



February 13, 2009
GDP 09-1009

Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

**Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001, Certificate No. GDP-1
10 CFR 71.95 - Type AF Transportation Package Report (USA/9196/AF-96)**

United States Enrichment Corporation (USEC) hereby submits this report pursuant to 10 CFR 71.95(a)(1) for discovery of an abnormal condition involving an NRC-approved Type AF package. The Model UX-30 transportation package, identified by USEC as SP-UX-0520, transportation package identification number USA/9196/AF-96, was found during receipt inspection at PGDP to have one of the ten ball lock pins used to fasten the overpack lid to its base disengaged and dangling from its lanyard. The package that had been transported from the Russian Federation to PGDP was inspected prior to departure from the Port of Baltimore during the shipment's return to Paducah and no abnormal conditions reported. Thus, USEC believes that the ball lock pin failed during transport from Baltimore, Maryland to Paducah, Kentucky. USEC has determined the failure mechanism of this pin to be similar to that reported in our 10 CFR 71.95 report submitted to NRC on December 5, 2008, Serial Number GDP 08-1047. Discussions with the UX-30 Certificate of Compliance holder did not result in a determination of the impact on the effectiveness of the packaging for a single ball lock pin loss.

Any questions regarding this report should be directed to Vernon J. Shanks, Regulatory Affairs Manager at (270) 441-6039.

Sincerely,

Steven R. Penrod
General Manager
Paducah Gaseous Diffusion Plant

Enclosures: As Stated

cc: NRC Region II
NRC Resident Inspector - PGDP
NRC Project Manager - PGDP

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NM5501

10 CFR 71.95 - Type AF Transportation Package Report (USA/9196/AF-96)

ABSTRACT

During a January 14, 2009, receipt inspection at the Paducah Gaseous Diffusion Plant (PGDP) of a shipment of UX-30 overpacks containing low enriched uranium (LEU) of Russian origin, one overpack, a Model UX-30 transportation package (USA/9196/AF-96), was found to have one of the ten ball lock pins that are used to fasten the overpack lid to its base disengaged and dangling from its lanyard. The package contained one full type 30B cylinder of 4.396 percent assay. The cylinder was not affected by this condition and there was no release of radioactive material. Since USEC is the owner of the package in question (user but, not certificate holder) and USEC's review of the available UX-30 overpack design documents and consultations with the UX-30 Certificate of Compliance holder did not result in a determination of the impact on the effectiveness of the packaging, USEC has chosen to conservatively report this incident under 10CFR71.95(a)(1).

USEC has reviewed its overpack inspection procedures and determined that they are adequate. The corrective actions described in our previous 10 CFR 71.95 report are sufficient to resolve this issue. As noted previously, USEC intends to replace any two-inch aluminum capped ball lock pins with all stainless steel ball lock pins in USEC owned UX-30 overpacks prior to their next shipment from PGDP.

DETAILS

On January 14, 2009, an ISO flatrack of four UX-30 overpack transportation packages, each with a 30B UF₆ cylinder containing fissile UF₆, arrived at the Paducah Gaseous Diffusion Plant. During receipt inspection, one of the ten ball lock pins that secure the overpack lid to its base was discovered to be disengaged and dangling from its lanyard.

Overpack SP-UX-0520 departed the Paducah site on February 2, 2008, bearing an empty 30B cylinder LU0716 to be delivered to the Siberian Chemical Integrated Plant (SCIP) in Russia. The cylinder was filled with low enriched uranium hexafluoride (LEU) at 4.396 percent assay in August 2008, and placed back in overpack SP-UX-0520 on August 4, 2008. The overpack was shipped by rail from SCIP to the Saint Petersburg Federal State Unitary Enterprise IZOTOP facility in St. Petersburg, Russia. Following routine inspections, the flatrack was loaded onto a vessel in the Port of St. Petersburg on December 19, 2008. The flatrack entered the United States through the Port of Baltimore on January 4, 2009, where the flatrack was loaded onto a trailer for transport to PGDP. The transportation agent responsible for the UF₆ shipments from Russia to USEC inspects each package for any damaged or failed components prior to shipping and upon receipt. No anomalies were reported with the ball lock pins prior to departure from Baltimore for the shipment's return to Paducah. It is suspected the pin became disengaged during transport from Baltimore, Maryland, to Paducah, Kentucky.

INVESTIGATION RESULTS

PGDP has inspected the disengaged pin and determined its failure mechanism to be similar to that described in USEC's previous report. An examination of the pin revealed that the pin had an aluminum cap with visible corrosion product where the aluminum cap is pressed onto the pin shank. During the examination the pin was inserted back into the overpack's lid pin engagement orifice and could be easily withdrawn. The corrosion had apparently caused the plunger mechanism to stick allowing the balls to free float, preventing the pin from being engaged. After exercising the pin's plunger several times, the pin was reinserted and would engage in the opening. The cause of failure appears to also be that previously reported as galvanic corrosion of the aluminum capped ball locking pins.

This overpack is one of the 145 USEC purchased overpacks after the manufacturer began to install aluminum capped pins on new overpacks in 2003.

Ball lock pin problems will continue to be discovered during inspections of shipping packages prior to shipment or during receipt inspections until all the aluminum capped pins have been replaced on USEC owned UX-30 overpacks as previously committed.

BALL LOCK PIN DESIGN INFORMATION

The UX-30 overpack is designed with ten, 2" grip, 7/16" diameter single acting ball lock pins to hold the top and bottom half together during transport. UX-30 overpacks are currently manufactured by Columbiana Hi Tech (CHT). CHT Drawing X-20-238E, "Fabrication and Assembly UX-30 Overpacks," states the ball lock pins are Avibank 7M2.00, Carr Lane, or approved equal. The aluminum capped pins in service at PGDP are labeled 800670, C7B209 and are manufactured by Jergens, and were judged by the manufacturer to be an approved equal.

PGDP currently stocks all stainless steel replacement pins; Avibank Part Number BLC7BC20SL6C7 that complies with part numbers 16 and 17 from CHT drawing X-20-238E.

ASSESSMENT OF SAFETY CONSEQUENCES

A review of the UX-30 Safety Analysis Report (SAR) and discussions with Energy Solutions (current UX-30 certificate holder) indicate the package was accepted on performance based testing conducted by Vectra (original equipment designer/manufacturer). No evaluations were performed in the Safety Analysis Report with less than the full complement of pins with full insertion. The package is placed on transport saddles that have metal straps that are clamped over the package. These devices provide a secondary clamping mechanism to hold the overpack halves together, but these devices are not credited in the Safety Analysis Report. Based on this review USEC is unable to quantify whether a single missing ball lock pin is a significant reduction in the effectiveness of the package. However, the user inspection conducted prior to any shipment provides reasonable assurance that the packages will be shipped in a safe condition.

CORRECTIVE ACTIONS

USEC inspects each UX-30 package prior to shipment according to Chapter 7 of the UX-30 SAR. If an inspection indicates that a ball lock pin is not functional then the ball lock pin is replaced. The pins are acceptable for use if the pins pass the UX-30 required inspections and are functional. However, as previously stated in our last report, based on the failure modes of the aluminum capped pins and the questionable life expectancy in a salt water environment, for UX-30 overpacks owned by USEC, the two-inch aluminum capped ball lock pins are being replaced with all stainless steel pins when the packages are returned to PGDP and prior to their subsequent shipment. USEC's overpack inspection procedures are adequate to identify aluminum capped ball lock pins. These ball lock pins will be replaced for the USEC fleet and should be completed by December 31, 2010, as previously committed.

SIMILAR EVENTS

Since USEC's previous 10 CFR 71.95 report submitted on December 5, 2008, Serial Number GDP 08-1047, USEC is aware of one additional similar event report filed by Global Nuclear Fuel, Americas - LLC (GNF-A). This report was filed by GNF-A on February 6, 2009, and also identified a ball lock pin disengaged and hanging from its lanyard. This pin failure on a single overpack was discovered by USEC during receipt inspection of a shipment of UX-30 overpacks with 30B cylinders containing heel quantities of low enriched uranium hexafluoride from GNF-A at Wilmington, NC.

LIST OF COMMITMENTS

No new commitments.