

L30077



October 29, 2010
REL:10:026

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

Gentlemen:

Subject: 10CFR 71.95 - Related Information of Event Involving Shipments of Uranium Dioxide Powder to Japan in Model TNF-XI Packagings that Violated the Requirements of DOT Competent Authority Certification USA/0653/AF-96

On September 3, 2010 AREVA NP Inc. (AREVA) discovered (through information provided by TN International) that all shipments of low enriched uranium dioxide powder previously shipped from its Richland, Washington fuel fabrication plant to the two Nuclear Fuel Industries, Ltd. (NFI) plants in Japan (Tokai and Kumatori) using the TNF-XI package potentially were in violation of the USDOT Competent Authority Certification CAC USA/0653/AF-96. During these shipments, the uranium dioxide powder in the inner pails was contained in polyethylene bags which were in the inner pails.

DOT CAC USA/0653/AF-96 is a revalidation of the French Certificate F/381/AF-96(Bc) which is based on the French Safety Analysis Report (SAR) for the TNF-XI, DOS-06-00037028. On September 3, 2010, AREVA requested and was provided with a copy of Chapter 5A of the SAR (DOS-06-00037028-500 Rev. 01, dated December 11, 2006). Chapter 5A prohibits the presence of any hydrogenous material with a hydrogen content greater than water inside the TNF-XI cavities or inside the inner pails. Inconsistent with this requirement, the polyethylene bags have hydrogen content greater than water.

The shipments were made from late 2003 to August 27, 2010 in strict conformance with the instructions received from NFI, the owner of the shipping containers, which included the use of the polyethylene bags. Other than the use of polyethylene bags inside the inner pails to contain the uranium dioxide powder, all other requirements of the USDOT and French Certificates for the TNF-XI were met. At no time were the packages or their contents challenged in conjunction with these shipments; there were no container system/component failures or exposures of individuals to radiation or radioactive materials. Criticality analysis on the actual maximum contents shipped from Richland in the TNF-XI packages was performed by TN Inc. (the domestic NRC COC 9301 certificate holder for the TNF-XI package) and showed that at no time did the k_{eff} reach or exceed the upper subcritical limit.

AREVA has informed all domestic users of the package of the problem. AREVA is actively working with TN Inc., TN International, and NFI to resolve the problem. While AREVA believes that the event may not be reportable to the NRC under the requirements of 10CFR 71.95 since no NRC Certificate of Compliance was involved, AREVA is conservatively providing this report to meet the information requirements specified in 10CFR 71.95(c).

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Two copies of that information is attached (one proprietary and one redacted). Please note that one copy contains proprietary information and AREVA requests that it be withheld from the public under Title 10 of the Code of Federal Regulations (10CFR), Section 2.390. One copy has been redacted that contains a public version of the information.

If you have any questions or require additional information, please feel free to contact me at 509-375-8409.

Very truly yours,



R. E. Link, Manager
Environmental, Health, Safety, & Licensing

cc: Ms. Vonna Ordaz, Director
Division of Spent Fuel Storage
and Transportation
Office of Nuclear Material Safety
and Safeguards
Washington, D.C. 20555

Mr. Richard W. Boyle
Chief, Radioactive Materials Branch
Office of Hazardous Materials
Technology
U.S. Department of Transportation
1200 New Jersey Ave., S.E.
Washington, DC 20590

/mah

Request for proprietary information (affidavit) removed per telephone conversation with Robert Link dated 11/5/10.
Jennie Rankin

AFFIDAVIT

STATE OF WASHINGTON)
 : ss
COUNTY OF BENTON)

Robert Link, being duly sworn on oath, states as follows:

1. I am employed by AREVA NP Inc. (AREVA) as Manager, Environmental, Safety, Health and Licensing at AREVA's facility located in Richland, Washington. I am responsible for the overall administration of the licensing under 10 CFR Part 70 for AREVA's Richland, Washington nuclear fuel fabrication facility, including transportation of nuclear materials. This affidavit is based on my first hand, personal knowledge and is submitted in my capacity as Manager of ESH&L and in accordance with the provisions of 10 CFR § 2.390.

2. I am familiar with the contents of the AREVA shipping procedures, standard operating procedures and other documents associated with shipment of nuclear materials.

3. AREVA is engaged in the business of designing and manufacturing nuclear fuel assemblies for commercial nuclear reactors and delivering SNM to other nuclear fuel fabricators in foreign countries for inclusion in nuclear fuel assemblies. Within the United States, there are two additional firms that design and manufacture nuclear fuel for commercial nuclear reactors and there are several other companies outside of the United States that engage in the same business as AREVA. Competition among these companies including AREVA is significant and production schedules on quantities of the nuclear fuel are critical to the maintenance of market share and to the growth of market share among utility customers.

4. The documents contain commercial information of a confidential nature that is not available in public sources or available to the public. The information

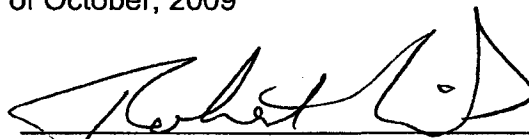
~~Proprietary Information submitted under 10 CFR § 2.390~~

Request for proprietary
information (affidavit)
Removed per telephone
conversation with Robert
Link dated
11/5/10.
Jenni Rankin

contained in the Shipping schedules is commercial and confidential because it reveals quantities of material shipped to our customers. This information can be used by competitors to gain undue insight into AREVA's commercial relationships and production loads, operations and business.

5. AREVA will suffer considerable competitive harm if the redacted contents of the report are made available to AREVA's domestic and international competitors because of the potential to undermine the financial position of AREVA.

Dated this 29th day of October, 2009



Robert Link
Manager, Environmental, Safety, Health and Licensing

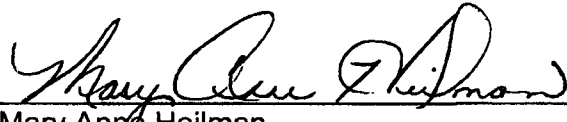
~~Proprietary Information submitted under 10 CFR § 2.390~~

Request for proprietary information (notary) removed per telephone conversation with Robert Link dated 11/5/10. Jennie Rankin

STATE OF WASHINGTON)
 :
 : ss
COUNTY OF BENTON)

On this 29th day of October, 2009, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Robert Link to me known to be the Manager, Environmental, Safety, Health and Licensing of AREVA NP Inc., the corporation that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that he is authorized to execute the said instrument.

Witness my hand and official seal hereto affixed the day and year first above written.



Mary Anne Heilman
Notary Public in and for the State of Washington,
residing at Benton, Washington.
MY COMMISSION EXPIRES: June 9, 2012



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.

Shipments of low-enriched uranium dioxide powder are routinely made from AREVA NP Inc.'s (AREVA's) Richland, Washington fuel fabrication plant (NRC License No. SNM-1227) to Nuclear Fuel Industries' (NFI's) fuel fabrication plants in Tokai, Japan and Kumatori, Japan. The shipments are made using Model TNF-XI fissile radioactive material packages owned by NFI and licensed under U.S. Department of Transportation (USDOT) Competent Authority Certification USA/0653/AF-96. These shipments routinely ship from the Port of Oakland, CA or the Port of Everett, WA to Tokyo, Japan.

The USDOT Competent Authority Certification USA/0653/AF-96 Revision 4 is a revalidation of French Competent Authority Certificate F/381/AF-96 (Bc). In Section 2 of both Appendix 1 (Content 1) and Appendix 2 (Content 2) is the following statement: "Materials containing more hydrogen than water are not authorized in the free gaps of the package." AREVA has always interpreted the term "free gaps" to be the free space outside the inner pails but inside the cavities of the TNF-XI. This interpretation was validated by the fact that NFI's packing specification for packing and loading the TNF-XI required that two polyethylene bags be placed in each inner pail to contain the powder for BWR projects and a single plastic bag be placed in each pail to contain the powder for PWR projects. Also, the NFI pails pre-date the TNF-XI package; they were used with the former NT-IX package and were always used with polyethylene bags in the pails.

TN International is the designer, manufacturer, and French Certificate holder for the Model TNF-XI package. Based on the French Safety Analysis Report (SAR) for the TNF-XI written by TN International, AREVA's interpretation of "free gaps" is incorrect. In all versions of the French SAR, hydrogenous materials with more hydrogen content than water are not allowed in the cavities or inner pails of the TNF-XI, although the SAR allows full flooding of the pails with water. The clear language of the French SAR was not recreated in the applicable French Certificates, which led to confusion about the requirement. On September 3, 2010, TN Inc. informed AREVA that TN International had informed them that there was a problem with using polyethylene bags inside the TNF-XI inner pails. It was after this information was received that AREVA obtained a copy of the TNF-XI criticality chapter contained in the French SAR. With this information in hand, it was clear that polyethylene was not allowed inside the TNF-XI. This information caused a shipment of loaded TNF-XI packages from Richland, WA to NFI in Japan to be postponed indefinitely until the issue could be resolved. Packaging of subsequent shipments has also been placed on hold.

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. The event is not related to the design of the TNF-XI packaging. Additional information related to the event is provided in (i) – (ix), below.

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

As described in (1) above, the event involved the use of polyethylene bags in the inner pails which were not allowed by the French SAR. The event did not involve any system or component failures with the containers themselves.

- (ii) Dates and approximate times of occurrences;

Since November 2003, AREVA has made 110 shipments of uranium dioxide powder to Japan using the TNF-XI packages. Rather than listing all 110 dates for the shipments, the table below summarizes the shipments by year, with the total number of TNF-XI's containers shipped in each year.

Year	Number of Shipments	Total Number TNF-XI Shipped
2003		
2004		
2005		
2006		
2007		
2008		
2009		
2010		

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

There were no TNF-XI component or system failures associated with this event. The exact cause of the problem has not yet been determined but it appears to involve communication problems between NFI and TN International in that vital information (for example NFI's use of polyethylene bags in the inner pails) was either not transmitted to, or not understood by, TN International in the licensing process.

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

No failed components were involved in this event.

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

There were no component failures associated with this event.

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

There were no component or system failures associated with this event.

As stated in (1) above, TN Inc. informed AREVA of the potential problem with using polyethylene bags in the TNF-XI package. AREVA's investigation into the problem validated

TN's concern and confirmed that polyethylene bags were not allowed in the TNF-XI inner pails per the French TNF-XI SAR.

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

The human performance deficiency for the apparent cause appears to be inadequate communication/understanding between NFI and TN International of each others processes. TN International did not realize that NFI used polyethylene bags inside the inner powder pails; and NFI did not realize that the French TNF-XI SAR did not allow the use of materials with a greater hydrogen content than water. This misunderstanding appears to have existed for years and only recently came to light. It is not known when TN International first learned that all users of the TNF-XI used polyethylene bags inside the powder pails.

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

There were no component failures associated with this event.

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

The large number of shipments make it difficult to list the individual quantities of each shipment, but all of the quantities met the quantity restrictions listed in the USDOT CAC USA/0653/AF-96 Section 2 in effect at the time of the shipment. The shipments consisted of uranium dioxide powder enriched to less than 5.0 weight percent U-235.

(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.

The actual safety consequences of this event are low. Criticality analysis performed by TN Inc. on the actual maximum enrichments and quantities that were shipped from Richland shows that while the small amount of polyethylene in the bags has a small positive effect on reactivity, the overall reactivity results remain below the upper subcritical limit. Other than the use of polyethylene bags inside the pails, all other requirements of the USDOT and French certificates for the TNF-XI were met. The occurrences did not result in the exposure of individuals to radiation or radioactive materials.

(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;

As previously stated, all shipments using the TNF-XI have been placed on hold pending resolution of this issue.

The short term corrective action is to find a suitable bag that is made of a material that contains less hydrogen than water. NFI has supplied AREVA with PVC bags which are currently being tested to determine if they are useable. Another possible bag material is nylon; AREVA is trying to obtain samples of nylon bags for testing.

It appears that the long term solution preferred by all users of the TNF-XI is for TN International to perform additional criticality analyses that include small amounts of polyethylene, update the SAR, submit the revised certificate/SAR to the French authorities, and finally the French authority's issuance of a French TNF-XI certificate that allows the use of polyethylene bags inside the TNF-XI powder pails.

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

AREVA is not aware of any previous similar events involving the TNF-XI.

(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.

*Robert E. Link, Manager
Environmental, Health, Safety, & Licensing
AREVA Richland Fuel Fabrication Plant
(509) 375-8409*

(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.