



Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428
Docket 50-302
Docket 72-1035
Operating License No. DPR-72

10 CFR 50.36a(a)(2)
PDTs 5.7.1.1(c)
ODCM 6.4

April 4, 2016
3F0416-01

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – 2015 Annual Radioactive Effluent Release Report

Dear Sir:

Duke Energy Florida, LLC, previously known as Duke Energy Florida, Inc. (DEF), hereby provides the 2015 Radioactive Effluent Release Report for Crystal River Unit 3 (CR-3) in accordance with 10 CFR 50.36a(a)(2), the CR-3 Permanently Defueled Technical Specifications (PDTs), Section 5.7.1.1(c) and Section 6.4 of the Offsite Dose Calculation Manual (ODCM). The attached report includes a summary of the quantities of radioactive liquid and gaseous effluents, and solid waste released from the CR-3 site during 2015. The data provided in the attached report is consistent with the objectives outlined in the ODCM and the Process Control Program (PCP), and is in conformance with 10 CFR 50, Appendix I, Section IV.B.1.

The CR-3 PDTs, Section 5.6.2.3, requires submittal of licensee initiated changes to the ODCM as part of the Radioactive Effluent Release Report for the period of the report in which any changes were made. The ODCM was revised in 2015; changes are described in this report. The PCP was not revised in 2015.

No new regulatory commitments are made in this letter.

If you have any questions regarding this submittal, please contact Mr. Mark Van Sicklen, Licensing Lead, Nuclear Regulatory Affairs, at (352) 563-4795.

Sincerely,

Terry D. Hobbs
General Manager, Decommissioning

TDH/mvs

Attachment 1: 2015 Annual Radioactive Effluent Release Report

xc: NMSS Project Manager
Regional Administrator, Region I

DUKE ENERGY FLORIDA, LLC

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ATTACHMENT 1

2015 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 2015



DUKE ENERGY FLORIDA, LLC
CRYSTAL RIVER UNIT 3

Facility Operating License No. DPR-72

Docket No. 50-302

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Date: 03-30-2016

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INTRODUCTION

This report is submitted as required by the Offsite Dose Calculation Manual, section 6.5, and Technical Specifications 5.6.2.3.3 and 5.7.1.1.c. All 40 CFR 190 limits have been met.

The scope of this report includes:

- A summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the plant.
- Quarterly and annual dose summaries.
- A list and description of unplanned releases to unrestricted areas.
- A description of any changes to the:
 - Process Control Program (PCP), and
 - Offsite Dose Calculation Manual (ODCM).
- Significant changes to any radioactive waste treatment system.
- A list of new dose calculation location changes identified by the annual land-use census.
- Information relating to effluent monitors or required supporting instrumentation being inoperable for 30 or more days.
- Information required to be included in this report per NEI 07-07 Industry Ground Water Protection Initiative-Final Guidance Document issued in August 2007.

Note for reporting purposes, N/D = Not Detected.

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 1A - Regulatory Guide 1.21

Gaseous Effluents - Summation of All Releases Unit: 3

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total % Error
A. Fission & Activation Gases						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E+01
2. Average Release Rate for Period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
B. Iodines						
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E+01
2. Average Release Rate for Period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
C. Particulates						
1. Particulates with half-lives > 8 days	Curies	0.00E+00	0.00E+00	4.17 E-07	0.00E+00	3.00E+01
2. Average Release Rate for Period	uCi/sec	0.00E+00	0.00E+00	5.24E-08	0.00E+00	
3. Gross Alpha Radioactivity	Curies	0.00E+00	5.08 E-08	0.00E+00	0.00E+00	
D. Tritium						
1. Total Release	Curies	1.25E-01	1.94E-01	3.54E-01	3.07E-01	3.00E+01
2. Average Release Rate for Period	uCi/sec	1.61E-02	2.47E-02	4.46E-02	3.87E-02	

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 1B - Regulatory Guide 1.21

Gaseous Effluents - Elevated Batch Mode Unit: 3

(This Table Does Not Apply to Crystal River Unit 3)

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Activation Gases					
Total	Curies	N/D	N/D	N/D	N/D
Iodines					
Total	Curies	N/D	N/D	N/D	N/D
Particulates					
Total	Curies	N/D	N/D	N/D	N/D
H-3	Curies	N/D	N/D	N/D	N/D
Gross Alpha	Curies	N/D	N/D	N/D	N/D

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 1B – (Continued) Regulatory Guide 1.21

Gaseous Effluents - Elevated Continuous Mode Unit: 3

(This Table Does Not Apply to Crystal River Unit 3)

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Activation Gases					
Total	Curies	N/D	N/D	N/D	N/D
Iodines					
Total	Curies	N/D	N/D	N/D	N/D
Particulates					
Total	Curies	N/D	N/D	N/D	N/D
H-3	Curies	N/D	N/D	N/D	N/D
Gross Alpha	Curies	N/D	N/D	N/D	N/D

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 1C - Regulatory Guide 1.21

Gaseous Effluents - Ground Batch Mode Unit: 3

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Activation Gases					
Total	Curies	N/D	N/D	N/D	N/D
Iodines					
Total	Curies	N/D	N/D	N/D	N/D
Particulates					
Total	Curies	N/D	N/D	N/D	N/D
H-3	Curies	N/D	N/D	N/D	N/D
Gross Alpha	Curies	N/D	N/D	N/D	N/D

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 1C – (Continued) Regulatory Guide 1.21

Gaseous Effluents - Ground Continuous Mode Unit: 3

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Activation Gases					
Total	Curies	N/D	N/D	N/D	N/D
Iodines					
Total	Curies	N/D	N/D	N/D	N/D
Particulates					
Cs-137	Curies	N/D	N/D	4.17E-07	N/D
Total	Curies	N/D	N/D	4.17E-07	N/D
H-3	Curies	1.25E-01	1.94E-01	3.54E-01	3.07E-01
Gross Alpha	Curies	N/D	5.08E-08	N/D	N/D

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 2A - Regulatory Guide 1.21

Liquid Effluents - Summation of All Releases Unit: 3

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total % Error
A. Fission & Activation Products						
1. Total Release (not including tritium, gases, alpha)	Curies	2.75E-03	2.01E-05	1.35E-05	8.09E-05	2.50E+01
2. Average diluted concentration during period	uCi/ml	1.59E-11	9.14E-14	5.44E-14	3.89E-13	
3. Percent of Applicable Limit	%	2.66E-06	9.10E-07	5.44E-07	1.79E-06	
B. Tritium						
1. Total Release	Curies	1.24E+00	9.32E-04	5.43E-04	1.11E-01	3.00E+01
2. Average diluted concentration during period	uCi/ml	7.18E-09	4.32E-12	2.19E-12	5.33E-10	
3. Percent of Applicable Limit	%	7.18E-05	4.32E-08	2.19E-08	5.33E-06	
C. Dissolved and Entrained Gases						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+01
2. Average diluted concentration during period	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
D. Gross Alpha Radioactivity						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E+01
E. Waste Volume Released (Pre-Dilution)						
	Liters	5.19E+06	6.82E+05	2.68E+05	3.58E+05	1.00E+01
F. Dilution Water Volume During Period						
	Liters	7.19E+11	2.21E+11	2.47E+11	2.08E+11	1.00E+01

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 2B - Regulatory Guide 1.21

Liquid Effluents - Batch Mode Unit: 3

Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
-------	---------	---------	---------	---------

Fission & Activation Products

Fe-55	Curies	2.64E-03	N/D	N/D	N/D
Co-60	Curies	4.63E-05	N/D	N/D	6.54E-05
Ni-63	Curies	6.17E-05	N/D	N/D	N/D
Cs-137	Curies	3.34E-06	3.70E-05	1.35E-05	1.54E-05
Total	Curies	2.75E-03	5.22E-04	1.35E-05	8.09E-05

Dissolved and Entrained Gases

Total	Curies	N/D	N/D	N/D	N/D
H-3	Curies	1.24E+00	9.32E-04	5.43E-04	1.11E-01
Gross Alpha	Curies	N/D	N/D	N/D	N/D

EFFLUENT and WASTE DISPOSAL REPORT-2015

Table 2B - (Continued) Regulatory Guide 1.21

Liquid Effluents - Continuous Mode Unit: 3

Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
-------	---------	---------	---------	---------

Fission & Activation Products

Total	Curies	N/D	N/D	N/D	N/D
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Dissolved and Entrained Gases

Total	Curies	N/D	N/D	N/D	N/D
-------	--------	-----	-----	-----	-----

H-3	Curies	N/D	N/D	N/D	N/D
-----	--------	-----	-----	-----	-----

Gross Alpha	Curies	N/D	N/D	N/D	N/D
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EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Gaseous Batch Release Summary Unit: 3

	Jan - Jun	Jul - Dec
Number of Batch Releases	0	0
Total Time Period for Batch Releases	0.00E+00 min	0.00E+00 min
Maximum Time Period for a Batch Release	0.00E+00 min	0.00E+00 min
Average Time Period for a Batch Release	0.00E+00 min	0.00E+00 min
Minimum Time Period for a Batch Release	0.00E+00 min	0.00E+00 min

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Liquid Batch Release Summary Unit: 3

	Jan - Jun	Jul - Dec
Number of Batch Releases	14	5
Total Time Period for Batch Releases	3.70E+03 min	1.30E+03 min
Maximum Time Period for a Batch Release	6.20E+02 min	5.72E+02 min
Average Time Period for a Batch Release	2.64E+02 min	2.59E+02 min
Minimum Time Period for a Batch Release	2.20E+01 min	5.00E+01 min
Average Stream Flow During Release Periods	1.50E+05 gpm	2.56E+05 gpm

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Gaseous Abnormal Release Summary

Unit: 3

	Jan - Jun	Jul - Dec
Number of Abnormal Releases	0	0
Total Time Period for Abnormal Releases	0.00E+00 min	0.00E+00 min
Maximum Time Period for an Abnormal Release	0.00E+00 min	0.00E+00 min
Average Time Period for an Abnormal Release	0.00E+00 min	0.00E+00 min
Minimum Time Period for an Abnormal Release	0.00E+00 min	0.00E+00 min
Total Activity for Abnormal Releases	0.00E+00 Ci	0.00E+00 Ci

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Liquid Abnormal Release Summary

Unit: 3

	Jan - Jun	Jul - Dec
Number of Abnormal Releases	0	0
Total Time Period for Abnormal Releases	0.00E+00 min	0.00E+00 min
Maximum Time Period for an Abnormal Release	0.00E+00 min	0.00E+00 min
Average Time Period for an Abnormal Release	0.00E+00 min	0.00E+00 min
Minimum Time Period for an Abnormal Release	0.00E+00 min	0.00E+00 min
Total Activity for Abnormal Releases	0.00E+00 Ci	0.00E+00 Ci

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Gaseous NNG Organ Dose

Unit: 3

Receptor Name: Infant Max Ind NW at 1.34 km

		1 st Quarter		2 nd Quarter		3 rd Quarter		4 th Quarter		Calendar Year	
Organ	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	
Bone	3.00E-05	4.00E-04	4.67E-05	6.22E-04	1.01E-04	1.34E-03	7.38E-05	9.84E-04	2.51E-04	1.67E-03	
Liver	3.00E-05	4.00E-04	4.67E-05	6.22E-04	1.03E-04	1.37E-03	7.38E-05	9.84E-04	2.53E-04	1.69E-03	
Total Body	3.00E-05	4.00E-04	4.67E-05	6.22E-04	8.87E-05	1.18E-03	7.38E-05	9.84E-04	2.39E-04	1.59E-03	
Thyroid	3.00E-05	4.00E-04	4.67E-05	6.22E-04	8.76E-05	1.17E-03	7.38E-05	9.84E-04	2.38E-04	1.59E-03	
Kidney	3.00E-05	4.00E-04	4.67E-05	6.22E-04	9.17E-05	1.22E-03	7.38E-05	9.84E-04	2.42E-04	1.61E-03	
Lung	3.00E-05	4.00E-04	4.67E-05	6.22E-04	8.93E-05	1.19E-03	7.38E-05	9.84E-04	2.40E-04	1.60E-03	
GI-Lli	3.00E-05	4.00E-04	4.67E-05	6.22E-04	8.77E-05	1.17E-03	7.38E-05	9.84E-04	2.28E-04	1.59E-03	

Maximum Organ was LIVER.

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Liquid Organ & Whole Body Dose Unit: 3

Receptor Name: Adult W at 1.34 km

1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Calendar Year
-------------------------	-------------------------	-------------------------	-------------------------	---------------

Organ	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit	Dose	% of ODCM Limit
Bone	1.99E-04	3.99E-03	1.47E-08	2.94E-07	3.47E-09	6.94E-08	5.43E-07	1.09E-05	2.00E-04	2.00E-03
Liver	1.35E-04	2.70E-03	2.01E-08	4.02E-07	4.74E-09	9.49E-08	7.44E-07	1.49E-05	1.36E-04	1.36E-03
Total Body	3.16E-05	2.11E-03	1.32E-08	8.78E-07	3.11E-09	2.07E-07	4.91E-07	3.28E-05	3.21E-05	1.07E-03
Thyroid	3.94E-08	7.89E-07	2.18E-11	4.35E-10	4.49E-12	8.98E-11	1.81E-09	3.62E-08	4.13E-08	4.13E-07
Kidney	4.00E-08	8.01E-07	6.83E-09	1.37E-07	1.61E-09	3.23E-08	2.53E-07	5.06E-06	3.02E-07	3.02E-06
Lung	7.51E-05	1.50E-03	2.29E-09	4.57E-08	5.39E-10	1.08E-08	8.53E-08	1.71E-06	7.52E-05	7.52E-04
GI-Lli	7.74E-05	1.55E-03	4.10E-10	8.21E-09	9.62E-11	1.92E-09	5.67E-08	1.13E-06	7.74E-05	7.74E-04

Liquid Effluent Dose Limits

Total Body: 1.5 mrem/quarter, 3 mrem/year
 Any Organ: 5 mrem/quarter, 10 mrem/year

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

Liquid App I Dose Assessment Unit: 3

Adult W at 1.34km

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual
Maximum Organ Dose	mrem	0.0	0.0	0.0	0.0	0.0
ODCM Limit	mrem	5.00	5.00	5.00	5.00	10.00
% of ODCM Limit	%	0.0	0.0	0.0	0.0	0.0

Maximum Organ was Bone

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual
Total Body	mrem	0.0	0.0	0.0	0.0	0.0
ODCM Limit	mrem	1.50	1.50	1.50	1.50	3.00
% of ODCM Limit	%	0.0	0.0	0.0	0.0	0.0

EFFLUENT and WASTE DISPOSAL REPORT-2015

Regulatory Guide 1.21

App I Dose Assessment

Unit: 3

Airborne Noble Gas Doses Child Site Boundary NW at 1.34 km

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual
Beta Air	mRad	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ODCM Limit	mRad	10.00	10.00	10.00	10.00	20.00
% of ODCM Limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual
Gamma Air	mRad	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ODCM Limit	mRad	5.00	5.00	5.00	5.00	10.00
% of ODCM Limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Gaseous Release Dose Summary

Due to the decision to decommission the plant, the facility will remain permanently defueled.

Gaseous Effluent Dose Limits

Gamma Air Dose: 5 mrad/quarter, 10 mrad/year
 Beta Air Dose: 10 mrad/quarter, 20 mrad/year
 Any Organ: 7.5 mrem/quarter, 15 mrem/year

TABLE 3
EFFLUENT and WASTE DISPOSAL REPORT-2015
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR PROCESSING OR BURIAL (Non-irradiated fuel)

1. Type of waste	Unit	12 month period	Est. Total Error %
a. Spent resins, filter sludge, evaporator bottoms, etc.	m3 Ci	1.93E+01 1.21E-01	25
b. Dry compressible waste, contaminated equipment, etc.	m3 Ci	9.56E+01 3.48E+00	25
c. Irradiated components, control rods, etc.	m3 Ci	0.00E+00 0.00E+00	25
d. Other (describe): 2005 RCS Crud Drum	m3 Ci	1.04E+00 4.88E+00	25
2. Estimate of major nuclide composition (by type of waste in %)*			
a.	H-3 12.57 C-14 7.35 Fe-55 20.08 Co-60 42.09	Ni-63 5.88 Cs-137 9.93 Ce-144 0.55 Pu-241 1.55	
b.	C-14 0.164 Fe-55 39.11 Co-60 21.27 Sb-125 0.01 Pu-241 0.31	Ni-63 20.53 Mn-54 3.77 Cs-137 2.65 Cs-134 0.90 Co-58 7.46	Ce-144 2.76 Nb-95 0.99 Cm-242 0.02 Cm-243 0.02 Pu-238 0.01
c.	N/A	N/A	N/A
d.	H-3 0.84 C-14 0.45 Fe-55 6.64 Co-60 7.00 Co-57 0.03	Ni-63 4.18 Mn-54 0.84 Cs-137 35.85 Cs-134 30.54 Co-58 11.17	Ce-144 0.87 Nb-95 0.99 Zr-95 0.25 Ag-110m 0.34

* Curie values and principle radionuclides are estimates based on a combination of direct and indirect methods.

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
	(Trucking Shipments)	
1	Hittman Transportation	Alaron Nuclear Services
6	Hittman Transport Services	Energy Solutions Services, Inc
1	Hittman Transportation	Energy Solutions Services, Inc.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

Unplanned Releases

There were no unplanned releases in 2015.

Radioactive Waste Treatment Systems

There were no significant changes to the radioactive waste treatment systems in 2015. Due to the lengthy shutdown of Crystal River Unit 3, liquid waste volume and radioactivity concentration had continued to decrease until the decision to retire CR3 and begin decommissioning was made in February of 2013. As part of the preparation to place the unit in SAFSTOR, liquid waste inventory of all systems no longer required to support spent fuel cooling have been processed and discharged as liquid wastes, where possible. The liquid waste demineralizers were recharged with new condensate resin that was previously loaded into the condensate demineralizers to support the plant restart from the refuel 16 outage. This resin is a 2:1 cation to anion macroporous gel mixture of Ambersep 200H cation resin and IRN78 anion resin. This resin has performed extremely well while processing higher activity waste tanks including reactor coolant and borated refueling water. The liquid waste processing demineralizers and filters were sluiced and recharged several times to support processing the large volume of water as systems are drained and abandoned to support reaching the SAFSTOR configuration.

Annual Land Use Census

The 2015 land-use census did not identify any new dose calculation locations.

Effluent Monitor Instrument Operability

For the year 2015 the main gaseous effluent pathway is the auxiliary building ventilation exhaust system. Radiation monitor RM-A2N is the effluent monitor for this pathway. This monitor remains in service and has two back up compensatory monitors RM-A4 and RM-A8, which sample various locations of the auxiliary building. The Reactor Building is now also lined-up for continuous venting via RM-A2 as a means of maintaining a habitable atmosphere inside containment.

The liquid effluent pathways are the primary plant liquid waste stream, which is monitored by radiation monitor RM-L2, and the secondary plant liquid waste stream, which is monitored by radiation monitor RM-L7. These liquid radiation monitors remain operable.

Meteorology Instrumentation Evaluation

During 2015 the metrology tower was abandoned. It was concluded that an on-site meteorological data collection system was no longer needed at CR3 to support its effluents program because:

- There is no explicit regulatory requirement or license condition to maintain an on-site meteorological program for a decommissioning unit (or facility), and
- From a technical perspective, a reasonably conservative estimate of dose to a member of the public in the unrestricted area can be performed without periodically assessing changes in atmospheric dispersion and deposition based on our low site source term and the conservative nature of the dispersion factors.

See NTM 229460-80 Met Tower Abandonment White Paper for additional details.

Offsite Dose Calculation Manual (ODCM) Changes

The ODCM was revised in 2015 to revision #36 to support various system abandonments as the facility is configured for SAFSTOR. The following changes were incorporated:

ODCM REVISION 36 CHANGE SUMAMRY	
SECTION/ STEP	CHANGE
Throughout	Removed all references to Iodine monitoring to support Permanently Defueled Technical Specifications (PDTs) revision per License Amendment # 316. See last page for step references/pages.
Page 1	Added definition for Channel Check and Channel Functional Test from Tech Specs.
Page 2	Step 1.8 changed Mode to Defueled. Step 1.10 added definition of operability per Tech Specs.
Page 8	Table 2-3 - Removed reference to RM-A1 as this monitor has been abandoned. Also removed Iodine sampler from RM-A2 as Iodine monitoring is no longer required.
Page 9	Removed Action 25 for RM-A1 due to abandonment of RM-A1.
Page 10	Removed Action 27 for RM-A1 as this monitor has been abandoned. Re-wrote Action 29 for RM-A2A as the accident range is no longer officially required by the PDEP.
Page 11	Table 2-4 - Removed reference to RM-A1 due to abandonment. Changed RM-A2 Mode to DEFUELED. Removed Iodine sampler from RM-A2 as Iodine sampling is no longer required.
Page 12	Table 2-4 - Removed footnote # referencing periods of Reactor Building Purge as this action will no longer be performed.

ODCM REVISION 36 CHANGE SUMAMRY	
SECTION/ STEP	CHANGE
Page 21	Table 2-6 - Removed Gaseous Release type B for Reactor Building Purge as this will no longer be performed. Removed charcoal sampling for RM-A2 as this is used for I monitoring. Changed filter change frequency to Monthly and added a footnote to explain frequency.
Page 22	Footnote B - Removed discussion referencing startup, shutdown, or change in power levels.
Page 23	Footnote D - Rewrote footnote to discuss filter change frequency to go to monthly.
Page 35	Step 2.14.H - Removed reference for special report for RM-A2A being out of service. Step 2.14.I - Removed reference for special report for Met Instrumentation as this equipment is being abandoned.
Pages 36 - 38	Step 2.15 - Re-wrote Met Tower instrumentation to provide discussion of usage after abandonment of Met tower instruments. Deleted Tables 2-10 and 2-11.
Page 40	Step 3.5 - Added verbiage regarding dissolved gases in liquid effluent concentrations and updated from Xe-133 & Xe-135 to Kr-85 due to lengthy shutdown.
Page 44	Step 3.17 - Removed Meteorological Instrumentation due to abandonment.
Page 47	Table 1 - Removed RM-A1 batch and continuous release typo as there are no longer RB purges. Changed RM-A2 filter change frequency to Monthly and added footnote for explanation of filter change.
Page 48	Gaseous Effluent Monitors setpoint specification 1.1-1 - Removed RM-A1 due to abandonment.
Page 50	Nuclide Analysis 1.2-1 - deleted Reactor Building Purge Exhaust as purges are no longer being performed.
Page 51	Nuclide Analysis 1.2-2 - changed RM-A2 Particulate filter from Weekly to Monthly and added footnote (c) for discussion. Removed Iodine weekly charcoal sampling as this is no longer required.
Page 55	Pre-Release Calculation 1.3-1 Gaseous Radwaste Release - Removed flow rates for RB Purge and Waste Gas Tanks as these are no longer performed.
Page 56	Removed Reactor Building Purge Exhaust Duct dilution flow discussion as this is no longer performed.

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Pages 58-59	Removed Pre-Release calculation for Iodine Evaluation as this is no longer performed.
Page 60	Setpoint Calculation 1.4-1, RB Purge Duct Monitor RM-A1 Batch Type Release - Removed as this is no longer performed.
Page 61	Removed Setpoint calculation 1.4-1A, RB Purge Exhaust Duct Monitor (RM-A1) (special release for Functional Testing of the RB Purge System) as this is no longer performed.
Page 62	Removed Setpoint Calculation 1.4-1B, RB Purge Exhaust Duct Monitor (RM-A1), (Special release following ILRT of Reactor Building) as this is no loner performed.)
Page 63	Removed Setpoint Calculation 1.4-2, RB Purge Exhaust Duct Monitor (RM-A1) (Continuous type release) as this is no longer performed.
Page 79	Effluent Flow Diagram - Gaseous 2.3-1 - Removed RM-A1 and HEPA filter from RB exhaust and showed a connection to the Aux Bldg Vent Exhaust for future RB air exchange function that would use the Aux Bldg Ventilation System to pull air through the RB and then out the AB exhaust. Also removed the Spent Fuel Penetration Cooling system due to system abandonment.
Page 80	Effluent flow diagram - Liquid 2.3-2 - Added a dotted line that shows a cross-connection from NUS demins and MWST to either ECST A or B that was previously omitted.
Page 82	Table III Gaseous & Liquid Effluent representative Sampling removed from Reactor Building Purge Exhaust and Reactor Building with both Personnel and Equipment hatches open from table as these release types are no longer performed.
Page 83	Representative Sampling Method 3.1-4 - removed reference to Reactor Building, RM-A1, RM-A6, and Iodine sampling as these methods are no longer utilized.
Page 84	Removed Representative Sampling Method 3.1-5 (Reactor Bldg with Personnel Hatch and Equipment Hatch opened) and Representative Sampling Method 3.1-6 (Reactor Bldg During Integrated Leak Rate Testing) as these methods are no longer performed.
Page 90	Removed Table Nuclide analysis 4.2-1, Reactor Building Exhaust, as it is no longer used.
Page 91	Changed Nuclide Analysis Table 4.4-2 for Aux Bldg Particulate Analysis from Weekly to Monthly and added a footnote "c" to explain sample frequency.
Page 97	Changed title of dilution water used in dose calculation for liquid effluents from Nuclear Services & Decay Heat Seawater to Raw Water.

ODCM REVISION 36 CHANGE SUMAMRY	
SECTION/ STEP	CHANGE
Page 123	Removed Section 4.5 - Methodology for Carbon-14 Dose as CR3 no longer creates any dose from C-14 as there is no production mechanisms due to the plant being shut down.
Page 140	Inserted detailed map of TLD Stations (on site) that was previously omitted (by mistake) in an earlier revision.
Page 143	Step 6.4, 2nd bullet - Added statement to explain that the meteorological tower instrumentation was abandoned due to decommissioning of the facility and that the section write-up in the Annual Radioactive Effluent Release Report will no longer be required to discuss Met tower recovery availability.
Iodine Monitoring	Note that Iodine, I-131, I-133 monitoring verbiage has been removed from the following pages: TOC, 3, 8, 11, 16, 20, 21, 25, 28, 29, 30, 31, 32, 35, 42, 48, 51, 53, 55, 58, 59, 83, 88, 81, 93, 96, 104, 109, 113, & 155.
Page 144	Section 6.5, 6th bullet - added reference to NRC Branch Technical Position Rev. 1, 1979. 9th bullet - removed the words "of Technical Specifications" as the statement does not reference TS.
Page listing changes	Title page, TOC pages i-v, 1-3, 5, 8-12, 15-16, 20-23, 25, 28-32, 35-38, 40, 42, 44, 47-48, 50-51, 53, 55-56, 58-64, 79, 82-84, 86, 88, 90-91, 93, 96-97, 104, 109, 113, 123-128, 134, 143-144, 155-159.

Process Control Program (PCP) Changes

The PCP was not revised in 2015.

Emergency Feed Pump 2 & Steam Releases

Due to the fact that the plant has not operated since September of 2009, the emergency feed pump has not operated, nor has there been any secondary plant steam releases that need to be evaluated for radioactive constituents.

Based on the decision to retire and decommission CR-3, the emergency feed pump 2 will never operate again and there will be no steam releases.

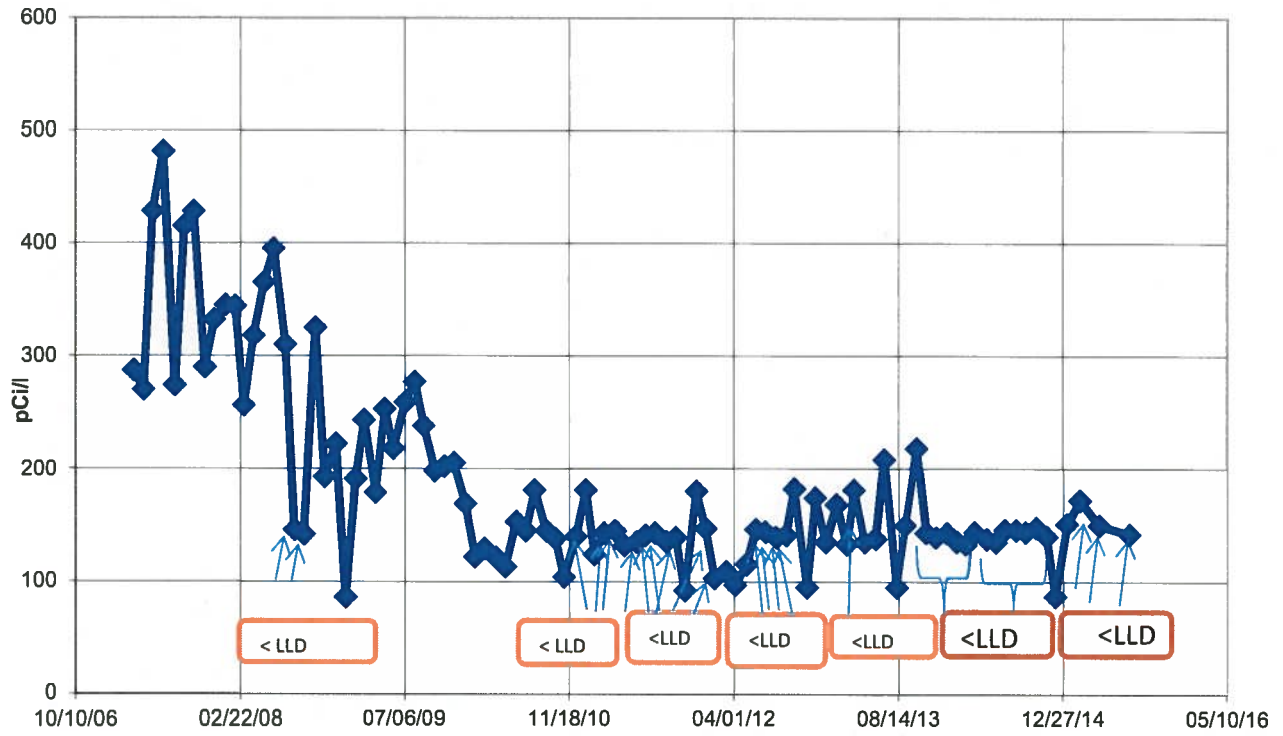
Carbon-14 Evaluation

During the entire year of 2015, Crystal River Unit 3 has been in a cold shutdown, defueled mode. The plant was taken off line in September of 2009 for refueling outage 16. In 2009, the primary plant was degassed, the reactor building was purged of radioactivity, waste gas decay tanks were released, a construction opening was made in the side of the reactor building containment wall, and both once through steam generators were replaced. Since the plant has been in cold shutdown for the entire years of 2010 through 2015 due to reactor building containment wall concrete delamination issues, there is no source term generation for carbon-14 production. Since the decision to retire the facility has been announced, there will be no C-14 source term generated ever again at CR-3.

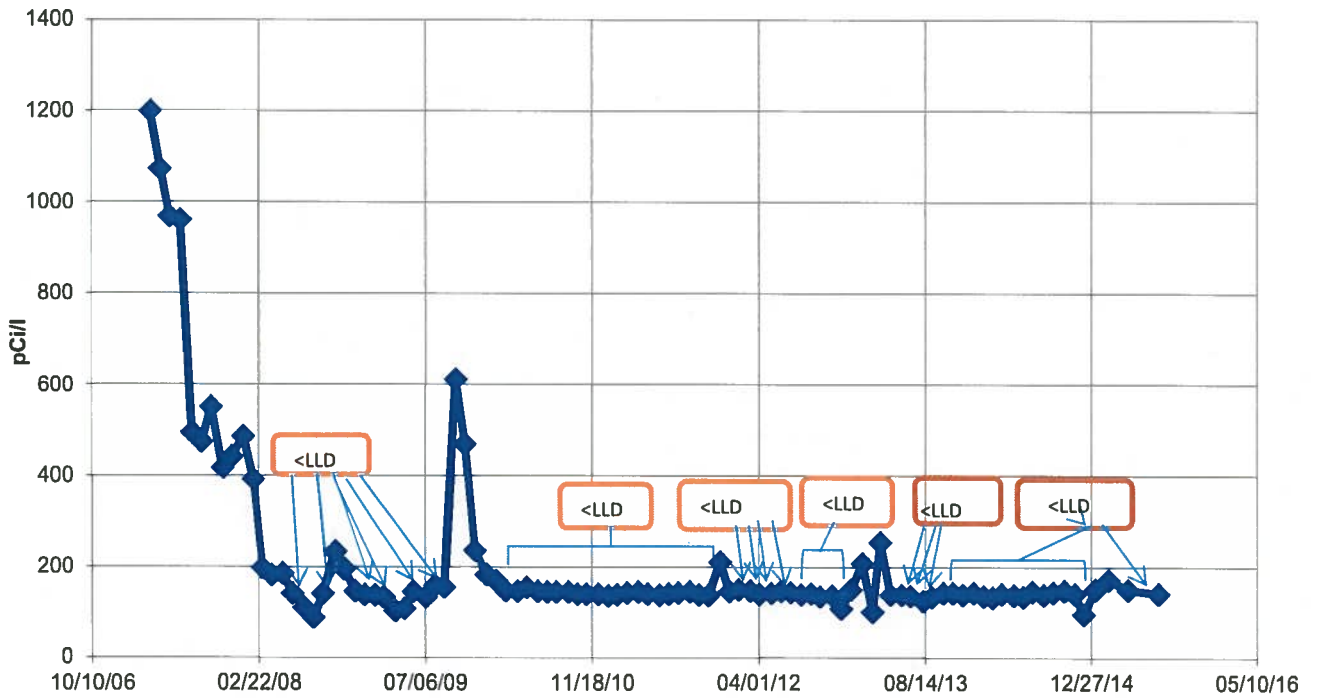
Nuclear Electric Institute (NEI) Required Information

The following environmental data is being included in this report per objective 2.4.b.i and 2.4.b.ii of NEI 07-07 Industry Ground Water Protection Initiative, as this groundwater well data is used to assist in evaluation of groundwater at the site, but is not officially included in the Radiological Environmental Monitoring Program (REMP) or the Offsite Dose Calculation Manual (ODCM). These 2 graphs are of tritium measurements in units of pCi/l, taken from groundwater monitoring wells located west of CR-3 on either side (north and south) of the site settling ponds. There are many other groundwater monitoring wells included in the REMP that are used for evaluating the groundwater in the vicinity of the CR-3 site. These 2 wells are providing supplemental information. The LLD for tritium measurement of these environmental well samples is ~150 pCi/l.

Tritium Measurements GW Well # MWC-IF2



Tritium Measurements GW Well # MWC-27



Additional Information

On February 5, 2013, Duke Energy announced that a decision has been made to permanently retire Crystal River Unit 3. The decision was made due to the high cost of repair and risk associated with repairing the containment building's delaminated concrete wall. The company is working to develop a comprehensive decommissioning plan and intends to place the facility in SAFSTOR for the immediate future and eventual dismantling. The plant staff (called SAFSTOR 1 organization) is working to shut down and abandon as many systems as possible, by removing energy sources, lubrications, greases, electrical, and system fluids to prepare the unit for SAFSTOR and eventual dismantlement.