction) and specifies only a maximum cumulative length. Therefore, the current rod supported foam configurations would meet the new license drawing. The new Note 5 reads as follows:

"Closed cell polyethylene (CCP) arrangement options (invoked only for fuel assemblies): perforated CCP covers the perforated metal channel and cover liner. Holes in the perforated CCP shall approximately match perforation holes in the metal. CCP without holes may be used, but the cumulative axial length of uncovered metal channel shall be

at least 32 inches along any channel or cover liner surfaces. Loose rods, contained in an approved pipe or rod box, may be shipped with any configuration of CCP."

The revised SP-1, SP-2, and SP-3 Safety Analysis Report, EMF-1563 Revision 16 with the new inner container license drawing was submitted to the NRC by the certificate owner on November 16, 2016.

(5) Reference to any previous similar events involving the same packaging that are known to the licensee or certificate holder.

The licensee has submitted eight event reports on the same packaging dated: March 25, 1998; September 24, 1998; November 6, 1998; July 30, 1999; May 21, 2003; June 25, 2006; January 15, 2013, and May 14, 2013.

(6) The name and telephone number of the person with the licensee's organization who is knowledgeable about the event and can provide additional information.

Timothy J. Tate, Manager
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(7) The extent of exposure to individuals to radiation or radioactive materials without identification of individuals by name.

This event did not involve the exposure of individuals to radiation or radioactive materials.