

June 23, 2005

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

Ladies and Gentlemen:

ULNRC-05164

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
2004 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
Reference: ULNRC-05140, dated April 29, 2005**



Please find enclosed a revision of the referenced 2004 Annual Radioactive Effluent Release Report for the Callaway Plant. Revised are Tables 1A and 1B for the first and second Quarters of 2004. Tables 5, 6, 7, and section 6 were also revised. The revisions were made following discovery of a discrepancy with Auxiliary Boiler Release Permit UR03-2004-G0036;2. The revisions are provided as attachments to this letter. These documents are submitted in accordance with Sections 5.6.3 and 5.5.1 of the Technical Specifications.

Very truly yours,

A handwritten signature in cursive script that reads "Keith D. Young".

Keith D. Young
Manager, Regulatory Affairs

DJW/jdg

- Attachments:
1. Table 1A, Semiannual Summation of Gaseous Releases, All Airborne Effluents 1st and 2nd Quarter 2004
 2. Table 1B, Semiannual Airborne Continuous and Batch Releases, Ground Level Releases 1st and 2nd Quarter 2004
 3. Table 5, Dose at the Site Boundary and to the Nearest Resident from Gaseous Effluents
 4. Table 6, Dose to the Member of the Public from Activities within the Site Boundary
 5. Table 7, Total Dose Due to the Uranium Fuel Cycle (Member of the Public)
 6. Section 6, Related Information – Unplanned Releases

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cc: U.S. Nuclear Regulatory Commission (Original and 1 copy)
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

Mr. Bruce S. Mallett
Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-4005

Senior Resident Inspector
Callaway Resident Office
U.S. Nuclear Regulatory Commission
8201 NRC Road
Steedman, MO 65077

Mr. Jack N. Donohew (2 copies)
Licensing Project Manager, Callaway Plant
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop 7E1
Washington, DC 20555-2738

Manager, Electric Department
Missouri Public Service Commission
PO Box 360
Jefferson City, MO 65102-0360

Mr. Bob Oliveira
ANI Account Engineer
95 Glastonbury
Glastonbury, CT 06033

Regional Administrator
Department of Natural Resources
Central Regional Office
P.O. Box 176
Jefferson City, MO 65102-0176

Semiannual Summation of Gaseous Releases

All Airborne Effluents

TABLE 1A

SEMIANNUAL SUMMATION OF GASEOUS RELEASES
ALL AIRBORNE EFFLUENTS

QUARTERS 1 AND 2, 2004

TYPE OF EFFLUENT	UNITS	FIRST QUARTER	SECOND QUARTER	EST TOTAL ERROR % (a)
A. FISSION AND ACTIVATION GASES				
1. TOTAL RELEASE	CURIES	3.01E+02	4.72E+02	20
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/SEC	3.83E+01	6.01E+01	
3. PERCENT OF TECH SPEC LIMIT	%	N/A	N/A	
B. RADIOIODINES				
1. TOTAL IODINE-131	CURIES	6.40E-05	2.30E-03	23
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/SEC	8.14E-06	2.93E-04	
3. PERCENT OF TECH SPEC LIMIT	%	N/A	N/A	
C. PARTICULATES				
1. PARTICULATE (HALF-LIVES > 8 DAYS)	CURIES	1.29E-04	6.32E-05	30
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/SEC	1.64E-05	8.03E-06	
3. PERCENT OF TECH SPEC LIMIT	%	N/A	N/A	
4. GROSS ALPHA RADIOACTIVITY	CURIES	4.71E-07	4.11E-07	
D. TRITIUM				
1. TOTAL RELEASE	CURIES	6.09E+00	1.31E+01	14
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/SEC	7.75E-01	1.66E+00	
3. PERCENT OF TECH SPEC LIMIT	%	N/A	N/A	

(a) Safety Analysis Calculation 87-063-00, January 6, 1988

Semiannual Airborne Continuous and Batch Releases, Ground Level Releases

TABLE 1B

SEMIANNUAL AIRBORNE CONTINUOUS AND BATCH RELEASES GROUND LEVEL RELEASES FISSION GASES, IODINES, AND PARTICULATES

QUARTERS 1 AND 2, 2004

NUCLIDE	UNITS	CONTINUOUS RELEASES		BATCH RELEASES	
		FIRST QUARTER	SECOND QUARTER	FIRST QUARTER	SECOND QUARTER
1. FISSION GASES					
AR-41	CURIES	0.00E+00	0.00E+00	6.62E-02	1.17E-01
XE-133	CURIES	2.77E+02	4.42E+02	2.09E-01	1.53E+01
XE-135	CURIES	1.08E+01	5.25E+00	1.47E-03	4.52E-02
KR-85M	CURIES	2.89E+00	4.71E-01	0.00E+00	2.76E-03
XE-135M	CURIES	0.00E+00	3.76E-01	2.63E-06	0.00E+00
KR-87	CURIES	9.03E-01	1.04E-01	0.00E+00	0.00E+00
XE-131M	CURIES	1.60E+00	1.71E+00	1.16E-03	1.15E-01
XE-133M	CURIES	2.54E+00	5.25E+00	9.20E-04	4.54E-02
KR-88	CURIES	3.42E+00	4.54E-01	0.00E+00	1.43E-02
KR-85	CURIES	0.00E+00	0.00E+00	2.10E+00	3.26E-01
XE-138	CURIES	0.00E+00	2.06E-01	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	2.99E+02	4.56E+02	2.38E+00	1.59E+01
2. IODINES					
I-133	CURIES	0.00E+00	1.86E-05	2.17E-05	9.16E-06
I-131	CURIES	5.30E-06	1.15E-03	5.87E-05	1.15E-03
I-132	CURIES	0.00E+00	1.04E-05	5.71E-06	1.21E-04
I-135	CURIES	0.00E+00	0.00E+00	4.66E-06	0.00E+00
TOTAL FOR PERIOD	CURIES	5.30E-06	1.18E-03	9.08E-05	1.28E-03
3. PARTICULATES					
CS-137	CURIES	1.05E-06	2.99E-07	1.62E-05	3.86E-06
SB-125	CURIES	2.61E-06	5.54E-07	0.00E+00	0.00E+00
BA-140	CURIES	0.00E+00	0.00E+00	5.13E-07	3.57E-07
CS-134	CURIES	0.00E+00	0.00E+00	2.44E-05	1.26E-05
CS-136	CURIES	0.00E+00	0.00E+00	2.61E-06	5.64E-07
NA-24	CURIES	0.00E+00	0.00E+00	4.30E-08	0.00E+00
CO-58	CURIES	0.00E+00	5.58E-06	2.55E-07	3.79E-06
CO-60	CURIES	4.67E-07	0.00E+00	8.07E-05	3.36E-05
NB-95	CURIES	0.00E+00	0.00E+00	0.00E+00	4.25E-07
CR-51	CURIES	0.00E+00	0.00E+00	0.00E+00	1.51E-06
ALPHA	CURIES	4.71E-07	4.11E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	4.60E-06	6.84E-06	1.25E-04	5.67E-05

**Semiannual Airborne Continuous and
Batch Releases, Ground Level Releases
Fission Gases, Iodines, and Particulates**

TABLE 1B (continued)

**SEMIANNUAL AIRBORNE CONTINUOUS AND BATCH RELEASES
GROUND LEVEL RELEASES
FISSION GASES, IODINES, AND PARTICULATES**

QUARTERS 1 AND 2, 2004

NUCLIDE	UNITS	CONTINUOUS RELEASES		BATCH RELEASES	
		FIRST QUARTER	SECOND QUARTER	FIRST QUARTER	SECOND QUARTER
4. TRITIUM					
H-3	CURIES	6.00E+00	1.20E+01	8.60E-02	1.02E+00

Table 5

Dose at the Site Boundary and to the

Nearest Resident From Gaseous Effluents

Table 5

DOSE AT THE SITE BOUNDARY AND TO THE NEAREST RESIDENT FROM GASEOUS EFFLUENTS

ORGAN	UNITS	SITE BOUNDARY		NEAREST RESIDENT	
		DOSE	% LIMIT (a)	DOSE	% LIMIT (b)
GAMMA AIR DOSE *	MRAD	1.29E-02	0.13	8.50E-03	N/A
BETA AIR DOSE *	MRAD	3.03E-02	0.15	1.99E-02	N/A
WHOLE BODY ***	MREM	1.17E-02	N/A	7.69E-03	N/A
SKIN ***	MREM	2.50E-02	N/A	1.65E-02	N/A
BONE **	MREM	4.86E-04	N/A	1.73E-03	0.01
LIVER **	MREM	1.75E-03	N/A	9.33E-03	0.06
TOTAL BODY **	MREM	1.75E-03	N/A	8.25E-03	0.05
THYROID **	MREM	2.90E-03	N/A	2.23E-01	1.49
KIDNEY **	MREM	1.75E-03	N/A	9.06E-03	0.06
LUNG **	MREM	1.78E-03	N/A	7.81E-03	0.05
GI-LLI **	MREM	1.75E-03	N/A	7.77E-03	0.05

* Dose from Noble Gases only.

** Dose from Tritium, Radioiodines, and Particulates only.

*** Dose from Noble Gases plus Ground Plane dose.

(a) Annual dose limits of Offsite Dose Calculation Manual (APA-ZZ-01003) of 10 mrad gamma air dose and 20 mrad beta air dose.

(b) Annual dose limits of Offsite Dose Calculation Manual (APA-ZZ-01003) of 15 mrem to any organ from I-131, I-133, H-3, and particulate radionuclides with half-lives greater than 8 days.

From Activities within the Site Boundary

Table 6

DOSE TO THE MEMBER OF THE PUBLIC FROM ACTIVITIES
WITHIN THE SITE BOUNDARY

(MEMBER OF THE PUBLIC)

ORGAN	UNITS	EFFLUENT DOSE WITHIN THE SITE BOUNDARY	DIRECT RADIATION FROM THE UNIT	DIRECT RADIATION FROM OUTSIDE TANKS	DIRECT RADIATION FROM RAM STORAGE	EFFLUENT DOSE FROM CLG. TWR	TOTAL DOSE FOR THE YEAR
SKIN	MREM	5.80E-03	N/A	N/A	N/A	N/A	5.80E-03
BONE	MREM	1.41E-04	8.79E-03	1.36E-03	1.82E-03	N/A	1.21E-02
LIVER	MREM	5.05E-04	8.79E-03	1.36E-03	1.82E-03	2.08E-05	1.25E-02
TOTAL BODY	MREM	3.15E-03	8.79E-03	1.36E-03	1.82E-03	2.08E-05	1.51E-02
THYROID	MREM	7.19E-04	8.79E-03	1.36E-03	1.82E-03	2.08E-05	1.27E-02
KIDNEY	MREM	5.05E-04	8.79E-03	1.36E-03	1.82E-03	2.08E-05	1.25E-02
LUNG	MREM	5.10E-04	8.79E-03	1.36E-03	1.82E-03	2.08E-05	1.25E-02
GI-LLI	MREM	5.04E-04	8.79E-03	1.36E-03	1.82E-03	2.08E-05	1.25E-02

Total Dose Due to the Uranium Fuel Cycle

(Member of the Public)

Table 7

TOTAL DOSE DUE TO THE URANIUM FUEL CYCLE

(MEMBER OF THE PUBLIC)

ORGAN	UNITS	EFFLUENT DOSE AT THE RESIDENCE LOCATION	DOSE FROM ACTIVITIES WITHIN SITE BOUNDARY	DOSE FROM CLG TWR H-3 AT NEAREST RESIDENCE	TOTAL DOSE TO THE MEMBER OF THE PUBLIC	% LIMITS*
SKIN	MREM	1.62E-02	5.80E-03	N/A	2.20E-02	0.09
BONE	MREM	6.61E-04	1.21E-02	N/A	1.28E-02	0.05
LIVER	MREM	5.38E-03	1.25E-02	1.42E-05	1.79E-02	0.07
TOTAL BODY	MREM	1.26E-02	1.51E-02	1.42E-05	2.77E-02	0.11
THYROID	MREM	7.98E-02	1.27E-02	1.42E-05	9.25E-02	0.12
KIDNEY	MREM	5.30E-03	1.25E-02	1.42E-05	1.78E-02	0.07
LUNG	MREM	4.85E-03	1.25E-02	1.42E-05	1.73E-02	0.07
GI-LLI	MREM	4.92E-03	1.25E-02	1.42E-05	1.74E-02	0.07

* Annual dose limits from 40CFR190.10(a) of 25 mrem whole body, 75 mrem to the thyroid, and 25 mrem to any other organ.

5.0

Solid Wastes

The quantities of radioactive material released in shipments of solid waste for burial and irradiated fuel transported from the site during the year are summarized in Table 3. The total quantity and radioactivity reported in Table 3 for each waste type was for waste buried and includes wastes buried by waste reprocesses after volume reduction. The activity and fractional abundance of each nuclide was determined for each waste type based upon radiochemical analysis by an independent laboratory. The curie concentration

of each nuclide listed in Table 3 was determined as the product of the fractional abundance and the total curies shipped. Those nuclides which comprise at least 1% of the total activity for a particular waste type are presented in Table 3.

6.0

Related Information

6.1 Unplanned Releases

Unplanned releases are:

- 1) Inadvertent or accidental releases of radioactive material.
- 2) Releases of radioactive material via normal pathways without a release permit, proper authorization, or proper sampling and analysis.
- 3) Releases which are conducted in such a manner as to result in significant deviation from the requirements of the release permit.

Auxiliary Boiler Contamination

On April 10, 1998, during a refueling outage, radioactivity was detected in the Auxiliary Boiler feed water system. The boiler was flushed and cleaned several times in an attempt to decontaminate the unit. Small amounts of contamination remained in the sludge. During subsequent operation of the boiler small amounts

of contamination leached from the sludge and were detected in the boiler water.

An investigation was performed to locate the source of the contamination. No miss-positioned valves or leaks were identified. The results of sampling different system components were inconclusive, but may indicate a small leak in the SLWE heat exchanger. During refueling operations, the concentration of radioactive nuclides in the SLWE system can be a factor of 1000 times higher than normal operations. The size of the leak may be small enough to only be recognized when these high concentrations are present. Increased monitoring was initiated in an attempt to identify the source of the contamination. No additional contamination was identified.

A 10CFR50.59 evaluation concluded that the resulting dose to a Member of the Public from the release of radioactive material to the environment would be a small fraction of the regulatory dose limits. Therefore, continued operation of the Auxiliary Boiler would not pose any significant safety or environmental concern.

6.0

Related Information

The Auxiliary Boiler was operated intermittently during 2004. The maximum total body dose to a Member of the Public from these releases was $4.85E-05$ mrem during 2004. This is negligible compared to the quarterly and annual effluent control limits. The total activity released from the Auxiliary Boiler in 2004 was $1.04E-01$ Curies.

Containment Equipment Hatch

Air samples taken outside of the Containment Equipment hatch during RF012 indicated reactor produced isotopes (CAR 200207059).

Releases of radioactivity from the Containment Equipment hatch in 2004 (RFO13) were quantified and are included in this report. The total amount of activity released from the Containment Equipment hatch was approximately 13.9 Curies, primarily consisting of Noble gases.

The maximum total body dose to a Member of the Public from these releases was $2.65E-04$ mrem during 2004. This is negligible compared to the quarterly and annual effluent control limits. The activity released from the Containment Equipment hatch during 2004 is included in Tables 1A, 1B, 5, 6, and 7.

Auxiliary Boiler Operated w/o Release Permit

On 1/27/04, the Auxiliary Boiler was started prior to release permit generation (CAR 200400644). Control room procedures require release permit generation prior to operation. Approximately 30 minutes after operation began, the Count Room technicians were notified and a release permit was generated. The total activity released during this release was $1.82E-03$ Curies and the Total Body dose to a Member of the Public was $3.28E-07$ mrem. As expected, the activity and dose from this release was well below regulatory limits.

To prevent reoccurrence, Radiation Protection procedures were revised to provide a continuously open Auxiliary Boiler release permit to allow the Callaway Operations staff increased operating flexibility.

Antimony-122 In Liquid Effluents

Antimony-122 (Sb-122) was discovered in liquid effluent release permits during Health Physicist review (CAR 200409000). Sb-122 was initially discovered in reactor coolant samples and added to the effluent release library based on the comparison. After the radionuclide was added to the release library, an interference with Cs-134 at the 564 keV energy was noticed. All of the liquid release permits from 2004 were evaluated for Sb-122. The evaluation revealed 10 batch liquid release permits where Sb-122 was present. The affected release permits were revised to account for Sb-122.

Sb-122 was also added to Table 2.1, Ingestion Dose Commitment Factor (A_{IT}) for Adult Age Group, of APA-ZZ-01003, Callaway ODCM. The total amount of Sb-122 activity released in liquid effluents was $1.29E-03$ Curies. The dose from Sb-122 was well below 1% of the total dose from liquid effluents in 2004.

'A' Mixed Bed Demineralizer Flush

On 4/6/04, the control room commenced a flush of 'A' Mixed Bed Demineralizer in accordance with plant procedures. Shortly after the flush began, the Auxiliary Building ventilation exhaust particulate monitor GL-RE-60 alarmed in the control room (CAR 200402553). Trends on GL-RE-60 indicated a step increase in activity. As a result of the alarm, the control room decided to secure the flush of 'A' Mixed Bed Demineralizer.