State of Utah
GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF RADIATION CONTROL
Rusty Lundberg
Director

FILE
SR

January 20, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUIRED

US Government – NASA PBRF Decommissioning
Keith Peecook, NASA PBRF Decommissioning Manager
6100 Columbus Avenue
Sandusky, OH 44870

RE: Generator Access Permit Number 0212001902, NOTICE OF VIOLATION AND NOTICE OF PROPOSED IMPOSITION OF CIVIL PENALTY

Dear Mr. Peecook:

As a result of observations made during an inspection, it has come the to attention of the Utah Division of Radiation Control that US Government – NASA PBRF Decommissioning, shipped radioactive waste to the EnergySolutions, LLC disposal facility located at Clive, Utah that did not conform to the Utah Radiation Control Rules.

Specifically, the Division of Radiation Control is concerned that the apparent lack of management control regarding the implementation of your waste classification procedures resulted in significant violations of Utah Radiation Control Rules. Consequently, your required response to this letter should describe those actions planned or taken to improve the effectiveness of the management control of your waste classification procedures, with particular emphasis on measures currently being taken to prevent future waste classification violations.

Corrective actions taken to avoid future noncompliance are expected to be effective and lasting. Utah Administrative Code Subsection R313-14-15(2)(b)(ii) states, "ineffective licensee programs for problem identification or correction are unacceptable. In cases involving repeated poor performance in an area of concern or serious breakdown in management control, the Executive Secretary may apply the full enforcement authority."

A Notice of Violation and Notice of Proposed Imposition of Civil Penalties is enclosed. The particular violations are described in the enclosed Notice. Your attention to this matter is appreciated.

UTAH RADIATION CONTROL BOARD

Rusty Lundberg

Rusty Lundberg, Executive Secretary

RL:jf
Enclosure
cc: Jeff Ginsburg, EnergySolutions

195 North 1950 West • Salt Lake City, UT
Mailing Address: P.O. Box 144850 • Salt Lake City, UT 84114-4850
Telephone (801) 536-4250 • Fax (801-533-4097 • T.D.D. (801) 536-4414
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UTAH RADIATION CONTROL BOARD
NOTICE OF VIOLATION
AND
NOTICE OF PROPOSED IMPOSITION OF CIVIL PENALTY

US Government – NASA PBRF Decommissioning
Keith Peecook, NASA PBRF Decommissioning Mgr.
6100 Columbus Avenue
Sandusky, OH 44870

Generator Site Access Permit No. 021 200 1902

In a letter dated December 13, 2010, EnergySolutions notified the Utah Division of Radiation Control (UDRC) of a non-compliance issue at the EnergySolutions Low-Level Radioactive Waste Disposal Facility in Clive, Utah. The purpose of the letter was to inform the Executive Secretary of the Utah Radiation Control Board of multiple shipments with containers containing waste exceeding Class A waste limits that were accepted and disposed at the Clive facility. As a result of the investigation, violations of the Utah Radiation Control Rules were identified. The authority for this proposed action is Utah Code Annotated (1953, as amended) Section 19-3-109. The proposed penalties have been arrived at by using Rule R313-14 of the Utah Administrative Code (UAC). The particular violations and the associated proposed civil penalty are set forth below:

1. Utah Radiation Control Rule R313-26-6 states: "Generator Site Access Permittees shall be subject to the provisions of Rule R313-14 for violations of federal regulations, state rules or requirements in the current land disposal facility operating license regarding radioactive waste packaging, transportation, labeling, notification, classification, marking, manifesting or description."

   License Condition 9.B of the receiving land disposal facility, EnergySolutions (Licensee), Radioactive Material License Number UT2300249, states: "In accordance with Utah Code Annotated 19-3-105, the Licensee may not receive Class B or Class C low-level radioactive waste without first receiving approval from the Executive Secretary of the Utah Radiation Control Board and also receiving approval from the Governor and the Legislature."

   Contrary to this requirement, a radioactive waste shipment from US Government – NASA PBRF Decommissioning, (Permittee), was identified and confirmed by the Division of Radiation Control as exceeding Class A limits. The permittee misclassified and certified the waste that EnergySolutions received, accepted and disposed of as Class A. Shipment number 9062-03-0001 consisted of 81 drums and was described on the Nuclear Regulatory Commission (NRC) Uniform Low-Level Waste Manifest Form 541 as Class A unstable material. It was determined that drum identification number 1906-01-099 containing Sr-90 exceeded the concentration limit listed in the Utah Administrative Code Rule R313-15-1009(d)(ii), Table II . Therefore, it was misclassified as Class A waste.

   This violation is of significant concern and has been characterized as Severity Level III. The base penalty for this Severity Level is $2,500.00.

   Therefore, a civil penalty of $2,500.00 is proposed.

   In addition, in accordance with Utah Radiation Control Rule R313-26-6 the above violation was evaluated utilizing the Generator Site Access Permit Enforcement Policy. Accordingly, US Government – NASA PBRF Decommissioning, Generator Site Access Permit will be assessed 125 points for mischaracterization of the waste shipment.

2. Utah Radiation Control Rule R313-15-1006(3), which incorporates by reference federal regulation 10 CFR 20, Appendix G, Section II. *Certification*, requires the authorized representative of the waste generator to certify that the transported material is properly classified and described.

UTAH RADIATION CONTROL BOARD
NOTICE OF VIOLATION
AND
NOTICE OF PROPOSED IMPOSITION OF CIVIL PENALTY

US Government – NASA PBRF Decommissioning
Keith Peecook, NASA PBRF Decommissioning Mgr.
6100 Columbus Avenue
Sandusky, OH 44870

Generator Site Access Permit No. 021 200 1902

Contrary to the above, the Permittee wrongly certified that the waste was classified as Class A.

This violation is characterized as a Severity Level IV. The base penalty for this Severity Level is $750.00.

Therefore, a civil penalty of $750.00 is proposed.

In accordance with Utah Radiation Control Rule R313-26-6 the above violation was evaluated utilizing the Generator Site Access Permit Enforcement Policy. Accordingly, US Government – NASA PBRF Decommissioning, Generator Site Access Permit will be assessed 100 points for failure to execute the required shipper's certification.

Regarding the civil penalties, the licensee may within 30 days of receipt of this Notice, pay the civil penalty in the amount of $3,250.00, or may protest the imposition of the civil penalties in whole or in part by written answer. Should the permittee fail to answer in the time specified, the Utah Radiation Control Board will issue an order imposing a civil penalty in the amount proposed.

Regarding the assessed points, the DRC requires until the corrective actions are accepted by the Executive Secretary permit renewal will be suspended. Any reply to the Notice of Violation should include, for each violation: (1) the corrective steps which have been taken and the results achieved; (2) the corrective steps which have been taken to prevent recurrence; and (3) the date full compliance will be achieved. A response protesting the Imposition of Civil Penalties shall include: (1) an admission or denial of the item of non-compliance; (2) a demonstration of extenuating circumstances; (3) a showing of error in the Notice of Violation; or (4) other reasons why the penalty should not be imposed.

Your response or written answer to this Notice of Violation/Notice of Proposed Imposition of Civil Penalty shall be addressed to Rusty Lundberg, Executive Secretary, Utah Radiation Control Board, 195 North 1950 West, P.O. Box 144850, Salt Lake City, Utah 84114-4850. The licensee's attention is directed to the Administrative Procedures set forth in Utah Code Annotated (UCA) 63G-4. If a hearing is requested, the Executive Secretary of the Utah Radiation Control Board will designate the time and place of the hearing.

Upon failure to pay any civil penalty due which has been subsequently determined in accordance with the applicable provisions of UCA 19-3-109 and R313-14, the matter may be referred to the Attorney General, and the civil penalty may be collected by civil action pursuant to UCA 19-3-109(5).

Dated at Salt Lake City, Utah
This 20th day of January, 2011

UTAH RADIATION CONTROL BOARD

Rusty Lundberg

Rusty Lundberg, Executive Secretary

FORM 540A

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
SHIPPING PAPER (CONTINUATION)

EnergySolutions, LLC

8. MANIFEST NUMBER (Use this number on all continuation pages)
9052-03-0001

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES				16. TOTAL PACKAGE ACTIVITY MBq	16. TOTAL PACKAGE ACTIVITY mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
Waste, UN2910, Radioactive Material, Excepted Package-Limited Quantity of Material, 7, RQ(D008) - 1 Metal Drum	NA	NA	Solid Oxides	Am-241	C-14	Cm-243	Co-60	1.9994E+02	(5.4037E+00)	NA	550 LBS; 7.5 FT3	1906-OJ-099
				Cs-137	Eu-154	Fe-55	H-3					
				Nb-94	Ni-59	Ni-63	Pu-238					
				Pu-239	Pu-241	Sr-90	Tc-99					
				U-234								
Waste, UN2910, Radioactive Material, Excepted Package-Limited Quantity of Material, 7, RQ(D008) - 1 Metal Drum	NA	NA	Solid Oxides	Am-241	C-14	Cm-243	Co-60	3.9491E+00	(1.0673E-01)	NA	780 LBS; 7.5 FT3	1906-OJ-106
				Cs-137	Eu-154	Fe-55	H-3					
				Nb-94	Ni-59	Ni-63	Pu-238					
				Pu-239	Pu-241	Sr-90	Tc-99					
				U-234								
Waste, UN2910, Radioactive Material, Excepted Package-Limited Quantity of Material, 7, RQ(D008) - 1 Metal Drum	NA	NA	Solid Oxides	Am-241	C-14	Cm-243	Co-60	3.9491E+00	(1.0673E-01)	NA	760 LBS; 7.5 FT3	1906-OJ-110
				Cs-137	Eu-154	Fe-55	H-3					
				Nb-94	Ni-59	Ni-63	Pu-238					
				Pu-239	Pu-241	Sr-90	Tc-99					
				U-234								
Waste, UN2910, Radioactive Material, Excepted Package-Limited Quantity of Material, 7, RQ(D008) - 1 Metal Drum	NA	NA	Solid Oxides	Am-241	C-14	Cm-243	Co-60	3.9491E+00	(1.0673E-01)	NA	800 LBS; 7.5 FT3	1906-OJ-132
				Cs-137	Eu-154	Fe-55	H-3					
				Nb-94	Ni-59	Ni-63	Pu-238					
				Pu-239	Pu-241	Sr-90	Tc-99					
				U-234								
Waste, UN2910, Radioactive Material, Excepted Package-Limited Quantity of Material, 7, RQ(D008) - 1 Metal Drum	NA	NA	Solid Oxides	Am-241	C-14	Cm-243	Co-60	3.9491E+00	(1.0673E-01)	NA	890 LBS; 7.5 FT3	1906-OJ-133
				Cs-137	Eu-154	Fe-55	H-3					

FORM 541A

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION (CONTINUATION)

EnergySolutions, LLC

2. MANIFEST NUMBER 9062-03-0001

3. PAGE 17 OF 29 PAGE(S)

DISPOSAL CONTAINER DESCRIPTION							WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER							16. WASTE CLASSIFICATION AS-Class A Stable AU-Class A Unstable B-Class B C-Class C
							PHYSICAL DESCRIPTION			14. CHEMICAL DESCRIPTION		15. RADIOLOGICAL DESCRIPTION		
5. CONTAINER IDENTIFICATION NUMBER/ GENERATOR ID NUMBER(S)	6. CONTAINER DESCRIPTION (See Note 1 & Note 1A)	7. VOLUME (m3) / (ft3)	8. WASTE AND CONTAINER WEIGHT (Kg) / (ton)	9. SURFACE RADIATION LEVEL (mSv/hr) / (mrem/hr)	10. SURFACE CONTAMINATION (MBq/100 cm2) / (dpm/100cm2) ALPHA	10. SURFACE CONTAMINATION (MBq/100 cm2) / (dpm/100cm2) BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2 & Note 2A)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER (m3) / (FT3)	13. SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3)	CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	INDIVIDUAL RADIONUCLIDES AND ACTIVITY (MBq) AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT			
												RADIONUCLIDES	pCi/gm	MBq	mCi	
												Eu-154	7.70552E-01	6.6600E-03	1.8000E-04	
												Fe-55	1.28425E+03	1.1100E+01	3.0000E-01	
												H-3	1.92638E+03	1.6650E+01	4.5000E-01	
												Nb-94	1.58391E+02	1.3690E+00	3.7000E-02	
												Ni-59	3.46748E+01	2.9970E-01	8.1000E-03	
												Ni-63	4.28084E+03	3.7000E+01	1.0000E+00	
												Pu-238 [2.4000E-07 g]	1.75515E+01	1.5170E-01	4.1000E-03	
												Pu-239 [1.2000E-04 g]	3.08221E+01	2.6640E-01	7.2000E-03	
												Pu-241 [3.4000E-07 g]	1.45549E+02	1.2580E+00	3.4000E-02	
											*	Sr-90	7.27743E+03	6.2900E+01	1.7000E+00	
												Tc-99	5.56510E+02	4.8100E+00	1.3000E-01	
												U-234 [3.6000E-07 kg]	9.41785E+00	8.1400E-02	2.2000E-03	
												Subtotal		1.9994E+02	5.4037E+00	
												Total		1.9994E+02	5.4037E+00	
												SNM [1.2058E-04 g]				
												Source [3.6000E-07 kg]				
1906-OJ-106/9062	4	0.21	353.80	1.0000E-04	<1.6700E-06	<1.6700E-05	59-other, lead glass, lead debris-H	0.19	100	Oxides/NP	NP	Am-241	4.73478E-01	5.9200E-03	1.6000E-04	AU
		7.50	0.39	1.0000E-02	<1.0000E+02	<1.0000E+03		6.75	100			C-14	1.27247E-01	1.5910E-03	4.3000E-05	
												Cm-243	3.84701E-02	4.8100E-04	1.3000E-05	
												Co-60	7.10218E+00	8.8800E-02	2.4000E-03	
												Cs-137	9.46957E+01	1.1840E+00	3.2000E-02	
												Eu-154	1.06533E-02	1.3320E-04	3.6000E-06	
												Fe-55	1.74595E+01	2.1830E-01	5.9000E-03	
												H-3	2.63372E+01	3.2930E-01	8.9000E-03	
												Nb-94	2.13066E+00	2.6640E-02	7.2000E-04	
												Ni-59	4.73478E-01	5.9200E-03	1.6000E-04	
												Ni-63	5.91848E+01	7.4000E-01	2.0000E-02	
												Pu-238 [6.8000E-09 g]	2.39698E-01	2.9970E-03	8.1000E-05	
												Pu-239 [2.3000E-06 g]	4.14294E-01	5.1800E-03	1.4000E-04	
												Pu-241 [6.7000E-09 g]	1.98269E+00	2.4790E-02	6.7000E-04	
												Sr-90	9.76549E+01	1.2210E+00	3.3000E-02	
												Tc-99	7.39810E+00	9.2600E-02	2.5000E-03	
												U-234 [6.9600E-09 kg]	1.27247E-01	1.5910E-03	4.3000E-05	
												Subtotal		3.9491E+00	1.0673E-01	
												Total		3.9491E+00	1.0673E-01	
												SNM [2.3115E-06 g]				
												Source [6.9600E-09 kg]				

FORM 541A (03-06)

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Plum Brook Station
Sandusky, OH 44870

January 20, 2011

Reply to Attn of: QD

Energy Solutions, LLC
1854 North 120 West
Tooele, UT 84074

Attention: Mr. Chris Lee

Subject: Revised Shipping Manifest for Shipment 9063-03-0001, Shipped on March 5, 2008

Dear Mr. Lee;

We have reviewed your email notification of October 20, 2010 and are in full agreement with your finding that there were errors in the documented classification for one of the fifty-one drums of material in shipment number 9063-03-0001. With the radionuclide content shown on the manifest, package number 1906-OJ-099 did not meet the regulatory criteria for classification as a Class A- Unstable waste form. We erred in our evaluation of this drum and we erred in our oversight process that failed to detect the misclassification.

The original assessment of this material was performed using extremely conservative methods and calculations to assess the radionuclide content and proper classification of the waste. We have recalculated the contents of the drum in question, as well as all other drums that were in the shipment, using the current version of the RADMAN computer software and our records of the drum contents and radiation surveys. The more realistic and accurate calculations show that all drums in the shipment did in fact meet the Department of Transportation criteria for classification as a "limited quantity of material", and they met the criteria of 10CFR61 and your Waste Acceptance Criteria for disposal as Class A-Unstable Waste.

The enclosure 1 to this letter provides a more detailed discussion of our investigation into this error and of our corrective actions to prevent recurrence of this error. Enclosures 2 and 3 to this letter are revised shipping papers, including a revised Uniform Low-Level Radioactive Waste Manifest, NRC Form 540 and 540A (18 pages), and a revised NRC Form 541 and 541A (51 pages).

We began using the RADMAN software, an industry accepted standard, for evaluation of all radioactive waste shipments in 2009 and have used it for all subsequent shipments. The accuracy and thoroughness of this software in conjunction with enhanced Quality review of shipping documentation should prevent recurrence of this error.

We apologize for the inconvenience that our error may have caused. We trust that this letter is responsive to the issue and hope that you find our corrective actions to be acceptable and adequate to prevent recurrence.

Should you have any questions or need additional information, please contact me at (419) 621-3277, or Mr. John Thomas of my staff at (419) 621-3357.

Sincerely,

Keith M. Peecook, P.E.
NASA Decommissioning Program Manager

Enclosures (3)
1. Detailed discussion of incident
2. Revised NRC Form 540/540A (18 pages)
3. Revised NRC Form 541/541A (51 pages)

ENCLOSURE
Details of Incident and Corrective Actions

Waste shipment 9062-03-0001 includes 51-type 17-H drums shipped in a closed transport trailer from Plum Brook Reactor Facility to Energy Solutions disposal site in Clive, Utah. The drums (55-gallon capacity) contained broken leaded glass from the facility's Hot Cell windows and other lead bearing components. Due to the leachability of lead from the glass, the waste material was classified as "Mixed Waste" with the waste designator of D-008. The shipment departed Plum Brook Station on March 5, 2008.

A calculation was performed on each individual drum in the shipment and each drum was assigned the Proper Shipping Name of "*Waste, UN2910, Radioactive Material, Excepted Package-Limited Quantity of Material, 7, RQ (D008).*" The NRC Form 541/541A showed each drum with the Waste Classification of "*AU*".

The project was in the early stage of a large waste shipping campaign following a hiatus of about 2 ½ years during which no significant waste shipping had occurred. The Contractor Waste Coordinator, a certified shipper, performed all necessary calculations and evaluations of the packages and prepared the NRC Form 540/540A, NRC Form 541/541A, and the EPA Uniform Hazardous Waste Manifest. These documents were then reviewed by the NASA Project QA Manager and presented to the NASA Waste Manager for signature. The Project QA Manager performed a review of the Waste Coordinator's calculations and reviewed the completed shipping papers. The QA review consisted of verifying inputs, selective review of parts of the documentation, and independent calculations for ten-percent of the containers (note: the NASA Project QA Manager and the NASA Waste Manager also have the requisite training to be certified as a hazardous material shippers).

At this time, containers were being assessed using MicroShield to calculate their radionuclide content. The activity content was then manually input into a spreadsheet for performing the necessary transportation and disposal calculations and the results were input to another software package that prepared the manifest documents. In addition, as the pace of the shipping program gained momentum, the QA Manager developed an independent spread sheet calculation for verifying the Waste Coordinator's calculations. The two individuals worked well together in finding and resolving occasional discrepancies between their respective calculations. The QA review of each shipment included a 100-percent verification of all DOT Transport assessments using the MicroShield print out provided with the manifest papers. The project had a high level of confidence in the process of performing and verifying the waste shipping documentation.

In 2009, the project obtained the RADMAN software to alleviate some of the work involved in our processes. We still use an independent verification calculation with a spreadsheet system to verify the RADMAN results for about 96 percent of our shipping calculations.

When notified by Energy Solutions of an error in manifest 9062-03-0001, we retrieved our records of this shipment and performed a thorough review. The original calculation should have identified Drum 1906-OJ-099 as not meeting the Class A criteria. In addition, with the inputs

used in the original calculation, the Drum also did meet the Limited Quantity criteria. It should have been classified as LSA-II. The verification calculation for this shipment performed an independent calculation of only five of the fifty-one drums, number 1906-OJ-099 not being among them.

The input for the transportation evaluation calculation used a very conservative evaluation of the radionuclide content. We used the output of a MicroShield calculation that was based on the highest contact dose rate on the drum and results based on "measurement assumed NO Buildup". We ran the calculation again using the spreadsheet currently used for independent verification calculations. That calculation showed that the A_2 fraction is 1.1029 E-3, which exceeds the Limited Quantity criteria of 1.0 E-3. The Strontium-90 Table 2 Class A fraction is 0.98 and the sum of fractions for Table 2 Class A limit is 1.03. The container exceeds Class A limits by this ultra conservative calculation. The calculation was rerun using the same MicroShield calculation, except using the more accurate calculation results based on "measurement assumed With Buildup". In this case, the A_2 fraction is 8.4843 E-4, which is within the Limited Quantity criteria, the Strontium-90 Table 2 Class A fraction is 0.76 and the sum of fractions for Table 2 Class A limit is 0.79. The container meets the Class A disposal limits.

Out practice had been to always use very conservative approaches in our calculations, knowing that we would probably over classify, but always err in the safe direction. When our calculations showed that we were approaching upper limits, we would reevaluate using a more accurate but less conservative approach. In this case, one drum out of fifty one should have been flagged and reevaluated. Our reviews missed it.

We reevaluated all drums in this shipment using the industry standard RADMAN software. In the revised calculations, we used the average dose rates taken at one meter and used the results "With Buildup". This is a more accurate and more realistic approach to the radionuclide content assessment. Using these output numbers, both RADMAN and our verification spreadsheet show that Drum 1906-OJ-099 had an A_2 fraction of 4.0413 E-4 which is well below the maximum for classification as "Limited Quantity". The Strontium-90 Table 2 Class A fraction is 0.36 and the sum of fractions for Table 2 Class A limit is 0.38. The container meets the Class A disposal limits.

A new set of shipping papers has been prepared for shipment 9062-03-0001 and are submitted to the disposal site as documentation that the shipment meets the criteria for Limited Quantity, UN2910 for transport, and meets the criteria for Class A Unstable for shallow land disposal.

As corrective actions to prevent recurrence, we have done the following:

- This issue has been discussed among the senior staff and all staff involved in the preparation, review, and signing of Radioactive Waste Manifests.

- This issue and our follow-up actions have been recorded in our QA Program Corrective Action database.

- All manifests and shipping related calculations are consistently performed using RADMAN computer software.

- All manifest and shipment documentation are independently reviewed by trained and experienced staff members.

- Independent calculations are performed for at least 85% of all shipments and those calculations include 100% of the packages in that consignment. The independent calculations are documented, signed, and maintained as a project record.

- All calculations of radionuclide content now use average one-meter dose rates rather than the overly conservative highest contact dose rate.

A copy of this document will be filed with the project records related to consignment 9062-03-0001, and retained with NASA records.