



September 24, 2015  
TJT:15:030

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  
One White Flint North  
Rockville, MD 20852

Gentlemen:

**Subject: Report of Non-Compliance with Condition in Certificate of Compliance 9196 for the Model UX-30 Overpack: Failure of Tampering-Indicating Valve Seals on Contained Model 30-B Cylinders**

Attached please find information as required by 10 CFR 71.95(c) pursuant to a shipment of six full Model 30-B UF<sub>6</sub> cylinders in Model UX-30 overpacks during which two of the plastic bag seals over the cylinder valves failed over the course of transport. Sealing the cylinder valves with tamper-indicating seals is a requirement of Chapter 7 of the UX-30 Safety Analysis Report (SAR); compliance with Chapter 7 of the SAR is a requirement of NRC Certificate of Compliance (COC) 9196 Revision 29 for the UX-30 overpack. Accordingly, this is being reported per 10 CFR 71.95(a)(3) as an instance in which the conditions of approval in the Certificate of Compliance were not observed in making a shipment. The cause of this event and planned preventive actions are discussed in the attachment.

There is no safety significance related to this failure to comply in that the seals on the UX-30 overpacks containing the Model 30-B cylinders were fully intact upon receipt at the receiver's facility, indicating that there was no tampering involved with the contained Model 30-B cylinders

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

Very truly yours,

A handwritten signature in black ink that reads 'T. J. Tate'.

T. J. Tate, Manager  
Environmental, Health, Safety & Licensing

**AREVA INC.**

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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.

*Due to the shutdown of a US UF<sub>6</sub> enrichment facility, over 380 of the enricher's full 30B cylinders are being stored at AREVA Richland until they are shipped to other US fuel fabricators' sites. From October 7, 2013 to June 24, 2014 the cylinders from the enrichment facility were shipped to Richland for storage. Per the enricher's standard practice, a clear plastic bag was placed over each cylinder valve and then a wire tamper-indicating seal was tightly attached around the base of the bag at the valve thread coupling location. These plastic valve seal bags remain over the valves while the cylinders are stored at Richland. The full 30B cylinders are stored outside and subject to the intense desert summer sun of eastern Washington. Due to the sun's ultra-violet rays, many of the valve plastic seal bags became embrittled over time and could be easily broken.*

*From October 15, 2014 to July 17, 2015, a combined total of twelve separate shipments of six full cylinders in UX-30 overpacks was made to the other two US fuel fabricator sites, with no noted issues upon receipt. During the preparation of these shipments, the plastic bags were visually inspected to make sure they were intact. If any of the plastic bags were broken, they were replaced with a new bag and a new AREVA tamper-indicating seal around the bag.*

*On August 7, 2015, during preparation of a shipment of six full 30B cylinders in UX-30 overpacks to another US fuel fabricator, AREVA personnel noticed that three of the plastic valve seal bags were broken. The three broken plastic seal bags were replaced. The three remaining original plastic seal bags were visually determined to be intact and were not replaced before loading the cylinders into the overpacks. The six loaded UX-30 overpacks were shipped to the fuel fabricator later that day.*

*On August 12, 2015, the receiving fuel fabricator's personnel informed AREVA Richland that two of the six full 30B cylinders received on that date had broken plastic valve seal bags when the UX-30 lids were removed from the overpacks. They did note that the two tamper-indicating seals on each UX-30 were intact when the shipment was received. The two broken tamper-indicating valve seal bags violate Chapter 7 paragraph 7.1.2.9 of the UX-30 Safety Analysis Report (SAR) which states: "A tamper-indicating seal shall be installed on the 30B cylinder prior to loading it into the Overpack." NRC Certificate of Compliance 9196 R29 for the Model UX-30 package paragraph 9(c) states: "The package shall be prepared for shipment and operated in accordance with Operating Procedures of Chapter 7 of the application, as supplemented." Since the intent of the requirement is that the tamper-indicating seals on the cylinder (valve and plug seals) remain intact throughout the shipment, the two broken plastic valve seal bags are a violation of the UX-30 certificate. 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) 9196 Revision 29 for the Model UX-30 Condition 9(c) requires that the package shall be prepared for shipment and operated in accordance with the Operating Procedures of Chapter 7 of the UX-30 SAR. As stated above, the receiver determined that two of the six cylinders had broken valve tamper-indicating seals upon removing the UX-30 lids at their site; thus the August 7, 2015 shipment of six Model UX-30 packages from AREVA Richland, WA to the Wilmington, NC receiver's site was made in violation of COC 9196.*

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

*As described above, the event involved shipping of enriched UF<sub>6</sub> in two 30B cylinders in Model UX-30 overpacks with broken 30B valve tamper-indicating seal bags. The seal bags were intact prior to loading the cylinders into the UX-30s but appear to have broken while in transit. The two tamper indicating seals on each of the UX-30s were intact throughout the entire shipment, so there is no indication that the cylinders were tampered with during the shipment.*

(ii) Dates and approximate times of occurrences;

*August 7, 2015, AREVA shipment of six full 30B cylinders containing 2.4% enriched UF<sub>6</sub> in UX-30 overpacks to Wilmington, NC, received August 12, 2015.*

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

*The UV rays of the sun embrittled the plastic bags over the cylinder valves causing them to easily break; it appears that during the shipment two of the three old plastic bags broke due to the embrittlement.*

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

*The sun's UV rays caused the plastic bags to become brittle and easily break.*

(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 receiver discovered the two broken valve seal bags during receipt inspection of the cylinders.*

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

*The decision to use a plastic bag as the valve seal was the primary cause of the condition since over time the sun's UV rays embrittled the plastic bags and caused them to easily break. A second cause was AREVA personnel assuming that a visually intact plastic seal bag that had been significantly exposed to the outdoor environment would remain intact throughout the shipment, though this assumption was based on the fact that this had been true for the 12 previous shipments of full cylinders in UX-30 overpacks.*

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

*The plastic seal bags are small commercial grade clear polyethylene bags.*

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

*The content of each cylinder involved was 2,221 kg of 2.4% enriched UF<sub>6</sub>.*

(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 two tamper-indicating seals on each of the UX-30 overpacks were completely intact when the cylinders were received by the fuel fabricator; showing that the cylinders were not tampered with while in transit.*

(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 owner of the cylinders is planning on replacing the plastic valve seal bags with a more robust tamper-indicating seal in the near future. Until a new robust valve seal is used, AREVA will replace the existing plastic valve seal bags with new plastic bags and tamper-indicating seals on all full 30B cylinder shipments in UX-30 packagings leaving Richland.*

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

*This is the first event involving a broken valve seal on a 30B cylinder in a UX-30 that AREVA is aware of.*

(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  
Environmental, Health, Safety, & Licensing  
AREVA Richland Fuel Fabrication Plant  
(509) 375-8550*

(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.*