

April 3, 2017

Mr. Gerard van Noordennen
Vice President, Regulatory Affairs
EnergySolutions
2105 South Bascom Avenue, Suite 230
Campbell, CA 95008

SUBJECT: AUTHORIZATION FOR SHIPMENT OF SHIELD INSERTS IN THE MODEL
NO. 10-160B PACKAGE

Dear Mr. van Noordennen:

As requested by your letter dated March 6, 2017, pursuant to Title 10 of the *Code of Federal Regulations* Part 71, the Certificate of Compliance (CoC) No. 9204 for the Model No. 10-160B package is amended to authorize eight one-time shipments of the shield inserts with non U.S. manufactured fasteners.

The already loaded shield inserts may be shipped with the non U.S. manufactured fasteners and an incorrect stenciled package gross weight. All other conditions of CoC No. 9204 shall remain the same. This authorization is valid for eight shipments, from the Southwest Research Institute, San Antonio, TX, to the Nevada Nuclear Security Site (NNSS), Mercury, NV, for the inserts with serial numbers listed in Enclosure 1, and shall expire on October 31, 2017.

If you have any questions regarding this authorization, please contact Pierre Saverot at (301) 415-7505.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA Bernard White Acting for/

John McKirgan, Chief
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9204
CAC No. L25201

Enclosure 1: Safety Evaluation Report

cc: R. Boyle, Department of Transportation
L. Gelder, DOE-SRNL

AUTHORIZATION FOR SHIPMENT OF SHIELD INSERTS IN THE MODEL NO. 10-160B
 PACKAGE, DATED: APRIL 3, 2017

DISTRIBUTION:

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OFC:	SFM		SFM	SFM	SFM	SFM
NAME:	PSaverot	DDunn	MRahimi	SFiguroa	BHWhite for JMcKirgan	
DATE:	03/29/2017	03/29/2017	03/29/2017	03/30/2017	4/3/17	

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SAFETY EVALUATION REPORT
Docket No. 71-9204
Model No. 10-160B
Certificate of Compliance No. 9204

SUMMARY

By application dated March 6, 2017, *EnergySolutions* (the applicant) requested a one-time authorization to ship eight currently loaded shield inserts that deviate from Condition Nos. 5(a)(2) and 5(a)(3) of the Certificate of Compliance (CoC).

CoC No. 9204 has been amended to authorize eight one-time shipments, based on the statements and representations in the application. The staff agrees that the deviation from Notes in the licensing drawings does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

EVALUATION

Eight loaded inserts, currently stored at Southwest Research Institute, are not in compliance with Condition Nos. 5(a)(2) and 5(a)(3) of CoC No. 9204:

1. Contrary to Note 18 of the licensing drawing, the shield insert fasteners were not U.S. manufactured,
2. Contrary to Note 4 of the licensing drawing, the stenciled package gross weight was 7,600 pounds, not 8,000 pounds as specified in the drawing.

If done in situ, i.e., under dry conditions, the replacement of the fasteners and the modification of the stenciling would create significant unnecessary radiation exposure for the personnel performing those operations: the applicant estimated exposures to be about 2,100 mrem to modify the stenciling in 3 different locations (front, back and top of the insert) because long-handled tools and temporary shielding cannot be used for those operations, and 350 mrem to remove and replace the fasteners on inserts loaded with a low of 2,080 Ci and a high of 6,635 Ci Co-60. The other option would be to perform Type B shipments with the non-compliant inserts, return the inserts to the pool for unloading, modifying the stenciling, reloading, installing compliant fasteners, and recertifying the waste in each insert before proceeding with the shipments to the disposal site.

To address the incorrect stenciled weight of the package, *EnergySolutions* noted that the 7,600 pound stenciled weights were bounded by the maximum design weight specified in Condition No. 5(a)(2) of the CoC, and that the gross weights of the shield insert units were all less than 7,600 lbs.

To address the nonconforming fasteners, *EnergySolutions* provided (i) a certification of the subject non-U.S. fasteners meeting the requirements of SAE J429 for Grade 5 fasteners, (ii) a report with (a) the manufacturer's (Jinn Her Enterprise Co., Ltd, Taiwan) Certificate of Inspection that includes dimensional inspections, surface hardness, core hardness, material tensile

strength and proof load test results and (b) a Petersen Incorporated test report for a sample of 6 Bolts, from a lot of 60, showing chemical composition, surface hardness, core hardness, and proof load testing.

The NRC staff reviewed the dimensional tolerances, surface hardness, core hardness, tensile strength, proof load test results, and fastener markings provided in the Jinn Her Enterprise Co., Ltd, Certificate of Inspection. The staff also reviewed the dimensional inspection results in the Jinn Her Enterprise Co., Ltd, Certificate of Inspection to the dimensional specifications for hex bolts listed in ASME B18.2.1 and determined that the samples tested met the dimensional specification requirements for the specified bolts. The staff reviewed the reported surface hardness and core hardness provided in the Jinn Her Enterprise Co., Ltd, Certificate of Inspection and determined that the samples tested met the SAE J429 grade 5 fasteners hardness specifications. The staff reviewed the tensile strength and proof load test data results reported in the Jinn Her Enterprise Co., Ltd, Certificate of Inspection and determined that the reported results met the SAE J429 grade 5 fasteners specifications.

The staff compared the chemical analysis in the Petersen Incorporated testing report to the chemical requirements listed in SAE J429 for Grade 5 bolts which includes specified ranges for Carbon (C), Phosphorous (P) and Sulfur (S). The staff reviewed the chemical analysis results for the sample of 6 bolts and determined that all 6 samples met the chemical specifications of SAE J429 for Grade 5 fasteners. The staff reviewed the surface and core hardness test results for the 6 bolt sample and determined that all 6 samples met the hardness specifications of SAE J429 for Grade 5 fasteners. The staff reviewed the reported mechanical properties measured on the 6 bolt sample and determined that all 6 of the bolts samples, from the lot of 60, met the proof load testing and full size tensile testing specifications of SAE J429 for grade 5 bolts.

The staff also reviewed ASTM F1470-12, "Standard Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection," and compared the stipulated Sampling Level for the Detection Process to the number of bolt samples tested by Petersen Incorporated. The staff determined that a sampling of 6 fasteners, out of a lot of 60 with zero nonconforming part detected, is sufficient to conclude that the lot of 60 fasteners meets the specifications of SAE J429 for Grade 5 fasteners.

Evaluation Findings

Based on the data provided by the applicant, i.e., the manufacturer's certificate of inspection and the results of the confirmatory testing conducted by Petersen Industries, the staff determined that the non-U.S. sourced fasteners used in the shield inserts meet the specifications of SAE J429 for grade 5 fasteners.

Based on its review, the staff determined that eight one-time shipments of those inserts in the Model No. 10-160B package do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

CONDITIONS

Loaded shield inserts of the Model No. 10-160B package (a total of 8 inserts, with serial numbers as listed below in Table No. 1) are authorized for one time shipments from the current dry storage location at Southwest Research Institute, San Antonio, TX, to the permanent disposal site at Nevada Nuclear Security Site (NNSS), Mercury, NV. There will be a maximum

of eight shipments. All other conditions of CoC No. 9204 shall remain the same. This authorization shall expire on October 31, 2017.

Table No. 1: Serial Numbers of Shield Insert Liners

Insert Type	Liner S/N
Insert A	1537-004-01
Insert A	1877-004-01
Insert A	1877-004-03
Insert A	1877-004-04
Insert A	1877-004-05
Insert A	1877-004-06
Insert A	1877-004-07
Insert B	1537-0001-03

CONCLUSION

CoC No. 9204 has been amended by letter to authorize the shipment of 8 inserts. This authorization expires October 31, 2017.

Based on the statements and representations in the application, and with the conditions listed above, the staff agrees that this change does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued on April 3, 2017.