

DUANE ARNOLD ENERGY CENTER

SEMI-ANNUAL REPORT

RADIOACTIVE EFFLUENT RELEASES

JANUARY 1, 1992 THROUGH JUNE 30, 1992

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INTRODUCTION

This semi-annual report covers the period of January 1, 1992, through June 30, 1992. During this period, DAEC had a scheduled refueling outage that lasted 59 days, from February 27, 1992 to April 26, 1992.

There were no radioactive liquid releases from DAEC during this reporting period.

Gaseous releases were continuous for the period and resulted in concentrations at the site boundary well below compliance levels for 10 CFR 50, Appendix I dose limits, and 10 CFR 20 concentration limits. There were no abnormal releases of radioactive material to the environment.

A total of six solid radioactive waste shipments were made during the period. Three shipments of spent resins and mechanical aqueous filters were sent directly for burial and three shipments of dry active waste were sent to a vendor for processing. The shipment summary report, therefore, indicates both waste quantities shipped and the amounts buried.

There were no changes to the Offsite Dose Assessment Manual.

There were changes to the Process Control Plan. A description of the change and a copy of the revised procedure are included as part of this report.

A summary of meteorological data will be included in the Semi-Annual Effluent Report for the second half of the calendar year per DAEC Technical Specifications.

There were no Technical Specification Limiting Conditions for Operation or other occurrences that required special reporting to be included with this report.

SEMIANNUAL RADIOACTIVE MATERIAL RELEASE REPORT (1992)

LIQUID EFFLUENT

Nuclides Released	Unit	1st Quarter	2nd Quarter
strontium-89	Ci	<LLD	<LLD
strontium-90	Ci	<LLD	<LLD
cesium-134	Ci	<LLD	<LLD
cesium-137	Ci	<LLD	<LLD
iodine-131	Ci	<LLD	<LLD

cobalt-58	Ci	<LLD	<LLD
cobalt-60	Ci	<LLD	<LLD
iron-55	Ci	<LLD	<LLD
iron-59	Ci	<LLD	<LLD
zinc-65	Ci	<LLD	<LLD
manganese-54	Ci	<LLD	<LLD
chromium-51	Ci	<LLD	<LLD

zirconium-niobium-95	Ci	<LLD	<LLD
molybdenum-99	Ci	<LLD	<LLD
technetium-99m	Ci	<LLD	<LLD
barium-lanthanum-140	Ci	<LLD	<LLD
cerium-141	Ci	<LLD	<LLD

Other (specify)	Ci	<LLD	<LLD
	Ci	<LLD	<LLD
	Ci	<LLD	<LLD
	Ci	<LLD	<LLD
	Ci	<LLD	<LLD
Total for period (above)	Ci	<LLD	<LLD

xenon-133	Ci	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD

<LLD means that all measurement results were less than the lower limit of detection as required by DAEC Technical Specifications

SEMIANNUAL RADIOACTIVE MATERIAL RELEASE REPORT (1992)

GASEOUS EFFLUENTS

Nuclides Released	Unit	1st Quarter	2nd Quarter
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1. Fission gases

krypton-85	Ci	<LLD	<LLD
krypton-85m	Ci	<LLD	<LLD
krypton-87	Ci	<LLD	<LLD
krypton-88	Ci	<LLD	<LLD
xenon-133	Ci	4.14E-07	<LLD
xenon-135	Ci	6.38E-01	2.41E+00
xenon-135m	Ci	3.35E+00	5.46E+00
xenon-138	Ci	<LLD	<MDA
tritium	Ci	2.42E+00	2.21E+00
nitrogen-13	Ci	5.84E-01	3.79E+00
Total for period	Ci	6.99E+00	1.39E+01

2. Iodines

iodine-131	Ci	3.31E-05	2.12E-05
iodine-133	Ci	4.10E-05	2.63E-05
iodine-135	Ci	2.49E-06	<LLD
Total for period	Ci	7.66E-05	4.75E-05

3. Particulates

chromium-51	Ci	2.62E-04	1.07E-04
manganese-54	Ci	2.02E-04	1.27E-04
iron-59	Ci	3.17E-05	4.84E-06
cobalt-58	Ci	4.76E-05	1.12E-05
cobalt-60	Ci	6.60E-04	3.59E-04
strontium-89	Ci	2.36E-06	6.73E-06
strontium-90	Ci	1.13E-07	2.89E-08
cesium-134	Ci	<LLD	<LLD
cesium-137	Ci	7.14E-08	<LLD
barium-lanthanum-140	Ci	<LLD	<LLD
cerium-144	Ci	2.42E-06	<LLD
Total for period	Ci	1.21E-03	6.16E-04

<LLD means that all measurement results were less than the lower limit of detection as required by DAEC Technical Specifications.

SEMI-ANNUAL REPORT SUMMARY
(January 1, 1992 - June 30, 1992)

SHIPMENTS MADE TO BURIAL FACILITIES

Final Disposition: Barnwell, SC

<u>Waste Type</u>	<u>#</u>	<u>Volume M3</u>	<u>Activity (Ci)</u>
Resin and Mechanical Aqueous Filters	3	14.9	1.75E+02

SHIPMENTS MADE TO PROCESSING FACILITIES

Shipped To: Scientific Ecology Group, Oak Ridge, TN

<u>Waste Type</u>	<u>#</u>	<u>Volume M3</u>	<u>Activity (Ci)</u>
Dry Active Waste	3	103.8	8.26E-01

TOTAL SOLID WASTE DISPOSITION

	<u>Volume M3</u>	<u>Activity (Ci)</u>
Waste Shipped:	118.7	1.76E+02
Waste Buried*:	27.0	1.76E+02

Mode of Transport: Exclusive-Use Vehicle #

Number of Shipments: 6

Destination: Barnwell, SC	3
Oak Ridge, TN	3

Waste Classification:	A-Unstable	3
	A-Stable	2
	B	1
	C	0

* Includes waste buried directly by DAEC and waste buried by processing facilities.

SUMMARY
(January 1, 1992 - June 30, 1992)

MAJOR NUCLIDE COMPOSITION
SPENT RESINS AND AQUEOUS MECHANICAL FILTERS

<u>PRINCIPLE NUCLIDES</u>	<u>1ST QTR (Ci)</u>	<u>2ND QTR (Ci)</u>	<u>TOTAL (Ci)</u>	<u>PERCENT ABUNDANCE</u>
Co-60	5.86E+00	5.40E+01	5.99E+01	34.28
Fe-55	8.67E+00	6.10E+01	6.97E+01	39.90
Cs-137	8.07E-01	1.35E+00	2.15E+00	1.23
Mn-54	6.77E-01	2.86E+01	2.93E+01	16.77
Cs-134	2.30E-01	4.70E-01	7.00E-01	0.40
Co-58	1.09E-01	8.81E+00	8.92E+00	5.11
Cr-51	2.17E-01	7.35E-01	9.52E-01	0.55
Ni-63	0.00E+00	1.18E+00	1.18E+00	0.67
Ni-59	0.00E+00	0.00E+00	0.00E+00	0.00
Fe-59	0.00E+00	1.01E+00	1.01E+00	0.58
Zn-65	0.00E+00	5.32E-01	5.32E-01	0.30
Ag-110M	0.00E+00	0.00E+00	0.00E+00	0.00
H-3	6.71E-03	7.41E-03	1.41E-02	0.01
C-14	6.78E-02	2.69E-01	3.36E-01	0.19
TRUs*	6.53E-06	5.81E-06	1.23E-05	0.00
Others**	0.00E+00	1.17E-04	1.17E-04	0.00
<u>TOTAL</u>	<u>1.66E+01</u>	<u>1.58E+02</u>	<u>1.75E+02</u>	<u>100.00</u>

* Alpha Emitting Transuranics with Half-Life >5 years, Pu-241 and Cm-242

** Sr-89, Sr-90, Co-57, U-233

SUMMARY
(January 1, 1992 - June 30, 1992)

MAJOR NUCLIDE COMPOSITION
DRY ACTIVE WASTE

<u>PRINCIPLE NUCLIDES</u>	<u>1ST QTR (Ci)</u>	<u>2ND QTR (Ci)</u>	<u>TOTAL (Ci)</u>	<u>PERCENT ABUNDANCE</u>
Co-60	4.75E-03	2.39E-01	2.44E-01	30.00
Fe-55	1.08E-02	5.43E-01	5.54E-01	67.00
Mn-54	2.36E-04	1.18E-02	1.21E-02	1.00
Ni-63	3.21E-04	1.61E-02	1.64E-02	2.00
TRUs*	0.00E+00	0.00E+00	0.00E+00	0.00
C-14	1.29E-06	6.46E-05	6.59E-05	0.00
Ni-59	0.00E+00	0.00E+00	0.00E+00	0.00
Sr-90	0.00E+00	0.00E+00	0.00E+00	0.00
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TOTAL	1.61E-02	8.10E-01	8.26E-01	100.00

* Alpha Emitting Transuranics with Half-Life >5 years Pu-241 and Cm-242

SUMMARY OF CHANGES

TO THE OFFSITE DOSE ASSESSMENT MANUAL (ODAM)

For the period of January 1, 1992, through June 30, 1992, no changes were made to the Offsite Dose Assessment Manual (ODAM).

SUMMARY OF CHANGES

TO

THE PROCESS CONTROL PLAN (PRCP)

During the period of January 1, 1992 through June 30, 1992, changes were made to pages 12, 24 and 26 of the Process Control Plan. The changes allow for transfer of resins and sludges from temporary local installations in addition to the normal Radwaste Solids Handling System.

The change was made due to chemical decontamination of recirculation piping that was performed during the refueling outage. During this process, resin waste produced by temporary equipment was transferred into a high integrity container where it was dewatered and processed for shipment and burial.