Exelon Generation®

Exelon Generation Company LLC
James A. FitzPatrick NPP
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William C. Drews
Regulatory Assurance Manager - JAF

JAFP-18-0039
April 30, 2018

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

SUBJECT: 2017 Annual Radioactive Effluent Release Report

Dear Sir or Madam:

This letter transmits the James A. FitzPatrick Nuclear Power Plant's (JAF) Annual Radioactive Effluent Release Report for the period of January 1, 2017 through December 31, 2017. The enclosure is submitted in accordance with 10 CFR 50.36a and the Reporting Requirements of Technical Specifications Section 5.6.3 and Technical Requirements Manual Appendix H, Offsite Dose Calculation Manual (ODCM), Part 1 Section 6.2, Radioactive Effluent Release Report.

This report (Enclosure 1) includes, as an Addendum, an Assessment of the Radiation Doses to the Public due to the radioactive liquid and gaseous effluents released during the 2017 calendar year. The format used for the effluent data is outlined in Appendix B of Regulatory Guide 1.21, Revision 1. Distribution is in accordance with Regulatory Guide 10.1, Revision 4.

Included in this letter are the procedures associated with changes in the Process Control Program (Enclosure 2).

There are no new regulatory commitments contained in this letter.

If you have any questions concerning the enclosed report, please contact Mr. Jeff Gerber, Chemistry Manager, at (315) 349-6635.

Sincerely,

William C. Drews
Regulatory Assurance Manager - JAF

WCD/JG/dc

Enclosure 1: Annual Radioactive Effluent Release Report, January 1 – December 31, 2017

Enclosure 2: Process Control Program Procedure Changes

cc:

Regional Administrator, Region I
U. S. Nuclear Regulatory Commission
2100 Renaissance Blvd., Suite 100
King of Prussia, PA 19406-2713

Resident Inspector's Office
U.S. Nuclear Regulatory Commission
James A. FitzPatrick Nuclear Power Plant
P.O. Box 136
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Tanya Hood
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J. Gerber (CHEM/JAF)
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K. Stoffle (NMP)

JAFP-18-0039

Enclosure 1

Annual Radioactive Effluent Release Report

January 1 – December 31, 2017

(38 Pages)

EXELON FITZPATRICK, LLC

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY 1, 2017 - DECEMBER 31, 2017

DOCKET NO. 50-333

LICENSE NO. DPR-59

EXELON FITZPATRICK, LLC
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 2017 - DECEMBER 2017

SUPPLEMENTAL INFORMATION

FACILITY: JAFNPP **LICENSEE: EXELON FITZPATRICK, LLC**

1. Offsite Dose Calculation Manual Part 1 Radiological Effluent Controls

a. Fission and Activation Gases:

(1) The dose rate at or beyond the site boundary due to radioactive materials released from the plant in gaseous effluent shall be limited as follows:

(a) Less than or equal to 500 mrem/year to the whole body and less than or equal to 3000 mrem/year to the skin from noble gases.

(2) The air dose to areas at or beyond the site boundary from noble gases released from the plant in gaseous effluent shall be limited:

(a) During any calendar quarter, to less than or equal to 5 mrad from gamma radiation, and less than or equal to 10 mrad from beta radiation; and,

(b) During any calendar year, to less than or equal to 10 mrad from gamma radiation and less than or equal to 20 mrad from beta radiation.

b. Tritium, Iodines and Particulates, Half Lives > 8 days:

(1) The dose to a member of the public at or beyond the site boundary from Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form with half-lives greater than 8 days released from the plant in gaseous effluent shall be limited:

(a) During any calendar quarter to less than or equal to 7.5 mrem to any organ; and,

(b) During any calendar year to less than or equal to 15 mrem to any organ.

(c) Less than 0.1% of the limits of ODCM Part 1, Section 3.4 Specification 3.4.1.c.1.a and 3.4.1.c.1.b as a result of burning contaminated oil.

(2) The dose rate at or beyond the site boundary due to radioactive materials released from the plant in gaseous effluents shall be limited as follows:

(a) Less than or equal to 1500 mrem/year to any organ from Iodine-131, Iodine-133, Tritium and for radioactive materials in particulate form with half-lives greater than 8 days (inhalation pathway only).

SUPPLEMENTAL INFORMATION (continued)

c. Liquid Effluents:

(1) The concentration of radioactive materials released to the unrestricted areas shall not exceed ten times the values specified in 10 CFR 20.1001-20.2402, Appendix B, Table 2, column 2. For dissolved or entrained noble gases the concentration shall be limited to 2.00E-04 μCi/ml.

(2) The dose to a member of the public from radioactive materials released from the plant in liquid effluents to unrestricted areas shall be limited as follows:

(a) During any calendar quarter, limited to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ; and,

(b) During any calendar year, limited to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

2. 10X Effluent Concentrations

a. Fission and activation gases: (None specified)

b. Iodines: (None specified)

c. Particulates, half-lives >8 days: (None specified)

d. Liquid effluents:

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
(1) Fission and activation products (mixture EC) (μCi/ml)	None	None	None	None
(2) Tritium (μCi/ml)	1.00E-02	1.00E-02	1.00E-02	1.00E-02
(3) Dissolved and entrained gases (μCi/ml)	2.00E-04	2.00E-04	2.00E-04	2.00E-04

SUPPLEMENTAL INFORMATION (continued)

3. Average Energy (None specified)

4. Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases: Continuous monitor on each release path calibrated to a marinelli grab sample analyzed by gamma spectroscopy; bubbler grab sample analyzed for Tritium.

b. Iodines: Gamma spectral analysis of charcoal cartridge and particulate filter on each release path.

c. Particulates: Gamma spectral analysis of each particulate filter and charcoal cartridge for each release path. A four week per quarter composite of particulate filters for each release path for Strontium-89 and Strontium-90. One week per month particulate filter for each release path for gross alpha.

d. Liquid Effluents: Gamma spectral analysis of each batch discharged, except composite analysis for Strontium-89, Strontium-90, Iron-55, Tritium, and Alpha.

e. Solid Waste: Gamma spectral analysis of a representative sample of each waste shipment. Scaling factors established from offsite composite sample analyses to estimate concentration of non-gamma emitters. Low activity trash shipments curie content is estimated by dose rate measurement and application of appropriate scaling factors.

f. Error Estimation Method: Overall error for sampling and analysis estimated by combining individual errors using error propagation methods. This process is composed of determinate and undeterminate errors.

Determinate - Pump flowrates, volume measurements and analysis collection yields
Undeterminate - Random counting error estimated using accepted statistical calculations

SUPPLEMENTAL INFORMATION (continued)

5. Batch Releases

a. Liquid: Canal	Quarter 1	Quarter 2	Quarter 3	Quarter 4
(1) Number of batch releases:	1.00E+00	0.00E+00	0.00E+00	2.00E+00
(2) Total time period for batch release: (min)	8.70E+01	0.00E+00	0.00E+00	3.50E+01
(3) Maximum time period for batch release: (min)	8.70E+01	0.00E+00	0.00E+00	3.10E+01
(4) Average time period for batch release: (min)	8.70E+01	0.00E+00	0.00E+00	1.75E+01
(5) Minimum time period for batch release: (min)	8.70E+01	0.00E+00	0.00E+00	4.00E+00
(6) Total Activity Released (Ci)	1.36E-06	0.00E+00	0.00E+00	8.51E-05
(7) Total Volume Released (liters)	1.32E+03	0.00E+00	0.00E+00	1.32E+04

b. Liquid: Non-Canal	Quarter 1	Quarter 2	Quarter 3	Quarter 4
(1) Number of batch releases:	3.00E+01	5.30E+01	1.08E+02	5.74E+02
(2) Total time period for batch release: (min)	2.87E+02	1.32E+02	2.31E+02	1.83E+03
(3) Maximum time period for batch release: (min)	1.68E+02	4.00E+00	1.30E+01	2.65E+02
(4) Average time period for batch release: (min)	9.57E+00	2.49E+00	2.14E+00	3.20E+00
(5) Minimum time period for batch release: (min)	1.00E+00	1.00E+00	1.00E+01	1.00E+00
(6) Total Activity Released (Ci)	0.00E+00	0.00E+00	1.51E-04	0.00E+00
(7) Total Volume Released (liters)	1.63E+05	7.40E+04	8.73E+04	6.94E+05

c. Gaseous

There were no gaseous batch releases for this report period.

SUPPLEMENTAL INFORMATION (continued)

6. Continuous Releases

a. Liquid: Non-Canal	Quarter 1	Quarter 2	Quarter 3	Quarter 4
(1) Number of releases:	1.40E+01	1.40E+01	1.40E+01	1.40E+01
(2) Total Activity Released (Ci)	2.09E-02	1.18E-02	9.94E-03	9.96E-03
(3) Total Volume Released (liters)	7.20E+06	7.09E+06	6.75E+06	6.03E+06

b. Liquid: Canal	Quarter 1	Quarter 2	Quarter 3	Quarter 4
(1) Number of releases:	0	0	0	0
(2) Total Activity Released (Ci)	N/A	N/A	N/A	N/A

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TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	UNIT	QTR 1	QTR 2	QTR 3	QTR 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION GASES						
1. Total Release	Ci	1.98E+01	1.26E+02	9.44E+01	1.80E+02	≤2.50E+01
2. Average release rate for period	μCi/sec	2.54E+00	1.61E+01	1.19E+01	2.26E+01	
3. Percentage ODCM Limit	%	*	*	*	*	
B. IODINE-131						
1. Total Iodine-131	Ci	1.97E-04	2.02E-04	8.85E-05	7.08E-05	≤2.50E+01
2. Average release rate for period	μCi/sec	2.53E-05	2.57E-05	1.11E-05	8.91E-06	
3. Percentage ODCM Limit	%	*	*	*	*	
C. PARTICULATES						
1. Particulates with half-lives >8 days	Ci	8.86E-05	4.46E-06	3.13E-05	2.27E-06	≤3.60E+01
2. Average release rate for period	μCi/sec	1.14E-05	5.68E-07	3.94E-06	2.86E-07	
3. Percentage ODCM Limit	%	*	*	*	*	
4. Gross alpha radioactivity	Ci	1.58E-07	2.38E-07	1.53E-07	2.39E-07	≤2.50E+01
D. TRITIUM						
1. Total Release	Ci	5.39E+00	3.36E+00	6.65E+00	7.76E+00	≤2.50E+01
2. Average release rate for period	μCi/sec	6.93E-01	4.28E-01	8.36E-01	9.76E-01	
3. Percentage ODCM Limit	%	*	*	*	*	
E. CARBON-14 (See Attachment 8)						

***F. PERCENT OF APPLICABLE ODCM LIMITS**

FISSION AND ACTIVATION GASES	UNIT	QTR 1	QTR 2	QTR 3	QTR 4
1. Quarterly gamma air dose limit	%	1.17E-02	4.08E-02	3.28E-02	4.35E-02
2. Quarterly beta air dose limit	%	7.37E-04	2.95E-03	2.32E-03	3.17E-03
3. Yearly gamma air dose limit	%	5.84E-03	2.04E-02	1.64E-02	2.17E-02
4. Yearly beta air dose limit	%	3.68E-04	1.47E-03	1.16E-03	1.58E-03
5. Whole body dose rate limit	%	9.25E-03	5.27E-02	2.59E-02	3.96E-03
6. Skin dose rate limit	%	1.98E-03	1.15E-02	5.62E-03	8.52E-04
HALOGENS, TRITIUM AND PARTICULATES WITH HALF-LIVES >8 DAYS					
7. Quarterly dose limit (organ)	%	3.41E-02	2.65E-02	1.53E-02	1.56E-02
8. Yearly dose limit (organ)	%	1.70E-02	1.33E-02	7.67E-03	7.78E-03
9. Organ dose rate limit	%	4.48E-05	1.24E-05	2.22E-05	2.45E-05

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TABLE 1B
GASEOUS EFFLUENTS - ELEVATED RELEASE

CONTINUOUS MODE

NUCLIDES RELEASED

1. Fission Gases	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Argon-41	Ci	5.46E+00	8.12E+00	7.54E+00	4.19E+00
Krypton-85	Ci	ND	ND	ND	ND
Krypton-85m	Ci	1.12E+00	1.42E+01	1.20E+01	3.39E+01
Krypton-87	Ci	1.66E+00	6.90E+00	5.77E+00	2.11E+00
Krypton-88	Ci	2.20E+00	1.96E+01	1.43E+01	3.01E+01
Krypton-89	Ci	3.17E-02	ND	ND	ND
Xenon-133	Ci	2.94E-03	4.99E+01	3.40E+01	1.06E+02
Xenon-133m	Ci	ND	7.97E-01	2.39E-01	ND
Xenon-135	Ci	1.64E+00	1.63E+01	9.13E+00	1.62E-01
Xenon-135m	Ci	1.66E+00	4.10E+00	4.35E+00	5.80E-01
Xenon-137	Ci	6.66E-02	ND	ND	ND
Xenon-138	Ci	5.93E+00	6.46E+00	7.17E+00	ND
TOTAL	Ci	1.98E+01	1.26E+02	9.44E+01	1.77E+02
2. Iodines					
Iodine-131	Ci	8.72E-05	1.89E-04	4.16E-05	1.38E-05
Iodine-132	Ci	4.36E-04	4.06E-05	ND	ND
Iodine-133	Ci	1.80E-03	7.68E-04	5.19E-05	3.57E-05
Iodine-134	Ci	8.89E-04	ND	ND	ND
Iodine-135	Ci	2.71E-03	2.89E-04	ND	ND
TOTAL	Ci	5.92E-03	1.29E-03	9.35E-05	4.95E-05
3. Particulates					
Barium-140	Ci	ND	ND	ND	ND
Cobalt-60	Ci	5.57E-07	ND	ND	ND
Cesium-137	Ci	ND	ND	2.13E-07	ND
Manganese-54	Ci	3.02E-07	ND	ND	ND
Strontium-89	Ci	2.82E-07	1.43E-06	3.99E-06	2.27E-06
Zinc-65	Ci	ND	ND	1.25E-06	ND
TOTAL	Ci	1.14E-06	1.43E-06	5.45E-06	2.27E-06
4. Tritium					
Hydrogen-3	Ci	3.28E-01	6.75E-01	6.19E-01	3.03E-01

Note: There were no batch releases for this report period.

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TABLE 1C
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

CONTINUOUS MODE

NUCLIDES RELEASED

1. Fission Gases	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Argon-41	Ci	ND	ND	ND	ND
Krypton-85	Ci	ND	ND	ND	ND
Krypton-85m	Ci	ND	ND	ND	ND
Krypton-87	Ci	ND	ND	ND	ND
Krypton-88	Ci	ND	ND	ND	ND
Xenon-133	Ci	8.17E-04	2.33E-02	1.80E-03	1.19E-02
Xenon-133m	Ci	ND	ND	ND	ND
Xenon-135	Ci	1.84E-03	2.84E-02	1.08E-03	1.52E-02
Xenon-135m	Ci	ND	8.35E-04	ND	2.78E-03
Xenon-137	Ci	ND	ND	ND	ND
Xenon-138	Ci	ND	ND	ND	ND
TOTAL	Ci	2.66E-03	5.25E-02	2.88E-03	2.99E-02
2. Iodines					
Iodine-131	Ci	1.10E-04	1.29E-05	4.69E-05	5.70E-05
Iodine-132	Ci	ND	ND	ND	ND
Iodine-133	Ci	5.49E-05	9.87E-05	1.62E-04	3.05E-04
Iodine-134	Ci	ND	ND	ND	ND
Iodine-135	Ci	ND	ND	ND	ND
TOTAL	Ci	1.64E-04	1.12E-04	2.09E-04	3.62E-04
3. Particulates					
Chromium-51	Ci	1.22E-05	ND	1.42E-05	ND
Cobalt-58	Ci	ND	ND	1.09E-06	ND
Cobalt-60	Ci	1.36E-05	ND	3.13E-06	ND
Manganese-54	Ci	1.53E-05	3.03E-06	5.48E-06	ND
Iron-59	Ci	5.49E-06	ND	1.96E-06	ND
Strontium-89	Ci	ND	ND	ND	ND
Zinc-65	Ci	4.09E-05	ND	ND	ND
TOTAL	Ci	8.75E-05	3.03E-06	2.59E-05	ND
4. Tritium					
Hydrogen-3	Ci	5.06E+00	2.69E+00	6.03E+00	7.45E+00

Note: There were no batch releases for this report period.

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TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNIT	QTR 1	QTR 2	QTR 3	QTR 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION PRODUCTS						
1. Total Release (not including tritium, gases and alpha)	Ci	ND	ND	ND	ND	NA
2. Average diluted concentration during period	µCi/ml	ND	ND	ND	ND	
3. Percentage ODCM Limit	%	NA	NA	NA	NA	
B. TRITIUM						
1. Total Release	Ci	2.09E-02	1.18E-02	1.01E-02	1.00E-02	≤2.50E+01
2. Average diluted concentration during period (Note 1)	µCi/ml	2.84E-06	1.64E-06	1.48E-06	1.46E-06	
3. Percentage ODCM Limit	%	*	*	*	*	
C. DISSOLVED AND ENTRAINED GASES						
1. Total Release	Ci	ND	ND	ND	ND	NA
2. Average diluted concentration during period	µCi/ml	ND	ND	ND	ND	
3. Percentage ODCM Limit	%	NA	NA	NA	NA	
D. GROSS ALPHA RADIOACTIVITY						
1. Total Release	Ci	ND	4.95E-08	ND	ND	≤4.20E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	liters	7.36E+06	7.17E+06	6.84E+06	6.80E+06	
F. VOLUME OF DILUTION WATER USED DURING PERIOD	liters	5.93E+06	0	0	5.64E+07	
***G. PERCENT OF APPLICABLE ODCM LIMITS**						
1. Quarterly Whole Body Dose	%	6.26E-05	3.45E-05	7.36E-05	3.04E-05	
2. Quarterly Organ Dose	%	1.88E-05	1.04E-05	2.21E-05	9.11E-06	
3. Annual Whole Body Dose	%	3.13E-05	1.73E-05	3.68E-05	1.52E-05	
4. Annual Organ Dose	%	9.39E-06	5.18E-06	1.10E-05	4.55E-06	

Note 1: Concentration includes summation from diluted and undiluted values from Canal and Non-Canal releases (Table 2B).

TABLE 2B
LIQUID EFFLUENTS CANAL

BATCH MODE

NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Fission and Activation Products					
ND	Ci	ND	ND	ND	ND
2. Tritium					
Hydrogen-3	Ci	1.36E-06	ND	ND	8.51E-05
3. Dissolved and Entrained Gases					
ND	Ci	ND	ND	ND	ND

TABLE 2B
LIQUID EFFLUENTS CANAL

CONTINUOUS MODE

NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Fission and Activation Products					
ND	Ci	ND	ND	ND	ND
2. Tritium					
Hydrogen-3	Ci	ND	ND	ND	ND
3. Dissolved and Entrained Gases					
ND	Ci	ND	ND	ND	ND

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TABLE 2B (SUPPLEMENT)
LIQUID EFFLUENTS NON-CANAL

CONTINUOUS MODE

NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Fission and Activation Products					
ND	Ci	ND	ND	ND	ND
2. Tritium					
Hydrogen-3	Ci	2.09E-02	1.18E-02	9.94E-03	9.96E-03
3. Dissolved and Entrained Gases					
ND	Ci	ND	ND	ND	ND

TABLE 2B (SUPPLEMENT)
LIQUID EFFLUENTS NON-CANAL

BATCH MODE

NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Fission and Activation Products					
ND	Ci	ND	ND	ND	ND
2. Tritium					
Hydrogen-3	Ci	ND	ND	1.51E-04	ND
3. Dissolved and Entrained Gases					
ND	Ci	ND	ND	ND	ND

TABLE 2B (continued)
ABNORMAL RELEASE
LIQUID EFFLUENTS CANAL

CONTINUOUS MODE

NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Fission and Activation Products					
ND	Ci	ND	ND	ND	ND
2. Tritium					
ND	Ci	ND	ND	ND	ND
3. Dissolved and Entrained Gases					
ND	Ci	ND	ND	ND	ND

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TABLE 3A
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)

1. Type of Waste	UNIT	CLASS A	CLASS B	CLASS C	EST. TOTAL ERROR %
a. Spent resins, filter sludges,	m^3	8.55E+01	0.00E+00	0.00E+00	1.00E+01
evaporator bottoms, etc.	Ci	6.37E+01	0.00E+00	0.00E+00	1.00E+01
b. Dry compressible waste,	m^3	2.17E+03	0.00E+00	0.00E+00	1.00E+01
contaminated equipment, etc.	Ci	3.05E+00	0.00E+00	0.00E+00	1.00E+01
c. Irradiated components,	m^3	0.00E+00	0.00E+00	0.00E+00	1.00E+01
control rods, etc.	Ci	0.00E+00	0.00E+00	0.00E+00	1.00E+01
d. Other: Dry compressible	m^3	1.49E+02	0.00E+00	0.00E+00	1.00E+01
waste, contaminated equipment,	Ci	1.74E-02	0.00E+00	0.00E+00	1.00E+01
spent resins for volume reduction.					

2. Estimate of Major Nuclide Composition (by type of waste)

a. Spent resins, filter sludges, evaporator bottoms, etc.

Isotope	Percent	Curies	
Fe-55	1.44E+01	9.17E+00	E
Co-60	1.93E+01	1.23E+01	E
Cs-137	3.26E+00	2.08E+00	E
Mn-54	7.16E+00	4.56E+00	E
Ni-63	3.88E+00	2.48E+00	E
Zn-65	5.17E+01	3.29E+01	E

b. Dry compressible waste, contaminated equipment, etc.

Isotope	Percent	Curies	
Fe-55	7.41E+01	2.26E+00	E
Co-60	1.05E+01	3.21E-01	E
Cs-137	1.10E+00	3.35E-02	E
Mn-54	5.77E+00	1.76E-01	E
Ni-63	1.89E+00	5.76E-02	E
Zn-65	5.77E+00	1.76E-01	E

(E- Estimated M- Measured)

TABLE 3A (continued)
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

c. Irradiated components, control rods, etc.
None

d. Other: Dry compressible waste, contaminated equipment, spent resins, contaminated oil, glycol and water for volume reduction.

Isotope	Percent	Curies	
H-3	2.33E+01	4.04E-03	E
Co-60	2.89E+00	5.02E-04	E
Cs-137	7.38E+01	1.28E-02	E

(E- Estimated M- Measured)

Percentage of nuclides and total activities are based on a combination of direct measurements and scaling for non-gamma emitting nuclides.

TABLE 3A (continued)
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

3. Solid Waste Disposition

No. of Shipments	Mode of Transportation	Destination
55	Trucks	*Energy Solutions Oak Ridge, TN
8	Trucks	*Energy Solutions Kingston, TN
14	Trucks	Energy Solutions, Clive , UT

* Volume Reduction Facility

B. IRRADIATED FUEL SHIPMENTS (Disposition)

No. of Shipments	Mode of Transportation	Destination
None	----------	----------

TABLE 3B
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. NRC CLASS A

SOURCE OF WASTE	PROCESSING EMPLOYED	CONTAINER VOLUME	TYPE OF CONTAINER	NUMBER OF CONTAINERS
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	1280 ft^3 (36.2m^3)	STC	66
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	96 ft^3 (2.72m^3)	STC	22
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	99 ft^3(2.80m^3)	STC	1
Dry compressible Waste(DAW), Contaminated Equipment etc.	Non-compacted	1033.5 ft^3(29.3m^3)	STC	7
Dry compressible Waste(DAW), Contaminated Equipment etc.	Non-compacted	217 ft^3(6.14m^3)	STC	1
Spent Resins, Filter Sludges, evaporator Bottoms, etc.	Air Drying Non-compacted	205.8 ft^3 (5.83m^3)	HIC	18
Spent Resins, Filter Sludges, evaporator Bottoms, etc.	Air Drying Non-compacted	121.0 ft^3 (3.43m^3)	HIC	4
Contaminated Oil/Water.	Non-compacted	1280 ft^3(36.2m^3)	STC	1
Dry compressible Waste(DAW), Contaminated Equipment etc.	Non-compacted	1335.05 ft^3(37.8m^3)	STC	1
Dry compressible Waste(DAW), Contaminated Equipment etc.	Non-compacted	1504.1 ft^3(42.6m^3)	STC	1

HIC-High Integrity Container, STC-Strong Tight Container

B. NRC CLASS B

SOURCE OF WASTE	PROCESSING EMPLOYED	CONTAINER VOLUME	TYPE OF CONTAINER	NUMBER OF CONTAINERS
None				

C. NRC CLASS C

SOURCE OF WASTE	PROCESSING EMPLOYED	CONTAINER VOLUME	TYPE OF CONTAINER	NUMBER OF CONTAINERS
None				

HIC-High Integrity Container, STC-Strong Tight Container

ATTACHMENT NO. 1

CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)

In accordance with the James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1 Radiological Effluent Controls (REC) Section 6.2.3, changes made to the Offsite Dose Calculation Manual (ODCM) during the reporting period shall be included in the Annual Radioactive Effluent Release Report.

The latest revision of the ODCM (Rev. 14) became effective during calendar year 2016. There were no changes to the ODCM in 2017.

ATTACHMENT NO. 2

SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM

In accordance with the James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1 Radiological Effluent Controls Section 6.2.3, changes made to the Process Control Program (PCP) during the reporting period shall be included in the Annual Radioactive Effluent Release Report.

EN-RW-105 Rev. 5, Process Control Program (issued 8/27/15).
RW-AA-100 Rev. 12, Process Control Program for Radioactive Wastes (issued 9/26/17), supersedes EN-RW-105.

EN-RW-102 Rev. 14, Radioactive Shipping Procedure
RW-AA-600 Rev. 1, Guidelines for Tracking Processed Liners (issued 9/5/17), supersedes EN-RW-102.

EN-RW-106 Rev. 5, Integrated Transportation Security Plan
EN-RW-106 Rev. 6, Integrated Transportation Security Plan (issued 1/5/17)
EN-RW-106 Rev. 7, Integrated Transportation Security Plan (issued 5/23/17)

EN-RW-108, Rev. 2, Radioactive Shipment Accident Response
OP-AA-106-102 Rev. 7, Accidents Involving the Transportation of Rad Materials (issued 9/7/17), supersedes EN-RW-108.

ATTACHMENT NO. 3

SUMMARY OF CHANGES TO THE ENVIRONMENTAL MONITORING AND DOSE CALCULATION LOCATIONS

In accordance with the James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1, Radiological Effluent Controls Section 6.2.3 a listing of new locations for dose calculation and/or environmental monitoring identified by the land use census shall be included in the Annual Radioactive Effluent Release Report.

During the reporting period, no changes in Dose Calculation Receptor Locations and/or the Environmental Monitoring were required based on the results of the land use census.

The following garden sample locations were added in 2017 as measured from the Nine Mile Point Unit 2 Reactor centerline. Sample location #240 located in the East Sector at 96 degrees and 1.86 miles. Sample location #69 in the East-South-East Sector at 124 degrees and 2.29 miles. Gardens were selected based on samples available, sector and deposition (D/Q) values.

ATTACHMENT NO. 4

DEVIATIONS FROM THE REQUIRED ENVIRONMENTAL SAMPLING SCHEDULE

In accordance with the James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1, Radiological Effluent Controls Section 6.2.7, the cause for the unavailability of any environmental samples required during the report period shall be included in the Annual Radioactive Effluent Release Report.

The following reports samples that were a deviation from the requirements of ODCM Part 1, Table 5.1-1. ODCM Part Section 5.1.1.c.1 allows for deviations from the program due to hazardous conditions, seasonal unavailability, theft, uncooperative residents, or to a malfunction of automatic sampling equipment.

A. ODCM Program Deviations

The following are deviations from the program specified by the ODCM:

- 17FI-461 Turbine Building Iodine and Particulate Sampler Flow Indicator failed bench calibration on 12/28/16. Due to the lack of replacement parts, compensatory actions were taken to maintain required sample flow and representative sampling capabilities. Once replacement flow indicator was obtained, validated and installed the permanent plant equipment was restored to service on 5/2/17.

- 17RM-351 Normal Service Water Radiation Monitor was declared inoperable on 5/11/17 due to sporadic low flow alarms during load drops. Chemistry initiated required compensatory sampling for an inoperable Normal Service Water Radiation Monitor. Multiple troubleshooting efforts were made but without conclusive results. Decision was made to change out 17FIT-10 Normal Service Water Radiation Flow Indicator. The existing flow indicator was obsolete and an Engineering Change Request was processed to install an updated style flow indicator. 17FIT-10 was replaced, calibrated and monitored prior to being declared operable on 7/13/2017.

- Groundwater Monitoring Well #8 well casing was found damaged on 5/17/17. This allowed surface water to enter Groundwater Monitoring Well #8 contents. Well casing was repaired and a new j-plug installed on 6/7/2017. Groundwater Monitoring Well #8 was pumped and validated to be recharging on 6/27/17. This allowed a valid third quarter 2017 sample to be obtained from Groundwater Monitoring Well #8.

The following are deviations from the program specified by the ODCM:

09/26/17-10/03/17 Air Station R5 Offsite sample pump was inoperable for approximately 22 hours. Out of service time was determined based upon sample pump run time integrator. The inoperability was due to loss of power to the sample station. No corrective actions were required to restore power to the station.

10/10/17-10/17/17 Air Station R5 Offsite Sample pump was inoperable for approximately 4.9 hours. Out of service time was determined based upon sample pump run time integrator. The inoperability was due to loss of power to the sample station. No corrective actions were required to restore power to the station.

Air Sampling Station Operability Assessment

The ODCM required air sampling program consists of 5 individual sampling locations. The collective operable time period for the air monitoring stations was 43,773 hours out of a possible 43,800 hours. The air sampling availability factor for the report period was 99.9%.

ATTACHMENT NO. 5

ANNUAL SUMMARY OF HOURLY METEOROLOGICAL DATA

The James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1, Radiological Effluent Controls Section 6.2 and 6.2.2 states in part: The Annual Radioactive Effluent Release Report submitted prior to May 1 of each year may include an annual summary of meteorological data collected over the previous year. If the meteorological data is not included, the licensee shall retain it on file and provide it to the U.S. Nuclear Regulatory Commission upon request.

In accordance with the aforementioned ODCM requirement, meteorological data is not included in this report. It is retained on file and is available upon request.

ATTACHMENT NO. 6

MAJOR MODIFICATIONS TO RADIOACTIVE LIQUID, GASEOUS AND SOLID WASTE TREATMENT SYSTEMS

In accordance with the James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1 Radiological Effluent Controls Section 7.0, Major Modifications to Radioactive Waste Treatment Systems (liquid, gaseous and solid) shall be reported in the Annual Radioactive Effluent Release Report for the period in which the modification is completed and made operational.

There were no major modifications to any liquid, gaseous, or solid radioactive waste treatment systems.

ATTACHMENT NO. 7

ONSITE GROUNDWATER MONITORING

In response to the Nuclear Energy Institute (NEI) Groundwater Protection Initiative, JAF instituted a groundwater monitoring program in 2007. FitzPatrick's Groundwater Monitoring Well Program consist of twenty-two wells which are sampled quarterly.

All samples collected were analyzed for tritium and gamma emitting radionuclides. The detection limits and results are reported in the following tables. All sample results were <LLD for gamma emitting nuclides and tritium. There is no potential to influence any offsite drinking well. No drinking water pathway exists at the James A. FitzPatrick site under normal operating conditions due to the direction and distance of the nearest water intake (Oswego, 8.5 miles west of the JAF discharge).

In conclusion, there were no plant related isotopes detected in groundwater monitoring wells during 2017 that are attributable to James A. FitzPatrick.

ATTACHMENT NO. 7 (continued)

ONSITE GROUNDWATER MONITORING

A) Gamma Isotopic Monitoring

For 2017, the 22 monitoring wells were sampled quarterly, providing enough water was present, and analyzed below the required lower limits of detection in accordance with the Offsite Dose Calculation Manual (ODCM) Part 1, Table 5.1-3.

Radionuclide	LLD Value (pCi/L)
Tritium (H-3)	3000
Manganese-54	15
Cobalt-58	15
Iron-59	30
Cobalt-60	15
Zinc-65	30

Radionuclide	LLD Value (pCi/L)
Zirconium-95	15
Niobium-95	15
Iodine-131	15
Cesium-134	15
Cesium-137	18
Barium/Lanthanum-140	15

There were no plant related gamma emitting nuclides or tritium detected in 2017 samples. Gross Beta and Hard to Detect nuclide analysis not required.

ATTACHMENT NO. 7 (continued)

ONSITE GROUNDWATER MONITORING

B) Tritium Summary

Well Name	# Samples in 2017	# Positive Samples in 2017	Minimum Positive Concentration	Maximum Positive Concentration
MW-1A	4	0		
MW-1B	4	0		
MW-2A	4	0		
MW-2B	4	0		
MW-3A	4	0		
MW-3B	4	0		
MW-4A	4	0		
MW-4B	4	0		
MW-5	4	0		
MW-6	4	0		
MW-7	4	0		
MW-8	4	0		
MW-9	4	0		
MW-10A	4	0		
MW-10B	4	0		
MW-13	4	0		
MW-14	4	0		
MW-15	4	0		
MW-16	4	0		
MW-19	4	0		
MW-20	4	0		
MW-21	4	0		

Note 1: All results are in pCi/L.
Note 2: A total of 88 samples were analyzed for H-3 in 2017, all results were <LLD.

ATTACHMENT NO. 8

GASEOUS EFFLUENTS – CARBON-14

a) **Date:** January 01, 2017 – December 31, 2017

b) **Location:** Elevated Release – Main Stack

c) **Duration:** 365 Days

d) **Flow rate:** N/A

e) **Volume Released:** N/A

f) **Nuclides Released:** Carbon-14

g) **Curies Released[(1)]:**

UNIT	QTR 1	QTR 2	QTR 3	QTR 4
Ci	1.20E+00	2.55E+00	2.66E+00	2.66E+00
μCi/sec	3.40E-01	3.39E-01	3.39E-01	3.40E-01

h) **Resultant Doses:** See Addendum 1—Assessment of Radiation Doses to the Public January-December 2017 Table 1, Section D

i) **Dose Calculations:** Doses were calculated in accordance with the Offsite Dose Calculation Manual (ODCM) Part 2, Section 4.4.1

[(1)]Curies released calculated using the methodology in EPRI Technical Report 1021106 **"Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents".**

ATTACHMENT NO. 9

EVENTS LEADING TO CONDITIONS WHICH RESULTED IN EXCEEDING RADIOACTIVITY LIMITS.

In accordance with the James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1 Radiological Effluent Controls Section 6.2.9, the report shall contain the events leading to the conditions which resulted in exceeding the radioactivity limits for the specified outdoor radioactive radwaste tanks specified in the Technical Requirements Manual, TRM 3.7.E

The radioactivity limits for the specified outdoor radioactive radwaste tanks were not exceeded.

ADDENDUM 1

ASSESSMENT OF RADIATION DOSES TO THE PUBLIC
JANUARY - DECEMBER 2017

1. INTRODUCTION

The James A. FitzPatrick Nuclear Power Plant Offsite Dose Calculation Manual (ODCM), Part 1 Radiological Effluent Controls, requires an assessment of the radiation doses to the likely most exposed member of the public due to radioactive liquid and gaseous effluents. This assessment of doses to the likely most exposed member of the public is based on accepted methodologies found in the Offsite Dose Calculation Manual (ODCM).

2. DOSE LIMITS

A. DOSE FROM LIQUID EFFLUENTS (ODCM, Part 1, Section 2.3)

Applicability

Applies to doses from radioactive material in liquid effluents.

Objective

To ensure that the dose limitations of 10 CFR 50, Appendix I, are met.

Specifications

The dose to a member of the public from radioactive materials released from the plant in liquid effluents to Unrestricted Areas shall be limited as follows:

1. During any calendar quarter, limited to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ.

2. During any calendar year, limited to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

B. GASEOUS DOSE RATES (ODCM, Part 1, Section 3.2)

Applicability

Applies to the radiation dose from radioactive material in gaseous effluents.

Objective

To ensure that the dose rates at or beyond the site boundary from gaseous effluents do not exceed the annual dose limits of 10 CFR 20 for Unrestricted Areas.

ADDENDUM 1 (continued)

Specifications

The dose rate at or beyond the Site Boundary due to radioactive materials released from the plant in gaseous effluents shall be limited as follows:

1. Less than or equal to 500 mrem/year to the whole body and less than or equal to 3000 mrem/year to the skin from noble gases; and,

2. Less than or equal to 1500 mrem/year to any organ from Iodine-131, Iodine-133, Tritium and for radioactive materials in particulate form with half-lives greater than 8 days (inhalation pathway only).

C. AIR DOSE, NOBLE GASES (ODCM, Part 1, Section 3.3)

Applicability

Applies to the air dose due to noble gases in gaseous effluents.

Objective

To ensure that the noble gas dose limitations of 10 CFR 50, Appendix I, are met.

Specifications

The air dose to areas at or beyond the Site Boundary from noble gases released from the plant in gaseous effluents shall be limited:

1. During any calendar quarter, to less than or equal to 5 mrad from gamma radiation, and less than or equal to 10 mrad from beta radiation; and,

2. During any calendar year, to less than or equal to 10 mrad from gamma radiation and less than or equal to 20 mrad from beta radiation.

ADDENDUM 1 (continued)

D. DOSE DUE TO IODINE-131, IODINE-133, TRITIUM AND RADIONUCLIDES IN PARTICULATE FORM (ODCM, Part 1, Section 3.4)

Applicability

Applies to the cumulative dose from Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents.

Objective

To ensure that the dose limitations of 10 CFR 50, Appendix I, are met.

Specifications

The dose to a member of the public at or beyond the Site Boundary from Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form with half-lives greater than 8 days released from the plant in gaseous effluents shall be limited:

a. During any calendar quarter to less than or equal to 7.5 mrem to any organ; and,

b. During any calendar year to less than or equal to 15 mrem to any organ.

c. Less than 0.1% of the limits of ODCM Part 1, Section 3.4, Specifications 3.4.1.c.1.a and 3.4.1.c.1.b as a result of burning contaminated oil.

E. TOTAL DOSE FROM URANIUM FUEL CYCLE (ODCM, Part 1, Section 4.0)

Applicability

Applies to radiation dose from releases of radioactivity and radiation from uranium fuel cycle sources.

Objective

1. To assure that the requirements of 40 CFR 190 are met.

2. To assure that the requirements of 10 CFR 72.104 are met in accordance with Section 3.2.3, Required Action A.2, Certificate of Compliance 1014 Appendix A, Technical Specifications for the Hi-Storm 100 Cask System.

Specifications

The dose or dose commitment to any member of the public, due to releases of radioactivity and radiation, from uranium fuel cycle sources shall be limited as follows:

1. Less than or equal to 25 mrem/year to the whole body; and,

2. Less than or equal to 25 mrem/year to any organ except the thyroid which shall be limited to less than or equal to 75 mrem/year.

ADDENDUM 1 (continued)

3. DOSE ASSESSMENT

A. METHODOLOGY

The assessment of radiation doses to the public due to radioactive liquid and gaseous effluents is performed in accordance with the ODCM. The ODCM is based on methodologies and models suggested by the Guidance Manual For "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants" (NUREG-0133) and "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I" (Regulatory Guide 1.109).

B. ASSUMPTIONS

Dose calculations are performed using formulas and constants defined in the ODCM. Specific radioactive release activities used in the dose calculations are listed in the Annual Radioactive Effluent Release Report (1.21 Report) for the period of January 1, 2017 to December 31, 2017. Historical meteorological data was used to generate tables of average dispersion factors. Locations of interest were identified from the 2017 land use census. These tables are available upon request.

C. ASSESSMENT RESULTS SUMMARY

The calculated doses to the public due to radioactive effluents are listed in Table 1. The calculated doses are small fractions of their respective dose limits.

4. 40 CFR 190 DOSE ASSESSMENT

A. METHODOLOGY

Evaluation to demonstrate compliance with the 40 CFR 190 dose limits must be performed when the doses calculated for 10 CFR 50 compliance exceed twice their respective limits. When additional dose assessment is required to demonstrate compliance with 40 CFR 190 it is performed in accordance with the ODCM.

B. RESULTS SUMMARY

The cumulative dose contribution from liquid and gaseous effluents for this report period were calculated and are listed in Table 1. The cumulative dose contribution from direct radiation from the reactor unit and from radwaste storage tanks is measured by environmental thermoluminescent dosimeters for the report period. This data is contained in the Annual Environmental Operating Report. The calculated doses from liquid and gaseous effluents are less than twice their respective 10 CFR 50 limits; therefore, additional calculations are not necessary to demonstrate compliance with 40 CFR 190 dose limits.

ADDENDUM 1 (continued)

TABLE 1
ANNUAL DOSE ASSESSMENT 2017

A. LIQUIDS

QUARTER	1	2	3	4	ANNUAL
	(a)	(a)	(a)	(a)	(a)
Organ (mrem)	9.39E-07	5.18E-07	1.10E-06	4.55E-07	3.02E-06
% of Limit	1.88E-05	1.04E-05	2.21E-05	9.11E-06	3.02E-05
	(b)	(b)	(b)	(b)	(b)
Whole Body (mrem)	9.39E-07	5.18E-07	1.10E-06	4.55E-07	3.02E-06
% of Limit	6.26E-05	3.45E-05	7.36E-05	3.04E-05	1.01E-04

(a) Dose to the Child Liver primarily by the potable water pathway.
(b) Dose to the Child Whole Body primarily by the potable water pathway.

ADDENDUM 1 (continued)

TABLE 1 (cont)
ANNUAL DOSE ASSESSMENT 2017

B. NOBLE GASES

QUARTER	1	2	3	4	ANNUAL
Total Body (mrem/yr)	4.63E-02	2.64E-01	1.30E-01	1.98E-02	2.64E-01
% of Limit	9.25E-03	5.27E-02	2.59E-02	3.96E-03	5.27E-02
Skin (mrem/yr)	5.94E-02	3.44E-01	1.69E-01	2.56E-02	3.44E-01
% of Limit	1.98E-03	1.15E-02	5.62E-03	8.52E-04	1.15E-02
Gamma (mrad)	5.84E-04	2.04E-03	1.64E-03	2.18E-03	6.44E-03
% of Limit	1.17E-02	4.08E-02	3.28E-02	4.35E-02	6.44E-02
Beta (mrad)	7.37E-05	2.95E-04	2.32E-04	3.17E-04	9.17E-04
% of Limit	7.37E-04	2.95E-03	2.32E-03	3.17E-03	4.59E-03

C. IODINES AND PARTICULATES

QUARTER	1	2	3	4	ANNUAL
	(a)	(a)	(b)	(b)	(a)
Organ (mrem)	2.55E-03	1.99E-03	1.15E-03	1.17E-03	6.68E-03
% of Limit	3.41E-02	2.65E-02	1.53E-02	1.56E-02	4.46E-02
	(b)	(b)	(b)	(b)	(b)
Organ Dose Rate (mrem/yr)	6.71E-04	1.86E-04	3.34E-04	3.67E-04	6.71E-04
% of Limit	4.48E-05	1.24E-05	2.22E-05	2.45E-05	4.48E-05

(a) Dose to the Infant Thyroid primarily by the Grass/Goat/Milk pathway.
(b) Dose to the Child Thyroid primarily by the Vegetation pathway.

ADDENDUM 1 (continued)

TABLE 1 (cont)
ANNUAL DOSE ASSESSMENT 2017

D. CARBON 14

QUARTER	1	2	3	4	ANNUAL
	(a)	(a)	(a)	(a)	(a)
Organ (mrem)	3.82E-03	8.15E-03	8.49E-03	8.49E-03	2.90E-02
% of Limit	5.09E-02	1.09E-01	1.13E-01	1.13E-01	1.93E-01
					(a)
Organ Dose Rate (mrem/yr)	NA	NA	NA	NA	2.90E-02
% of Limit	NA	NA	NA	NA	1.93E-03

(a) Dose to the Child Bone primarily by the vegetation pathway.

JAFP-18-0039

Enclosure 2

Process Control Program Procedure Changes

RW-AA-100 Revision 12
RW-AA-600 Revision 1
EN-RW-106 Revision 6
EN-RW-106 Revision 7
OP-AA-106-102 Revision 7

(122 Pages)

PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES

1. PURPOSE

1.1. The purpose of the Process Control Program (PCP) is to:

1.1.1. Establish the process and boundary conditions for the preparation of specific procedures for processing, sampling, analysis, packaging, storage, and shipment of solid radwaste in accordance with local, state, and federal requirements. **(CM-1)**

1.1.2. Establish parameters which will provide reasonable assurance that all Low Level Radioactive Wastes (LLRW), processed by the in-plant waste process systems on-site OR by on-site vendor supplied waste processing systems, meet the acceptance criteria to a Licensed Burial Facility, as required by 10CFR Part 20, 10CFR Part 61, 10CFR Part 71, 49CFR Parts 171-172, "Technical Position on Waste Form (Revision 1)" [1/91], "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification" [5/83], and the Station Technical Specifications, as applicable.

1.1.3. Provide reasonable assurance that waste placed in "on-site storage" meets the requirements as addressed within the Safety Analysis Reports for the low level radwaste storage facilities for dry and/or processed wet waste.

2. TERMS AND DEFINITIONS

2.1. **Blending:** The mixing of LLRW with different concentrations of radionuclides, typically in an effort to create a relatively homogeneous mixture for disposal.

2.2. **Classification Controlling Nuclides**: One or more nuclides, listed in Table 1 or Table 2 of 10CFR61.55, whose concentration is the specific basis for the classification of the waste container. This could be a single nuclide or multiple nuclides that make up >50% of the sum of the fractions.

2.3. **Compaction:** When dry wastes such as paper, wood, plastic, cardboard, incinerator ash, and etc. are volume reduced through the use of a compactor.

2.4. **Concentration Averaging**: The averaging of the radionuclide concentrations for specific wastes or mixture of waste over the volume or weight of the waste.

2.5. **Dewatering:** The process of removing fluids from liquid waste streams to produce a waste form that meets the requirements of 10CFR Part 61 and applicable burial site criteria, $\leq$0.5% by volume when the waste is packaged to an "unstable" state, or $\leq$1% by volume when the waste is packaged to a "stable" form.

2.6. **Encapsulation**: Encapsulation is the surrounding of a radioactive source or component with a nonradioactive material. Encapsulation involves a radioactive core surrounded by a non-radioactive matrix.

2.7. **High Integrity Container (HIC):** A disposable container that is approved to the Requirements of 10CFR61. The use of HIC's is an alternative to solidification or encapsulation in a steel container to meet burial stability. HIC's are used to package dewatered liquid wastes, (e.g. filter cartridges, filter media, resin, sludges, etc), or dry active waste.

2.8. **Homogeneous Waste:** Waste in which concentrations of radionuclides of concern are likely to approach uniformity in the context of reasonable foreseeable intruder scenarios (This is because hot spots are a concern with respect to protection of an individual who may inadvertently intrude into the burial site).

2.9. **Incineration, RVR, and/or Glass Vitrification of Liquid or Solid:** Dry or wet waste processed via incineration and/or thermal processing where the volume is reduced by thermal means meets 10CFR61 requirements.

2.10. **Liquid Waste Processing Systems:** In-plant or vendor supplied processing systems consisting of equipment utilized for evaporation, filtration, demineralization, dewatering, compression dewatering, solidification, or reverse osmosis (RO) for the treatment of liquid wastes (such as Floor Drains, Chemical Drains and Equipment Drain inputs).

2.11. **Mixable Waste**: Waste that is amenable to physical mixing to create relatively uniform radionuclide concentrations.

2.12. **Nuclides of Concern**: A nuclide in the waste in concentrations greater than 1% of the concentration of that nuclide listed in Table 1 of 10CFR61.55 or 1% of the applicable class-dependent concentration of that nuclide in Table 2 of 10CFR61.55, Column 2 or 3.

2.13. **Process Control Program (PCP):** The program which contains the current formulas, sampling, analysis, tests, and determinations to be made to ensure that processing and packaging of solid radioactive waste based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure the waste meets the stabilization criteria specified in 10CFR Parts 20, 61 and 71, state regulations, and burial site requirements.

2.14. **Solidification:** Liquid waste processed to either an unstable or stable form per 10CFR61 requirements. Waste solidified does not have to meet the 300-year free standing monolith criteria. Approved formulas, samples and tests do not have to meet NRC approval for wastes solidified in a container meeting stability criteria (e.g. High Integrity Container).

2.15. **Solidification Media:** An approved media (e.g. Barnwell - vinyl ester styrene, cement, bitumen) when waste containing nuclides with greater than 5-year half lives is solidified in a container with activity greater than 1 micro curie/cc. Waste solidified in a HIC is approved by the commission meeting the 10CFR61 stabilization criteria, including 1% free standing liquids by volume when the waste is packaged to a "stable" form and $\leq$ 0.5% when waste is packaged to an "unstable" form. The formulas, sampling, analysis, and test do not require NRC approval, because the HIC meets the stability criteria.

2.15.1. Solidification to an unstable or stable state is performed by vendors, when applicable. Liquid waste solidified to meet stabilization criteria (10CFR61 and 01-91 Branch Technical Requirements) shall have documentation available that demonstrates that the process is approved by the NRC or disposal facility.

2.16. **Stabilization:** Liquid waste processed to a "stable state" per 10CFR61 Requirements. Established formulas, samples, and tests shall be approved by the NRC in order to meet solidification "stabilization" criteria. This processing method is currently not available, because the NRC recognizes that waste packed in a High Integrity Container meets the 300-year stabilization criteria. In the event that this processing method becomes an acceptable method, then the NRC shall approve the stabilization formulas, samples, tests, etc.

2.17. **Waste Streams:** Consist of but are not limited to

- Filter media (powdered, bead resin and fiber),
- Filter cartridges,
- Pre-coat body feed material,
- Contaminated charcoal,
- Fuel pool activated hardware,
- Oil Dry absorbent material added to a container to absorb liquids
- Fuel Pool Crud
- Sump and tank sludges,
- High activity filter cartridges,
- Concentrated liquids,
- Contaminated waste oil,
- Dried sewage or wastewater plant waste,
- Dry Active Waste (DAW): Waste such as filters, air filters, low activity cartridge filters, paper, wood, glass, plastic, cardboard, hoses, cloth, and metals, etc, which have become contaminated as a consequence of normal operating, housekeeping and maintenance activities.
- Other radioactive waste generated from cleanup of inadvertent contamination.

3. RESPONSIBILITIES

3.1. Implementation of this Process Control Program (PCP) is described in procedures at each station and is the responsibility of the each site to implement.

4. **MAIN BODY**

4.1. Process Control Program Requirements

4.1.1. A change to this PCP (Radioactive Waste Treatment Systems) may be made provided that the change is reported as part of the annual radioactive effluent release report, Regulatory Guide 1.21, and is approved by the Plant Operations Review Committee (PORC).

4.1.2. Changes become effective upon acceptance per station requirements.

4.1.3. A solidification media, approved by the burial site, may be **REQUIRED when** liquid radwaste is solidified to a stable/unstable state.

4.1.4. **When** processing liquid radwaste to meet solidification stability using a vendor supplied solidification system:

1. **If** the vendor has its own Quality Assurance (QA) Program, **then** the vendor shall **ADHERE** to its own QA Program and shall have **SUBMITTED** its process system topical report to the NRC or agreement state.

2. **If** the vendor does **not HAVE** its own Quality Assurance Program, **then** the vendor shall **ADHERE** to an approved Quality Assurance Topical Report standard belonging to the Station or to another approved vendor.

4.1.5. The vendor processing system(s) is/are controlled per the following:

1. A commercial vendor supplied processing system(s) may be **USED** for the processing of LLRW streams.

2. Vendors that process liquid LLRW at the sites shall **MEET** applicable Quality Assurance Topical Report and Augmented Quality Requirements.

4.1.6. Vendor processing system(s) operated at the site shall be **OPERATED and CONTROLLED** in accordance with vendor approved procedures or station procedures based upon vendor approved documents.

4.1.7. All waste streams processed for burial or long term on-site storage shall **MEET** the waste classification and characteristics specified in 10CFR Part 61.55, Part 61.56, the 5-83 Branch Technical Position for waste classification, and the applicable burial site acceptance criteria (for any burial site operating at the time the waste was processed).

4.1.8. An Exelon Nuclear plant may store waste at another Exelon Nuclear plant, provided formal NRC approval has been **RECEIVED** for the transfer of waste.

4.2. General Waste Processing Requirements

NOTE: On-site resin processing involves tank mixing and settling, transferring to the station or vendor processing system via resin water slurry or vacuuming into approved waste containers, and, when applicable, dewatering for burial.

4.2.1. Vendor resin beds may be **USED** for decontamination of plant systems, such as, SFP (Spent Fuel Pool), RWCU (reactor water cleanup), and SDC (Shut Down Cooling). These resins are **then PROCESSED** via the station or vendor processing system.

4.2.2. Various drains and sump discharges will be **COLLECTED** in tanks or suitable containers for processing treatment. Water from these tanks may be **SENT** through a filter, demineralizer, concentrator or vendor supplied processing systems.

4.2.3. Process waste (e.g. filter media, sludges, resin, etc) will be periodically **DISCHARGED** to the station or vendor processing system for onsite waste treatment **or PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.

4.2.4. Process water (e.g. chemical, floor drain, equipment drain, etc.) may be **SENT** to either the site waste processing systems or vendor waste processing systems for further filtration, demineralization for plant re-use, or discharge.

4.2.5. All dewatering and solidification/stabilization will be **PERFORMED** by either utility site personnel or by on-site vendors **or** will be **PACKAGED and SHIPPED** to an off-site vendor low-level radwaste processing facility.

4.2.6. Dry Active Waste (DAW) will be **HANDLED and PROCESSED** per the following:

1. DAW will be **COLLECTED and SURVEYED and** may be **SORTED** for compactable and non-compactable wastes.

2. DAW may be packaged in containers to facilitate on-site pre-compaction and/or off-site vendor contract requirements.

3. DAW items may be **SURVEYED** for release onsite or offsite when applicable.

4. Contaminated filter cartridges will be **PLACED** into a HIC **or** will be **ENCAPSULATED** in an in-situ liner for disposal **or SHIPPED** to an offsite waste processor in drums, boxes or steel liners per the vendor site criteria for processing and disposal.

4.2.7. Filtering devices using pre-coat media may be **USED** for the removal of suspended solids from liquid waste streams. The pre-coat material or cartridges from these devices may be routinely **REMOVED** from the filter vessel and discharged to a Filter Sludge Tank or Liner/HIC. Periodically, the filter sludge may be **DISCHARGED** to the vendor processing system for waste treatment onsite **or PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.

4.2.8. Activated hardware stored in the Spent Fuel Pools will be **PROCESSED** periodically using remote handling equipment **and** may then be **PUT** into a container for shipment or storage in the pool or loading the processed activated hardware into the Dry Cask storage system.

4.2.9. High Integrity Containers (HIC):

1. For disposal at Barnwell, vendors supplying HIC's to the station shall **PROVIDE** a copy of the HIC Certificate of Compliance, which details specific limitations on use of the HIC.

2. For disposal at Clive or WCS, vendors supplying HIC's to the station shall **PROVIDE** a copy of the HIC Certificate of Conformance, which details specific limitations on use of the HIC.

3. Vendors supplying HIC's to the station shall **PROVIDE** a handling procedure which establishes guidelines for the utilization of the HIC. These guidelines serve to protect the integrity of the HIC and ensure the HIC is handled in accordance with the requirements of the Certificate of Compliance or Certificate of Conformance.

4.2.10. Lubricants and oils contaminated as a consequence of normal operating and maintenance activities may be PROCESSED on-site (by incineration, for oils meeting 10CFR20.2004 and applicable state requirements, or by an approved vendor process) **or SHIPPED** offsite (for incineration or other acceptable processing method).

4.2.11. Former in-plant systems GE or Stock Drum Transfer Cart and Drum Storage Areas may be **USED** for higher dose DAW storage at Clinton, Dresden, Quad Cities, Braidwood, Byron and Nine Mile Point.

4.2.12. Certain waste, including flowable solids from holding pond, oily waste separator, cooling tower basin and emergency spray pond, may be disposed of onsite under the provisions of a 10CFR20.2002 permit. Specific requirements associated with the disposal shall be incorporated into station implementing procedures. **(CM-2)**

4.2.13. Concentration averaging may be **PERFORMED** to combine LLRW having different concentrations of radionuclides to form a homogeneous mixture in accordance with the guidance in the NRC's Branch Technical Position on Concentration Averaging and Encapsulation-1995, NRC-2011-0022:

- For homogeneous waste types such as resins and filter media, the concentration of the mixture for classification purposes may be based on either the highest radionuclide concentration in any of the individual waste types contributing to the mixture or the volumetric or weight-averaged nuclide concentrations in the mixture provided that the concentrations of the individual waste type contributors to the mixture are within a factor of 10 of the average concentration of the resulting mixture. (NOTE: a designed collection of homogeneous waste types (from different sources within a facility) is not considered 'mixing' and the concentration for classification purposes may be the average concentration of the combination).
- For non-homogeneous waste types such as activated metals, cartridge filters or components incorporating radioactivity in their design, the concentration should be determined from the total weight or displaced volume (excluding major void spaces) of the component. Mixtures of components in a disposal container is permissible. Concentration averaging of a mixture of components of similar types can be performed in accordance with the NRC's Branch Technical Position on Concentration Averaging and Encapsulation and any State or Disposal Site specific requirements.

4.2.14. Blending may be **PERFORMED** for routine LLRW such as resins and filter media in accordance with the guidance in the NRC's Branch Technical Position on Concentration Averaging and Encapsulation as further clarified in SECY 2010-0043. The concentration of the mixture may be determined based on the total activity of all components in the mixture divided by the total volume or mass of the mixture. Reasonable effort should be made to mix blended LLRW so that activity is evenly distributed.

4.2.15. Encapsulation may be **PERFORMED** for routine wastes such as filters, filter cartridges, or sealed sources centered in an encapsulated mass, in accordance with the guidance in the NRC's Branch Technical Position on Concentration Averaging and Encapsulation. Classification may be based on the overall volume of the final solidified mass provided that;

- The minimum solidified volume or mass should be reasonably difficult to move by hand.
- The maximum solidified volume or mass used for determining concentration for any single discrete source should be no more than 0.2 m^3 or 500Kg (typically 55-gallon drum).
- The maximum amount of gamma-emitting radioactivity or radioactive material is <0.02 mrem/hr on the surface of the encapsulation over a 500-year decay period.

- The maximum amount of any radionuclide in a single encapsulation, when averaged over the waste and encapsulating media, does not exceed the maximum concentration limits for Class C waste.
- Written procedures should be established to ensure that the radiation source(s) is reasonably centered (or distributed) within the encapsulating media.
- All other disposal facility requirements for encapsulated material are met.

4.3. Burial Site Requirements

4.3.1. Waste sent directly to burial shall **COMPLY** with the applicable parts of 49CFR171-172, 10CFR61, 10CFR71, and the acceptance criteria for the applicable burial site.

4.4. Shipping and Inspection Requirements

4.4.1. All shipping/storage containers shall be **INSPECTED**, as required by station procedures, for compliance with applicable requirements (Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), station, on-site storage, and/or burial site requirements) prior to use.

4.4.2. Containers of solidified liquid waste shall be **INSPECTED** for solidification quality and/or dewatering requirements per the burial site, offsite vendor acceptance, or station acceptance criteria, as applicable.

4.4.3. Shipments sent to an off site processor shall be **INSPECTED** to ensure that the applicable processor's waste acceptance criteria are being met.

4.4.4. Shipments sent for off site storage shall **MEET** the storage site's waste acceptance criteria.

4.5. Inspection and Corrective Action

4.5.1. Inspection results that indicate non-compliance with applicable NRC, State, vendor, or site requirements shall be IDENTIFIED and TRACKED through the Corrective Action Program.

4.5.2. Administrative controls for preventing unsatisfactory waste forms from being released for shipment are described in applicable station procedures. **If** the provisions of the Process Control Program are not satisfied, **then SUSPEND** shipments of defectively packaged radioactive waste from the site. **(CM-1)**

4.5.3. **If** freestanding water or solidification **not** meeting program requirements is observed, **then** samples of the particular series of batches shall be **TAKEN** to determine the cause. Additional samples shall be **TAKEN**, as warranted, to ensure that **no** freestanding water is present and solidification requirements are maintained.

4.6. Procedure and Process Reviews

4.6.1. The Exelon Nuclear Process Control Program and subsequent changes (other than editorial/minor changes) shall be **REVIEWED and APPROVED** in accordance with the station procedures, plant-specific Technical Specifications (Tech Spec), Technical Requirements Manual (T&RM), Operation Requirements Manual (ORM), as applicable, for the respective station and LS-AA-106. Changes to the Licensees Controlled Documents, UFSAR, ORM, or TRM are controlled by the provisions of 10CFR 50.59.

4.6.2. Any changes to the PCP shall be reviewed to determine if reportability is required in the Annual Radiological Effluent Release Report (ARERR). The Radwaste Specialist shall ensure correct information is **SUBMITTED** to the ODCM program owner prior to submittal of the ARERR.

4.6.3. Procedures shall be **IMPLEMENTED** as follows:

- Station processes or other vendor waste processing/operating procedures shall be technically reviewed and approved per RM-AA-102-1006.
- Procedures related to waste manifests, shipment inspections, and container activity determinations are **CONTROLLED** by Radiation Protection Standard Procedures (RP-AA-600 Series).
- Site waste processing **IS CONTROLLED** by site operating procedures.
- Liquid processed by vendor equipment shall be **PERFORMED** in accordance with vendor procedures.
- The dewatering procedures implemented by Vendor for the purpose of compliance to the Process Control Program **SHALL BE REVIEWED and APPROVED** in accordance with the plant specific TRM or ORM (either Current Technical Specifications (CTS) or Improved Technical Specifications (ITS), as applicable for the respective stations).

4.7. Waste Types, Point of Generation, and Processing Method

Methods of processing and individual vendors may **CHANGE** due to changing financial and regulatory options. The table below is a representative sample. It is **not** intended be all encompassing.

WASTE STREAM	POINTS OF GENERATION	AVAILABLE WASTE PROCESSING METHODS
Bead Resin	Systems - Fuel Pool, Condensate, Reactor Water Cleanup, Blowdown, Equipment Drain, Chemical and Volume Control Systems, Floor Drain, Maximum Recycle, Blowdown, Boric Acid Recycling System, Vendor Supplied Processing Systems, and Portable Demin System	Dewatering, solidification to an unstable/stable state Thermal Processing Free Release to a Land Fill
Powdered Resin	Systems - (Condensate System, Floor Drain/Equipment Drain filtration, Fuel Pool)	Dewatering, solidification to an unstable/stable state Thermal Processing
Concentrated Waste	Waste generated from Site Evaporators resulting typically from the Floor Drain and Equipment Drain Systems	Solidification to an unstable/stable state Thermal Processing
Sludge	Sedimentation resulting from various sumps, condensers, tanks, cooling tower, emergency spray pond, holding pond, and oily waste separators	Dewatering, solidification to an unstable/stable state Thermal Processing Evaporation on-site or at an offsite processor On-site disposal per 10CFR20.2002 permit
Filter cartridges	Systems - Floor/Equipment Drains, Fuel Pool; cartridge filters are typically generated from clean up activities within the fuel pool, torus, etc	Dewatering, solidification to an unstable/stable state Processed by a vendor for volume reduction
Dry Active Waste	Paper, wood, plastic, rubber, glass, metal, and etc. resulting from daily plant activities	Decon/Sorting for Free Release Compaction/Super-compaction Thermal Processing by Incineration or glass vitrification Sorting for Free Release Metal melting to an ingot
Contaminated Oil	Oil contaminated with radioactive materials from any in-plant system.	Solidification unstable state Thermal Processing by Incineration Free Release for recycling

WASTE STREAM	POINTS OF GENERATION	AVAILABLE WASTE PROCESSING METHODS
Drying Bed Sludge	Sewage Treatment and Waste Water Treatment Facilities	Free release to a landfill or burial
Metals	See DAW	See DAW
Irradiated Hardware	Fuel Pool, Reactor Components	Volume Reduction for packaging efficiencies

5. DOCUMENTATION

5.1. Records of reviews performed shall be retained for the duration of the unit operating license. This documentation shall contain:

1. Sufficient information to support the change together with the appropriate analyses or evaluations justifying the change, and

2. A determination which documents that the change will maintain the overall conformance of waste products to Federal (10CFR61 and the Branch Technical Position), State, or other applicable requirements, including applicable burial site criteria.

6. REFERENCES

6.1. Station Commitments:

6.1.1. Peach Bottom

CM-1, T03819, Letter from G.A. Hunger, Jr., dated Sept. 29 1994, transmitting TSCR 93-16 (Improved Technical Specifications). (Step 1.1.1, 4.5.2)

6.1.2. Limerick

CM-2, T03896, 10CFR20.2002 permit granted to Limerick via letter dated July 10, 1996. (Step 4.2.12)

6.2. Technical Specifications:

6.2.1. The details contained in Current Tech Specs (CTS) or Improved Technical Specifications (ITS), as applicable, in regard to the Process Control Program (PCP), are to be relocated to the Licensee Controlled Documents. Some facilities have elected to relocate these details into the Operational Requirements Manual (ORM). Relocation of the description of the PCP from the CTS or ITS does **not** affect the safe operation of the facility. Therefore, the relocation details are **not** required to be in the CTS or the ITS to provide adequate protection of the public health and safety.

6.3. UFSAR

6.3.1. Braidwood UFSAR, Section 11.4, Solid Waste Management System

6.3.2. Byron UFSAR Section 11.4, Solid Waste Management System

6.3.3. Calvert Cliffs UFSAR Section 11.1.2.3 Solid Waste Processing System

6.3.4. Clinton USAR Table 11.4, Solid Waste Management System

6.3.5. Dresden UFSAR Section 11.4, Waste Management System

6.3.6. Ginna UFSAR Section 11.4, Solid Waste Management System

6.3.7. James A. FitzPatrick UFSAR Section 11.3, Radioactive Solid Waste System

6.3.8. LaSalle UFSAR Section 11.4.2.7 Storage areas, Table 12.3.6- IRSF Storage Area

6.3.9. Limerick UFSAR Section11.4, Solid Waste Management

6.3.10. Nine Mile Point Unit 1 UFSAR Section 2.3 Solid Waste System

6.3.11. Nine Mile Point Unit 2 UFSAR Section 11.4, Solid Waste Management System

6.3.12. Oyster Creek UFSAR Section 11.4, Solid Waste Management System

6.3.13. Peach Bottom UFSAR Section 9.0, Radioactive Waste Systems

6.3.14. Quad Cities UFSAR Section 11.4.4.5, Interim Radwaste Storage Facility

6.3.15. Three Mile Island UFSAR Section 11.2, Radioactive Waste Disposal Systems Summary

6.4. Writers' References:

- Amendment No. 202 to Facility Operating License No. NPF-11 and Amendment No. 189 to Facility Operating License (FOL) No. NPF-18 for the LaSalle County Station (LSCS), Units 1 and 2
- Code of Federal Regulations: 10 CFR Part 20, Part 61, Part 71, 49 CFR Parts 171-172
- I.E. Circular 80.18, 10CFR 50.59 Safety Evaluation for Changes to Radioactive Waste Treatment Systems
- Low Level Waste Licensing Branch Technical Position on Radioactive Waste Classification, May 1983
- NRC Branch Technical Position on Blending of Low-Level Radioactive Waste, SECY-10-0043
- NRC Concentration Averaging and Encapsulation Branch Technical Position, NRC-2011-0022
- Regulatory Guide 1.21, Measuring Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants
- Technical Position on Waste Form (Revision 1), January 1991

6.5. Users' References:

- CY-AA-170-2000, Annual Radioactive Effluent Release Report
- LS-AA-106, Plant Operations Review Committee
- Quality Assurance Program (QATR)
- RM-AA-101, Records Management Program
- RM-AA-102-1006, Processing Vendor Documents
- RP-AA-600 Series, Radioactive Material/Waste Shipments

7. **ATTACHMENTS** - None

GUIDELINES FOR TRACKING OF PROCESSED LINERS

1. PURPOSE

1.1. The purpose of this procedure is to track actions once a liner is declared full. Tracking items include liner accrual, resin sample analysis/review, characterization, classification method, storage of liner, and adjustment to accrual if necessary.

1.2. This procedure is intended to be used for Class B waste liners. It is not necessary for all liners to follow this tracking process. It can however, be used if the site/corporate determines the need for tracking based on performance or management of liners. This is a suggested method and does not have to be followed in order.

2. TERMS AND DEFINITIONS

2.1. **Accrual**: Funds allocated for establishing the liability based on the existing contract rates when the waste container is considered full (85% or greater).

NOTE: If the liner cannot be filled to 85% or greater due to operational issues and is deemed complete for this evolution, then the accrual amount is determined by the liner burial volume multiplied by the waste class price per cubic foot

Example: (Liner burial volume x price per ft^3 of waste = accrual)

2.2. **Waste Classification**: Determination of radioactive waste given the concentration of long lived radionuclides and the concentration of short lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

2.3 **Process Memo**: A copy of the Vendor's form used to document contents of liners during filling/dewatering operations.

3. RESPONSIBILITIES

3.1. Radwaste/Environmental Supervisor is responsible for implementation of this procedure.

3.2. Radwaste Specialist is responsible for tracking mechanism and proper accrual.

3.3. Radwaste Specialist is responsible for obtaining the samples.

3.4. RP Shipping Specialist is responsible for determining waste classification of the resin liner.

3.5. Chemistry Management is responsible for resin sample analysis.

3.6. Radiochemist is responsible for the technical review of the resin sample isotopic scans.

3.7. Business Operation Site Controller is responsible for ensuring accruals are recorded properly and tracked to the disposal liner invoice.

4. MAIN BODY

4.1. Upon notification that a liner is approximately 85% full, or deemed complete for this evolution, the Radwaste Specialist shall **INITIATE** Attachment 1 by recording liner identification number.

NOTE: If the liner cannot be filled to 85% or greater due to operational issues and is deemed complete for this evolution, then the accrual amount is determined by the liner burial volume multiplied by the waste class price per cubic foot

Example: (liner burial volume x price per ft3 of waste = accrual)

4.2. Radwaste Specialist shall **CREATE** passport assignments to individuals responsible for applicable steps on Attachment 1.

4.3. Radwaste Specialist shall **VERIFY** that the liner has been placed on the Radwaste accrual spreadsheet. The proper amount accrued is based on the burial size (volume) of the liner and type of waste that was transferred into the liner. Condensate/Radwaste resin will typically be accrued as Class A, **and** Reactor Water Clean-up resin (RWCU) Primary Resin or Filter Sludge will initially be accrued as Class B. This should be based on historical data.

4.4. Radwaste Specialist shall **ARRANGE** for the radiological survey of the liner. RW and RP personnel should coordinate activity.

4.5. Radwaste Specialist shall **VERIFY** resin sample was delivered to the lab by a qualified person, **and REQUEST** Chemistry Management to schedule resin sample analysis.

NOTE: Resin samples should be analyzed within two weeks of receipt and the Liner serial number shall be used to track the sample

4.6. Chemistry Management shall **VERIFY** that waste samples have been analyzed in accordance with Chemistry Procedures, protocol, and processes.

4.6.1. Chemistry personnel **ENTER** the liner serial number/tracking number into the counting room system to serve as a unique identifier which may be used as a search field at a later date.

4.7. Chemistry Management shall **VERIFY** that waste sample analysis has been provided to the Radiochemist.

4.8. Radiochemist shall **REVIEW** waste sample analysis for accuracy **and PROVIDE** the results to the RW Specialist.

4.9. Radwaste Specialist **will PROVIDE** the Processing memo and any other information on the liner as necessary to the RP Shipping Specialist.

4.10. The RP Shipping Specialist shall **CHARACTERIZE** the liner within 2 weeks of the receipt of the Process memo, radiological survey, and isotopic sample(s). This duration may be altered if a 10CFR61 sample must be analyzed.

4.11. If there is any change in classification from the classification expected for that waste liner type, **then PERFORM** the following:

4.11.1. RP Shipping Specialist shall **INFORM** Radwaste Specialist **and** appropriate Radwaste/Environmental Management.

4.11.2. The RP Shipping Specialist should **GENERATE** an IR noting the change.

4.11.3. Radwaste/Environmental Management and Radwaste Specialist shall **REVIEW** results for accuracy **and INFORM** Business Ops **and** the Senior Leadership Team (SLT) of the classification change **and** the impact to the Radwaste budget.

4.11.4. RW Specialist shall **MAKE** the proper accrual change as directed.

NOTE: Accruals reductions should not take place until the liner has been accepted for burial by the disposal site operator

4.12. Radwaste Specialist shall **DOCUMENT** the liner storage location (Low-Level Radwaste Storage Facility/IRSF or designated Radwaste Storage location).

4. DOCUMENTATION

4.6. Records of liner classification, storage, and accrual are kept in accordance with other procedures. This procedure is the mechanism to drive connection of the departments involved in the process. No documentation is required.

5. REFERENCES

5.6. IR 1502266, IR 2527585

5.7. BO-AA-1201 Accrual Guidelines

5.8. RP-AA-605 10CFR 61 Program

6. ATTACHMENTS

6.6. Attachment 1, Liner Tracking

ATTACHMENT 1
Liner Tracking
PAGE 1 OF 1

Liner ID# _____

Liner Model_____

Burial Volume (ft^3) _____

	Initials / Date
Passport assignments created ATI#_____	_____/_____
Waste Stream _____	_____/_____
Waste Type _____	_____/_____
Expected Waste Class _____	_____/_____
Waste sample(s) obtained	_____/_____
Process memo, radiological survey, and isotopic sample analysis delivered to Shipping Specialist	_____/_____
10CFR61 Sample required (Y / N) _____	_____/_____
Liner characterized and waste class determined	_____/_____
Actual Waste Class _____	_____/_____
If required, notification of classification change made	_____/_____
If required, Radwaste accrual adjusted	_____/_____
If required, notification made to Bus Ops and SMT	_____/_____
Liner storage location: _____	_____/_____

Copy of Liner data/information remains with RW Specialist until shipped

_____/_____

Radwaste Specialist Date

Entergy	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-RW-106	REV. 6
		INFORMATIONAL USE	Page 1 of 47	

Integrated Transportation Security Plan

Procedure Contains NMM ECH eB REFLIB Forms: YES ☒ NO ☐

Procedure Revision Type: New ☐ **NON-Editorial** ☒ **Editorial** ☐ **TC** ☐ **Cancellation** ☐

HQN Effective Date	Procedure Owner: Title: Site:		Governance Owner: Title: Site:	
1/5/17		Alan Zelie Manager, RP PNPS		Reid Tagliamonte Manager, Fleet RP HQN

Site	Site Procedure Champion	Title
ANO	Bert Lynch	Manager, RP
BRP	N/A	N/A
CNS	Chris Sunderman	Manager, RP
GGNS	Roy Miller	Manager, RP
IPEC	Scott Stevens	Manager, RP
JAF	Robert Heath	Manager, RP
PLP	Dave Nestle	Manager, RP
PNPS	Alan Zelie	Manager, RP
RBS	Shannon Peterkin	Manager, RP
VY	Michael Pletcher	Manager, RP
W3	Eric Neal	Manager, RP
HQN	Reid Tagliamonte	Manager, Fleet RP

For site implementation dates see ECH eB REFLIB using site tree view (Navigation panel).

Site and NMM Procedures Canceled or Superseded By This Revision

None

Process Applicability Exclusion: All Sites: ☐

Specific Sites: ANO ☐ BRP ☐ CNS ☐ GGNS ☒ IPEC ☐ JAF ☐ PLP ☒ PNPS ☒ RBS VY ☐ W3 ☐

Change Statement

The purpose of this revision is to add requirements for refresher training per 10 CFR 37.43 in response to CR-WF3-2016-02243.

Added step 5.6[6]

Add Check off for attachment 9.6 and 9.7 to verify Department of Homeland Security and MARSEC levels prior to shipment of Category 1 and Category 2 quantities of radioactive material.

Associated PRHQN #: 2016-00323

Procedure Writer: Ron Schwartz

Contains Proprietary Information: YES ☐ NO ☒

TABLE OF CONTENTS

1.0 PURPOSE

This document implements the requirements of the DOT Transportation Security Requirements and the NRC's Additional Security Measures for Radioactive Material – Category 1 and Category 2 Quantities. The requirements stem from the Department of Transportation as well as the Nuclear Regulatory Commission.

2.0 REFERENCES

[1] 49 Code of Federal Regulations, Part 172-173, Hazardous Materials

[2] EPRI Hazardous Material Transportation Security Plan Risk Assessment

[3] 10 CFR Parts 70, 71, 72 and 73 (NRC Regulations)

[4] 33 CFR 105, Temporary Interim Rule, Effective July 1, 2003 (US Coast Guard Regulations)

[5] 49 CFR 172.800, Revised Regulations, Effective March 25, 2003 (DOT Regulations)

[6] American Chemistry Council, et al; Transportation Security Guidelines for the U.S. Chemical Industry, 2001

[7] DOE Memorandum, Jessie Roberson to Distribution, Approval of Commercial Shipments of Radioactive Materials and Waste on Behalf of the Office of Environmental Management, June 27, 2003

[8] DOT-RSPA, Enhancing Security of Hazardous Materials Shipments Against Acts of Terrorism or Sabotage Using RSPA's Risk Management Self-Evaluation Framework (RMSEF), January 2002

[9] DOT-RSPA, Three Case Studies for the Risk Management Framework for Hazardous Materials Transportation, November 1, 2000

[10] DOT-RSPA, Flyer DHM50-0023-1002, Shippers and Carriers Enhanced Security Measures, not dated

[11] DOT Slide Presentation, Hazardous Materials Transportation Security, NEI Transportation Security Meeting, May 29, 2003

[12] DOT Federal Motor Carrier Safety Administration, Hazardous Materials Company Anti-Terrorism Tips, DOT Web Site, Internet download July 7, 2003

[13] Federal Register, Volume 68, Number 126, page 39315-39338, 33 CFR 105, July 1, 2003

2.0 continued

[14] GAO Report to Congressional Requesters, GAO-03-435 Rail Safety and Security, Some Actions Already Taken to Enhance Rail Security, but Risk-based Plan Needed, April 2003

[15] NRC, Fact Sheet on Dirty Bombs, NRC Web Site, internet download, June 30. 2003

[16] U.S. Department of Justice, Special Report, A Method to Assess the Vulnerability of U.S. Chemical Facilities, November 2002

[17] NRC letter from J. E. Dyer dated July 19, 2005, "Issuance of Order for Additional Security Measures on the Transportation of Radioactive Material Quantities of Concern" EA 05-007

[18] NEI 14-XX [Rev C], Implementation Guidelines for 10 CFR 37 Subpart D Physical Protection in Transit

[19] 10 CFR Part 37, “Physical Protection Of Category 1 And Category 2 Quantities Of Radioactive Material”

[20] NUREG-2155, Rev. 1, “Implementation Guidance for 10 CFR Part 37, ‘Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material’”

3.0 DEFINITIONS

[1] Acronyms:

ANI – American Nuclear Insurers
ASM – Additional Security Measures (EA 05-007)
COTP – Captain of the Port (US Coast Guard designation)
DAW – Dry Active Waste
DOT – Department of Transportation
ENOI – Entergy Nuclear Operations, Incorporated
EOI – Entergy Operations, Incorporated
FBI – Federal Bureau of Investigation
LLEA – Local Law Enforcement Agencies
MCC – Movement Control Center
NEI – Nuclear Energy Institute
NRC – Nuclear Regulatory Commission
SAS – Secondary Alarm Station
SRCP – Security Risk Control Points
TSA – Transportation Security Administration
TSP – Transportation Security Plan

3.0[1] continued

TSP-RA – Transportation Security Plan – Risk Assessment
USCGS – U.S. Coast Guard Service

[2] **Aggregated** – Accessible by the breach of a single physical barrier that would allow access to radioactive material in any form, including any devices that contain the radioactive material, when the total activity equals or exceeds a category 2 quantity of radioactive material

[3] **Dry Active Waste** – Dry, solid radioactive waste (as opposed to wet wastes such as resins, filters, or filter media)

[4] **Greater Than Class C Waste (GTCC)** – Low-level radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in 10 CFR Part 61.55.

[5] **Hazardous Material** – For the purposes of the TSP-RA, this term includes the definition in 49CFR173.403 and as listed in associated table under 49CFR172.101.

[6] **Highway Route Control Quantities (HRCQ)** – A quantity within a single package which exceeds 3000 times the A1 value for special form or 3000 times the A2 value for normal form or 1000 TBq (27,000 Ci), whichever is the least.

[7] **Lost or Missing Licensed Material –** Means licensed material whose location is unknown.

[8] **Low Specific Activity (LSA)** – Radioactive material with limited specific activity which satisfies the following limits: ores containing only naturally occurring radionuclides, solid un-irradiated natural or depleted uranium or natural thorium or their solid or liquid mixtures, etc. (see 49CFR173.403 for exact definition).

[9] **Materials of Significant Concern** – For the purposes of the TSP-RA, this refers to hazardous materials which are known or presumed to be so acutely toxic to humans as to afford a hazard to health during transportation, thereby representing a significant transportation security risk.

[10] **Movement Control Center** – An operations center that is remote from transport activity and that maintains position information on the movement of radioactive material, receives reports of attempted attacks or thefts, provides a means for reporting these and other problems to appropriate agencies and can request and coordinate appropriate aid.

3.0 continued

[11] **National Security Threat Level** – Transportation of certain types of hazmat shipments may be restricted during periods of elevated security threat levels. The degree of restriction, associated risk, and the affected hazmat shipments will affect the level of security control applied to certain hazmat shipments. The National Security Threat Level is established by the Department of Homeland Security and serves as a general guide for the security threat level established by other agencies, such as the NRC and USCGS. Also note that the NRC and USCGS may have different (higher) security threat levels than the national security threat level. Nuclear plant security activities are governed by the highest security threat level applied by the NRC and, as applicable, the USCGS.

[12] **NO-LATER-THAN Arrival Time** – The date and time that the shipping licensee and the receiving licensee have established as the time at which an investigation will be initiated if the shipment has not arrived at the receiving facility.

[13] **NRC Security Threat Level** – Corresponds to the National Security Threat Level. However, it is independently controlled and established by the NRC, and fluctuates independently from the National Threat Level. This is the primary threat level monitored by nuclear plants, and it encompasses a combination of threats from National, Maritime, and other sources.

[14] **MARSEC Level** – Maritime Security [Threat] Level as identified and maintained by the USCGS. It is independently controlled and established by the USCGS, and fluctuates independently from the National Threat Level or the NRC Threat Level. The MARSEC is also monitored by the affected nuclear plants, which respond accordingly.

[15] **Physical Security Plan (PSP)** – For a nuclear plant, this is the PSP required by 10 CFR 73. For some decommissioning nuclear plants and for other licensed nuclear support facilities (e.g., radioactive laundry vendors, waste processors, nuclear plant maintenance facilities), this refers to the “industrial security plan.” The term PSP also encompasses the USCGS FSP and all of the related requirements specified in 33 CFR 105, Subpart D.

[16] **Radioactive Material** – For the purposes of the TSP-RA, this term includes both radioactive materials and radioactive wastes.

[17] **Safe Haven** – Readily accessible site at which security is present or from which, in the event of an emergency, the transport crew can notify and wait for local law enforcement authorities.

[18] **Storage Incidental to Movement** – Storage that takes place between the time that a hazardous material is offered for transportation to a carrier and the time it reaches its destination.

3.0 continued

[19] **Telemetric Positioning Monitoring** – A data transfer system that captures information by instrumentation and/or measuring devices about the location and status of a transport vehicle or package between the departure and destination locations.

[20] **TSP** - Hazardous Material (and Radioactive Material) Transportation Security Plan.

[21] **TSP-RA** – Transportation Security Plan Risk Assessment.

[22] **Unauthorized Persons** - An unauthorized person is any person who is not authorized by the shipper or the transportation carrier to have access to hazardous materials or transport conveyances being prepared for transportation. This includes all persons who are not employed by the shipper or the transportation carrier, including members of the general public, unless such persons are specifically authorized by the shipper or transportation carrier to have access to hazardous materials or transport vehicles being prepared for transportation.

4.0 RESPONSIBILITIES

[1] **Materials, Purchasing & Contracts Manager** is responsible for supporting the key elements of the procedure within the requirements of Section 5.0 [3].

[2] **Training Manager** is responsible for the key elements of the procedure to ensure that Hazardous Material (HAZMAT) **AND** 10 CFR Part 37.43(c) training requirements outlined in Section 5.0 of this procedure are developed and implemented.

[3] **Radiation Protection Manager (RPM)** is responsible for ensuring the Risk Assessment outlined in this procedure will meet radioactive hazardous materials processing requirements and notifying MP&C of the need to ship materials, from a site warehouse, that meet the requirements of hazardous materials.

[4] **Chemistry Superintendent** is responsible for ensuring the Risk Assessment outlined in this procedure will meet non-radioactive hazardous materials processing requirements and notifying MP&C of the need to ship materials, from a site warehouse, that meet the requirements of hazardous materials.

5.0 DETAILS

5.1 PRECAUTIONS AND LIMITATIONS

None

5.2 GENERAL

NOTE

"Tables" referenced in this procedure are located in Attachment 9.1, "TSP-RA Tables"
Table 1: Typical Radioactive and Hazardous Material Shipments
Table 2: Hazmat Carriers, Types of Hazmat Shipments and Quantities Shipped
Table 3: Determination of Hazardous Materials of Significance to This Assessment
Table 4: Category 1 and Category 2 Threshold
Table 5: Hazardous Materials of Significant Concern Shipped from Facilities

[1] The Physical or Industrial Security Plans already contain security procedures, access controls, requirements for employee background checks, etc. Such procedures, controls regulations and therefore need not be duplicated.

[2] The Entergy (EOI / ENOI) standard language approach to the TSP consists of a simplified and minimal TSP document plus an attachment used in association with the procedure.

5.3 RISK ASSESSMENT

[1] This TSP-RA is applicable to packaging, staging/storage in preparation for transport, and shipment of the radioactive and hazardous materials addressed in 49 CFR 172.800. Table 1 identifies the types of radioactive and hazardous materials shipments.

[2] Transportation Carriers contracted to carry radioactive and/or hazardous materials and who's TSPs are relied upon to provide all necessary security during transport and during storage incidental to movement. This includes the categories of carriers listed in Table 2.

5.3 continued

[3] For bulk quantity shipments of hazardous material identified in Table 5 which will cross bridges spanning water, through tunnels under water, or on water which is patrolled by the USCGS, regardless of whether the shipment is made by highway, rail or vessel, advance notification of the shipment or of a series of shipments is to be given to the affected USCGS Port Authority. The licensee SHALL notify the USCGS at least 10 days before the shipment physically begins within the United States. For shipments where 10 days of advance notice is not possible, the notification is to be made as soon as practicable. The notification SHALL be made to the appropriate USCGS Port Authority. (The USCGS may choose to require facility-specific notification for other materials.)

[4] In the event that a shipment of material described in 5.3[3] arrives at the intended consignee but is refused by the consignee, the Carrier maintains responsibility for security of the shipment until it arrives at an acceptable destination designated by the shipper.

[5] **IF** the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System (NTAS) issues an "Elevated Alert" or "Imminent Alert", **OR IF** the USCGS MARSEC Level reaches 2 or 3 (as applicable to each plant), **THEN Category 1** and **Category 2** as well as **HRCQ** shipments are **not to be shipped**.

[6] The shipment of all hazardous material described in Table 1 may have other controls implemented by the shipper (during shipment preparation & shipping coordination) or carrier (en-route security).

5.4 CARRIER TSP AND CONTRACTS MANAGEMENT

[1] The optimum approach is for the carrier to implement its own TSP which addresses all aspects of the transportation security regulations, including hazmat employee training and driver commercial licenses and endorsements. Accordingly, MP&C will incorporate standard language in their Contracts and Purchase Orders, where applicable, that will require the transportation company to implement its own TSP. It is not necessary to review and approve each carrier's TSP prior to implementation by the carrier.

[2] The language in Section 5.5, "Carrier Hazardous Material Transportation Security Plan," or similar language, is to appear in every carrier contract where the carrier is anticipated to transport any of the highly hazardous materials identified in 49 CFR 172.800. The end user (contract requisitioner) should identify whether the transportation of hazardous materials is anticipated when submitting a request for a new contract.

5.5 CARRIER HAZARDOUS MATERIAL TRANSPORTATION SECURITY PLAN

[1] The Carrier will affirm each time (i.e., separate shipment) that it has a Hazardous Material Transportation Security Plan in place prior to approval of the contract or contract amendment, that the plan meets all applicable Federal and International transportation security regulations in effect as of the contract or contract amendment date, and that said TSP will be updated in a timely manner to remain current with revised and new Federal and International transportation security regulations.

[2] The Carrier is also responsible for implementing regulations for commercial driver licenses hazardous material endorsements.

[3] Advanced approval of the Carrier's TSP is not required for implementation of this contract. However, it will be made available for review and approval by an authorized representative of ENTERGY (EOI / ENOI) if requested and on reasonable verbal or written notice, with due consideration given to document security and control.

[4] The Transportation Security Plan for Carriers under contract shall be reviewed at least annually.

[5] Prior to dispatching any driver to an ENTERGY (EOI / ENOI) facility for the purposes of transporting hazardous material, the Carrier is to verify that the driver has the appropriate commercial driver license hazardous material endorsements.

[6] The carrier is to also notify the designated ENTERGY (EOI / ENOI) representative of the name of the driver and any other requested driver identification information, which will be used to verify that the appropriate driver has arrived to transport the shipment.

[7] Transportation of any of the hazardous materials identified in 49 CFR 172.800 is not to be assigned or subcontracted without the prior written agreement of all parties.

NOTE

Some vendors subcontract carriers to prepare and ship hazardous materials off-site. For example, a major maintenance contractor may subcontract an independent transportation company to ship hazardous materials from one plant to the next.

[8] All contracts **OR** purchase orders, where applicable, which potentially involve transportation of the hazardous materials covered in the TSP are to be examined to ensure that subcontracted carriers have **AND** maintain a TSP acceptable to ENTERGY (EOI / ENOI). Consideration is to be given to amending any such contracts to include the preceding language **OR** to include a restriction similar to the following:

"Transportation of any of the hazardous materials identified in 49 CFR 172.800 will not be assigned or subcontracted without the prior written agreement of all parties."

5.5 continued

[9] It is recommended that an affirmation letter on carrier letterhead paper be received from the carrier prior to awarding any transportation contract or other scheduled carrier for radioactive and non-radioactive materials. A copy of the affirmation is available in Attachment 9.2, "Sample Carrier Affirmation Letter."

5.6 TRAINING

[1] Employees involved with processing (including vehicles) and transporting hazardous material must be provided with the following personnel security awareness and transportation security training modules:

- Security Awareness Training
- In-Depth Transportation Security Training module (including specific information on the existence of the company's TSP).

[2] Both training modules may supplement the existing hazmat employee training program consistent with the intent of and frequency specified in 49 CFR 172.704. Re-qualification training will be provided at the same frequency as other hazmat employee training.

[3] All new hazardous material employees must receive this training within 90 days of employment.

[4] Hazmat employees must receive training required by 49 CFR 172.704 at least once every three years.

[5] Hazmat employees required to have In-Depth Security Training must receive training at least once every three years **OR IF** the security plan for which training is required is revised during the three-year recurrent training cycle, **THEN** the employee must receive training within 90 days of implementation of the revised plan.

[6] Personnel responsible for implementing the Integrated Transportation Security Plan shall have refresher training as required by 10 CFR 37.43 at a frequency not to exceed 12 months **AND** when significant changes are made to the security program. [10 CFR 37.43(c)(3)] [CR-WF3-2016-02243]

5.7 ADDITIONAL SECURITY MEASURES FOR RADIOACTIVE SHIPMENTS – CATEGORY 1 AND CATEGORY 2 QUANTITIES

5.7.1 General

NOTE

This section is based on the 10 CFR part 37 subpart D final rule, NUREG 2155 Q & A, and NRC response to industry questions.

[1] Section 5.7 applies to the following activities

- Transfer and receipt of a category 1 and category 2 quantity of radioactive material.
- Preplanning and coordination of shipments,
- Physical protection during shipment,
- Notifications, investigations, and event reporting,

[2] Attachments 9.6 through 9.8 of this procedure includes a table of 10 CFR Part 37 Subpart D Physical Protection requirement checklists for category 1 and category 2 quantity of radioactive material shipments.

5.7.2 Transfer of Category 1 and Category 2 Quantities of Radioactive Material

5.7.2.1 License Verification

[1] Any licensee transferring a category 2 quantity of radioactive material is required to perform and document licensee verification activities based on the quantity of material being transferred. The purpose of the licensee verification is to make sure the transferee's license is valid and authorized to receive the type, form and quantity of radioactive material transferred. Use Attachment 9.3, “License Verification System Credential Guide” to obtain credentials for using the License Verification System.

[2] Except for emergencies, the licensee is required to use the Licensee Verification System (LVS) developed by the NRC or contact the regulatory agency (NRC or Agreement State) to verify that the license is valid before shipping a category 2 quantity of radioactive material.

5.7.2.1 continued

[3] **IF** there exists an emergency where the licensee cannot verify the license of the transferee by the LVS or regulatory agency, **THEN** the licensee may accept written verification by the transferee that it is authorized to receive the type, form and quantity of radioactive material being transferred. In which case use Attachment 9.4 “Manual License Verification Form Guide,” **OR** Attachment 9.5, “Manual License Verification Procedure Guide.”

[4] The licensee is not required to perform license verification of transfers to the Department of Energy, other Federal entities, or transfers within the same organization of the licensee. Verification is not required for imports and exports, however the requirements of 10 CFR Part 110, "Export and Import of Nuclear Equipment and material," would apply

5.7.2.2 Category 2 Transfer

[1] The licensee transferring the category 2 quantity of radioactive material will verify the transferee is authorized to receive the radioactive material prior to shipment. The licensee uses the LVS or direct contact with the applicable regulatory agency.

[2] The licensee may not use a fax, email, or a copy of the recipient's license to verify the transferee is authorized to receive a category 2 quantity of radioactive material. The verification of each shipment is required and the licensee should document the verification process used (i.e. LVS, regulatory agency contact, or recipient licensee certification).

[3] **IF** the licensees rely on the recipient licensee's certification, as permitted in an emergency situation above, **AND** later discover the recipient's license is not valid, **THEN** the licensee should contact the LLEA and the NRC's Operation Center if the shipment has been delivered.

5.7.2.3 Category 1 Transfer

[1] The licensee transferring a category 1 quantity of radioactive material is required to meet the same requirements as the transfer of a category 2 quantity of radioactive material.

[2] In addition to the requirements for transfer for category 2 transfers, verify that the receiving licensee is authorized to receive radioactive material at the address requested for delivery.

5.7.3 Guidance for Physical Protection During Transit

NOTE

Section 5.7.3 addresses the shipping licensee responsibility for implementing 10 CFR Part 37 Subpart D requirements for preplanning and coordination and physical protection during transit.

5.7.3.1 Licensee Responsibility

[1] The shipping licensee is responsible for meeting the requirements of 10 CFR Part 37 Subpart D unless the receiving licensee has agreed in writing to arrange for the in-transit physical protection. The licensee is also responsible for meeting the requirements of Subpart D for category 1 or category 2 quantity of radioactive material from the point that the material enters the United States for import and until the material is under the jurisdiction of a U.S. Government agency at a port, border crossing, or airport for material exported.

[2] The licensee should have a contract with the carrier that obligates the carrier to comply with the applicable requirements in Subpart D

[3] The shipping licensee is responsible for providing physical security of a category 2 or greater quantity of radioactive material until the carrier accepts the consignment of radioactive material for shipment and begins movement of the loaded transport vehicle. The shipping licensee's control applies outside of the protective area until the departure of the shipment.

5.7.3.2 Category 1 Shipment

[1] The shipping licensee must conduct preplanning and coordination activities with the receiving licensee and with each state that the shipment enters. The shipping licensee preplanning and coordination procedures should address, as a minimum, the following items:

- Shipment contract(s) with a carrier that identify carriers responsibilities for implementing applicable regulations,
- Protocol for carrier actions to take if a shipment is rerouted during bad weather or other unusual event,
- Shipping licensee should preplan and coordinate the shipments arrival and departure time with the receiving licensee,
- Shipping licensee establish protocol for coordinating and contacting the governor of the State or the governor's designee,

5.7.3.2[1] continued

- Shipping licensee works with the States to identify its intention to provide escorts and any additional State-imposed transportation security requirements',
- Shipping licensee works with the carrier to identify safe haven(s) along the route at approximately 50 mile intervals, if available,
- Carrier coordination with State escorts if applicable.

[2] The licensee maintains documentation of the above activities as attachments to the shipping package.

[3] A licensee that transports, or delivers to a carrier for transport in a single shipment by road, a category 1 quantity of radioactive material should address the following items, as a minimum:

(a) Licensee establishes or uses a carrier that has established movement control centers (MCC). The MCC should:

- Monitor shipments on a continuous basis 24 hours a day, 7 days a week,
- Maintain the ability to immediately communicate with LLEA in an emergency,
- Provide positive confirmation of the location of the shipment, its status, individuals in control of the shipment,
- Develop and implement preplanned procedures in response to deviations from the authorized route (s), **OR**
- Provide notification of actual or attempted theft or diversion or suspicious activity related to the theft, loss, or diversion of a shipment,
- Immediately awareness if a shipment deviates from shipping plans, planned route, unscheduled stops, or scheduled stops longer than expected,
- Redundant communications consisting of two systems that do not rely on the same hardware or software to transmit a signal,
- The use of telemetric monitoring system to permit the remote monitoring and reporting of the location of a transport vehicle or package,

5.7.3.2[3](a) continued

- Ensure carrier provides a second individual when the driving time period is greater than the maximum number of allowable hours of service in a 24-hour duty day as established by the DOT,
- The driver or accompanying individual or both perform the following:
  - Periodically call the MCC to provide verbal status of the shipment and delivery,
  - Maintain vigilance of the surrounding environment during transport,
  - Maintain constant visual surveillance when transport vehicle is stopped,
  - Periodically walk around vehicle while it is not in motion, to confirm no apparent safety or security related issues,
  - Confirm no evidence of tampering with the contents of the vehicle or no unusual or suspicious activity in the immediate vicinity.
- Normal operating procedures address activities to meet regulatory requirements:
  - Refueling and comfort stops,
  - Meal stops, and
  - Routine check-in.

(b) Contingency procedures address issues that could interfere with compliance during preparation for transport or during transport:

- Bad weather,
- Suspicious activities,
- Mechanical breakdown,
- Road or bridge closures, detours, accidents, or
- Acute illness.

5.7.3.2[3](b) continued

- Communication protocol for:
  - Duress codes to enable off-site individual to signal the need for assistance,
  - Authentication codes to confirm the true identity of the employee,
  - Loss of communication actions to take.

(c) Licensee ensures access to normal and contingency procedures by drivers, accompanying personnel, and MCC personnel.

5.7.3.3 Category 2 Shipment

[1] A licensee that transports, or delivers to a carrier for transport in a single shipment by road, a category 2 quantity of radioactive material should include the following items as a minimum in its preplanning and coordination process:

- Coordinate the expected arrival time and the no-later-than (NLT) arrival time, and the method of notification of receipt of shipment with the receiving licensee.
- Shipping licensee initiates investigation if shipment has not arrived by more than 6 hours past NLT
- The receiving licensee confirms to the shipping licensee that the shipment has arrived by phone, e-mail, or facsimile as agreed in the preplanning and coordination activities.
- Shipping licensee notifies the receiving licensee of any new NLT arrival time as soon as practicable after the driver or authorized member of the transfer crew determines the category 2 shipment cannot arrive before the NLT arrival time.

[2] A licensee that transports category 2 quantity of radioactive material should address the following items, as a minimum:

- Establishment of a security zone around the radioactive material, the use of the transport vehicle is permitted, [37.47(a)]
- Limit access to the security zone to authorized individuals, [37.47(c)]
- Monitor, detect, assess, and respond to any unauthorized access, [37.49]

5.7.3.3 continued

[3] A licensee that transports, or delivers to a carrier for transport in a single shipment by road, a category 2 quantity of radioactive material should address the following items, as a minimum:

- The use of carriers with an established, documented package tracking system that allows shipping licensee to see the chain of custody for the package and who is accountable at each stage of the trip,
- The shipping licensee or carrier can promptly determine if the shipment is lost or missing,
- The tracking system requires an authorized signature (receiving licensees employee or contractor) before release for delivery or return,
- Licensee's carrier maintains constant control and surveillance during transit with capability to immediately summon response by an armed LLEA, trained emergency services personnel to prevent or mitigate any collateral impacts of a safety event, or immediately requests assistance for emergency or urgent conditions to avoid or minimize unplanned delay of shipment.
- Immediate communication to summon response or assistance may be met with cell or satellite phones and two-way radios. No backup communication system is required.
- The licensee's carrier maintains a package-tracking system with a reliable on-demand capability to ascertain the last location and current status of the shipment.

[4] A licensee who transports, or delivers to a carrier for transport in a single shipment by rail, a category 2 quantity of radioactive material should address the following items, as a minimum:

- The use of a carrier with a documented, proven, and reliable tracking system,
- The capability to allow the shipping licensee or carrier to identify when and where package was when the train last reported, and when it will arrive at the next point of control,
- The carrier maintains constant control and surveillance during transit and has the capability for immediately communication to summon an appropriate response or assistance,

5.7.3.3[4] continued

- Immediate communication to summon response or assistance may be met with cell or satellite phones, and two-way radios. No backup communication system is required,
- The tracking system requires an authorized signature (receiving licensees' employee or contractor) before release for delivery or return.

5.7.4 Advance Notification of Shipment of Category 1

5.7.4.1 Advance Notification

[1] The shipping licensee provides advance notification to the NRC and the governor of a State or the governor's designee in writing and postmarked 7 days before the shipment begins.

[2] Notifications by fax or email are required 4 days before transport within or through the state.

[3] The shipping licensee should confirm the notification by fax or its intended recipient receives email. The preferred notification method to the NRC is by email to RAMQC_SHIPMENTS@nrc.gov or by fax to 301-816-5151. The contact information of governors and governor's designee is available on the NRC Web site at http://nrc-stp.ornl.gov/special/designee.pdf

[4] The following is a summary of the information to be furnished in an Advance Notification of Shipment:

- The name, address, and telephone number of the shipper, carrier, and receiver of the category 1 radioactive material,
- The license numbers of the shipper and receiver,
- A description of the radioactive material contained in the shipment, including the radionuclides and quantity,
- The point of origin of the shipment and the estimated time and date that the shipment will commence,
- The estimated time and date that the shipment is expected to enter each State along the route,
- The estimated time and date of arrival of the shipment at the destination,
- A point of contact, with a telephone number, for current shipment information.

5.7.4.1 continued

[5] The licensee is expected to include all of the above information when it makes the initial advance notification. Any missing information is required to be provided before commencement of the shipment.

5.7.4.2 Updating Advance Notification

[1] The shipping licensee is required to provide a revision notice with any information that was not available when the initial notification was submitted.

[2] The shipping licensee is required to notify any affected State's governor or designee as soon as it discovers or is advised of the following changes in the shipment:

- A change is made to the description of the radioactive material radionuclides or quantities,
- A change is made in the shipment's point of origin or estimated time or date of commencement,
- A change of 6 hours or more is made in the estimated time or date that the shipment is expected to enter each State along the route,
- A change of 6 hours or more is made in the estimated time or date of arrival of the shipment at the destination,
- A change is made in the name or telephone number of the point of contact for current shipment information.

[3] The driver or other authorized member of the transfer crew is to make notification of any changes in shipment information en route as soon as the change is determined.

[4] **IF** the shipment is canceled, **THEN** the shipping licensee is required to notify the States to which advance notification was provided **AND** the NRC, **OR** Agreement State agency with jurisdiction in the State of origin. The licensee is required to send a cancellation notice via email, facsimile, or written correspondence as soon as possible. A telephone call may be necessary to ensure timely receipt of the notice to provide a State time to cancel any planned escorts.

5.7.5 Reporting of Events

5.7.5.1 Shipment Investigations

[1] **IF** the licensee asks for a status of its shipment, **AND** the carrier's telemetric monitoring system or railroad's communications center cannot tell where the shipment is within a few minutes **AND** the shipping licensee is not confident that the tracking and communication system are functioning normally, **THEN** the licensee should consider the shipment lost or missing

[2] The shipping licensee must investigate immediately if a category 1 quantity shipment is lost or missing.

[3] The investigation of the lost or missing category 1 quantity shipment should include as a minimum the following actions:

- Determine the time and location of the last transport crew check-in.
- Determine where communication was lost.
- Determine where tracking was lost.
- Confirm that the equipment is working properly.
- Contact the escort if one was being used.

[4] The shipping licensee must investigate immediately if a category 2 quantity shipment does not arrive by the NLT arrival time based on the receiving licensee notification.

[5] The investigation of the lost or missing category 2 quantity shipments should include as a minimum the following actions:

- Determine the shipment's last known location from carrier.
- Determine the shipment's current location.

[6] **IF** the carrier cannot determine the location of the shipment, **THEN** the shipping licensee notifies the NRC Operations Center that a category 2 quantity shipment is lost or missing

[7] Contact the NRC Operations Center if the shipment is still missing after 24 hours of the initial notification.

5.7.5.2 Category 1 Notifications

[1] The shipping licensee must make the following notifications after determining a shipment of category 1 quantities of radioactive material is lost or missing:

- Notify the LLEA as soon as the carrier has completed its first unsuccessful attempt to locate the material and confirmed its inability to trace it was not a result of human error, or a malfunction of the position monitoring system,
- Notify the NRC Operations Center within 1 hour after determining the category 1 shipment is lost or missing. Discuss with the NRC the expected frequency of updates,
- Notify the NRC and the LLEA as soon as possible when the lost or missing licensed material is again in the physical possession of, or in a location otherwise under the control of the carrier, shipping, or recipient licensee, authorized State or Federal agency, or an LLEA that is able to prevent or deter unauthorized access to the material.

[2] The shipping licensee must make the following notifications as soon as possible upon discovery of any actual or attempted theft, or diversion of a shipment, or suspicious activities related to the theft or diversion of a shipment of a category 1 quantity of material:

- Notify the designated LLEA along the shipment route as soon as possible, **AND**
- Notify the NRC Operations Center (301-816-5100). The NRC will notify other affected States and Federal partners as appropriate.

[3] The Transportation Security Administration (TSA) has guidance for private or contract carrier employees that list a number of activities that may be considered suspicious.

[4] A written report is required to be submitted to the NRC within 30 days of the shipping licensee's initial telephonic notifications that a shipment of category 1 material is lost or missing, or telephonic notification of actual, or attempted theft or diversion of a shipment of category 1 material.

5.7.5.2 continued

[5] The written report is provided to the Director, Division of Security Policy, Office of Nuclear Security and Incident Response and must provide the following information:

- A description of the licensed material involved, including kind, quantity, and chemical and physical form;
- A description of the circumstances under which the loss or theft occurred;
- A statement of disposition, or probable disposition, of the licensed material involved;
- Actions that have been taken, or will be taken to recover the material;
- Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed material.

[6] After filing the written report, if the shipping licensee gathers any information not previously reported to the NRC, such as findings from a completed investigation of the loss or theft of category 1 material, the licensee has to report that additional information within 30 days.

[7] A Condition Report will be initiated to document any actual or attempted theft or diversion of a shipment or any suspicious activity related to a shipment of category 1 quantities of radioactive material.

[8] Contact the site Licensing group in the event of an accident (e.g., shipment is lost, missing, actual or attempted theft or diversion, vehicular accident etc.) involving category 1 quantities of radioactive material to ensure appropriate notification of ANI is made.

5.7.5.3 Category 2 Notifications

[1] The shipping licensee is required to notify the NRC Operations Center within 4 hours of its determining a shipment of category 2 quantities of radioactive material is lost or missing. If after 24 hours from its determination the licensee still cannot locate the material, the NRC operations Center must be notified again.

[2] The shipping licensee is also required to notify the NRC Operations Center as soon as possible after discovery of an actual or attempted theft or diversion of a category 2 quantity shipment or any suspicious activity related to a shipment.

[3] The shipping licensee is required to notify the NRC Operations Center when a lost or missing shipment of category 2 quantities of radioactive material has been located.

[4] A written report is required to be submitted to the NRC within 30 days of the shipping licensee initial telephonic notifications that a shipment of category 2 material is lost or missing or telephonic notification of actual or attempted theft or diversion of a shipment of category 1 material.

[5] After filing the written report, if the shipping licensee gathers any information not previously reported to the NRC, such as findings from a completed investigation of the loss or theft of category 2 materials, the licensee has to report that additional information to the NRC within 30 days.

[6] A Condition Report will be initiated to document any actual or attempted theft or diversion of a shipment or any suspicious activity related to a shipment of category 2 quantities of radioactive material.

[7] Contact the site Licensing group in the event of an accident (e.g., shipment is lost, missing, actual or attempted theft or diversion, vehicular accident etc.) involving category 2 quantities of radioactive material to ensure appropriate notification of ANI is made.

5.7.6 Records

5.7.6.1 Documentation

[1] The records that result from the activities in this procedure are to be retained a minimum of three years as required but typically through the life of the nuclear power plant's license.

[2] The following records are generated as a result of implementing this section:

- Licensee verification documentation
- Documentation for preplanning and coordination, and any revision. Documentation is to include:
  - Any phone conversations or e-mail communications that it has with the receiving licensee to include the names of the individuals participating in the call or e-mail communications a general description of the shipment, and the departure and arrival times
  - Any interactions with the governor’s designee to include the names of the individuals participating in the call or e-mail, the route-affected States’ decisions on escorts, the safe havens identified, and any other information that the licensee considers pertinent
- Advance notification and any revision and cancellation notices

5.7.6.1[2] continued

- Written reports and additional substantive information

[3] Records resulting from the activities in this procedure are to be retained with records generated by EN-RW-102, "Radioactive Shipping Procedure."

5.7.6.2 Protection of Information

[1] The information to be furnished in advance notification of category 1 quantities of radioactive material shipment shall be protected against unauthorized disclosure as specified in 10 CFR 73.21 Protection of Safeguards Information: Performance requirements. The schedule information specified in 37.77(b) is provided to State officials, State employees, and other individuals that are not licensees of the NRC or an Agreement State.

[2] The governor of a State or his or her designated State employee representative, Federal, State, or local law enforcement personnel are relieved from the fingerprinting, identification, and criminal history records checks, and other elements of background investigations and are permitted access to the category 1 shipping information.

[3] A licensee that plans to transport or deliver to a carrier for transport, licensed material that is a category 1 quantity of radioactive material will only use carriers that certify they have an access authorization program that meets the requirements of 10 CFR 73.21 and 10 CFR 73.23. The carrier must include in the access authorization program the vehicle drivers, accompanying individuals, movement control center personnel, and any individual whose assigned duties provide access to shipment information on category 1 quantities of radioactive material.

[4] The shipment of category 2 quantities of radioactive material does not require the commercial drivers and package handlers to meet the access authorization program requirements since these individuals are subject to DOT security requirements.

5.8 TYPES OF HAZMAT SHIPMENTS ADDRESSED BY THE ENTERGY (EOI / ENOI) TSP-RA

[1] Specifically for Nuclear Power Reactors, this transportation security plan (TSP) applies to:

(a) Radioactive laundry shipments,

(b) Some shipments of low-level radioactive waste (dry active waste) to offsite processors,

(c) Some shipments of radioactive vendor equipment offsite, and

5.8[1] continued

(d) Shipments of processed radioactive waste and reactor hardware for offsite disposal.

NOTE

For Highway Route Controlled Quantity shipments of radioactive materials, the shipper must refer to the NRC Physical Security Plan along with the Additional Security Measures for Radioactive Shipments – Category 1 and Category 2 Quantities (Section 5.7 of this procedure).

[2] A highway route-controlled quantity of a Class 7 (radioactive) material, as defined in 49 CFR 173.403, in a motor vehicle, rail car, or freight container;

[3] More than 25 kg (55 pounds) of a Division 1.1, 1.2, or 1.3 (explosive) material in a motor vehicle, rail car, or freight container;

[4] More than one L (1.06 qt) per package of a material poisonous by inhalation, as defined in Part 171.8 of this subchapter, that meets the criteria for Hazard Zone A, as specified in § 173.116(a)or 173.133(a) of this subchapter;

[5] A shipment of a quantity of hazardous materials in bulk packaging having a capacity equal to or greater than 13,248 L (3,500 gallons) for liquids or gases or more than 13.24 cubic meters (468 cubic feet) for solids;

[6] A shipment in other than a bulk packaging of 2,268 kg (5,000 pounds) gross weight or more of one class of hazardous materials for which placarding of a vehicle, rail car, or freight container is required for that class under the provisions of subpart F of this part;

[7] A select agent or toxin regulated by the Centers for Disease Control and Prevention under 42 CFR part 73; or

[8] A quantity of hazardous material that requires placarding under the provisions of subpart F of this part.

5.9 INFORMATION

[1] Attachment 9.1 provides all associated tables that are applicable to the ENTERGY (EOI / ENOI) Risk Assessment.

6.0 INTERFACES

[1] EN-RW-102, “Radioactive Shipping Procedure”

7.0 RECORDS

NOTE

Records resulting from the activities in this procedure are retained with records generated by EN-RW-102, “Radioactive Shipping Procedure.”

[1] Licensee verification documentation

[2] Documentation for preplanning and coordination, and any revision

[3] Advance notification and any revision and cancellation notices

[4] Written reports and additional substantive information

[5] Attachment 9.6, “10 CFR37 Subpart D Category 1 Physical Protection Requirement Checklist”

[6] Attachment 9.7, “10 CFR37 Subpart D Category 2 Physical Protection Requirement Checklist”

[7] Attachment 9.8, “10 CFR 37 Subpart D Category 1 Quantities of Concern State Coordination Log”

8.0 SITE SPECIFIC COMMITMENTS

None

9.0 ATTACHMENTS

9.1 TSP-RA Tables

9.2 Sample Carrier Affirmation Letter

9.3 License Verification System Credential Guide

9.4 Manual License Verification Form Guide

9.5 Manual License Verification Procedure Guide

9.6 10 CFR 37 Subpart D Category 1 Physical Protection Requirement Checklist

9.7 10 CFR 37 Subpart D Category 2 Physical Protection Requirement Checklist

9.8 10 CFR 37 Subpart D Category 1 Quantities of Concern State Coordination Log

[33 CFR 105.400]

TABLE 1
Typical Radioactive and Hazardous Materials Shipments

RADIOACTIVE MATERIALS SHIPMENTS	
TYPES OF MATERIALS SHIPPED	**TYPICAL MATERIALS IN SHIPMENT**
Radioactive Material Category 1 and Category 2 as defined in Attachment 9.1, Table 4, "Category 1 and Category 2 Threshold".	Examples include, but are not limited to: certain radioactive calibration sources, ion-exchange resin, certain activated reactor components and limited amounts of irradiated reactor fuel.
Highway route controlled quantities (HRCQ) of radioactive material.	Highly irradiated reactor components; some Greater Than Class C (GTCC) wastes.
Shipment of Type B quantities of radioactive materials in an NRC-approved shipping container.	High activity resin, filters, and irradiated reactor components, such as control rod blades and velocity limiters.
Shipment of radioactive materials in bulk packaging of 3,500 gallons or more for liquids or 468 cubic feet or more for solids.	Radioactively contaminated oil or aqueous liquids; routine sea-land and inter-modal containers of dry active waste.
Shipment in other than bulk packaging of 5,000 pounds or more of radioactive materials that is required to be placarded.	Most shipments made in Type A or Type B casks.
A quantity of radioactive material that requires placarding.	Most radioactive waste shipments, laundry shipments, vendor equipment shipments.
HAZARDOUS MATERIALS SHIPMENTS	
TYPES OF MATERIALS SHIPPED	**TYPICAL MATERIALS IN SHIPMENT**
A quantity of hazardous materials in a bulk packaging having a capacity equal to or greater than 3500 gallons (13,248 liters) for liquids or gases or more than 468 ft^3 (13.24 m^3) for solids.	Most shipments of diesel fuel, used oil, acids, caustics, sodium hypochlorite, and similar hazmat.
A quantity of hazardous material that requires placarding.	Most shipments of hazardous waste (such as paint waste, parts cleaning solutions, and lab packs), liquid and solid mixed waste, PCB waste, asbestos and waste water treatment chemicals.

TABLE 2
Hazmat Carriers, Types of Hazmat Shipments, and Quantities Shipped

CARRIER CATEGORY	TYPICAL MATERIALS TRANSPORTED BY THIS CARRIER CATEGORY	MAXIMUM QUANTITIES PER SHIPMENT
Laundry services suppliers	1. Radioactive laundry 2. Low activity DAW	Co-60 = < 1 Ci Cs-137 = < 1 Ci
Plant maintenance equipment and services suppliers (including their subcontracted Carriers)	1. Low activity radioactive material	Co-60 = < 8.1 Ci Cs-137 = < 10 Ci
Waste processors, and other waste Carriers and Hazmat Carriers	1. Radioactive materials and waste 2. Reactor components and other irradiated hardware 3. Vendor equipment 4. Hazardous waste 5. Mixed waste 6. PCB waste 7. Asbestos waste	HRCQ, excluding spent fuel (rarely) RAMQC (rarely) Type A and Type B LSA/SCO Bulk and/or placarded hazmat
Common carrier (Federal Express, UPS)	Radioactive sources	Could be Category 1 or 2
Entergy	Radioactive material/special tools/sources	Could be Category 1 or 2

TABLE 3
Determination of Hazardous Materials of Significance to This Assessment

(a) Hazard Class	(b) Hazard Class Division Of Concern	(c)(c) General Description of Significant Hazard or Class	(d) Typical Materials Shipped in this Hazard Class Division by these Facilities and Discussion of Relative Significance	(e) Significance to This Risk Assessment
1	1.1, 1.2, 1.3	Explosives	No significant quantity of explosives are shipped by these facilities.	None
2	2.3	Poison Gas (inhalation hazard)	Anhydrous ammonia gas, chlorine gas.	High
3	None	Flammable (liquids)	Diesel fuel, gasoline, paint, solvents. These materials are relatively low toxicity (i.e., are not acutely toxic; do not contain lethal concentrations or doses).	Low
4	4.3	Dangerous When Wet	Sodium. No significant quantities of such materials are shipped by these facilities. (Significant quantities may be shipped by sodium-moderated reactors if any are included in the facility listing in Section 1.1. Significance would be Low.)	None
5	5.2	Organic Peroxide, Type B (may be liquid or solid and are thermally controlled)	Type B organic peroxides can undergo a thermal explosion. As a genera; rule, they are not shipped by any of these facilities. In the event a shipment becomes necessary, the shipment is pre-approved in writing by the DOT Associate Administrator and is shipped in accordance with the instructions provided by the Associate Administrator.	None
6	6.1	Poison Inhalation Hazard (liquid poisons)	Hydrazine and most other hazmat in this division are not Hazard Zone A or B (Package Group I) and are, therefore, not **High** significance.) Note: some plants may still have stabilized acrolein on site, which would be **High** significance.)	Medium
8	None	Corrosives	Acids, caustics. These materials are relatively low toxicity (i.e., are not acutely toxic; do not contain lethal concentrations or doses).	Low
9	None	Miscellaneous	Hazardous waste, solid, n.o.s.; Hazardous waste, liquid, n.o.s.; asbestos; PCBs. These materials are relatively low toxicity (i.e., are not acutely toxic; do not contain lethal concentrations or doses).	Low

TABLE 4
Category 1 and Category 2 Threshold

The terabecquerel (TBq) values are the regulatory standard. The curie (Ci) values specified are obtained by converting from the TBq value. The curie values are provided for practical usefulness only.

Radioactive material	Category 1 (TBq)	Category 1 (Ci)	Category 2 (TBq)	Category 2 (Ci)
Americium-241	60	1,620	0.6	16.2
Americium-241/Be	60	1,620	0.6	16.2
Californium-252	20	540	0.2	5.40
Cobalt-60	30	810	0.3	8.10
Curium-244	50	1,350	0.5	13.5
Cesium-137	100	2,700	1	27.0
Gadolinium-153	1,000	27,000	10	270
Iridium-192	80	2,160	0.8	21.6
Plutonium-238	60	1,620	0.6	16.2
Plutonium-239/Be	60	1,620	0.6	16.2
Promethium-147	40,000	1,080,000	400	10,800
Radium-226	40	1,080	0.4	10.8
Selenium-75	200	5,400	2	54.0
Strontium-90	1,000	27,000	10	270
Thulium-170	20,000	540,000	200	5,400
Ytterbium-169	300	8,100	3	81.0

Continued on next page

Note: *Calculations Concerning Multiple Sources or Multiple Radionuclides*

The "sum of fractions" methodology for evaluating combinations of multiple sources or multiple radionuclides is to be used in determining whether a location meets or exceeds the threshold and is thus subject to the requirements of this procedure.

I. If multiple sources of the same radionuclide and/or multiple radionuclides are aggregated at a location, the sum of the ratios of the total activity of each of the radionuclides must be determined to verify whether the activity at the location is less than the category 1 or category 2 thresholds of Table 4, as appropriate. If the calculated sum of the ratios, using the equation below, is greater than or equal to 1.0, then the applicable requirements of this part apply.

II. First determine the total activity for each radionuclide from Table 4. This is done by adding the activity of each individual source, material in any device, and any loose or bulk material that contains the radionuclide. Then use the equation below to calculate the sum of the ratios by inserting the total activity of the applicable radionuclides from Table 4 in the numerator of the equation and the corresponding threshold activity from Table 4 in the denominator of the equation.

Calculations must be performed in metric values (i.e., TBq) and the numerator and denominator values must be in the same units.

R_1 = total activity for radionuclide 1
R_2 = total activity for radionuclide 2
R_N = total activity for radionuclide n
AR_1 = activity threshold for radionuclide 1
AR_2 = activity threshold for radionuclide 2
AR_N = activity threshold for radionuclide n

$$\sum_{1}^{n}\left[\frac{R_1}{AR_1}+\frac{R_2}{AR_2}+\frac{R_n}{AR_n}\right]\geq 1.0$$

TABLE 5
Hazardous Materials of Significant Concern Shipped From Facilities

Hazard Class Division Of Concern	General Description of Significant Hazard or Class	Typical Materials Shipped in this Hazard Class Division by these Facilities and Discussion of Relative Significance
2.3	Poison Gas (inhalation hazard)	Anhydrous ammonia gas, chlorine gas.

ATTACHMENT 9.2 **SAMPLE CARRIER AFFIRMATION LETTER**

Sheet 1 of 1

EXAMPLE:

Date:

To: Entergy (EOI / ENOI)
(Appropriate Site Address)

Subject: Carrier Hazardous Material Transportation Security Plan

(Carrier Company Name) affirms that we have a Hazardous Material Transportation Security Plan in place which meets all applicable Federal and International transportation security regulations in effect as of the contract or contract amendment date, and that said Transportation Security Plan will be updated in a timely manner to remain current with revised and new Federal and International transportation security regulations. We further affirm that our Transportation Security Plan fully implements the regulations for commercial driver licenses hazardous material endorsements.
Our Transportation Security Plan will be made available for review and approval by an authorized representative of ENTERGY (EOI / ENOI) NS if requested and on reasonable verbal or written notice, with due consideration given to document security and control. We understand that we will not mail, send, or otherwise transmit any confidential documents to ENTERGY (EOI / ENOI).

Prior to dispatching any driver to an ENTERGY (EOI / ENOI) facility for the purposes of transporting hazardous material, we will verify that the driver has the appropriate commercial driver license hazardous material endorsements. We also agree to notify a designated ENTERGY (EOI / ENOI) representative of the name of the driver and any other requested driver identification information, which will be used to verify that the appropriate driver has arrived to transport the shipment.

It is further agreed that transportation of any of the hazardous materials identified in 49 CFR 172.800 will not be assigned or subcontracted without the prior written agreement of all parties.

Authorized Carrier Representative Signature Block

ATTACHMENT 9.3 **LICENSE VERIFICATION SYSTEM CREDENTIAL GUIDE**

Sheet 1 of 1

NOTE

The purpose of this guide is to aid individuals in getting credentialed for using the NRC License Verification System (LVS).

The NRC LVS web site provides an on-line User Guide.

[1] Using a web browser, go to http://www.nrc.gov.

[2] Click on “Nuclear Security” tab.

[3] Click on the “Radioactive Material Security” bulleted item.

[4] Click on “License Verification System (LVS)” under “NRC Activities for Radioactive Material Security.”

[5] Click on “Get credentialed for LVS.” A public Disclosure of Submitted Information will appear. **IF** you want to continue with getting your LVS Credentialed, **THEN** click on “I ACCEPT.”

[6] After you mouse click on I ACCEPT, the Web Page Portfolio Enrollment Module will appear. Fill out all the information requested from the Portfolio Enrollment Request Form. Once all the required information blocks are filled out, mouse click on Submit at the lower right corner of the request form.

ATTACHMENT 9.4 **MANUAL LICENSE VERIFICATION FORM GUIDE**

Sheet 1 of 2

[1] Using a web browser, go to http://www.nrc.gov.

[2] Click on “Nuclear Security” tab.

[3] Click on “Radioactive Material Security” bulleted item.

[4] Click on “License Verification System (LVS)” under “NRC Activities for Radioactive Material Security.”

[5] Click on “Manual License Verification Form.” A PDF document similar to the following should display.

OFFICIAL USE ONLY - SECURITY-RELATED INFORMATION

Submit by E-mail

NRC FORM 749 (07-2014) 10 CFR 37.71 — U.S. NUCLEAR REGULATORY COMMISSION

MANUAL LICENSE VERIFICATION REPORT

APPROVED BY OMB: NO. 3150-0223 EXPIRES: 07/31/2017

Estimated burden per response to comply with this collection request: 8 minutes. This form is a voluntary means of fulfilling the requirements in 10 CFR 37.71. The information provided will be used to perform a license verification prior to transfer. Send comments regarding burden estimate to the FOIA, Privacy, and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0223), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

Sections A-B to be completed by LVS Help Desk (if applicable). Sections C-D to be completed by the licensee: Complete sections C and D below for NRC or Agreement State licensees needing to verify a license outside of the License Verification System. For issues with submitting this form, please contact the LVS Help Desk: 1-877-671-6787 or E-mail: lvshelp.resource@nrc.gov.

A. CONTACTED VIA ☐ Phone ☐ E-mail		**B. DATE (MM/DD/YYYY)**	
C. TRANSFERRING LICENSEE INFORMATION			
C.1 Agency (issuing Agency for license)			
C.2 Licensee Name			
C.3 License Number			
C.4 Contact Name and Title			
C.5 Contact Telephone Number		C.7 Contact Fax Telephone Number	
C.6 Contact E-mail Address			
D. RECEIVING LICENSEE INFORMATION			
D.1 Agency (issuing Agency for license)			
D.2 Licensee Name			
D.3 License Number		D.4 Amendment Number	
D.5 Issue Date			
D.6 Authorized Location			
D.7 Material(s) of concern being requested	D.8 Chemical/Physical Form	D.9 Quantity/Activity/Unit (being requested)	
1.	1.	1.	
2.	2.	2.	
3.	3.	3.	
4.	4.	4.	

Sections E-F instructions (Agency representative to provide): Verify the information in Section D above and make sure that all information provided is valid and the authorized location, materials and quantities being requested are authorized on the recipient's license. Record the verification outcome below. Return the completed form via e-mail to the LVS Help Desk (lvshelp.resource@nrc.gov).

E. VERIFIER'S INFORMATION			
E.1 Verifier's Name			
E.2 Verifier's Telephone Number		E.3 Verifier's Fax Telephone Number	
E.4 Verifier's E-mail Address			
F. VERIFICATION OUTCOME			
F.1 Verification Date			
F.2 Verification Outcome	☐ Requested materials, quantities, and authorized location are authorized on the license ☐ Requested materials, quantities, and authorized location are not authorized on the license ☐ Other		
F.3 If other, please explain:			

NRC FORM 749 (07-2014)

OFFICIAL USE ONLY - SECURITY-RELATED INFORMATION

[6] Save the form in PDF format.

NOTE

At this time the green “Submit by E-mail” button on the form does not work.

[7] **WHEN** completed, **THEN** email the form to LVSHelp.Resource@nrc.gov.

Manual License Verification

NOTE

The purpose of this attachment is to guide licensees transferring Category 1 and/or Category 2 quantities of radioactive materials in verifying licenses outside of the License Verification System (LVS).

Steps for Licensees

[1] Contact the LVS Help Desk by phone at 1-877-671-6787 or by email at LVSHelp.Resource@nrc.gov.

[2] Be prepared to provide the following information to the LVS Help Desk representative.

(a) Transferring licensee information:

- License-issuing agency
- Licensee name
- License number
- Contact name and title
- Contact phone
- Contact email
- Contact fax number

(b) Receiving licensee information:

- License-issuing agency
- Licensee name
- License number
- Amendment number or license issue date
- Authorized storage location address
- Material(s) being requested
- Chemical/Physical form of the material(s) being requested
- Quantity/Activity being requested

[3] The transferring licensee will receive notification from the LVS Help Desk of the verification outcome as soon as the verification is complete by the license issuing regulatory agency.

[4] The verification outcome will include a notification of whether:

(a) The requested materials, quantities, and authorized location are authorized on the license, **OR**

(b) The requested materials, quantities, and/or authorized location are NOT authorized on the license, **OR**

(c) Other reason (with an explanation)

[5] The licensee **must keep** a copy of the verification outcome sent by the LVS Help Desk for their records in accordance with the 10 CFR Part 37 requirements for keeping records of license verifications.

ATTACHMENT 9.6 **10 CFR 37 SUBPART D CATEGORY 1 PHYSICAL PROTECTION REQUIREMENT CHECKLIST**

Sheet 1 of 4

Shipment Number: _____

[1] Verify the recipient is authorized to receive the type, form and quantity of material per NRC's License Verification System OR License Issuing Authority in accordance with 10 CFR 37.71

_____ (initials)

[2] Verify the delivery address matches the location authorized in the recipient's license.

_____ (initials)

[3] Attach documentation of license verification.

_____ (initials)

[4] **IF** shipping to a licensee in an agreement state, **THEN** obtain written verification of licensee compliance with physical security requirements for Category 1 quantities of radioactive materials in accordance with 10 CFR 37. Attach verification documentation.

_____ (initials)

[5] Pre-plan and coordinate shipment arrival and departure times with receiving licensee.

Planned departure date and time: _____

Planned arrival date and time: _____

_____ (initials)

ATTACHMENT 9.6 10 CFR 37 SUBPART D CATEGORY 1 PHYSICAL PROTECTION REQUIREMENT CHECKLIST

Sheet 2 of 4

[6] Provide advance notification to the NRC prior to transport per 10 CFR 37.77. Notification by mail must be postmarked at least seven (7) days prior to commencement of transport. Other means of notification must reach NRC at least four (4) days prior to shipment commencement.

Information required in notification. **IF** information is not available at the time of shipment, **THEN** provide the information as soon as possible, but before commencing shipment.

- Name, address, telephone number, and license number of shipper.
- Name, address, and telephone number of carrier.
- Name, address, telephone number, and license number of the recipient.
- Description of radioactive material, including radionuclides and quantities.
- Point of origin and estimated date and time shipment will commence.
- Estimated date and time shipment expected to enter each state along route.
- Estimated date and time of arrival
- Point of contact and telephone number to obtain current shipment information

Date and time of notification: _____

_____
(initials)

[7] Pre-plan and coordinate shipment information with the Governor, or designee, of any state through which the shipment will pass, including the State's intentions to provide law enforcement escorts and identification of safe havens. Use attachment 9.8, "Category 1 Quantities of Concern State Coordination Log," or equivalent, to document coordination activities. **IF** coordination was performed carrier or recipient, attach copy of documentation.

_____
(initials)

[8] Notify each state Governor or designee immediately of any changes or cancellation. Attach documentation of notification.

_____
(initials)

ATTACHMENT 9.6 **10 CFR 37 SUBPART D CATEGORY 1 PHYSICAL PROTECTION REQUIREMENT CHECKLIST**

Sheet 3 of 4

[9] Verify the carrier meets the requirements for physical protection of Category 1 quantities of radioactive material during shipments by road per 10 CFR 37.79(a).

_____ (initials)

[10] **IF** provided, **THEN** attach carrier verification of 10 CFR 37 compliance.

_____ (initials)

[11] Verify normal and emergency contingency procedures addressing the following are available to drivers, accompanying personnel AND the movement control center.

- Notification to communications center and law enforcement agencies
- Communication protocols that include a strategy for authentication and duress codes and provisions for refueling or other stops.
- Loss of communications
- Response to actual or attempted theft or diversion of shipment

_____ (initials)

[12] Verify movement control center(s) established to maintain position information from a remote location comply with the following:

- The center has the ability to immediately contact appropriate law enforcement agencies.
- The center has redundant communications with transport or escort vehicle.
- The center continuously and actively monitors shipment by telemetric position monitoring, or alternative tracking system, twenty-four hours a day, seven days a week.
- The center is prepared to implement pre-planned procedures in response to deviations from authorized route or notification of suspicious activities or attempted theft or diversion of material.

_____ (initials)

ATTACHMENT 9.6 **10 CFR 37 SUBPART D CATEGORY 1 PHYSICAL PROTECTION REQUIREMENT CHECKLIST**

Sheet 4 of 4

[13] **IF** the highway shipment driving time is greater than the maximum number of hours established by the Department of Transportation, **THEN** verify there is an accompanying individual.

_____
(initials)

[14] **Verify** that the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System (NTAS) has not issued an "Elevated Alert" or "Imminent Alert", OR/IF the USCGS MARSEC Level has not reached 2 or 3 (as applicable to each plant), prior to shipment.

_____
(initials)

[15] Notify Site Security (S.A.S) of shipment AND have Security make a log entry.

Date and time of notification: _____

Security point of contact: _____

Security log entry number: _____

_____
(initials)

Performed by (print, sign, date): _____

Reviewed by (print, sign, date): _____

ATTACHMENT 9.7 **10 CFR 37 SUBPART D CATEGORY 2 PHYSICAL PROTECTION REQUIREMENT CHECKLIST**

Sheet 1 of 2

Shipment Number: _____

[1] Verify the recipient is authorized to receive the type, form and quantity of material per NRC's License Verification System OR License Issuing Authority in accordance with 10 CFR 37.71

_____ (initials)

[2] Attach documentation of license verification.

_____ (initials)

[3] **IF** shipping to a licensee in an agreement state, **THEN** obtain written verification of licensee compliance with physical security requirements for Category 2 quantities of radioactive materials in accordance with 10 CFR 37. Attach verification documentation.

_____ (initials)

[4] Pre-plan and coordinate shipment arrival and departure times with receiving licensee.

Planned departure date and time: _____

Planned arrival date and time: _____

No-Later-Than date and time: _____

_____ (initials)

[5] Verify the carrier meets the requirements for physical protection of Category 2 quantities of radioactive material during shipments by road per 10 CFR 37.79(a).

_____ (initials)

[6] Verify the carrier has established a package tracking system that allows the shipper or transporter to identify where the package was last and when it should arrive at the next point of control.

_____ (initials)

ATTACHMENT 9.7 **10 CFR 37 SUBPART D CATEGORY 2 PHYSICAL PROTECTION REQUIREMENT CHECKLIST**

Sheet 2 of 2

[7] Verify the carrier has constant control and/or surveillance during transit and has the capability for immediate communication to summon appropriate response or assistance.

_____ (initials)

[8] Verify the carrier has established a tracking system that requires an authorized signature prior to releasing the package for delivery or return.

_____ (initials)

[9] **IF** provided, **THEN** attach carrier verification of 10 CFR 37 compliance.

_____ (initials)

[10] Notify Site Security (S.A.S) of shipment AND have Security make a log entry.

Date and time of notification: _____

Security point of contact: _____

Security log entry number: _____

_____ (initials)

[11] **Verify** that the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System (NTAS) has not issued an "Elevated Alert" or "Imminent Alert", OR/IF the USCGS MARSEC Level has not reached 2 or 3 (as applicable to each plant), prior to shipment.

_____ (initials)

[12] Refer to 10 CFR 71.97 to see if the shipment also meets the criteria for Highway Route Control Quantity limits requiring advanced notification.

_____ (initials)

Performed by (print, sign, date): _____

Reviewed by (print, sign, date): _____

ATTACHMENT 9.8 **10 CFR 37 SUBPART D CATEGORY 1 QUANTITIES OF CONCERN STATE COORDINATION LOG**

Sheet 1 of 1

Shipment Number: _____

State:_____

State representative name and title: _____

Date of coordination conversation: _____

Expected entry:
Date and time: _____ Location: _____

Expected exit:
Date and time: _____ Location: _____

Does the state intend to provide law enforcement escorts? _____

Safe havens identified: _____

_____

_____

_____

Additional discussion items concerning shipment through state: _____

_____

_____

_____

_____

_____

Performed by (Print, sign, date): _____

Reviewed by (Print, sign, date): _____

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Integrated Transportation Security Plan

Procedure Revision Type: New ☐ **NON-Editorial** ☒ **Editorial** ☐ **TC** ☐ **Cancellation** ☐

Effective Date	Procedure Owner: / Title: / Site:			
5/23/17	Procedure Owner: Title: Site:	Adam King Manager, RP JAF		

Site Procedures Canceled or Superseded By This Revision

None

Process Applicability Exclusion: JAF: ☐

Change Statement

The purpose of this revision is to give guidance on how to proceed during a change in Threat Level Advisory when issued by Home Land Security and/or the NRC.

Procedure Writer: Ryan Conger

Contains Proprietary Information: YES ☐ NO ☒

TABLE OF CONTENTS

1.0 PURPOSE

This document implements the requirements of the DOT Transportation Security Requirements and the NRC's Additional Security Measures for Radioactive Material – Category 1 and Category 2 Quantities. The requirements stem from the Department of Transportation as well as the Nuclear Regulatory Commission.

2.0 REFERENCES

[1] 49 Code of Federal Regulations, Part 172-173, Hazardous Materials

[2] EPRI Hazardous Material Transportation Security Plan Risk Assessment

[3] 10 CFR Parts 70, 71, 72 and 73 (NRC Regulations)

[4] 33 CFR 105, Temporary Interim Rule, Effective July 1, 2003 (US Coast Guard Regulations)

[5] 49 CFR 172.800, Revised Regulations, Effective March 25, 2003 (DOT Regulations)

[6] American Chemistry Council, et al; Transportation Security Guidelines for the U.S. Chemical Industry, 2001

[7] DOE Memorandum, Jessie Roberson to Distribution, Approval of Commercial Shipments of Radioactive Materials and Waste on Behalf of the Office of Environmental Management, June 27, 2003

[8] DOT-RSPA, Enhancing Security of Hazardous Materials Shipments Against Acts of Terrorism or Sabotage Using RSPA's Risk Management Self-Evaluation Framework (RMSEF), January 2002

[9] DOT-RSPA, Three Case Studies for the Risk Management Framework for Hazardous Materials Transportation, November 1, 2000

[10] DOT-RSPA, Flyer DHM50-0023-1002, Shippers and Carriers Enhanced Security Measures, not dated

[11] DOT Slide Presentation, Hazardous Materials Transportation Security, NEI Transportation Security Meeting, May 29, 2003

[12] DOT Federal Motor Carrier Safety Administration, Hazardous Materials Company Anti-Terrorism Tips, DOT Web Site, Internet download July 7, 2003

[13] Federal Register, Volume 68, Number 126, page 39315-39338, 33 CFR 105, July 1, 2003

2.0 continued

[14] GAO Report to Congressional Requesters, GAO-03-435 Rail Safety and Security, Some Actions Already Taken to Enhance Rail Security, but Risk-based Plan Needed, April 2003

[15] NRC, Fact Sheet on Dirty Bombs, NRC Web Site, internet download, June 30. 2003

[16] U.S. Department of Justice, Special Report, A Method to Assess the Vulnerability of U.S. Chemical Facilities, November 2002

[17] NRC letter from J. E. Dyer dated July 19, 2005, "Issuance of Order for Additional Security Measures on the Transportation of Radioactive Material Quantities of Concern" EA 05-007

[18] NEI 14-XX [Rev C], Implementation Guidelines for 10 CFR 37 Subpart D Physical Protection in Transit

[19] 10 CFR Part 37, "Physical Protection Of Category 1 And Category 2 Quantities Of Radioactive Material"

[20] NUREG-2155, Rev. 1, "Implementation Guidance for 10 CFR Part 37, 'Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material'"

[21] RIS-2005-12, NRC Regulatory Issue Summary, NRC Threat Advisory and Protective Measures System.

3.0 DEFINITIONS

[1] Acronyms:

ANI – American Nuclear Insurers
ASM – Additional Security Measures (EA 05-007)
COTP – Captain of the Port (US Coast Guard designation)
DAW – Dry Active Waste
DOT – Department of Transportation
ENOI – Entergy Nuclear Operations, Incorporated
EOI – Entergy Operations, Incorporated
FBI – Federal Bureau of Investigation
NTAS – National Terrorism Advisory System
LLEA – Local Law Enforcement Agencies
MCC – Movement Control Center
NEI – Nuclear Energy Institute
NRC – Nuclear Regulatory Commission
SAS – Secondary Alarm Station

3.0[1] continued

SRCP – Security Risk Control Points
TSA – Transportation Security Administration
TSP – Transportation Security Plan
TSP-RA – Transportation Security Plan – Risk Assessment
USCGS – U.S. Coast Guard Service

[2] **Aggregated** – Accessible by the breach of a single physical barrier that would allow access to radioactive material in any form, including any devices that contain the radioactive material, when the total activity equals or exceeds a category 2 quantity of radioactive material

[3] **Dry Active Waste** – Dry, solid radioactive waste (as opposed to wet wastes such as resins, filters, or filter media)

[4] **Greater Than Class C Waste (GTCC)** – Low-level radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in 10 CFR Part 61.55.

[5] **Hazardous Material** – For the purposes of the TSP-RA, this term includes the definition in 49CFR173.403 and as listed in associated table under 49CFR172.101.

[6] **Highway Route Control Quantities (HRCQ)** – A quantity within a single package which exceeds 3000 times the A1 value for special form or 3000 times the A2 value for normal form or 1000 TBq (27,000 Ci), whichever is the least.

[7] **Lost or Missing Licensed Material** – Means licensed material whose location is unknown.

[8] **Low Specific Activity (LSA)** – Radioactive material with limited specific activity which satisfies the following limits: ores containing only naturally occurring radionuclides, solid un-irradiated natural or depleted uranium or natural thorium or their solid or liquid mixtures, etc. (see 49CFR173.403 for exact definition).

[9] **Materials of Significant Concern** – For the purposes of the TSP-RA, this refers to hazardous materials which are known or presumed to be so acutely toxic to humans as to afford a hazard to health during transportation, thereby representing a significant transportation security risk.

[10] **Movement Control Center** – An operations center that is remote from transport activity and that maintains position information on the movement of radioactive material, receives reports of attempted attacks or thefts, provides a means for reporting these and other problems to appropriate agencies and can request and coordinate appropriate aid.

3.0 continued

[11] **National Security Threat Level** – Transportation of certain types of hazmat shipments may be restricted during periods of elevated security threat levels. The degree of restriction, associated risk, and the affected hazmat shipments will affect the level of security control applied to certain hazmat shipments. The National Security Threat Level is established by the Department of Homeland Security and serves as a general guide for the security threat level established by other agencies, such as the NRC and USCGS. Also note that the NRC and USCGS may have different (higher) security threat levels than the national security threat level. Nuclear plant security activities are governed by the highest security threat level applied by the NRC and, as applicable, the USCGS.

[12] **NO-LATER-THAN Arrival Time** – The date and time that the shipping licensee and the receiving licensee have established as the time at which an investigation will be initiated if the shipment has not arrived at the receiving facility.

[13] **NRC Security Threat Level** – Corresponds to the National Security Threat Level. However, it is independently controlled and established by the NRC, and fluctuates independently from the National Threat Level. This is the primary threat level monitored by nuclear plants, and it encompasses a combination of threats from National, Maritime, and other sources.

[14] **MARSEC Level** – Maritime Security [Threat] Level as identified and maintained by the USCGS. It is independently controlled and established by the USCGS, and fluctuates independently from the National Threat Level or the NRC Threat Level. The MARSEC is also monitored by the affected nuclear plants, which respond accordingly.

[15] **Physical Security Plan (PSP)** – For a nuclear plant, this is the PSP required by 10 CFR 73. For some decommissioning nuclear plants and for other licensed nuclear support facilities (e.g., radioactive laundry vendors, waste processors, nuclear plant maintenance facilities), this refers to the "industrial security plan." The term PSP also encompasses the USCGS FSP and all of the related requirements specified in 33 CFR 105, Subpart D.

[16] **Radioactive Material** – For the purposes of the TSP-RA, this term includes both radioactive materials and radioactive wastes.

[17] **Safe Haven** – Readily accessible site at which security is present or from which, in the event of an emergency, the transport crew can notify and wait for local law enforcement authorities.

[18] **Storage Incidental to Movement** – Storage that takes place between the time that a hazardous material is offered for transportation to a carrier and the time it reaches its destination.

3.0 continued

[19] **Telemetric Positioning Monitoring** – A data transfer system that captures information by instrumentation and/or measuring devices about the location and status of a transport vehicle or package between the departure and destination locations.

[20] **TSP** - Hazardous Material (and Radioactive Material) Transportation Security Plan.

[21] **TSP-RA** – Transportation Security Plan Risk Assessment.

[22] **Unauthorized Persons** - An unauthorized person is any person who is not authorized by the shipper or the transportation carrier to have access to hazardous materials or transport conveyances being prepared for transportation. This includes all persons who are not employed by the shipper or the transportation carrier, including members of the general public, unless such persons are specifically authorized by the shipper or transportation carrier to have access to hazardous materials or transport vehicles being prepared for transportation.

4.0 RESPONSIBILITIES

[1] **Materials, Purchasing & Contracts Manager** is responsible for supporting the key elements of the procedure within the requirements of Section 5.0 [3].

[2] **Training Manager** is responsible for the key elements of the procedure to ensure that Hazardous Material (HAZMAT) **AND** 10 CFR Part 37.43(c) training requirements outlined in Section 5.0 of this procedure are developed and implemented.

[3] **Radiation Protection Manager (RPM)** is responsible for ensuring the Risk Assessment outlined in this procedure will meet radioactive hazardous materials processing requirements and notifying MP&C of the need to ship materials, from a site warehouse, that meet the requirements of hazardous materials.

[4] **Chemistry Superintendent** is responsible for ensuring the Risk Assessment outlined in this procedure will meet non-radioactive hazardous materials processing requirements and notifying MP&C of the need to ship materials, from a site warehouse, that meet the requirements of hazardous materials.

5.0 DETAILS

5.1 PRECAUTIONS AND LIMITATIONS

None

5.2 GENERAL

NOTE

"Tables" referenced in this procedure are located in Attachment 9.1, "TSP-RA Tables"
Table 1: Typical Radioactive and Hazardous Material Shipments
Table 2: Hazmat Carriers, Types of Hazmat Shipments and Quantities Shipped
Table 3: Determination of Hazardous Materials of Significance to This Assessment
Table 4: Category 1 and Category 2 Threshold
Table 5: Hazardous Materials of Significant Concern Shipped from Facilities

[1] The Physical or Industrial Security Plans already contain security procedures, access controls, requirements for employee background checks, etc. Such procedures, controls regulations and therefore need not be duplicated.

[2] The Entergy (EOI / ENOI) standard language approach to the TSP consists of a simplified and minimal TSP document plus an attachment used in association with the procedure.

5.3 RISK ASSESSMENT

[1] This TSP-RA is applicable to packaging, staging/storage in preparation for transport, and shipment of the radioactive and hazardous materials addressed in 49 CFR 172.800. Table 1 identifies the types of radioactive and hazardous materials shipments.

[2] Transportation Carriers contracted to carry radioactive and/or hazardous materials and who's TSPs are relied upon to provide all necessary security during transport and during storage incidental to movement. This includes the categories of carriers listed in Table 2.

5.3 continued

[3] For bulk quantity shipments of hazardous material identified in Table 5 which will cross bridges spanning water, through tunnels under water, or on water which is patrolled by the USCGS, regardless of whether the shipment is made by highway, rail or vessel, advance notification of the shipment or of a series of shipments is to be given to the affected USCGS Port Authority. The licensee SHALL notify the USCGS at least 10 days before the shipment physically begins within the United States. For shipments where 10 days of advance notice is not possible, the notification is to be made as soon as practicable. The notification SHALL be made to the appropriate USCGS Port Authority. (The USCGS may choose to require facility-specific notification for other materials.)

[4] In the event that a shipment of material described in 5.3[3] arrives at the intended consignee but is refused by the consignee, the Carrier maintains responsibility for security of the shipment until it arrives at an acceptable destination designated by the shipper.

[5] **IF** the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System (NTAS) issues an "Elevated Alert" or "Imminent Alert", **OR IF** the USCGS MARSEC Level reaches 2 or 3 (as applicable to each plant), **THEN Category 1** and **Category 2** as well as **HRCQ** shipments are **not to be shipped**.

[6] **IF** the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System declares a threat condition **OR** the NRC establishes protective measures while a Category1, Category 2 or HRCQ shipment is in transit **THEN** refer to RIS 2005-12 for guidance.

[7] The shipment of all hazardous material described in Table 1 may have other controls implemented by the shipper (during shipment preparation & shipping coordination) or carrier (en-route security).

5.4 CARRIER TSP AND CONTRACTS MANAGEMENT

[1] The optimum approach is for the carrier to implement its own TSP which addresses all aspects of the transportation security regulations, including hazmat employee training and driver commercial licenses and endorsements. Accordingly, MP&C will incorporate standard language in their Contracts and Purchase Orders, where applicable, that will require the transportation company to implement its own TSP. It is not necessary to review and approve each carrier's TSP prior to implementation by the carrier.

[2] The language in Section 5.5, "Carrier Hazardous Material Transportation Security Plan," or similar language, is to appear in every carrier contract where the carrier is anticipated to transport any of the highly hazardous materials identified in 49 CFR 172.800. The end user (contract requisitioner) should identify whether the

transportation of hazardous materials is anticipated when submitting a request for a new contract.

5.5 CARRIER HAZARDOUS MATERIAL TRANSPORTATION SECURITY PLAN

[1] The Carrier will affirm each time (i.e., separate shipment) that it has a Hazardous Material Transportation Security Plan in place prior to approval of the contract or contract amendment, that the plan meets all applicable Federal and International transportation security regulations in effect as of the contract or contract amendment date, and that said TSP will be updated in a timely manner to remain current with revised and new Federal and International transportation security regulations.

[2] The Carrier is also responsible for implementing regulations for commercial driver licenses hazardous material endorsements.

[3] Advanced approval of the Carrier's TSP is not required for implementation of this contract. However, it will be made available for review and approval by an authorized representative of ENTERGY (EOI / ENOI) if requested and on reasonable verbal or written notice, with due consideration given to document security and control.

[4] The Transportation Security Plan for Carriers under contract shall be reviewed at least annually.

[5] Prior to dispatching any driver to an ENTERGY (EOI / ENOI) facility for the purposes of transporting hazardous material, the Carrier is to verify that the driver has the appropriate commercial driver license hazardous material endorsements.

[6] The carrier is to also notify the designated ENTERGY (EOI / ENOI) representative of the name of the driver and any other requested driver identification information, which will be used to verify that the appropriate driver has arrived to transport the shipment.

[7] Transportation of any of the hazardous materials identified in 49 CFR 172.800 is not to be assigned or subcontracted without the prior written agreement of all parties.

NOTE

Some vendors subcontract carriers to prepare and ship hazardous materials off-site. For example, a major maintenance contractor may subcontract an independent transportation company to ship hazardous materials from one plant to the next.

[8] All contracts **OR** purchase orders, where applicable, which potentially involve transportation of the hazardous materials covered in the TSP are to be examined to ensure that subcontracted carriers have **AND** maintain a TSP acceptable to ENTERGY (EOI / ENOI). Consideration is to be given to amending any such contracts to include the preceding language **OR** to include a restriction similar to the following:

5.5 continued

"Transportation of any of the hazardous materials identified in 49 CFR 172.800 will not be assigned or subcontracted without the prior written agreement of all parties."

[9] It is recommended that an affirmation letter on carrier letterhead paper be received from the carrier prior to awarding any transportation contract or other scheduled carrier for radioactive and non-radioactive materials. A copy of the affirmation is available in Attachment 9.2, "Sample Carrier Affirmation Letter."

5.6 TRAINING

[1] Employees involved with processing (including vehicles) and transporting hazardous material must be provided with the following personnel security awareness and transportation security training modules:

- Security Awareness Training
- In-Depth Transportation Security Training module (including specific information on the existence of the company's TSP).

[2] Both training modules may supplement the existing hazmat employee training program consistent with the intent of and frequency specified in 49 CFR 172.704. Re-qualification training will be provided at the same frequency as other hazmat employee training.

[3] All new hazardous material employees must receive this training within 90 days of employment.

[4] Hazmat employees must receive training required by 49 CFR 172.704 at least once every three years.

[5] Hazmat employees required to have In-Depth Security Training must receive training at least once every three years **OR IF** the security plan for which training is required is revised during the three-year recurrent training cycle, **THEN** the employee must receive training within 90 days of implementation of the revised plan.

[6] Personnel responsible for implementing the Integrated Transportation Security Plan shall have refresher training as required by 10 CFR 37.43 at a frequency not to exceed 12 months **AND** when significant changes are made to the security program. [10 CFR 37.43(c)(3)] [CR-WF3-2016-02243]

5.7 ADDITIONAL SECURITY MEASURES FOR RADIOACTIVE SHIPMENTS – CATEGORY 1 AND CATEGORY 2 QUANTITIES

5.7.1 General

NOTE

This section is based on the 10 CFR part 37 subpart D final rule, NUREG 2155 Q & A, and NRC response to industry questions.

[1] Section 5.7 applies to the following activities

- Transfer and receipt of a category 1 and category 2 quantity of radioactive material.
- Preplanning and coordination of shipments,
- Physical protection during shipment,
- Notifications, investigations, and event reporting,

[2] Attachments 9.6 through 9.8 of this procedure includes a table of 10 CFR Part 37 Subpart D Physical Protection requirement checklists for category 1 and category 2 quantity of radioactive material shipments.

5.7.2 Transfer of Category 1 and Category 2 Quantities of Radioactive Material

5.7.2.1 License Verification

[1] Any licensee transferring a category 2 quantity of radioactive material is required to perform and document licensee verification activities based on the quantity of material being transferred. The purpose of the licensee verification is to make sure the transferee's license is valid and authorized to receive the type, form and quantity of radioactive material transferred. Use Attachment 9.3, "License Verification System Credential Guide" to obtain credentials for using the License Verification System.

[2] Except for emergencies, the licensee is required to use the Licensee Verification System (LVS) developed by the NRC or contact the regulatory agency (NRC or Agreement State) to verify that the license is valid before shipping a category 2 quantity of radioactive material.

5.7.2.1 continued

[3] **IF** there exists an emergency where the licensee cannot verify the license of the transferee by the LVS or regulatory agency, **THEN** the licensee may accept written verification by the transferee that it is authorized to receive the type, form and quantity of radioactive material being transferred. In which case use Attachment 9.4 "Manual License Verification Form Guide," **OR** Attachment 9.5, "Manual License Verification Procedure Guide."

[4] The licensee is not required to perform license verification of transfers to the Department of Energy, other Federal entities, or transfers within the same organization of the licensee. Verification is not required for imports and exports, however the requirements of 10 CFR Part 110, "Export and Import of Nuclear Equipment and material," would apply

5.7.2.2 Category 2 Transfer

[1] The licensee transferring the category 2 quantity of radioactive material will verify the transferee is authorized to receive the radioactive material prior to shipment. The licensee uses the LVS or direct contact with the applicable regulatory agency.

[2] The licensee may not use a fax, email, or a copy of the recipient's license to verify the transferee is authorized to receive a category 2 quantity of radioactive material. The verification of each shipment is required and the licensee should document the verification process used (i.e. LVS, regulatory agency contact, or recipient licensee certification).

[3] **IF** the licensees rely on the recipient licensee's certification, as permitted in an emergency situation above, **AND** later discover the recipient's license is not valid, **THEN** the licensee should contact the LLEA and the NRC's Operation Center if the shipment has been delivered.

5.7.2.3 Category 1 Transfer

[1] The licensee transferring a category 1 quantity of radioactive material is required to meet the same requirements as the transfer of a category 2 quantity of radioactive material.

[2] In addition to the requirements for transfer for category 2 transfers, verify that the receiving licensee is authorized to receive radioactive material at the address requested for delivery.

5.7.3 Guidance for Physical Protection During Transit

NOTE

Section 5.7.3 addresses the shipping licensee responsibility for implementing 10 CFR Part 37 Subpart D requirements for preplanning and coordination and physical protection during transit.

5.7.3.1 Licensee Responsibility

[1] The shipping licensee is responsible for meeting the requirements of 10 CFR Part 37 Subpart D unless the receiving licensee has agreed in writing to arrange for the in-transit physical protection. The licensee is also responsible for meeting the requirements of Subpart D for category 1 or category 2 quantity of radioactive material from the point that the material enters the United States for import and until the material is under the jurisdiction of a U.S. Government agency at a port, border crossing, or airport for material exported.

[2] The licensee should have a contract with the carrier that obligates the carrier to comply with the applicable requirements in Subpart D

[3] The shipping licensee is responsible for providing physical security of a category 2 or greater quantity of radioactive material until the carrier accepts the consignment of radioactive material for shipment and begins movement of the loaded transport vehicle. The shipping licensee's control applies outside of the protective area until the departure of the shipment.

5.7.3.2 Category 1 Shipment

[1] The shipping licensee must conduct preplanning and coordination activities with the receiving licensee and with each state that the shipment enters. The shipping licensee preplanning and coordination procedures should address, as a minimum, the following items:

- Shipment contract(s) with a carrier that identify carriers responsibilities for implementing applicable regulations,
- Protocol for carrier actions to take if a shipment is rerouted during bad weather or other unusual event,
- Shipping licensee should preplan and coordinate the shipments arrival and departure time with the receiving licensee,
- Shipping licensee establish protocol for coordinating and contacting the governor of the State or the governor's designee,

5.7.3.2[1] continued

- Shipping licensee works with the States to identify its intention to provide escorts and any additional State-imposed transportation security requirements',
- Shipping licensee works with the carrier to identify safe haven(s) along the route at approximately 50 mile intervals, if available,
- Carrier coordination with State escorts if applicable.

[2] The licensee maintains documentation of the above activities as attachments to the shipping package.

[3] A licensee that transports, or delivers to a carrier for transport in a single shipment by road, a category 1 quantity of radioactive material should address the following items, as a minimum:

(a) Licensee establishes or uses a carrier that has established movement control centers (MCC). The MCC should:

- Monitor shipments on a continuous basis 24 hours a day, 7 days a week,
- Maintain the ability to immediately communicate with LLEA in an emergency,
- Provide positive confirmation of the location of the shipment, its status, individuals in control of the shipment,
- Develop and implement preplanned procedures in response to deviations from the authorized route (s), **OR**
- Provide notification of actual or attempted theft or diversion or suspicious activity related to the theft, loss, or diversion of a shipment,
- Immediately awareness if a shipment deviates from shipping plans, planned route, unscheduled stops, or scheduled stops longer than expected,
- Redundant communications consisting of two systems that do not rely on the same hardware or software to transmit a signal,
- The use of telemetric monitoring system to permit the remote monitoring and reporting of the location of a transport vehicle or package,

5.7.3.2[3](a) continued

- Ensure carrier provides a second individual when the driving time period is greater than the maximum number of allowable hours of service in a 24-hour duty day as established by the DOT,
- The driver or accompanying individual or both perform the following:
  - Periodically call the MCC to provide verbal status of the shipment and delivery,
  - Maintain vigilance of the surrounding environment during transport,
  - Maintain constant visual surveillance when transport vehicle is stopped,
  - Periodically walk around vehicle while it is not in motion, to confirm no apparent safety or security related issues,
  - Confirm no evidence of tampering with the contents of the vehicle or no unusual or suspicious activity in the immediate vicinity.
- Normal operating procedures address activities to meet regulatory requirements:
  - Refueling and comfort stops,
  - Meal stops, and
  - Routine check-in.

(b) Contingency procedures address issues that could interfere with compliance during preparation for transport or during transport:

- Bad weather,
- Suspicious activities,
- Mechanical breakdown,
- Road or bridge closures, detours, accidents, or
- Acute illness.

5.7.3.2[3](b) continued

- Communication protocol for:
  - Duress codes to enable off-site individual to signal the need for assistance,
  - Authentication codes to confirm the true identity of the employee,
  - Loss of communication actions to take.

(c) Licensee ensures access to normal and contingency procedures by drivers, accompanying personnel, and MCC personnel.

5.7.3.3 Category 2 Shipment

[1] A licensee that transports, or delivers to a carrier for transport in a single shipment by road, a category 2 quantity of radioactive material should include the following items as a minimum in its preplanning and coordination process:

- Coordinate the expected arrival time and the no-later-than (NLT) arrival time, and the method of notification of receipt of shipment with the receiving licensee.
- Shipping licensee initiates investigation if shipment has not arrived by more than 6 hours past NLT
- The receiving licensee confirms to the shipping licensee that the shipment has arrived by phone, e-mail, or facsimile as agreed in the preplanning and coordination activities.
- Shipping licensee notifies the receiving licensee of any new NLT arrival time as soon as practicable after the driver or authorized member of the transfer crew determines the category 2 shipment cannot arrive before the NLT arrival time.

[2] A licensee that transports category 2 quantity of radioactive material should address the following items, as a minimum:

- Establishment of a security zone around the radioactive material, the use of the transport vehicle is permitted, [37.47(a)]
- Limit access to the security zone to authorized individuals, [37.47(c)]
- Monitor, detect, assess, and respond to any unauthorized access, [37.49]

5.7.3.3 continued

[3] A licensee that transports, or delivers to a carrier for transport in a single shipment by road, a category 2 quantity of radioactive material should address the following items, as a minimum:

- The use of carriers with an established, documented package tracking system that allows shipping licensee to see the chain of custody for the package and who is accountable at each stage of the trip,
- The shipping licensee or carrier can promptly determine if the shipment is lost or missing,
- The tracking system requires an authorized signature (receiving licensees employee or contractor) before release for delivery or return,
- Licensee's carrier maintains constant control and surveillance during transit with capability to immediately summon response by an armed LLEA, trained emergency services personnel to prevent or mitigate any collateral impacts of a safety event, or immediately requests assistance for emergency or urgent conditions to avoid or minimize unplanned delay of shipment.
- Immediate communication to summon response or assistance may be met with cell or satellite phones and two-way radios. No backup communication system is required.
- The licensee's carrier maintains a package-tracking system with a reliable on-demand capability to ascertain the last location and current status of the shipment.

[4] A licensee who transports, or delivers to a carrier for transport in a single shipment by rail, a category 2 quantity of radioactive material should address the following items, as a minimum:

- The use of a carrier with a documented, proven, and reliable tracking system,
- The capability to allow the shipping licensee or carrier to identify when and where package was when the train last reported, and when it will arrive at the next point of control,
- The carrier maintains constant control and surveillance during transit and has the capability for immediately communication to summon an appropriate response or assistance,

5.7.3.3[4] continued

- Immediate communication to summon response or assistance may be met with cell or satellite phones, and two-way radios. No backup communication system is required,
- The tracking system requires an authorized signature (receiving licensees' employee or contractor) before release for delivery or return.

5.7.4 Advance Notification of Shipment of Category 1

5.7.4.1 Advance Notification

[1] The shipping licensee provides advance notification to the NRC and the governor of a State or the governor's designee in writing and postmarked 7 days before the shipment begins.

[2] Notifications by fax or email are required 4 days before transport within or through the state.

[3] The shipping licensee should confirm the notification by fax or its intended recipient receives email. The preferred notification method to the NRC is by email to RAMQC_SHIPMENTS@nrc.gov or by fax to 301-816-5151. The contact information of governors and governor's designee is available on the NRC Web site at http://nrc-stp.ornl.gov/special/designee.pdf

[4] The following is a summary of the information to be furnished in an Advance Notification of Shipment:

- The name, address, and telephone number of the shipper, carrier, and receiver of the category 1 radioactive material,
- The license numbers of the shipper and receiver,
- A description of the radioactive material contained in the shipment, including the radionuclides and quantity,
- The point of origin of the shipment and the estimated time and date that the shipment will commence,
- The estimated time and date that the shipment is expected to enter each State along the route,
- The estimated time and date of arrival of the shipment at the destination,
- A point of contact, with a telephone number, for current shipment information.

5.7.4.1 continued

[5] The licensee is expected to include all of the above information when it makes the initial advance notification. Any missing information is required to be provided before commencement of the shipment.

5.7.4.2 Updating Advance Notification

[1] The shipping licensee is required to provide a revision notice with any information that was not available when the initial notification was submitted.

[2] The shipping licensee is required to notify any affected State's governor or designee as soon as it discovers or is advised of the following changes in the shipment:

- A change is made to the description of the radioactive material radionuclides or quantities,
- A change is made in the shipment's point of origin or estimated time or date of commencement,
- A change of 6 hours or more is made in the estimated time or date that the shipment is expected to enter each State along the route,
- A change of 6 hours or more is made in the estimated time or date of arrival of the shipment at the destination,
- A change is made in the name or telephone number of the point of contact for current shipment information.

[3] The driver or other authorized member of the transfer crew is to make notification of any changes in shipment information en route as soon as the change is determined.

[4] **IF** the shipment is canceled, **THEN** the shipping licensee is required to notify the States to which advance notification was provided **AND** the NRC, **OR** Agreement State agency with jurisdiction in the State of origin. The licensee is required to send a cancellation notice via email, facsimile, or written correspondence as soon as possible. A telephone call may be necessary to ensure timely receipt of the notice to provide a State time to cancel any planned escorts.

5.7.5 Reporting of Events

5.7.5.1 Shipment Investigations

[1] **IF** the licensee asks for a status of its shipment, **AND** the carrier's telemetric monitoring system or railroad's communications center cannot tell where the shipment is within a few minutes **AND** the shipping licensee is not confident that the tracking and communication system are functioning normally, **THEN** the licensee should consider the shipment lost or missing

[2] The shipping licensee must investigate immediately if a category 1 quantity shipment is lost or missing.

[3] The investigation of the lost or missing category 1 quantity shipment should include as a minimum the following actions:

- Determine the time and location of the last transport crew check-in.
- Determine where communication was lost.
- Determine where tracking was lost.
- Confirm that the equipment is working properly.
- Contact the escort if one was being used.

[4] The shipping licensee must investigate immediately if a category 2 quantity shipment does not arrive by the NLT arrival time based on the receiving licensee notification.

[5] The investigation of the lost or missing category 2 quantity shipments should include as a minimum the following actions:

- Determine the shipment's last known location from carrier.
- Determine the shipment's current location.

[6] **IF** the carrier cannot determine the location of the shipment, **THEN** the shipping licensee notifies the NRC Operations Center that a category 2 quantity shipment is lost or missing

[7] Contact the NRC Operations Center if the shipment is still missing after 24 hours of the initial notification.

5.7.5.2 Category 1 Notifications

[1] The shipping licensee must make the following notifications after determining a shipment of category 1 quantities of radioactive material is lost or missing:

- Notify the LLEA as soon as the carrier has completed its first unsuccessful attempt to locate the material and confirmed its inability to trace it was not a result of human error, or a malfunction of the position monitoring system,
- Notify the NRC Operations Center within 1 hour after determining the category 1 shipment is lost or missing. Discuss with the NRC the expected frequency of updates,
- Notify the NRC and the LLEA as soon as possible when the lost or missing licensed material is again in the physical possession of, or in a location otherwise under the control of the carrier, shipping, or recipient licensee, authorized State or Federal agency, or an LLEA that is able to prevent or deter unauthorized access to the material.

[2] The shipping licensee must make the following notifications as soon as possible upon discovery of any actual or attempted theft, or diversion of a shipment, or suspicious activities related to the theft or diversion of a shipment of a category 1 quantity of material:

- Notify the designated LLEA along the shipment route as soon as possible, **AND**
- Notify the NRC Operations Center (301-816-5100). The NRC will notify other affected States and Federal partners as appropriate.

[3] The Transportation Security Administration (TSA) has guidance for private or contract carrier employees that list a number of activities that may be considered suspicious.

[4] A written report is required to be submitted to the NRC within 30 days of the shipping licensee's initial telephonic notifications that a shipment of category 1 material is lost or missing, or telephonic notification of actual, or attempted theft or diversion of a shipment of category 1 material.

5.7.5.2 continued

[5] The written report is provided to the Director, Division of Security Policy, Office of Nuclear Security and Incident Response and must provide the following information:

- A description of the licensed material involved, including kind, quantity, and chemical and physical form;
- A description of the circumstances under which the loss or theft occurred;
- A statement of disposition, or probable disposition, of the licensed material involved;
- Actions that have been taken, or will be taken to recover the material;
- Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed material.

[6] After filing the written report, if the shipping licensee gathers any information not previously reported to the NRC, such as findings from a completed investigation of the loss or theft of category 1 material, the licensee has to report that additional information within 30 days.

[7] A Condition Report will be initiated to document any actual or attempted theft or diversion of a shipment or any suspicious activity related to a shipment of category 1 quantities of radioactive material.

[8] Contact the site Licensing group in the event of an accident (e.g., shipment is lost, missing, actual or attempted theft or diversion, vehicular accident etc.) involving category 1 quantities of radioactive material to ensure appropriate notification of ANI is made.

5.7.5.3 Category 2 Notifications

[1] The shipping licensee is required to notify the NRC Operations Center within 4 hours of its determining a shipment of category 2 quantities of radioactive material is lost or missing. If after 24 hours from its determination the licensee still cannot locate the material, the NRC operations Center must be notified again.

[2] The shipping licensee is also required to notify the NRC Operations Center as soon as possible after discovery of an actual or attempted theft or diversion of a category 2 quantity shipment or any suspicious activity related to a shipment.

[3] The shipping licensee is required to notify the NRC Operations Center when a lost or missing shipment of category 2 quantities of radioactive material has been located.

[4] A written report is required to be submitted to the NRC within 30 days of the shipping licensee initial telephonic notifications that a shipment of category 2 material is lost or missing or telephonic notification of actual or attempted theft or diversion of a shipment of category 1 material.

[5] After filing the written report, if the shipping licensee gathers any information not previously reported to the NRC, such as findings from a completed investigation of the loss or theft of category 2 materials, the licensee has to report that additional information to the NRC within 30 days.

[6] A Condition Report will be initiated to document any actual or attempted theft or diversion of a shipment or any suspicious activity related to a shipment of category 2 quantities of radioactive material.

[7] Contact the site Licensing group in the event of an accident (e.g., shipment is lost, missing, actual or attempted theft or diversion, vehicular accident etc.) involving category 2 quantities of radioactive material to ensure appropriate notification of ANI is made.

5.7.6 Records

5.7.6.1 Documentation

[1] The records that result from the activities in this procedure are to be retained a minimum of three years as required but typically through the life of the nuclear power plant's license.

[2] The following records are generated as a result of implementing this section:

- Licensee verification documentation
- Documentation for preplanning and coordination, and any revision. Documentation is to include:
  - Any phone conversations or e-mail communications that it has with the receiving licensee to include the names of the individuals participating in the call or e-mail communications a general description of the shipment, and the departure and arrival times
  - Any interactions with the governor's designee to include the names of the individuals participating in the call or e-mail, the route-affected States' decisions on escorts, the safe havens identified, and any other information that the licensee considers pertinent
- Advance notification and any revision and cancellation notices

5.7.6.1[2] continued

- Written reports and additional substantive information

[3] Records resulting from the activities in this procedure are to be retained with records generated by EN-RW-102, "Radioactive Shipping Procedure."

5.7.6.2 Protection of Information

[1] The information to be furnished in advance notification of category 1 quantities of radioactive material shipment shall be protected against unauthorized disclosure as specified in 10 CFR 73.21 Protection of Safeguards Information: Performance requirements. The schedule information specified in 37.77(b) is provided to State officials, State employees, and other individuals that are not licensees of the NRC or an Agreement State.

[2] The governor of a State or his or her designated State employee representative, Federal, State, or local law enforcement personnel are relieved from the fingerprinting, identification, and criminal history records checks, and other elements of background investigations and are permitted access to the category 1 shipping information.

[3] A licensee that plans to transport or deliver to a carrier for transport, licensed material that is a category 1 quantity of radioactive material will only use carriers that certify they have an access authorization program that meets the requirements of 10 CFR 73.21 and 10 CFR 73.23. The carrier must include in the access authorization program the vehicle drivers, accompanying individuals, movement control center personnel, and any individual whose assigned duties provide access to shipment information on category 1 quantities of radioactive material.

[4] The shipment of category 2 quantities of radioactive material does not require the commercial drivers and package handlers to meet the access authorization program requirements since these individuals are subject to DOT security requirements.

5.8 TYPES OF HAZMAT SHIPMENTS ADDRESSED BY THE ENTERGY (EOI / ENOI) TSP-RA

[1] Specifically for Nuclear Power Reactors, this transportation security plan (TSP) applies to:

(a) Radioactive laundry shipments,

(b) Some shipments of low-level radioactive waste (dry active waste) to offsite processors,

(c) Some shipments of radioactive vendor equipment offsite, and

5.8[1] continued

(d) Shipments of processed radioactive waste and reactor hardware for offsite disposal.

NOTE

For Highway Route Controlled Quantity shipments of radioactive materials, the shipper must refer to the NRC Physical Security Plan along with the Additional Security Measures for Radioactive Shipments – Category 1 and Category 2 Quantities (Section 5.7 of this procedure).

[2] A highway route-controlled quantity of a Class 7 (radioactive) material, as defined in 49 CFR 173.403, in a motor vehicle, rail car, or freight container;

[3] More than 25 kg (55 pounds) of a Division 1.1, 1.2, or 1.3 (explosive) material in a motor vehicle, rail car, or freight container;

[4] More than one L (1.06 qt) per package of a material poisonous by inhalation, as defined in Part 171.8 of this subchapter, that meets the criteria for Hazard Zone A, as specified in § 173.116(a)or 173.133(a) of this subchapter;

[5] A shipment of a quantity of hazardous materials in bulk packaging having a capacity equal to or greater than 13,248 L (3,500 gallons) for liquids or gases or more than 13.24 cubic meters (468 cubic feet) for solids;

[6] A shipment in other than a bulk packaging of 2,268 kg (5,000 pounds) gross weight or more of one class of hazardous materials for which placarding of a vehicle, rail car, or freight container is required for that class under the provisions of subpart F of this part;

[7] A select agent or toxin regulated by the Centers for Disease Control and Prevention under 42 CFR part 73; or

[8] A quantity of hazardous material that requires placarding under the provisions of subpart F of this part.

5.9 INFORMATION

[1] Attachment 9.1 provides all associated tables that are applicable to the ENTERGY (EOI / ENOI) Risk Assessment.

6.0 INTERFACES

[1] EN-RW-102, "Radioactive Shipping Procedure"

7.0 RECORDS

NOTE

Records resulting from the activities in this procedure are retained with records generated by EN-RW-102, "Radioactive Shipping Procedure."

[1] Licensee verification documentation

[2] Documentation for preplanning and coordination, and any revision

[3] Advance notification and any revision and cancellation notices

[4] Written reports and additional substantive information

[5] Attachment 9.6, "10 CFR37 Subpart D Category 1 Physical Protection Requirement Checklist"

[6] Attachment 9.7, "10 CFR37 Subpart D Category 2 Physical Protection Requirement Checklist"

[7] Attachment 9.8, "10 CFR 37 Subpart D Category 1 Quantities of Concern State Coordination Log"

8.0 SITE SPECIFIC COMMITMENTS

None

9.0 ATTACHMENTS

9.1 TSP-RA Tables

9.2 Sample Carrier Affirmation Letter

9.3 License Verification System Credential Guide

9.4 Manual License Verification Form Guide

9.5 Manual License Verification Procedure Guide

9.6 10 CFR 37 Subpart D Category 1 Physical Protection Requirement Checklist

9.7 10 CFR 37 Subpart D Category 2 Physical Protection Requirement Checklist

9.8 10 CFR 37 Subpart D Category 1 Quantities of Concern State Coordination Log

[33 CFR 105.400]

TABLE 1
Typical Radioactive and Hazardous Materials Shipments

RADIOACTIVE MATERIALS SHIPMENTS	
TYPES OF MATERIALS SHIPPED	**TYPICAL MATERIALS IN SHIPMENT**
Radioactive Material Category 1 and Category 2 as defined in Attachment 9.1, Table 4, "Category 1 and Category 2 Threshold".	Examples include, but are not limited to: certain radioactive calibration sources, ion-exchange resin, certain activated reactor components and limited amounts of irradiated reactor fuel.
Highway route controlled quantities (HRCQ) of radioactive material.	Highly irradiated reactor components; some Greater Than Class C (GTCC) wastes.
Shipment of Type B quantities of radioactive materials in an NRC-approved shipping container.	High activity resin, filters, and irradiated reactor components, such as control rod blades and velocity limiters.
Shipment of radioactive materials in bulk packaging of 3,500 gallons or more for liquids or 468 cubic feet or more for solids.	Radioactively contaminated oil or aqueous liquids; routine sea-land and inter-modal containers of dry active waste.
Shipment in other than bulk packaging of 5,000 pounds or more of radioactive materials that is required to be placarded.	Most shipments made in Type A or Type B casks.
A quantity of radioactive material that requires placarding.	Most radioactive waste shipments, laundry shipments, vendor equipment shipments.
HAZARDOUS MATERIALS SHIPMENTS	
TYPES OF MATERIALS SHIPPED	**TYPICAL MATERIALS IN SHIPMENT**
A quantity of hazardous materials in a bulk packaging having a capacity equal to or greater than 3500 gallons (13,248 liters) for liquids or gases or more than 468 ft^3 (13.24 m^3) for solids.	Most shipments of diesel fuel, used oil, acids, caustics, sodium hypochlorite, and similar hazmat.
A quantity of hazardous material that requires placarding.	Most shipments of hazardous waste (such as paint waste, parts cleaning solutions, and lab packs), liquid and solid mixed waste, PCB waste, asbestos and waste water treatment chemicals.

TABLE 2
Hazmat Carriers, Types of Hazmat Shipments, and Quantities Shipped

CARRIER CATEGORY	TYPICAL MATERIALS TRANSPORTED BY THIS CARRIER CATEGORY	MAXIMUM QUANTITIES PER SHIPMENT
Laundry services suppliers	1. Radioactive laundry 2. Low activity DAW	Co-60 = < 1 Ci Cs-137 = < 1 Ci
Plant maintenance equipment and services suppliers (including their subcontracted Carriers)	1. Low activity radioactive material	Co-60 = < 8.1 Ci Cs-137 = < 10 Ci
Waste processors, and other waste Carriers and Hazmat Carriers	1. Radioactive materials and waste 2. Reactor components and other irradiated hardware 3. Vendor equipment 4. Hazardous waste 5. Mixed waste 6. PCB waste 7. Asbestos waste	HRCQ, excluding spent fuel (rarely) RAMQC (rarely) Type A and Type B LSA/SCO Bulk and/or placarded hazmat
Common carrier (Federal Express, UPS)	Radioactive sources	Could be Category 1 or 2
Entergy	Radioactive material/special tools/sources	Could be Category 1 or 2

TABLE 3
Determination of Hazardous Materials of Significance to This Assessment

(a) Hazard Class	(b) Hazard Class Division Of Concern	(c)(c) General Description of Significant Hazard or Class	(d) Typical Materials Shipped in this Hazard Class Division by these Facilities and Discussion of Relative Significance	(e) Significance to This Risk Assessment
1	1.1, 1.2, 1.3	Explosives	No significant quantity of explosives are shipped by these facilities.	None
2	2.3	Poison Gas (inhalation hazard)	Anhydrous ammonia gas, chlorine gas.	High
3	None	Flammable (liquids)	Diesel fuel, gasoline, paint, solvents. These materials are relatively low toxicity (i.e., are not acutely toxic; do not contain lethal concentrations or doses).	Low
4	4.3	Dangerous When Wet	Sodium. No significant quantities of such materials are shipped by these facilities. (Significant quantities may be shipped by sodium-moderated reactors if any are included in the facility listing in Section 1.1. Significance would be Low.)	None
5	5.2	Organic Peroxide, Type B (may be liquid or solid and are thermally controlled)	Type B organic peroxides can undergo a thermal explosion. As a genera; rule, they are not shipped by any of these facilities. In the event a shipment becomes necessary, the shipment is pre-approved in writing by the DOT Associate Administrator and is shipped in accordance with the instructions provided by the Associate Administrator.	None
6	6.1	Poison Inhalation Hazard (liquid poisons)	Hydrazine and most other hazmat in this division are not Hazard Zone A or B (Package Group I) and are, therefore, not **High** significance.) Note: some plants may still have stabilized acrolein on site, which would be **High** significance.)	Medium
8	None	Corrosives	Acids, caustics. These materials are relatively low toxicity (i.e., are not acutely toxic; do not contain lethal concentrations or doses).	Low
9	None	Miscellaneous	Hazardous waste, solid, n.o.s.; Hazardous waste, liquid, n.o.s.; asbestos; PCBs. These materials are relatively low toxicity (i.e., are not acutely toxic; do not contain lethal concentrations or doses).	Low

TABLE 4
Category 1 and Category 2 Threshold

The terabecquerel (TBq) values are the regulatory standard. The curie (Ci) values specified are obtained by converting from the TBq value. The curie values are provided for practical usefulness only.

Radioactive material	Category 1 (TBq)	Category 1 (Ci)	Category 2 (TBq)	Category 2 (Ci)
Americium-241	60	1,620	0.6	16.2
Americium-241/Be	60	1,620	0.6	16.2
Californium-252	20	540	0.2	5.40
Cobalt-60	30	810	0.3	8.10
Curium-244	50	1,350	0.5	13.5
Cesium-137	100	2,700	1	27.0
Gadolinium-153	1,000	27,000	10	270
Iridium-192	80	2,160	0.8	21.6
Plutonium-238	60	1,620	0.6	16.2
Plutonium-239/Be	60	1,620	0.6	16.2
Promethium-147	40,000	1,080,000	400	10,800
Radium-226	40	1,080	0.4	10.8
Selenium-75	200	5,400	2	54.0
Strontium-90	1,000	27,000	10	270
Thulium-170	20,000	540,000	200	5,400
Ytterbium-169	300	8,100	3	81.0

Continued on next page

Note: *Calculations Concerning Multiple Sources or Multiple Radionuclides*

The "sum of fractions" methodology for evaluating combinations of multiple sources or multiple radionuclides is to be used in determining whether a location meets or exceeds the threshold and is thus subject to the requirements of this procedure.

I. If multiple sources of the same radionuclide and/or multiple radionuclides are aggregated at a location, the sum of the ratios of the total activity of each of the radionuclides must be determined to verify whether the activity at the location is less than the category 1 or category 2 thresholds of Table 4, as appropriate. If the calculated sum of the ratios, using the equation below, is greater than or equal to 1.0, then the applicable requirements of this part apply.

II. First determine the total activity for each radionuclide from Table 4. This is done by adding the activity of each individual source, material in any device, and any loose or bulk material that contains the radionuclide. Then use the equation below to calculate the sum of the ratios by inserting the total activity of the applicable radionuclides from Table 4 in the numerator of the equation and the corresponding threshold activity from Table 4 in the denominator of the equation.

Calculations must be performed in metric values (i.e., TBq) and the numerator and denominator values must be in the same units.

R_1 = total activity for radionuclide 1
R_2 = total activity for radionuclide 2
R_N = total activity for radionuclide n
AR_1 = activity threshold for radionuclide 1
AR_2 = activity threshold for radionuclide 2
AR_N = activity threshold for radionuclide n

$$\sum_{1}^{n}\left[\frac{R_1}{AR_1}+\frac{R_2}{AR_2}+\frac{R_n}{AR_n}\right]\geq 1.0$$

TABLE 5
Hazardous Materials of Significant Concern Shipped From Facilities

Hazard Class Division Of Concern	General Description of Significant Hazard or Class	Typical Materials Shipped in this Hazard Class Division by these Facilities and Discussion of Relative Significance
2.3	Poison Gas (inhalation hazard)	Anhydrous ammonia gas, chlorine gas.

ATTACHMENT 9.2 **SAMPLE CARRIER AFFIRMATION LETTER**

Sheet 1 of 1

EXAMPLE:

Date:

To: Entergy (EOI / ENOI)
(Appropriate Site Address)

Subject: Carrier Hazardous Material Transportation Security Plan

(Carrier Company Name) affirms that we have a Hazardous Material Transportation Security Plan in place which meets all applicable Federal and International transportation security regulations in effect as of the contract or contract amendment date, and that said Transportation Security Plan will be updated in a timely manner to remain current with revised and new Federal and International transportation security regulations. We further affirm that our Transportation Security Plan fully implements the regulations for commercial driver licenses hazardous material endorsements.
Our Transportation Security Plan will be made available for review and approval by an authorized representative of ENTERGY (EOI / ENOI) NS if requested and on reasonable verbal or written notice, with due consideration given to document security and control. We understand that we will not mail, send, or otherwise transmit any confidential documents to ENTERGY (EOI / ENOI).

Prior to dispatching any driver to an ENTERGY (EOI / ENOI) facility for the purposes of transporting hazardous material, we will verify that the driver has the appropriate commercial driver license hazardous material endorsements. We also agree to notify a designated ENTERGY (EOI / ENOI) representative of the name of the driver and any other requested driver identification information, which will be used to verify that the appropriate driver has arrived to transport the shipment.

It is further agreed that transportation of any of the hazardous materials identified in 49 CFR 172.800 will not be assigned or subcontracted without the prior written agreement of all parties.

Authorized Carrier Representative Signature Block

ATTACHMENT 9.3 LICENSE VERIFICATION SYSTEM CREDENTIAL GUIDE

Sheet 1 of 1

NOTE

The purpose of this guide is to aid individuals in getting credentialed for using the NRC License Verification System (LVS).

The NRC LVS web site provides an on-line User Guide.

[1] Using a web browser, go to http://www.nrc.gov.

[2] Click on "Nuclear Security" tab.

[3] Click on the "Radioactive Material Security" bulleted item.

[4] Click on "License Verification System (LVS)" under "NRC Activities for Radioactive Material Security."

[5] Click on "Get credentialed for LVS." A public Disclosure of Submitted Information will appear. **IF** you want to continue with getting your LVS Credentialed, **THEN** click on "I ACCEPT."

[6] After you mouse click on I ACCEPT, the Web Page Portfolio Enrollment Module will appear. Fill out all the information requested from the Portfolio Enrollment Request Form. Once all the required information blocks are filled out, mouse click on Submit at the lower right corner of the request form.

ATTACHMENT 9.4 **MANUAL LICENSE VERIFICATION FORM GUIDE**

Sheet 1 of 2

[1] Using a web browser, go to http://www.nrc.gov.

[2] Click on "Nuclear Security" tab.

[3] Click on "Radioactive Material Security" bulleted item.

[4] Click on "License Verification System (LVS)" under "NRC Activities for Radioactive Material Security."

[5] Click on "Manual License Verification Form." A PDF document similar to the following should display.

OFFICIAL USE ONLY - SECURITY-RELATED INFORMATION

Submit by E-mail

NRC FORM 748 U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0223 EXPIRES: 07/31/2017

MANUAL LICENSE VERIFICATION REPORT

Sections A-B to be completed by LVS Help Desk (if applicable). Sections C-D to be completed by the licensee. Complete sections C and D below for NRC or Agreement State licensees needing to verify a license outside of the License Verification System. For issues with submitting this form, please contact the LVS Help Desk: 1-877-671-6787 or E-mail: lvshelp.resource@nrc.gov.

A. CONTACTED VIA	☐ Phone ☐ E-mail	B. DATE (MM/DD/YYYY)	

C. TRANSFERRING LICENSEE INFORMATION

C.1 Agency (Issuing Agency for license)			
C.2 Licensee Name			
C.3 License Number			
C.4 Contact Name and Title			
C.5 Contact Telephone Number		C.7 Contact Fax Telephone Number	
C.6 Contact E-mail Address			

D. RECEIVING LICENSEE INFORMATION

D.1 Agency (Issuing Agency for license)			
D.2 Licensee Name			
D.3 License Number		D.4 Amendment Number	
D.5 Issue Date			
D.6 Authorized Location			
D.7 Material(s) of concern being requested	D.8 Chemical/Physical Form	D.9 Quantity/Activity/Unit (being requested)	
1.	1.	1.	
2.	2.	2.	
3.	3.	3.	
4.	4.	4.	

Sections E-F Instructions (Agency representative to provide): Verify the information in Section D above and make sure that all information provided is valid and the authorized location, materials and quantities being requested are authorized on the recipient's license. Record the verification outcome below. Return the completed form via e-mail to the LVS Help Desk (lvshelp.resource@nrc.gov).

E. VERIFIER'S INFORMATION

E.1 Verifier's Name			
E.2 Verifier's Telephone Number		E.3 Verifier's Fax Telephone Number	
E.4 Verifier's E-mail Address			

F. VERIFICATION OUTCOME

F.1 Verification Date	
F.2 Verification Outcome	☐ Requested materials, quantities, and authorized location are authorized on the license ☐ Requested materials, quantities, and authorized locations are not authorized on the license ☐ Other
F.3 If other, please explain:	

NRC FORM 748 (07-2014)

OFFICIAL USE ONLY - SECURITY-RELATED INFORMATION

[6] Save the form in PDF format.

NOTE

At this time the green "Submit by E-mail" button on the form does not work.

[7] **WHEN** completed, **THEN** email the form to LVSHelp.Resource@nrc.gov.

Manual License Verification

NOTE

The purpose of this attachment is to guide licensees transferring Category 1 and/or Category 2 quantities of radioactive materials in verifying licenses outside of the License Verification System (LVS).

Steps for Licensees

[1] Contact the LVS Help Desk by phone at 1-877-671-6787 or by email at LVSHelp.Resource@nrc.gov.

[2] Be prepared to provide the following information to the LVS Help Desk representative.

(a) Transferring licensee information:

- License-issuing agency
- Licensee name
- License number
- Contact name and title
- Contact phone
- Contact email
- Contact fax number

(b) Receiving licensee information:

- License-issuing agency
- Licensee name
- License number
- Amendment number or license issue date
- Authorized storage location address
- Material(s) being requested
- Chemical/Physical form of the material(s) being requested
- Quantity/Activity being requested

[3] The transferring licensee will receive notification from the LVS Help Desk of the verification outcome as soon as the verification is complete by the license issuing regulatory agency.

[4] The verification outcome will include a notification of whether:

(a) The requested materials, quantities, and authorized location are authorized on the license, **OR**

(b) The requested materials, quantities, and/or authorized location are NOT authorized on the license, **OR**

(c) Other reason (with an explanation)

[5] The licensee **must keep** a copy of the verification outcome sent by the LVS Help Desk for their records in accordance with the 10 CFR Part 37 requirements for keeping records of license verifications.

ATTACHMENT 9.6 **10 CFR 37 SUBPART D CATEGORY 1 PHYSICAL PROTECTION REQUIREMENT CHECKLIST**

Sheet 1 of 4

Shipment Number: _____

[1] Verify the recipient is authorized to receive the type, form and quantity of material per NRC's License Verification System OR License Issuing Authority in accordance with 10 CFR 37.71

_____
(init)

[2] Verify the delivery address matches the location authorized in the recipient's license.

_____
(init)

[3] Attach documentation of license verification.

_____
(init)

[4] **IF** shipping to a licensee in an agreement state, **THEN** obtain written verification of licensee compliance with physical security requirements for Category 1 quantities of radioactive materials in accordance with 10 CFR 37. Attach verification documentation.

_____
(init)

[5] Pre-plan and coordinate shipment arrival and departure times with receiving licensee.

Planned departure date and time: _____

Planned arrival date and time: _____

_____
(init)

[6] Provide advance notification to the NRC prior to transport per 10 CFR 37.77. Notification by mail must be postmarked at least seven (7) days prior to commencement of transport. Other means of notification must reach NRC at least four (4) days prior to shipment commencement.

Information required in notification. **IF** information is not available at the time of shipment, **THEN** provide the information as soon as possible, but before commencing shipment.

- Name, address, telephone number, and license number of shipper.
- Name, address, and telephone number of carrier.
- Name, address, telephone number, and license number of the recipient.
- Description of radioactive material, including radionuclides and quantities.
- Point of origin and estimated date and time shipment will commence.
- Estimated date and time shipment expected to enter each state along route.
- Estimated date and time of arrival
- Point of contact and telephone number to obtain current shipment information

Date and time of notification: _____

_____
(init)

[7] Pre-plan and coordinate shipment information with the Governor, or designee, of any state through which the shipment will pass, including the State's intentions to provide law enforcement escorts and identification of safe havens. Use attachment 9.8, "Category 1 Quantities of Concern State Coordination Log," or equivalent, to document coordination activities. **IF** coordination was performed carrier or recipient, attach copy of documentation.

_____
(init)

[8] Notify each state Governor or designee immediately of any changes or cancellation. Attach documentation of notification.

_____
(init)

[9] Verify the carrier meets the requirements for physical protection of Category 1 quantities of radioactive material during shipments by road per 10 CFR 37.79(a).

_____ (init)

[10] **IF** provided, **THEN** attach carrier verification of 10 CFR 37 compliance.

_____ (init)

[11] Verify normal and emergency contingency procedures addressing the following are available to drivers, accompanying personnel AND the movement control center.

- Notification to communications center and law enforcement agencies
- Communication protocols that include a strategy for authentication and duress codes and provisions for refueling or other stops.
- Loss of communications
- Response to actual or attempted theft or diversion of shipment

_____ (init)

[12] Verify movement control center(s) established to maintain position information from a remote location comply with the following:

- The center has the ability to immediately contact appropriate law enforcement agencies.
- The center has redundant communications with transport or escort vehicle.
- The center continuously and actively monitors shipment by telemetric position monitoring, or alternative tracking system, twenty-four hours a day, seven days a week.
- The center is prepared to implement pre-planned procedures in response to deviations from authorized route or notification of suspicious activities or attempted theft or diversion of material.

_____ (init)

[13] **IF** the highway shipment driving time is greater than the maximum number of hours established by the Department of Transportation, **THEN** verify there is an accompanying individual.

_____ (init)

[14] **Verify** that the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System (NTAS) has not issued an "Elevated Alert" or "Imminent Alert", OR/IF the USCGS MARSEC Level has not reached 2 or 3 (as applicable to each plant), prior to shipment.

_____ (init)

[15] Notify Site Security (S.A.S) of shipment AND have Security make a log entry.

Date and time of notification: _____

Security point of contact: _____

Security log entry number: _____ _____ (init)

[16] **IF** the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System declares a threat condition **OR** the NRC establishes protective measures while a Category1, Category 2 or HRCQ shipment is in transit **THEN** refer to RIS 2005-12 for guidance.

Performed by (print, sign, date): _____

Reviewed by (print, sign, date): _____

ATTACHMENT 9.7 10 CFR 37 SUBPART D CATEGORY 2 PHYSICAL PROTECTION REQUIREMENT CHECKLIST

Sheet 1 of 2

Shipment Number: _____

[1] Verify the recipient is authorized to receive the type, form and quantity of material per NRC's License Verification System OR License Issuing Authority in accordance with 10 CFR 37.71

_____ (init)

[2] Attach documentation of license verification.

_____ (init)

[3] **IF** shipping to a licensee in an agreement state, **THEN** obtain written verification of licensee compliance with physical security requirements for Category 2 quantities of radioactive materials in accordance with 10 CFR 37. Attach verification documentation.

_____ (init)

[4] Pre-plan and coordinate shipment arrival and departure times with receiving licensee.

Planned departure date and time: _____

Planned arrival date and time: _____

No-Later-Than date and time: _____

_____ (init)

[5] Verify the carrier meets the requirements for physical protection of Category 2 quantities of radioactive material during shipments by road per 10 CFR 37.79(a).

_____ (init)

[6] Verify the carrier has established a package tracking system that allows the shipper or transporter to identify where the package was last and when it should arrive at the next point of control.

_____ (init)

ATTACHMENT 9.7 10 CFR 37 SUBPART D CATEGORY 2 PHYSICAL PROTECTION REQUIREMENT CHECKLIST

Sheet 2 of 2

[7] Verify the carrier has constant control and/or surveillance during transit and has the capability for immediate communication to summon appropriate response or assistance.

_____ (init)

[8] Verify the carrier has established a tracking system that requires an authorized signature prior to releasing the package for delivery or return.

_____ (init)

[9] **IF** provided, **THEN** attach carrier verification of 10 CFR 37 compliance.

_____ (init)

[10] Notify Site Security (S.A.S) of shipment AND have Security make a log entry.

Date and time of notification: _____

Security point of contact: _____

Security log entry number: _____ _____ (init)

[11] **Verify** that the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System (NTAS) has not issued an "Elevated Alert" or "Imminent Alert", OR/IF the USCGS MARSEC Level has not reached 2 or 3 (as applicable to each plant), prior to shipment.

_____ (init)

[12] Refer to 10 CFR 71.97 to see if the shipment also meets the criteria for Highway Route Control Quantity limits requiring advanced notification.

_____ (init)

[13] **IF** the U.S. Department of Homeland Security's (DHS's) National Terrorism Advisory System declares a threat condition **OR** the NRC establishes protective measures while a Category1, Category 2 or HRCQ shipment is in transit **THEN** refer to RIS-2005-12 for guidance.

Performed by (print, sign, date): _____

Reviewed by (print, sign, date): _____

ATTACHMENT 9.8 10 CFR 37 SUBPART D CATEGORY 1 QUANTITIES OF CONCERN STATE COORDINATION LOG

Sheet 1 of 1

Shipment Number: _____

State: _____

State representative name and title: _____

Date of coordination conversation: _____

Expected entry:
Date and time: _____ Location: _____

Expected exit:
Date and time: _____ Location: _____

Does the state intend to provide law enforcement escorts? _____

Safe havens identified: _____

_____

_____

_____

Additional discussion items concerning shipment through state: _____

_____

_____

_____

_____

_____

Performed by (Print, sign, date): _____

Reviewed by (Print, sign, date): _____

ACCIDENTS INVOLVING THE TRANSPORTATION OF RAD MATERIALS

1. PURPOSE

1.1. This procedure provides guidance for the emergency response activities and notifications to be performed following an offsite incident involving a vehicle containing radioactive materials. This procedure applies to the response to company vehicles transporting licensed radioactive materials, and to contractors or couriers transporting radioactive materials originating from Exelon nuclear facilities.

1.2. Department of Transportation (DOT) regulations require:

1.2.1. Carriers of radioactive material shipments to have a DOT shipping paper and associated emergency response information for shipments except small quantities (DOT definition of small quantity is referred to as excepted quantity). The emergency response information provides the driver with basic information in the event of an accident.

1.2.2. The Station to provide a 24 hour per day emergency response phone number while the shipment is in progress on each shipping paper. This number is typically the Station emergency response number.

1.3. Texas Department of State Health Services (DSHS) requires:

1.3.1. In the event of a transportation accident of radioactive materials coming from Exelon nuclear facilities and traveling through the state of Texas are required to provide notifications at a minimum, to the emergency number on the shipping documentation, Texas local law enforcement, the DSHS, and the shipper. The DSHS 24-Hour emergency phone number is (512) 458-7460.

1.3.2. Exelon is required to ensure that notification has been provided to DSHS (512) 458-7460 and the Texas local law enforcement.

2. TERMS AND DEFINITIONS

2.1. Transportation Accident: (must meet either step 2.1.1 or step 2.1.2)

NOTE: The Exelon definition of transportation accident is provided below. This definition parallels the DOT definition of a transportation "incident" in 49CFR for which notification to the National Response Center is required. For purposes of this procedure, the term "hazardous materials" refers to radioactive material under transport.

NOTE: A traffic accident involving a radioactive shipment that results in a death, injured person hospitalization, or any of the other criteria specified below does **not** meet the criteria for transportation accident unless the death, injury requiring hospitalization, etc., is the direct result of the hazardous material.

2.1.1. As a direct result of hazardous materials, one of the following occurs:

- A person is killed, or
- An injured person is hospitalized, or
- Estimated carrier or property damage exceeds $50,000, or
- An evacuation of the general public occurs lasting one or more hours, or
- One or more major transportation arteries or facilities are closed or shutdown for one hour or more hours, or
- Flight pattern of an aircraft is altered.

OR

2.1.2. Fire, breakage, spillage, or suspected radioactive contamination occurs.

- Breakage: is defined as the loss of package integrity.
- Spillage: is defined as leakage from any package.
- Package: is defined on the Radioactive Shipment Notification Form.

2.2. Transportation Incident: is an event **not** meeting the requirements of step 2.1.

- Includes events related to Security and safe transportation of the shipment

3. RESPONSIBILITIES

3.1. The Radiation Protection Department provides a Radioactive Shipment Notification Form and Emergency Response Information to the Operations Department.

3.2. In the event a driver or other individual calls the listed emergency response number, the Operations Department shall immediately assist in the mitigation and resolution of the accident as necessary. (Reference 6.5)

4. **MAIN BODY**

NOTE: The Shift Manager may transfer control of this event. Both parties involved in the transfer control must understand their roles and the responsibilities that are transferred. Face to face verbal communication should occur. The transfer can be made to any individual proficient in transportation events; however, the recommended person is the Radiation Protection Manager.

NOTE: As an issue of potential public interest, the company Communications Department should handle all interactions with the media and other non-official outside groups. Communications with government agencies such as the NRC or the DOT are the responsibility of the Shift Manager or the person in control of the event at the Station.

4.1. The Shift Manager shall ensure the following activities are completed:

4.1.1. **COMPLETE** Attachment 1, "Transportation Accident / Incident Reporting Form" while the caller is on the phone.

1. **VERIFY / OBTAIN** the Radioactive Shipment Notification Form and Emergency Response Information provided to the Operations Department by the Radiation Protection Department. This step is **not** applicable for small quantity shipments (DOT definition of small quantities is referred to as excepted quantities).

NOTE: Specific requirements for off normal and emergency communications for RAMQC Shipments are Safeguards Information – Modified Handling, use appropriate security measures when making these communications.

2. **REVIEW** the Radioactive Shipment Notification **to DETERMINE** if the shipment is Radioactive Material Quantity of Concern (RAMQC) shipment performed in accordance with RP-AA-600-1006 **or** RP-AA-600-1009.

A. **If** the shipment is a RAMQC shipment performed in accordance with RP-AA-600-1006 **or** RP-AA-600-1009, **then CONTACT** Security, obtain a copy of SY-AA-101-134-1002, **and INITIATE** immediate NRC investigation and notification requirements.

4.1.2. **DETERMINE** if the situation is a transportation accident or transportation incident using the criteria of step 2.1 or step 2.2.

4.1.3. Refer to LS-AA-1120 for reportability requirements since conditions may require a report within 15 minutes.

1. Applicable sections of the reportability manual include RAD 1.7 and RAD 1.24.

4.1.4. EVALUATE initiation of a prompt investigation in accordance with RP-AA-1004 "Radiation Protection Stop Work Authority and Corporate RPM Event Notification" and OP-AA-106-101-1001 "Event Response Guidelines".

4.1.5. **If** the criteria of a transportation accident per step 2.1 are met, **then PROCEED** to step 4.2. **If <u>not</u>**, **then PROCEED** to step 4.3.

4.2. <u>Transportation Accident Notifications:</u>

NOTE: The current telephone numbers for non-Exelon response facilities are found in the Emergency Response Facilities (ERF) telephone directory.

4.2.1. **COMPLETE** Attachment 2, "Transportation Accident / Incident Notification Log" as the following notifications are made:

1. **NOTIFY** the Station Duty Officer and / or Duty Station Manager.

2. **NOTIFY** the Station Radiation Protection Manager (RPM) or designee.

3. **NOTIFY** the Nuclear Duty Officer.

4. **NOTIFY** the United States Department of Transportation / National Response Center if Exelon Nuclear is the carrier; **otherwise VERIFY** the carrier has made this notification. This notification must include as a minimum:

   A. Name of the person making the notification.

   B. Phone number of the person making the notification.

   C. Name and address of the carrier.

   D. Date, time, and location of the accident.

   E. Extent of injuries, if applicable.

   F. Name of hazard, classification, and quantity of hazardous materials involved.

   G. Type of accident and nature of hazardous material involvement including whether a dangerous conditions currently exists.

5. **NOTIFY** the Illinois Emergency Management Agency if the shipment originated in Illinois. The State official will ask a series of questions in order to evaluate the situation.

6. **If** the accident occurred outside of the State of Illinois, **then NOTIFY** the appropriate State Emergency Response Agency using the phone number contained under the State Emergency tab in the ERF directory or other site-specific telephone reference.

7. **NOTIFY** the NRC Operations Center using the Emergency Notification System (ENS) following notification of the accident in accordance with the Exelon Reportability Reference Manual.

8. **If** the shipment involves Special Nuclear Material (plutonium, enriched uranium, or other fissile isotopes), **then NOTIFY** the Nuclear Materials Custodian.

9. **If** the shipment involves mixed hazardous and radiological waste, **then NOTIFY** the Exelon Nuclear Environmental Services Department (via the Nuclear Duty Officer, if necessary).

10. **NOTIFY** Corporate Communications and affected site communicator of the event. The need to develop a comprehensive company response will be required.

11. **NOTIFY** American Nuclear Insurers (ANI)

4.2.2. **If** an Exelon Nuclear response team should be dispatched to the accident location, **then COORDINATE** with the Nuclear Duty Officer.

4.2.3. **EXIT** this procedure.

4.3. Transportation Incident Notifications:

4.3.1. **NOTIFY** the Station Duty Officer and / or the Duty Station Manager.

4.3.2. **NOTIFY** the Nuclear Duty Officer.

4.3.3. **NOTIFY** the Station Radiation Protection Manager (RPM) or designee.

4.3.4. **If** an Exelon Nuclear response team should be dispatched to the incident location, **then COORDINATE** with the Nuclear Duty Officer.

4.3.5. **CONSIDER** notifying the agencies listed on Attachment 2. **If** agencies are notified, **then DOCUMENT** the notification on Attachment 2.

1. **NOTIFY** Corporate Communications and affected site communicator of the event. The need to develop a comprehensive company response may be required

4.3.6. In the event of a transportation accident of radioactive materials coming from Exelon nuclear facilities and traveling through the state of Texas are required to provide notifications at a minimum, to the emergency number on the shipping documentation, Texas local law enforcement, the DSHS, and the shipper. The DSHS 24-Hour emergency phone number is (512) 458-7460.

4.3.7. Exelon is required to ensure that notification has been provided to DSHS 512-458-7460.

5. DOCUMENTATION - None

6. REFERENCES

6.1. Commitments

6.1.1. Braidwood: 456-200-98-CAQS00043. (Entire Procedure)

6.2. Exelon Nuclear Reportability Manual, current revision.

6.3. Code of Federal Regulation 49CFR171.15 and 49CFR171.16.

6.4. Code of Federal Regulations 49CFR172.604.

6.5. NRC Information Notice 92-62, “Emergency Response Information Requirements for Radioactive Material Shipments”.

6.6. Code of Federal Regulations 10CFR50.72(b)(2)(vi).

6.7. Emergency Resources Manual INPO 86-032 or most recent revision.

6.8. RP-AA-600-1006, Shipment of Category 1 Quantities of Radioactive Material or Waste (Category 1 RAMQC)

6.9. RP-AA-600-1009, Shipment of Category 2 Quantities of Radioactive Material or Waste (Category 2 RAMQC)

6.10. SY-AA-101-134-1002, RAMQC Shipment Notification Requirements – Safeguards Information – Modified Handling.

7. ATTACHMENTS

7.1. Attachment 1, Transportation Accident / Incident Notification Form

7.2. Attachment 2, Transportation Accident / Incident Notification Log

ATTACHMENT 1
Transportation Accident / Incident Notification Form
Page 1 of 2

Date / Time Of This Call	
Date / Time Of The Event	
Name Of Caller	
Company Name And Address Of Caller	
Telephone Number Of Caller (On Scene)	
Exelon Nuclear Shipment Number	
Is this a RAMQC Shipment	*YES* ☐ *or* *NO* ☐
Incident Location (As specific as possible, include State, County, Road, Intersection) If in Illinois and if known: (Section, Township, Range)	
Vehicles Involved.	
AS A DIRECT RESULT OF THE HAZARDOUS MATERIAL, WERE:	
People Killed?	YES ☐ or NO ☐
People Injured?	YES ☐ or NO ☐
Injured Taken To Hospital? If YES, Where?	YES ☐ or NO ☐
Does The Estimate Of Carrier Or Property Damages Exceed $50,000?	YES ☐ or NO ☐
Has A Major Transportation Artery Or Facility Been Closed One Or More Hours?	YES ☐ or POTENTIAL ☐ or NO ☐

ATTACHMENT 1
Transportation Accident / Incident Notification Form
Page 2 of 2

Has An Evacuation Of The General Public Lasting One Or More Hours Occurred?	YES ☐ or POTENTIAL ☐ or NO ☐
Has The Flight Pattern Of An Aircraft Been Altered?	YES ☐ or POTENTIAL ☐ or NO ☐
Were Package(s) Impacted By Fire? (Package defined on Radioactive Shipment Notification Form)	YES ☐ or NO ☐
Was there a Loss Of Package(s) Integrity? If YES, then does the potential exist for a spread of contamination?	YES ☐ or NO ☐

NOTE: If ALL of the above questions are answered NO, then a transportation accident has <u>not</u> occurred.

Name Of Emergency Response Units Contacted Or At The Scene	
Name Of Hazard Being Shipped	
UN ID Number (Reference number of hazard)	
Public Health Precautions Implemented, If Any	
Weather Conditions: (Rain, snow, temperature, etc.)	
Person Completing This Form. (Please print)	

ATTACHMENT 2
Transportation Accident / Incident Notification Log
Page 1 of 2

NOTE: The current telephone numbers for non-Exelon Response Facilities are found in the Emergency Response Facilities (ERF) telephone directory.

	Position	Date/Time Contacted	Person Contacted
4.2.1.1	Station Duty Officer	__ / __ / __ _____	
	AND / OR		
	Duty Station Manager	__ / __ / __ _____	
4.2.1.2	Rad Protection Manager	__ / __ / __ _____	
4.2.1.3	Nuclear Duty Officer	__ / __ / __ _____	
4.2.1.4	United States Department of Transportation/National Response Center	__ / __ / __ _____	

Ensure the following information is provided to USDOT as a minimum:
☐ Name of person making contact (your name)
☐ Phone number of Station
☐ Name and address of Carrier
☐ Date, time, and location of the accident / incident
☐ Extent of injuries, if applicable
☐ Name, classification, and quantity of hazardous material involved
☐ Accident information including type, nature of hazard
☐ If a hazardous condition still exists

ATTACHMENT 2
Transportation Accident / Incident Notification Log
Page 2 of 2

	Position	Date/Time Contacted	Person Contacted
4.2.1.5	Illinois Emergency Mgmt Agency	__ / __ / __ _____	
4.2.1.6	Non-Illinois State Emergency Agency	__ / __ / __ _____	Agency: Person:
4.2.1.7	NRC Operations Center	__ / __ / __ _____	
4.2.1.8	Nuclear Material Cust (SNM shipments only)	__ / __ / __ _____	
4.2.1.9	Exelon Nuclear Environ Services Dept (mixed waste shipments only)	__ / __ / __ _____	
4.2.1.10	American Nuclear Insurers	__ / __ / __ _____	

Other Agencies / Individuals Contacted:

CONSIDER:

- NRC / NRC Regional Communications
- Nearest Site Communicator
- Corporate Communications
- All Company Communicators
- State Authorities
- Institute of Nuclear Power Operations
- Local Authorities
- Transportation Company Communications
- Destination Communications (agency receiving the shipment)
- Contractor Communications

Name of Agency	Date / Time Contacted	Person Contacted
	__ / __ / __ _____	
	__ / __ / __ _____	
	__ / __ / __ _____	