

LICENSE TERMINATION REPORT

USNRC LICENSE NO. SNM-951

DETERMINATION OF RADIOLOGICAL SURVEY ACCEPTANCE CRITERIA
FOR LICENSE TERMINATION SURVEYS

DECEMBER 1, 1992

WESTINGHOUSE ELECTRIC CORPORATION
LARGE, PA

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PDR ADOCK 07000997
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Report #004

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DETERMINATION OF RADIOLOGICAL SURVEY ACCEPTANCE CRITERIA
FOR LICENSE TERMINATION SURVEYS

TABLE OF CONTENTS

	<u>Page Number</u>
Purpose	1
Scope	1
Basis for Acceptance Criteria	1
Justification for Using Enriched Uranium Limits	2
Soil Concentration Limit	2
Appendix A - USNRC License Number SNM-951	
Appendix B - Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites	
Appendix C - Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material	
Appendix D - Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations (46 FR 52601; October 23, 1981)	
Appendix E - Analytical Laboratory Analysis Reports	

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Report #004 **117646**

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DETERMINATION OF RADIOLOGICAL SURVEY ACCEPTANCE CRITERIA
FOR LICENSE TERMINATION SURVEYS

Purpose

The Westinghouse Electric Corporation is preparing to request the termination of USNRC License Number SNM-951 for the site located in Large, PA. This report is one of a series of reports that presents the necessary information to establish that the site meets all applicable regulatory requirements so that the license can be terminated by the United States Nuclear Regulatory Commission.

Scope

This report establishes and justifies the radiological survey acceptance criteria to be used as part of the license termination surveys. These criteria are based on published information from the U. S. Nuclear Regulatory Commission. Information is presented based on measured analytical data to establish the isotopic mixture of radionuclides on the site. Based on this, the acceptable soil concentration criteria is derived. These acceptance criteria will be used as the limit for comparison against all other license termination surveys.

Basis for Acceptance Criteria

U. S. Nuclear Regulatory Commission License Number SNM-951, which covers the Large Site, is a broad scope license which authorized the possession of Byproduct, Source and Special Nuclear Material in moderate quantities (see Appendix A). The most recent license issued is limited in the authorized possession limits. Historically, the most important use of radioactive materials on the site was the use of highly enriched uranium as part of the NERVA project conducted during the 1960's to early 1970's. Measurements made of the sludge collected over the years in the waste water collection tanks verify that unirradiated enriched uranium is the principle radioactive material of importance. While other radioactive materials were used, their use was in small quantities or as sealed sources so that their contribution to potential contamination is small.

As a basis for establishing acceptance criteria for the license termination surveys, the primary USNRC document utilized was the "Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites" (see Appendix B). Although the Westinghouse Large Site is not covered by the Site Decommissioning Management Plan (SDMP) program, this document defines acceptable criteria for uranium contamination. In summary, the following three major acceptance criteria are established:

- 1) Surface contamination limits for facilities and equipment. (See Appendix C).
- 2) Soil Contamination limits for uranium. (See Appendix D).
- 3) Indoor gamma exposure rate of less than five microrentgen per hour above natural background. (See Appendix A, Section II.A.3).

Table 1 compiles this information into the basic set of acceptance criteria which will be used for comparison against the license termination surveys. Justification for these selections is provided in other sections of this report.

Justification For Using Enriched Uranium Limits

Historically, unirradiated enriched uranium has been the principle radioactive material used on the site. There has also existed a waste water collection system known as the Monitored Drain Line (MDL) system, which serviced all the areas where unencapsulated radioactive materials had been used. All collected water was directed to three holding tanks located within Building #9 for sampling and treatment prior to discharge. Thus, the sludge present in these tanks represented an average of the radioactive materials that were used over the years. Samples of the sludge were collected and submitted for analytical analysis. The results are summarized in Table 2 and the analytical laboratory analysis reports for those samples are included in Appendix E. The average isotopic enrichment for the four samples is 65% U-235.

Soil Concentration Limit

Option 1 presented in Appendix D establishes a limit of 30 pCi/gram for enriched uranium. This was therefore selected as the basic acceptance criteria for soil concentration measurements. As a working criteria for gamma spectroscopy measurements, an equivalent working criteria of 1 pCi/gram of U-235 was established based on a value of 30 for the ratio of total uranium to the U-235 isotope. Initially this ratio was established on the basis of two factors:

- 1) This ratio is generally considered the upper limit for enriched uranium.
- 2) The analytical results presented in Table 2 give an average ratio of about 29.

During the removal of the Monitored Drain Line system, a large number of soil samples were taken and analyzed. In some cases, the samples were analyzed by both gamma and alpha spectroscopy.

Table 3 presents a summary of the alpha spectrometry results and calculates the activity ratio of the total uranium to U-235. This information confirms that a value of 30 as originally assumed in the

project is valid. Table 4 compares the results obtained by both alpha and gamma spectrometry for a number of samples. In this table the ratio value of 30 is used to convert the gamma spectrometry results for U-235 to total uranium. The gamma spectrometry results using the ratio of 30 provides a conservative estimate of the total uranium present in the soil as compared to the alpha spectrometry results. Using the gamma spectrometry method overestimates the total uranium concentration by a factor of 4 to 5 on the average. This information confirms the following:

- 1) The activity ratio of 30 for total uranium to U-235 is reasonable.
- 2) Using a working limit of 1 pCi/gram for U-235 and the gamma spectrometry method provides a conservative estimate for the total uranium concentration in soil.

Appendix E includes the analytical laboratory analysis reports for all the samples used to derive the information presented in Tables 3 and 4.

TABLE 1

RADIOLOGICAL SURVEY ACCEPTANCE CRITERIA

I. Acceptable Surface Contamination Levels

Measurement	Limit (dpm/100 cm ²)
<hr/>	
Total Surface Contamination	
Average Value	- 5,000
Maximum Value	-15,000
Removable Surface Contamination	- 1,000

II. Acceptable Soil Contamination Levels

All Uranium Isotopes	- 30 pCi/gram
U-235 Isotope	- 1 pCi/gram (Note 1)

III. Gamma Dose Rate

Dose Rate measured at 1 meter above the surface	- 5 micro Roentgen per hour above natural background
--	--

Note 1: The working limit for U-235 is based on the ratio of Uranium to U-235 being 30. Information is presented in this report to justify this working limit.

TABLE 2

ANALYSIS OF ANALYTICAL RESULTS FOR SAMPLES TAKEN
FROM MONITORED DRAIN LINE SYSTEM HOLDING TANKS

Activity Distribution

SAMPLE NUMBER	U-234 pCi/gm	U-235 pCi/gm	U-238 pCi/gm	U-233 pCi/gm	U-TOTAL pCi/gm	RATIO U-TOT/U-235
91-1924	1550	514	17	8	2089	4.1
91-1925	19400	321	79	46	19846	61.8
91-1926	4200	52	1	6	4259	81.9
91-1933	301	11	1	2	315	27.9
AVERAGE	6363	225	25	15	6627	29.5

Isotopic Distribution (Weight Percent)

SAMPLE NUMBER	U-234	U-235	U-238	U-233	U-TOTAL
91-1924	0.09%	82.38%	17.53%	0.0003%	100.0%
91-1925	0.80%	38.40%	60.80%	0.0013%	100.0%
91-1926	2.33%	83.25%	14.42%	0.0021%	100.0%
91-1933	0.51%	55.36%	44.12%	0.0019%	100.0%
AVERAGE	0.93%	64.85%	34.22%	0.0014%	100.0%

TABLE 3

MEASUREMENT OF TOTAL URANIUM TO U-235 RATIO

PROJ.	LAB. SPL#	ALPHA SPECTROMETRY RESULTS				TOTAL	TOTAL
		U-238	U-235	U-234	U-233	URANIUM	URANIUM
		pCi/gm	pCi/gm	pCi/gm	pCi/gm	pCi/gm	TO U-235
	91-1924	1.70E+01	5.14E+02	1.55E+03	8.00E+00	2.09E+03	4.1
	91-1925	7.90E+01	3.21E+02	1.94E+04	4.60E+01	1.98E+04	61.8
	91-1926	1.00E+00	5.20E+01	4.20E+03	6.00E+00	4.26E+03	81.9
	91-1933	1.00E+00	1.10E+01	3.01E+02	2.00E+00	3.15E+02	28.6
002	92-1260	3.70E-01	1.70E-01	1.40E+00	3.40E-01	2.28E+00	13.4
003	92-1261	2.50E-01	2.60E-01	3.30E-01	2.50E-01	1.09E+00	4.2
004	92-1262	3.50E-01	2.00E-01	3.60E-01	2.90E-01	1.20E+00	6.0
005	92-1263	9.70E-01	3.50E-01	1.20E+00	3.20E-01	2.84E+00	8.1
006	92-1394	5.37E-01	1.00E-01	1.50E+00	ND	2.14E+00	21.4
007	92-1395	1.50E-02	1.00E-01	8.90E-02	3.98E-01	6.02E-01	6.0
008	92-1396	7.91E-01	7.56E-02	1.10E+00	2.80E-02	1.99E+00	26.4
009	92-1397	5.30E-01	2.00E-01	8.00E-01	2.34E-01	1.76E+00	8.8
010	92-1398	7.64E-01	4.87E-01	1.10E+00	5.70E-01	2.92E+00	6.0
011	92-1399	5.05E-01	3.40E-02	7.00E-01	ND	1.24E+00	36.4
012	92-1400	5.12E-01	1.90E-02	8.00E-01	2.80E-02	1.36E+00	71.5
013	92-1401	9.14E-01	3.20E-02	8.00E-01	2.70E-02	1.77E+00	55.4
014	92-1402	8.45E-01	1.00E-01	9.00E-01	3.70E-02	1.88E+00	18.8
015	92-1403	9.82E-01	3.00E-01	2.00E+00	8.32E-02	3.37E+00	11.2
016	92-1404	6.80E-01	3.40E-02	1.35E+00	ND	2.06E+00	60.7
017	92-1404	5.78E-01	3.20E-02	7.00E-01	5.90E-02	1.37E+00	42.8
018	92-1405	6.15E-01	9.46E-02	2.00E+00	ND	2.71E+00	28.6
019	92-1406	4.90E-01	2.90E-02	6.00E-01	2.00E-02	1.14E+00	39.3
020	92-1407	1.03E+00	2.70E-02	1.20E+00	ND	2.26E+00	83.6
021	92-1408	1.04E+00	2.90E-02	1.40E+00	1.80E-02	2.49E+00	85.8
052	92-1471	9.28E-01	4.68E-02	1.40E+00	1.10E-02	2.39E+00	51.0
069	92-1488	1.42E+00	1.40E+00	4.00E+00	5.48E-01	7.37E+00	5.3
085	92-1535	8.64E-01	3.00E-01	7.60E+00	1.40E-02	8.78E+00	29.3
086	92-1536	7.27E-01	1.89E-01	3.30E+00	2.20E-02	4.24E+00	22.4
087	92-1537	1.14E+00	4.00E-01	8.30E+00	1.10E-02	9.85E+00	24.6
119	92-1593	5.05E-01	2.90E-02	3.00E-01	1.10E-02	8.45E-01	29.1
127	92-1601	1.51E-01	2.00E-01	1.10E+00	1.75E-01	2.03E+00	10.1
128	92-1602	1.5E-01	1.1E+00	2.00E+00	1.43E+00	5.20E+00	5.2
179	92-1672	8.03E-01	1.00E-01	2.70E+00	1.80E-02	3.62E+00	36.2
180	92-1673	1.07E+00	5.56E-01	1.03E+00	1.90E-02	2.68E+00	4.8
181	92-1674	1.29E+00	4.00E-01	8.80E+00	1.20E-02	1.05E+01	26.3
218	92-1832	9.46E-01	5.16E-02	9.00E-01	2.50E-02	1.92E+00	37.3
						AVERAGE	30.3
						STD. DEV.	24.2

TABLE 4

COMPARISON OF ALPHA SPECTROMETRY RESULTS vs. GAMMA SPECTROMETRY RESULTS FOR URANIUM

LICENSE TERMINATION PROJECT
WESTINGHOUSE ELECTRIC CORP.
LARGE, PENNSYLVANIA

SAMPLE NUMBER		GAMMA SPECTROMETRY RESULTS	ALPHA SPECTROMETRY RESULTS					RATIO	TOTAL URANIUM BASED ON ALPHA SPECTROMETRY	TOTAL URANIUM BASED ON GAMMA SPECTROMETRY	TOTAL URANIUM RATIO GAMMA/ALPHA SPECTROMETRY	U-235 ENRICHMENT
PROJECT ID	LAB SPL#	(wet basis) U-235 pCi/gm	(dry basis) U-238 pCi/gm	U-235 pCi/gm	U-234 pCi/gm	U-233 pCi/gm	GAMMA/ALPHA SPECTROMETRY FOR U-235	pCi/gm	pCi/gm	% U-235		
002	92-1260	1.00E-01	3.70E-01	1.70E-01	1.40E+00	3.40E-01	0.59	2.3	3.0	1.3	6.65%	
003	92-1261	5.26E-02	2.50E-01	2.60E-01	3.30E-01	2.50E-01	0.20	1.1	1.6	1.4	13.88%	
004	92-1262	4.72E-02	3.50E-01	2.00E-01	3.60E-01	2.90E-01	0.24	1.2	1.4	1.2	8.14%	
005	92-1263	1.30E-01	9.70E-01	3.50E-01	1.20E+00	3.20E-01	0.37	2.8	3.9	1.4	5.30%	
006	92-1394	3.22E-01	5.37E-01	1.00E-01	1.50E+00	ND	3.22	2.1	9.7	4.5	2.81%	
007	92-1395	5.40E-01	1.50E-02	1.00E-01	8.90E-02	3.98E-01	5.40	0.6	16.2	26.9	50.79%	
008	92-1396	3.20E-01	7.91E-01	7.56E-02	1.10E+00	2.80E-02	4.23	2.0	9.6	4.8	1.46%	
009	92-1397	3.80E-01	5.30E-01	2.00E-01	8.00E-01	2.34E-01	1.90	1.8	11.4	6.5	5.53%	
010	92-1398	3.60E-01	7.64E-01	4.87E-01	1.10E+00	5.70E-01	0.74	2.9	10.8	3.7	8.99%	
011	92-1399	3.80E-01	5.05E-01	3.40E-02	7.00E-01	ND	11.18	1.2	11.4	9.2	1.03%	
012	92-1400	3.60E-01	5.12E-01	1.90E-02	8.00E-01	2.80E-02	18.95	1.4	10.8	7.9	0.57%	
013	92-1401	1.40E-01	9.14E-01	3.20E-02	8.00E-01	2.70E-02	4.38	1.8	4.2	2.4	0.54%	
014	92-1402	3.30E-01	8.45E-01	1.00E-01	9.00E-01	3.70E-02	3.30	1.9	9.9	5.3	1.80%	
015	92-1403	3.60E-01	9.82E-01	3.00E-01	2.00E+00	8.32E-02	1.20	3.4	10.8	3.2	4.52%	
016	92-1404	2.40E-01	6.80E-01	3.40E-02	1.35E+00	ND	7.06	2.1	7.2	3.5	0.77%	
017	92-1404	2.20E-01	5.78E-01	3.20E-02	7.00E-01	5.90E-02	6.88	1.4	6.6	4.8	0.85%	
018	92-1405	1.27E-01	6.15E-01	9.46E-02	2.00E+00	ND	1.34	2.7	3.8	1.4	2.33%	
019	92-1406	2.20E-01	4.90E-01	2.90E-02	6.00E-01	2.00E-02	7.59	1.1	6.6	5.8	0.91%	
020	92-1407	1.60E-01	1.03E+00	2.70E-02	1.20E+00	ND	5.93	2.3	4.8	2.1	0.40%	
021	92-1408	1.44E-01	1.04E+00	2.90E-02	1.40E+00	1.80E-02	4.97	2.5	4.3	1.7	0.43%	
052	92-1471	5.80E-01	9.28E-01	4.68E-02	1.40E+00	1.10E-02	12.39	2.4	17.4	7.3	0.78%	
069	92-1488	1.29E+00	1.42E+00	1.40E+00	1.40E+00	5.48E-01	0.92	7.4	38.7	5.3	13.25%	
085	92-1535	1.26E+00	8.64E-01	3.00E-01	7.60E+00	1.40E-02	4.20	8.8	37.8	4.3	5.10%	
086	92-1536	4.64E-01	7.27E-01	1.89E-01	3.30E+00	2.20E-02	2.46	4.2	13.9	3.3	3.87%	
087	92-1537	5.00E-01	1.14E+00	4.00E-01	8.30E+00	1.10E-02	1.25	9.9	15.0	1.5	5.16%	
119	92-1593	1.30E-01	5.05E-01	2.90E-02	3.00E-01	1.10E-02	4.48	0.8	3.9	4.6	0.88%	
127	92-1601	6.17E-01	5.51E-01	2.00E-01	1.10E+00	1.75E-01	3.09	2.0	18.5	9.1	5.33%	
128	92-1602	5.22E-01	7.73E-01	1.00E+00	2.00E+00	1.43E+00	0.52	5.2	15.7	3.0	16.70%	
179	92-1672	3.47E-01	8.03E-01	1.00E-01	2.70E+00	1.80E-02	3.47	3.6	10.4	2.9	1.89%	
180	92-1673	5.93E-01	1.07E+00	5.16E-01	1.03E+00	1.90E-02	1.07	2.7	17.8	6.7	7.45%	
181	92-1674	7.89E-01	1.29E+00	4.00E-01	8.80E+00	1.20E-02	1.97	10.5	23.7	2.3	4.58%	
218	92-1832	4.11E-01	9.46E-01	5.16E-02	9.00E-01	2.50E-02	7.97	1.9	12.3	6.4	0.84%	
AVERAGE		3.89E-01	7.43E-01	2.30E-01	1.93E+00	1.56E-01	4.2	3.1	11.7	4.9	5.74%	
STD. DEV.		2.91E-01	3.01E-01	2.94E-01	2.19E+00	2.80E-01	4.1	2.5	8.7	4.6	9.09%	

APPENDIX A

USNRC LICENSE NUMBER SNM-951

COPY

UNITED STATES
ATOMIC ENERGY COMMISSION

SPECIAL NUCLEAR MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material", a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		3. License No.
1. Name	Westinghouse Electric Corporation	SNM-951
2. Address	3 Gateway Center Pittsburgh, Pennsylvania 15222	4. Expiration Date
		April 30, 1974
		5. Docket No.
		70-997

6. Special Nuclear Material	7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license
Uranium enriched in the U-235 isotope	350 grams U-235

8. Authorized use
For research and development in accordance with the statements, representations and conditions specified in the licensee's application dated March 17, 1972.

CONDITIONS

9. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.
Authorized places of use: The licensee's Astronuclear Laboratory, Large, Pennsylvania, except as noted in Item 10 below.

MATERIAL LICENSE

License Number SNM-951

Supplementary Sheet

10. The licensee is authorized to possess and use up to 100 grams of U-235 for purposes of nonnuclear, nondestructive, modification, demonstration and testing anywhere in the United States where the Atomic Energy Commission maintains jurisdiction for regulating the use of special nuclear material provided that the conditions of Paragraph 13 of the license application are met.

Date MAY 25 1972

COPY

For the U. S. Atomic Energy Commission
Original Signed byRobert L. Layfield
by Materials BranchDivision of Materials Licensing
Washington, D. C. 20545



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

DEC 13 1972

L:FFR:TRW
70-997
SNM-951, Amendment No. 1

Westinghouse Electric Corporation
ATTN: Mr. Karl L. Schendel
License Administrator
Monroeville Nuclear Center
P. O. Box 355
Pittsburgh, Pennsylvania 15230

Gentlemen:


Pursuant to 10 CFR 70, Special Nuclear Material License No. SNM-951, is hereby amended to authorize the possession of 250 grams of encapsulated plutonium containing at least 80% Pu-238 for use as a heart source for operation of an artificial heart device in accordance with the procedures described in applications dated October 13, November 17, and December 6, 1972, subject to the conditions listed below. Also, the possession limit for U-235 is increased to 450 grams, at any enrichment.

In addition to the initial leak test described in page 37 of application dated October 13, 1972, sealed plutonium sources shall be leak tested in accordance with the enclosed license condition.

The licensee is exempt from the requirements of Section 70.24, 10 CFR Part 70, insofar as this section applies to the material covered by this license.

All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION


R. B. Chitwood, Chief
Fuel Fabrication and Reprocessing
Branch
Directorate of Licensing

Enclosure:
As Stated Above

LICENSE CONDITION FOR LEAK TESTING

SEALED PLUTONIUM SOURCES

- A. Each plutonium source shall be tested for leakage at intervals not to exceed six (6) months. In the absence of a certificate from a transferor indicating that a test has been made within six (6) months prior to the transfer, the sealed source shall not be put into use until tested.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of alpha contamination on the test sample. The test sample shall be taken from the source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable alpha contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired by a person appropriately licensed to make such repairs or to be disposed of in accordance with the Commission regulations. Within five (5) days after determining that any source has leaked, the licensee shall file a report with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545, describing the source, the test results, the extent of contamination, the apparent or suspected cause of source failure, and the corrective action taken. A copy of the report shall be sent to the Director of the nearest AEC Regional Compliance Office listed in Appendix D of Title 10, Code of Federal Regulations, Part 20.
- D. The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six (6) months prior to the date of use or transfer.



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

APR 20 1973

L:FFRB:RTW
70-997
SNM-951, Amendment No. 2


Westinghouse Electric Corporation
ATTN: Mr. Karl L. Schendel
License Administrator
Monroeville Nuclear Center
P. O. Box 355
Pittsburgh, Pennsylvania 15230

Gentlemen:

Pursuant to 10 CFR 70, Amendment No. 1 of Special Nuclear Material License No. SNM-951 is hereby revised to reduce the possession limit for encapsulated plutonium to 160 grams, and to reduce the possession limit for U-235 to 175 grams.

All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION


L. C. Rouse, Chief
Fuel Fabrication and Reprocessing
Branch
Directorate of Licensing



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JUL 03 1974

L:FFRB:RTW
70-997
SNM-951, Amendment No. 3

Westinghouse Electric Corporation
ATTN: Mr. Karl Schendel
License Administrator
P.O. Box 355
Pittsburgh, Pennsylvania 15230

Gentlemen:

In response to your application dated March 18, 1974 and pursuant to Title 10, Code of Federal Regulations, Part 70, Special Nuclear Material License No. SNM-951 is hereby amended to extend the expiration date to May 31, 1979.

All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION

R. J. Dube

R. J. Dube
Fuel Fabrication and Reprocessing
Branch
Directorate of Licensing

**U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE**

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated April 15, 1978,
1. Westinghouse Electric Corporation Westinghouse Building		3. License number SNM-951 is amended in its entirety to read as follows:
2. Gateway Center Pittsburgh, Pennsylvania 15222		4. Expiration date July 31, 1983
		5. Docket or Reference No. 070-00997
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Uranium 235	A. Enriched uranium Any form	A. 140 grams
B. Natural and/or Depleted uranium	B. Any	B. 50 kilograms
C. Any byproduct material with Atomic Nos. 1-83, inclusive	C. Sealed sources or special form	C. Not to exceed 1 curie total
D. Any byproduct material	D. Any	D. As specified in 10 CFR 33.11(b)
9. Authorized use:		
A. through D. Research and development as defined in 10 CFR 70.4(j) and instrument calibration.		

CONDITIONS

10. Licensed material shall be used only at Westinghouse Electric Corporation, Advanced Energy Systems Division, Large, Pennsylvania, except that 100 grams uranium 235, 25 kilograms natural and/or depleted uranium and 1.25 millicuries of any byproduct material may also be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.

MATERIALS LICENSE

Supplementary Sheet

License Number SNM-951

Docket or
Reference No. 070-00997

CONDITIONS

Amendment No. 04

(continued)

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation and Safety Committee.

13. A. (1) Each sealed source acquired from another person and containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

(2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.

(3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.

C. Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.

D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

MATERIALS LICENSE

Supplementary Sheet

License Number SNM-951

Docket or
Reference No. 070-00997

CONDITIONS

Amendment No. 04

13. continued

E. If the test required by Subsection A. or C. of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region I, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.

14. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

15. Individuals involved in operations which utilize, at any one time, more than 100 millicuries of Hydrogen 3 in a non-contained form, other than metallic foil, shall have bioassays performed within one week following a single operation and at weekly intervals for continuing operations.

16. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Section 71.5, Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For Transport."

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications dated April 15, 1977, October 28, 1977, and letter with attachments dated June 30, 1978.

JUL 10 1978

For the U. S. Nuclear Regulatory Commission

by 5 Radioisotopes Licensing Branch
Division of Materials and Fuel Cycle
Facility Licensing

Date _____

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SNM-951

Docket or Reference number

070-00997

Amendment No. 05

Westinghouse Electric Corporation
Westinghouse Building
Gateway Center
Pittsburgh, Pennsylvania 15222

In accordance with letter dated October 13, 1983, License Number SNM-951 is amended as follows:

Items 6., 7., 8. and 9. are amended to add:

- | | | |
|---|----------------------------------|--|
| 6. Byproduct, source, and/or special nuclear material | 7. Chemical and/or physical form | 8. Maximum amount that licensee may possess at any one time under this license |
| E. Neptunium 237 | E. Sealed Sources | E. 1 millicurie |
| 9. Authorized use | | |
| E. Research and development as defined in 10 CFR 70.4(j) and instrument calibration | | |

Condition 17. is amended to read:

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated April 15, 1977, October 28, 1977, letter with attachments dated June 30, 1978 and letter dated October 13, 1983. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

For the U.S. Nuclear Regulatory Commission

Date NOV 14 1983

By

John E. Glenn
Nuclear Materials and Safeguards Branch
Region I
King of Prussia, Pennsylvania 19406

MATERIALS LICENSE

Amendment No. 06

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated June 30, 1983	
1. Westinghouse Electric Corporation		3. License number SNM-951 is amended	
2. P. O. Box 355 Pittsburgh, Pennsylvania 15230		in its entirety to read as follows:	
		4. Expiration date January 31, 1989	
		5. Docket or Reference No. 070-00997	
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license	
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license	
A. Uranium 235	A. Enriched uranium any form	A. 200 grams	
B. Uranium 233	B. Enriched uranium any form	B. 1 gram	
C. Plutonium 238/242	C. Any form	C. 20 millicuries	
D. Natural and/or depleted uranium	D. Any form	D. 1050 kilograms	
E. Any byproduct material with Atomic Nos. 1-83, inclusive	E. Sealed sources or special form	E. Not to exceed 5 curies total	
F. Any byproduct material specified in Section 33.100, Schedule A, of 10 CFR Part 33.11(b)	F. Any form	F. As specified in Section 33.11(b) of 10 CFR 33	
G. Americium 241	G. Any form	G. 30 millicuries	
H. Neptunium 237	H. Any form	H. 20 millicuries	

9. Authorized use

A. through H. Research and development as defined in 10 CFR 70.4(j) and instrument calibration.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SNM-951

Docket or Reference number

070-00997

Amendment No. 06

CONDITIONS

10. Licensed material shall be used only at Westinghouse Electric Corporation, Advanced Energy Systems Division, Large, Pennsylvania, except that 100 grams uranium 235, 25 kilograms natural and/or depleted uranium and 1.25 millicuries of any byproduct material may also be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instruction and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation and Safety Committee.
13. A. (1) Each sealed source acquired from another person and containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for contamination and/or leakage prior to use. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
(2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting material or 10 microcuries or less of alpha emitting material.
(3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
- B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.
- C. Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed three months.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SNM-951

Docket or Reference number

070-00997

Amendment No. 06

(13.continued)

CONDITIONS

- D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- E. If the test required by Subsection A. or C. of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U.S. Nuclear Regulatory Commission, Region I, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
14. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
15. Licensed material shall not be used in or on human beings or in products distributed to the public.
16. The licensee shall conduct a physical inventory every six (6) months to account for all licensed material received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of licensed material and the date of the inventory.
17. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."
18. Except for plutonium contained in a medical device designed for individual human application, no plutonium, regardless of form, shall be delivered to a carrier for shipment by air transport or transported in an aircraft by the licensee except in packages the design of which the NRC has specifically approved for transport of plutonium by air.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SNM-951

Docket or Reference number

070-00997

Amendment No. 06

(continued)

CONDITIONS

- 19. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated June 30, 1983, and letter dated November 28, 1983 with Revision Number 1 to the June 30, 1983 application dated November 28, 1983. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Date DEC 28 1983

For the U.S. Nuclear Regulatory Commission

Original Signed By:

John D. Kinneman

By

Nuclear Materials and Safeguards Branch
Region I

King of Prussia, Pennsylvania 19406

MATERIALS LICENSE

Amendment No. 07

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated December 21, 1988	
1. Westinghouse Electric Corporation		3. License number SNM-951 is amended in its entirety to read as follows:	
2. P. O. Box 355 Pittsburgh, Pennsylvania 15230		4. Expiration date October 31, 1996	
		5. Docket or Reference No 070-00997	
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license	
A. Uranium 235	A. Enriched uranium any form	A. 100 grams	
B. Uranium 235	B. Sealed sources or special form	B. 200 grams	
C. Any byproduct material with Atomic Nos. 1-83, inclusive	C. Sealed sources or special form	C. Not to exceed 10 millicuries per source and 100 millicuries total	
D. As specified in Section 33.100, Schedule A of 10 CFR Part 33 (Type C Broad License)	D. Any	D. See Condition 12	
E. Americium 241	E. Any form	E. 30 millicuries	
F. Neptunium 237	F. Any form	F. 20 millicuries	

9. Authorized use

A. through F. Research and development as defined in 10 CFR 70.4 and 30.4, and instrument calibration

CONDITIONS

- 10.A. Licensed material may be used only at the licensee's facilities at Westinghouse Electric Corporation, Advanced Energy Systems Division, Large, Pennsylvania.
- B. Licensed material listed in Subitem 6.A and 1.25 millicuries of material listed in subitem 6.D may be used at temporary job sites of the licensee anywhere in the United States where the U. S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of license material.

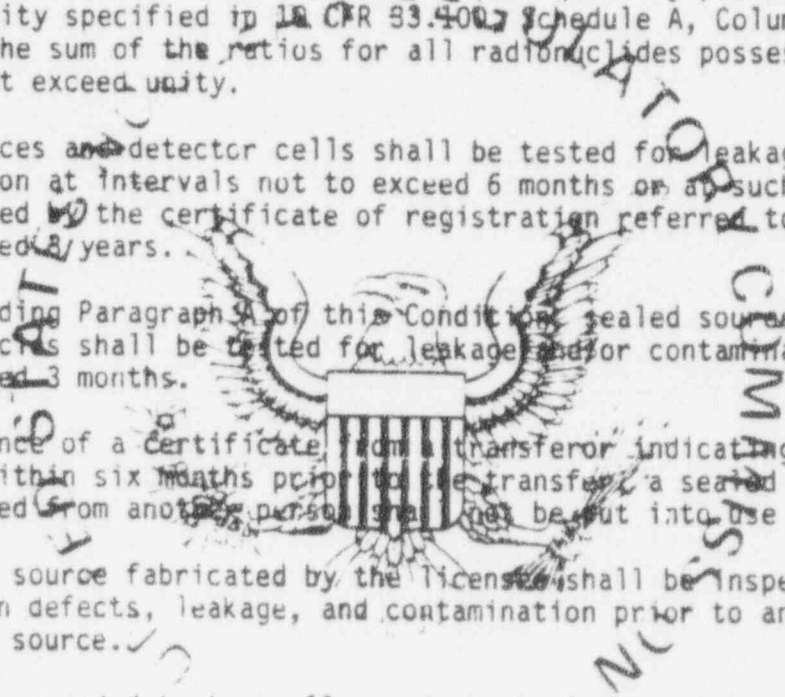
MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number	SNM-951
Docket or Reference number	070-00997
Amendment No. 07	

(Continued)

CONDITIONS

11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Protection Committee .
- B. The Radiation Safety Officer for this license is R.G. Kitzer, Jr.
12. If only one radionuclide is possessed, the possession limit is the quantity specified for that radionuclide in 10 CFR 33.100, Schedule A, Column II. If two or more radionuclides are possessed, the possession limit is determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in 10 CFR 33.400, Schedule A, Column II, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.
13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed 8 years.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- E. Sealed sources and detector cells need not be leak tested if:
 - (i) they contain only hydrogen 3; or
 - (ii) they contain only a gas; or
 - (iii) the half-life of the isotope is 30 days or less; or
 - (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
 - (v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.



MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number	SNM-951
Docket or Reference number	070-00997
Amendment No. 07	

(13. Continued)

CONDITIONS

- F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 425 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source involved, the test results, and corrective action taken.
- G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
14. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 5 years from the date of each inventory.
15. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
16. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."
17. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated December 21, 1988
 - B. Letter dated July 13, 1990
 - C. Letter dated May 15, 1991
 - D. Letter dated July 18, 1991
 - E. Letter dated August 14, 1991

Date

OCT 01 1991

For the U.S. Nuclear Regulatory Commission

Original Signed By:
John D. Kinnaman
 Nuclear Materials Safety Branch
 Region I
 King of Prussia, Pennsylvania 19406

REQUIREMENTS FOR MATERIALS LICENSEES

As a holder of an NRC materials license, you must:

1. Operate in accordance with NRC regulations contained in 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Possess radioactive material only in the quantity(ies) and form(s) indicated in your license.
3. Use radioactive material only for the purpose(s) indicated in your license.
4. Notify NRC in writing of any change in mailing address (no fee required if the location of radioactive material remains the same).
5. Request and obtain appropriate amendments if you plan to change the ownership of your organization, change locations of radioactive material, or make any other changes in your facility or program which are contrary to your license conditions or representations made in your license application and any supplemental correspondence with NRC. A license fee may be charged for the amendment as specified in 10 CFR Part 170.
6. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date on your license. You should receive a reminder notice approximately 90 days before the expiration date. However, it is your responsibility to file a renewal application at the proper time. Possession of radioactive material after your license expires is a violation of NRC regulations.
7. Request termination of your license if you plan to permanently discontinue activities involving radioactive material.

APPENDIX B

ACTION PLAN TO ENSURE TIMELY CLEANUP
OF SITE DECOMMISSIONING MANAGEMENT PLAN SITES

NMSS Licensee Newsletter



U.S. Nuclear
Regulatory
Commission

Office of Nuclear
Material Safety
and Safeguards

NUREG/BR-0117
No. 92-2
June 1992

ACTION PLAN TO ENSURE TIMELY CLEANUP OF SITE DECOMMISSIONING MANAGEMENT PLAN SITES

(The following Notice of Availability appeared in the *Federal Register* on April 16, 1992. It describes the approach NRC will use to accelerate the cleanup of sites listed on the Site Decommissioning Management Plan (SDMP). The Commission expects that the action plan described in the notice will facilitate more timely cleanup of these SDMP sites. Further, the Commission believes that broadly disseminating this information will be helpful to all NRC licensees.)

Agency: Nuclear Regulatory Commission.

Action: Notice of availability of NRC action plan.

Summary: The NRC has developed an Action Plan to describe the approach the agency will use to accelerate the cleanup of radiologically contaminated sites listed in NRC's Site Decommissioning Management Plan (SDMP). The objective of this plan is to communicate the Commission's general expectation that sites listed in the SDMP be cleaned up in a timely and effective manner. This plan (1) identifies existing criteria to guide cleanup of contaminated soils, structures, and equipment, and emphasizes site-specific application of the As Low As Reasonably Achievable (ALARA) principle; (2) states the NRC's position on the finality of decommissioning decisions; (3) describes the NRC's general expectation that SDMP site cleanup will be completed within a 4-year timeframe after operations cease or 3 years after issuance of an initial cleanup order; (4) identifies currently available guidance on site characterization work in support of decommissioning; and (5) describes the process the NRC staff will use to establish and enforce schedules for timely cleanup on a site-specific basis.

Addressees: Other documents referenced in this notice may be reviewed and/or copied for a fee from the NRC Public Document Room, 2120 L. Street NW. (Lower Level), Washington, DC 20555.

Supplementary Information

I. Introduction and Purpose

Over the past several years, the Nuclear Regulatory Commission (NRC) has identified over 40 nuclear material sites that warrant special attention by the Commission. These sites have buildings, former waste disposal areas, large piles of tailings, groundwater, and soil contaminated with low levels of uranium or thorium (source material) or other radionuclides. Consequently, they present varying degrees of radiological hazard, cleanup complexity, and cost. Some of the sites are still under the control of active NRC licenses, whereas licenses for other sites may have already been terminated or may have never been issued. At some sites licensees are financially and technically capable of completing cleanup in a reasonable timeframe, whereas at other sites, the licensee or responsible party is unable or unwilling to perform cleanup. In addition, the sites are currently in various stages of decommissioning. At some sites, licensees have initiated decommissioning, whereas at other sites, decommissioning has not yet been planned or initiated.

The NRC believes that the best approach for minimizing the potential for unnecessary radiation exposures and environmental contamination in the future is to ensure that these sites are cleaned up in a timely and effective manner. In 1990, the NRC implemented the Site Decommissioning Management Plan (SDMP) to identify and resolve issues associated with the timely cleanup of these sites. The SDMP provides a comprehensive strategy for NRC and licensee activities dealing with the cleanup and closure of contaminated nuclear material facilities over which the NRC has jurisdiction. The appendix to this document lists the sites that are currently included in the SDMP (the SDMP does not include more routine decommissioning cases such as nuclear power reactors). The SDMP has been effective in ensuring coordination and resolution of some of the policy and regulatory issues affecting site decommissioning. Progress on actual site remediation, however, continues to be slow. The limited progress to date has prompted the Commission to direct the NRC staff to initiate actions to accelerate the cleanup of SDMP sites.

It should be noted that this Action Plan itself does not contain enforceable standards and is not intended to

	Page
1. Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites (Notice of availability of NRC action plan, in <i>Federal Register</i> , Vol. 57, No. 74, April 16, 1992, pp. 13389-13392) (Contact: Chad Glenn, 301-504-2546)	1
2. NRC Requests Campbell Engineering Company to Retract Marketing Material Statements (Contact: Priscilla Dwyer, 301-504-2478)	5
3. Medical Supervision (Contact: Sally Merchant, 301-504-2637)	5
4. Quality Management Rule (Contact: Sally Merchant, 301-504-2637)	5
5. Teletherapy (Contact: Sally Merchant, 301-504-2637)	6
6. NRC Staff Denies License Renewal Applications; Issues Order to Decommission Bloomsburg Site (Contact: Pat Vacca, 301-504-2615)	6
7. Participatory Rulemaking on Decontamination Criteria (Contact: Robert Meck, 301-492-3737)	7
8. Information Notice Published March 25, 1992—May 15, 1992 (Contact: Paul Goldberg, 301-504-2631).	8
9. Rules Published January 20, 1992—May 14, 1992 (Contact: Paul Goldberg, 301-504-2631)	9
10. Regulatory Guides Issued November 4, 1991—April 15, 1992 (Contact: Paul Goldberg, 301-504-2631)	10
11. A Sampling of Significant Enforcement Actions against Material Licensees (Contact: Joe Delmedico, 301-504-2739)	10

create new rights or obligations on third parties or to preclude litigation of properly framed issues in any pending proceeding. Implementation of this plan may result in the establishment of legally binding requirements by order or license amendment that may be enforced on a site-specific basis. However, nothing in this Action Plan is intended to affect hearing rights associated with such orders or licensee amendments or the hearing rights of parties to

presently pending adjudications and, to the extent that rules promulgated in accord with 5 U.S.C. 583 are not applicable, each case will be judged on its own merits.

II. Action Plan

In accordance with the overall objective of ensuring timely and effective cleanup of SDMP sites, the NRC staff will review site-specific plans and take decommissioning actions consistent with the following elements:

A. Cleanup Criteria

Pending NRC rulemaking on generic radiological criteria for decommissioning, the NRC will continue to consider existing guidance, criteria, and practices listed below to determine whether sites have been sufficiently decontaminated so that they may be released for unrestricted use, pursuant to, or consistent with, the decommissioning rules in 10 CFR 30.36, 40.42, 50.82, 70.38, and 72.54. These cleanup criteria will be applied on a site-specific basis with emphasis on residual contamination levels that are ALARA.

1. Options 1 and 2 of the Branch Technical Position "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations" (46 FR 52601; October 23, 1981).
2. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," Policy and Guidance Directive FC 83-23, Division of Industrial and Medical Nuclear Safety, November 4, 1983.
3. "Termination of Operating Licenses for Nuclear Reactors," Regulatory Guide 1.86, June 1974, Table 1, for surface contamination of reactor facility structures. Also Cobalt-60, Cesium-137, and Europium-132, that may exist in concrete, components, and structures should be removed so the indoor exposure rate is less than 5 microrentgen per hour above natural background at 1 meter, with an overall dose objective of 10 millirem per year (cf. Letter to Stanford University from James R. Miller, Chief, Standardization and Special Projects Branch, Division of Licensing, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, April 21, 1982, Docket No. 50-141).

Comments, and suggestions you may have for information that is not currently being included, that might be helpful to licensees, should be sent to:

E. Kraus
NMSS Licensee Newsletter Editor
Office of Nuclear Material Safety and Safeguards
One White Flint North, Mail Stop 6-E-6
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

4. The Environmental Protection Agency's (EPA's) "Interim Primary Drinking Water Regulations," 40 CFR Part 141 (41 FR 38404; July 9, 1978). In accordance with FC 83-23, the maximum contaminant levels for radionuclides in public drinking water as established by the EPA should be used as reference standard for protection of groundwater and surface water resources.
5. The EPA's "Persons Exposed To Transuranium Elements In The Environment" (42 FR 80956; November 30, 1977). This document provides guidelines for acceptable levels of transuranium elements in soil.

The criteria of this section will be considered in establishing site-specific ALARA levels for each of the SDMP sites in license amendments and orders.

B. Finality

The NRC's decision to terminate a license will relieve the licensee from any further obligation to the NRC to conduct additional cleanup, as long as the licensee decommissioned the site in full accordance with an approved decommissioning plan. The licensee will demonstrate compliance with the cleanup levels described in the decommissioning plan by performing a radiologic survey of the site prior to license termination. The NRC usually conducts an independent survey to confirm the accuracy of the licensee's termination survey. Therefore, if a licensee or responsible party cleaned up a site, or was in the process of cleaning up a site, under an NRC-approved decommissioning plan, the NRC will not require the licensee to conduct additional cleanup in response to NRC criteria or standards established after NRC approval of the plan. An exception to this case would be in the event that additional contamination, or noncompliance with the plan, is found, indicating a significant threat to public health and safety. Noncompliance would occur if a licensee or responsible party does not comply with an approved decommissioning plan, or provides false information.

The NRC will inform EPA about specific decommissioning actions at sites. NRC will also inform State and local agencies that have jurisdiction over aspects concerning decommissioning actions.

C. Timing

The NRC staff will address the timing of SDMP site cleanups on a case-by-case basis, with the expectation that cleanup generally be completed within about 4 years after operations that caused the contamination cease or 3 years after issuance of an initial cleanup order. To achieve this objective, major decommissioning milestones should be established within the following timeframes:

1. As soon as practical, but generally not later than 12 months after notification by the NRC that decom-

missioning is expected to commence, the licensee or responsible party identified by the NRC should submit to the NRC an adequate site characterization report, if that has not yet been completed. The NRC encourages early and substantive coordination and communication between the licensee or responsible party in planning for site characterization, including NRC review of site characterization plans.

2. As soon as practical, but generally not later than 6 months after NRC approval of the site characterization report, the licensee or responsible party should submit to the NRC a site decommissioning plan for approval based on the site characterization results. The decommissioning plan should include schedules for completing site decommissioning work in a timely and effective manner, including plans to dispose of contaminated materials either onsite pursuant to 10 CFR 20.302 (or 10 CFR 20.2002 of the revised 10 CFR Part 20), or at a licensed disposal facility offsite.
3. As soon as practical, but generally not later than 18 months after NRC approval of the site decommissioning plan, the licensee or responsible party should complete all decommissioning work and termination surveys, so that sites or facilities can be released for unrestricted use after termination of the license, as appropriate.

In implementing this approach, the NRC will establish specific and enforceable milestones for each phase of decommissioning through license amendments or orders. These schedules will provide flexibility to allow a licensee or responsible party to demonstrate good cause for delaying cleanup based on technical and risk reduction considerations, or for reasons beyond its control. NRC recognizes that at sites containing hazardous chemical wastes, schedules will depend, at least in part, on the necessary reviews and approvals by other responsible agencies (e.g., EPA or State agencies).

D. Site Characterization

Inadequate site characterization has been one of the technical issues that has delayed timely approval and implementation of site-specific decommissioning actions. Therefore, the NRC is developing new guidance on the content of acceptable site characterization programs conducted in support of decommissioning actions. The NRC has developed a draft "Guidance Manual for Conducting Radiological Surveys in Support of License Termination" (NUREG/CR-5849)¹ through Oak Ridge Associated Universities. This draft manual, which will be published for interim use and evaluation in April 1992, should be

¹A free single copy of draft NUREG/CR-5849 may be requested by writing to the U.S. Nuclear Regulatory Commission, Attn: Distribution and Mail Services Section, Mail Stop P-370, Washington, DC 20555. A copy is also available for inspection and/or copying in the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, D.C.

consulted regarding general aspects of site characterization activities. In addition, this draft manual should be used by licensees when conducting radiological surveys in support of license terminations in the interim until the manual is finalized. NRC is developing additional guidance on specific aspects of site characterization, such as hydrogeologic assessment of contaminated sites.

Until specific NRC guidance on site characterization is developed, licensees should continue to review relevant information from existing documents on site characterization such as those identified below. Although NRC recognizes that these documents do not completely address site characterization needs for decommissioning, use of these references, in addition to site-specific consultation with the NRC staff, will help ensure that site characterization is appropriately planned and conducted so that final site characterization reports are submitted with minimal deficiencies and in a timely manner. The following documents, available from the NRC Public Document Room, should be reviewed regarding general aspects of site characterization activities:

1. "Survey Procedures Manual for the ORAU Environmental Survey and Site Assessment Program," Oak Ridge Associated Universities, March 1990.
2. "Laboratory Procedures Manual for the Environmental Survey and Site Assessment Program," Revision 5, Oak Ridge Associated Universities, February 1990.
3. "Quality Assurance Manual for the Oak Ridge Associated Universities' Environmental Survey and Site Assessment Program," Revision 3, Oak Ridge Associated Universities, February 1990.
4. "Monitoring for Compliance with Decommissioning Termination Survey Criteria," NUREG/CR-2082, June 1981.
5. "Guidance on the Application of Quality Assurance for Characterizing a Low-Level Radioactive Waste Disposal Site," NUREG-1383, October 1990.

E. Procedures to Compel Timely Cleanup

The NRC staff will seek voluntary cooperation by licensees or other responsible parties in establishing and implementing decommissioning plans in accordance with the objectives of this Action Plan. For sites with active NRC licenses, an approved decommissioning plan that includes appropriate schedules and cleanup levels will be incorporated into the license by amendment through normal licensing procedures. For sites with joint licenses

*Copies of NUREGS may be purchased from the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7042. Copies are also available from the National Technical Information Service, 3285 Port Royal Road, Springfield, VA 22181. A copy is also available for inspection and/or copying at the NRC Public Document Room, 2120 L Street, NW (Lower Level), Washington, DC.

(i.e., facilities that possess both a materials and a non-power reactor license), a coordinated approach under both licenses will be taken in establishing appropriate schedules and plans for decommissioning. If a site is not under an active license, the NRC may impose a decommissioning plan by order.

In cases where voluntary cooperation is ineffective in establishing acceptable schedules for completing decommissioning actions, the NRC will establish legally binding requirements and take enforcement action, as necessary, to compel timely and effective cleanup of SDMP sites. Demands for Information may be used to establish licensee commitments to perform major decommissioning activities. Enforcement actions may include issuance of orders, including immediately effective orders, to compel actions by licensees or other responsible parties. If necessary, NRC will issue orders requiring payment of funds into a decommissioning escrow account when a licensee or responsible party fails to meet an agreed upon schedule and has not already established an adequate decommissioning fund pursuant to, or consistent with, the decommissioning funding rules (10 CFR 30.35, 40.36, 50.82, 70.25, and 72.30). The amount of the escrow account will be based upon and be consistent with the estimated cost required to complete site cleanup. Other enforcement actions may include escalated payment of funds into the escrow account based on a licensee's or responsible party's failure to comply with the order. Accumulations into that account will be dedicated for use to finance the cleanup of the site. Finally the NRC will consider issuing civil penalties where (1) the licensee or responsible party fails to comply with an order compelling payment into an escrow account; or (2) the licensee or responsible party fails to comply with a requirement or an order compelling cleanup when there is already sufficient decommissioning funding. Additionally, NRC may seek court injunctions to compel enforcement of these orders.

Appendix—Existing SDMP Sites

Site Name	Location
Advanced Medical Systems	Cleveland, OH
ALCOA	Cleveland, OH
AMAX	Wood County, WV
Aberdeen Proving Ground	Aberdeen, MD
Army Arsenal	Watertown, MA
Babcock and Wilcox	Appollo, PA
Babcock and Wilcox	Parks Township, PA
BP Chemicals	Lima, OH
Budd Company	Philadelphia, PA
Cabot Corporation	Boyertown, PA
Cabot Corporation	Reading, PA
Cabot Corporation	Revere, PA
Chematron Corporation (Bert Ave.)	Cleveland, OH

Site Name	Location (cont'd)
Chematron Corporation (Harvard Ave.)	Cleveland, OH
Chevron Corporation	Pawling, NY
Dow Chemical	Midland, MI and Bay City, MI
Elkern Metals	Marietta, OH
Englehard	Plainville, MA
Fansteel	Muskogee, OK
General Services Administration	Watertown, MA
Hartley and Hartley	Bay County, MI
Heritage Minerals	Lakehurst, NJ
Kerr-McGee (Cimarron)	Crescent, OK
Kerr-McGee	Cushing, OK
Magnesium Elektron	Flemington, NJ
Molycorp	Washington, PA
Molycorp	York, PA
NE Ohio Regional Sewer District	Cuyahoga Heights, OH
Nuclear Metals	Concord, MA
Permagrain	Media, PA
Pesses Chemical	Pulaski, PA
Remington Arms Company	Independence, MO
RMI Titanium	Ashtabuta, OH
RTL, Inc	Rockaway, NJ
Safety Light Corporation	Bloomsburg, PA
Schott Glass	Dureyea, PA
Shieldalloy	Cambridge, OH
Shieldalloy	Newfield, NJ
Texas Instruments	Attieboro, MA
United Nuclear Corporation	Wood River Junction, RI
Victoreen	Cleveland, OH
Westinghouse (Waltz Mill)	Madison, PA
West Lake Landfill	St. Louis, MO
Whittaker Metals	Greenville, PA
Wyman-Gordon	North Grafton, MA
3M Company	Kerrick, MN

APPENDIX C

GUIDELINES FOR DECONTAMINATION OF FACILITIES
AND EQUIPMENT PRIOR TO RELEASE FOR UNRESTRICTED USE
OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE OR
SPECIAL NUCLEAR MATERIAL

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT
PRIOR TO RELEASE FOR UNRESTRICTED USE
OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE,
OR SPECIAL NUCLEAR MATERIAL

U.S. Nuclear Regulatory Commission
Division of Fuel Cycle, Medical, Academic,
and Commercial Use Safety
Washington, DC 20555

May 1987

The instructions in this guide, in conjunction with Table 1, specify the radionuclides and radiation exposure rate limits which should be used in decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use. The limits in Table 1 do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control is considered on a case-by-case.

1. The licensee shall make a reasonable effort to eliminate residual contamination.
2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table 1 prior to the application of the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.
3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.
4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer to premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:
 - a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.
 - b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment, or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table 1. A copy of the survey report shall be filed with the Division of Fuel Cycle, Medical, Academic, and Commercial Use Safety, U. S. Nuclear Regulatory Commission, Washington, DC 20555, and also the Administrator of the NRC Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:
- a. Identify the premises.
 - b. Show that reasonable effort has been made to eliminate residual contamination.
 - c. Describe the scope of the survey and general procedures followed.
 - d. State the findings of the survey in units specified in the instruction.

Following review of the report, the NRC will consider visiting the facilities to confirm the survey.

TABLE 1
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES ^a	AVERAGE ^{b c f}	MAXIMUM ^{b d f}	REMOVABLE ^{b e f}
U-nat, U-235, U-238, and associated decay products	5,000 dpm α /100 cm ²	15,000 dpm α /100 cm ²	1,000 dpm α /100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm ²	3000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm $\beta\gamma$ /100 cm ²	15,000 dpm $\beta\gamma$ /100 cm ²	1000 dpm $\beta\gamma$ /100 cm ²

^aWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^bAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^cMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

^dThe maximum contamination level applies to an area of not more than 100 cm².

^eThe amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

^fThe average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

APPENDIX D

DISPOSAL OR ONSITE STORAGE OF THORIUM OR
URANIUM WASTES FROM PAST OPERATIONS
(46 FR 52601; OCTOBER 23, 1981)

Technical Position for administration by the Uranium Fuel Licensing Branch, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards.

DATES: Comments on the options for disposal or onsite storage of thorium or uranium are encouraged. Such comments will be considered in any subsequent revision of the Branch Technical Position. Comments are due December 22, 1981.

Note.—Comments received after the expiration date will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments filed on or before that date.

FOR FURTHER INFORMATION CONTACT: Ralph G. Page, Chief, Uranium Fuel Licensing Branch, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, Washington, D.C. 20555, telephone 301-427-4308.

SUPPLEMENTARY INFORMATION:

I. Introduction

Some of the sites formerly used for processing thorium and uranium are known today to be contaminated with residual radioactive materials. Some are currently covered by NRC licenses. Others were once licensed, but the licenses to possess and use material have expired. In many cases, the total amount of contaminated soil is large, but the activity concentrations of radioactive materials are believed sufficiently low to justify their disposal on privately owned lands or storage onsite rather than their transport to a licensed radioactive materials disposal (commercial) site. In many instances packaging and transporting these wastes to a licensed disposal site would be too costly and not justified from the standpoints of risk to the public health or cost-benefit. Furthermore, because of the total volume of these wastes, limited commercial waste disposal capacity, and restrictions placed on receipt of long-lived wastes at commercial sites, it is not presently feasible to dispose of these wastes at commercial low-level waste disposal sites.

Effective January 21, 1981, NRC regulations in 10 CFR 20, "Standards for Protection Against Radiation", were amended (45 FR 71761-71762) to delete § 20.304 which provided general authority for disposal of radioactive materials by burial in soil. Under the amended regulations, licensees must apply for and obtain specific NRC approval to dispose of radioactive materials in this manner under the provisions of 10 CFR 20.302. A case-by-case review was believed needed to

assure that burial of radioactive wastes would not present an unreasonable health hazard at some future date.

The deleted provisions of § 20.304 previously permitted burial of up to 100 millicuries of thorium or natural uranium at any one time, with a yearly limitation of 12 burials for each type of material at each site. The only disposal standards specified were (1) burial at a minimum depth of four feet, and (2) successive burials separated by at least six feet. Thus a total of 1.2 curies of these materials were permitted to be disposed of each year by burial in a 12 foot by 18 foot or larger plot of ground.

Under the amended regulations, it is incumbent on an applicant who wants to bury radioactive wastes to demonstrate that local land burial is preferable to other disposal alternatives. The evaluation of the application takes into account the following information: Types and quantities of material to be buried

Packaging of waste

Burial location

Characteristics of burial site

Depth of burial

Access restrictions to disposal site

Radiation safety procedures during disposal operations

Recordkeeping

Local burial restrictions, if any

For applications involving disposal of soils contaminated with low level concentrations of thorium and uranium (other than concentrations not exceeding EPA cleanup standards), the matters of principal importance are:

Concentrations of thorium and uranium (either in secular equilibrium with their daughters or without daughters present)

Volume of contaminated soil

Costs for offsite and onsite disposal

Availability of offsite burial space

Disposal site characteristics

Depth of burial and accessibility of buried wastes

State and local government views

II. Branch Technical Position

There are five acceptable options for disposal or onsite storage of thorium and uranium contaminated wastes. Applications for disposal or storage will be approved if the guidelines discussed under any option are met. Applications for other methods of disposal may be submitted and these will be evaluated on their own merits.

1. Disposal of acceptably low concentrations (which meet EPA cleanup standards) of natural thorium with daughters in secular equilibrium, depleted or enriched uranium, and

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards, Subcommittee on Callaway Plant; Location Change

The ACRS Subcommittee on Callaway Plant will hold a meeting on November 4 and 5, 1981, at the HOLIDAY INN—WEST, 1900 I-70 Drive Southwest, Columbia, MO instead of the Hilton Inn.

Notice of this meeting was published in the Federal Register on October 19, 1981 (46 FR 51329), and all other items remain the same except for the location change as indicated above.

Dated: October 19, 1981.

John C. Heyls,

Advisory Committee, Management Officer.

[FR Doc. 81-38738 Filed 10-23-81; 2:46 am]

BILLING CODE 7560-01-01

Disposal or Onsite Storage of Thorium or Uranium Wastes From Past Operations

AGENCY: Nuclear Regulatory Commission (NRC).

ACTION: Discussion of options for NRC approval of applications for disposal or onsite storage of thorium or uranium wastes; interim use and public comment.

SUMMARY: This notice discusses five options for NRC approval of disposal or onsite storage of thorium or uranium wastes from past nuclear operations. The options are contained in a Branch

uranium ores with daughters in secular equilibrium with no restriction on burial method.

Under this option, the concentrations of natural thorium and depleted or enriched uranium wastes are set sufficiently low that no member of the public is expected to receive a radiation dose commitment from the disposed materials in excess of 1 millirad per year to the lung or 3 millirads per year to the bone from inhalation and ingestion, under any foreseeable use of the material or property. These radiation dose guidelines were recommended by the Environmental Protection Agency (EPA) for protection against transuranium elements present in the environment as a result of unplanned contamination (42 FR 80966-80969). In addition, the concentrations are sufficiently low so that no individual may receive an external dose in excess of 10 microcentgens per hour above background. This is compatible with guidelines EPA proposed as cleanup standards for inactive uranium processing sites (46 FR 2556-2563).

For natural uranium ores having daughters in equilibrium, the concentration limit is equal to that set by the EPA (46 FR 2556-2563) for radium-226 (i.e., 8 pCi/gm, including background) and its decay products.

The concentrations specified below are believed appropriate to apply. It is expected, however, that currently licensed operations will be conducted in such a manner as to minimize the possibility of soil contamination and when such occurs the contamination will be reduced to levels as low as reasonably achievable.

Kind of material	Concentration (pCi/gm)
Natural Thorium (Th-232 plus Th-230 if all daughters are present and in equilibrium)	10
Depleted Uranium	30
Enriched Uranium	30
Natural Uranium Ores (U-238 plus U-234) if all daughters are present and in equilibrium	10

The analysis upon which the Branch Technical Position is based is available for inspection at the Commission's Public Document Room at 1717 H St., N.W., Washington, D.C.

The concentrations specified under this option may be compared with naturally occurring thorium and uranium ore concentrations of 1.3 pCi/gm in igneous rock and uranium concentrations of 120 pCi/gm in Florida phosphate rock and 50-80 pCi/gm in Tennessee bituminous shale. Concentration limits for natural thorium

and natural uranium ore wastes containing daughters not at secular equilibrium can be calculated on a case-by-case basis using the applicable isotopic activities data.

2. Disposal of certain low concentrations of natural thorium with daughters in secular equilibrium and depleted or enriched uranium with no daughters present when buried under prescribed conditions with no subsequent land use restrictions and no continuing NRC licensing of the material.

Under this option the concentrations of natural thorium and uranium are set sufficiently low so that no member of the public will receive a radiation dose exceeding those discussed under option 1 when the wastes are buried in an approved manner absent intrusion into the burial grounds. This option will require establishing prescribed conditions for disposal in the license, such as depth and distribution of material, to minimize the likelihood of intrusion. Burial will be permitted only if it can be demonstrated that the buried materials will be stabilized in place and not be transported away from the site.

Acceptability of the site for disposal will depend on topographical, geological, hydrological and meteorological characteristics of the site. At a minimum, burial depth will be at least four feet below the surface. In the event that there is an intrusion into the burial ground, no member of the public will likely receive a dose in excess of 170 millirems to a critical organ. An average dose not exceeding 170 millirems to the whole body for all members of a general population is recommended by international and national radiation expert bodies to limit population doses. With respect to limiting doses to individual body organs, the concentrations are sufficiently low that no individual will receive a dose in excess of 170 millirems to any organ from exposure to natural thorium, depleted uranium or enriched uranium.

The average activity concentration of radioactive material that may be buried under this option in the case of natural thorium (Th-232 plus Th-230) is 50 pCi/gm, if all daughters are present and in equilibrium; for enriched uranium it is 100 pCi/gm if the uranium is soluble and 250 pCi/gm if insoluble; for depleted uranium it is 100 pCi/gm if the uranium is soluble and 300 pCi/gm if insoluble. Natural uranium ores containing radium 226 and its daughters are not included under this option, because of possible radon 222 emanations and resultant higher than acceptable exposure of individuals in private residences if houses were built over buried materials.

3. Disposal of low concentrations of natural uranium ores, with all daughters in equilibrium, when buried under prescribed conditions in areas zoned for industrial use and the recorded title documents are amended to state that the specified land contains buried radioactive materials and are conditioned in a manner acceptable under state law to impose a covenant running with the land that the specified land may not be used for residential building. (There is no continuing NRC licensing of the material.)

Disposal will be approved if the burial criteria outlined in option 2 (including burial at a minimum of 4 feet) are met. Depending upon local soil characteristics, burials at depths greater than 4 feet may be required. In order to assure protection against radon 222 releases (daughter in decay chain of uranium 238 and uranium 234), it is necessary that the recorded title documents be amended to state in the permanent land records that no residential building should be permitted over specified areas of land where natural uranium ore residues (U-238 plus U-234) in concentrations exceeding 10 pCi/gm has been buried. Industrial building is acceptable so long as the concentration of buried material does not exceed 40 pCi/gm of uranium (i.e., Ra-226 shall not exceed 20 pCi/gm).

4. Disposal of land-use-limited concentrations of natural thorium or natural uranium with daughters in secular equilibrium and depleted or enriched uranium without daughters present when buried under prescribed conditions in areas zoned for industrial use and the recorded title documents are amended to state that the land contains buried radioactive material and are conditioned in a manner acceptable under state law to impose a covenant running with land that the land (1) may not be excavated below stated depths in specified areas of land unless cleared by appropriate health authorities, (2) may not be used for residential or industrial structures over specified areas where radioactive materials in concentrations higher than specified in options 2 and 3 are buried, and (3) may not be used for agricultural purposes in the specified areas. (There is no continuing NRC licensing of the disposal site.)

Under this option, conditions of burial will be such that no member of the public will receive radiation doses in excess of those discussed under option 1 absent intrusion into the burial ground. Criteria for disposal under these conditions is predicated upon the assumption that intentional intrusion is less likely to occur if a warning is given

in land documents of record not to excavate below burial depths in specified areas of land without clearance by health authorities; not to construct residential or industrial building on the site; and not to use specified areas of land for agricultural purposes. Because of this, we believe it appropriate to apply a maximum critical organ exposure limit of 800 millirems per year to thorium and uranium buried under this restriction instead of 170 millirems as used in options 2 and 3. In addition, any exposure to such materials is likely to be more transient than assumed (essentially continual exposure) under those options. These two factors combine to increase the activity concentration limits calculated under option 2 by about 10. Thus, the average concentration that may be buried under this option for thorium (Th-232 plus Th-228) is 800 pCi/gm if all daughters are present and in equilibrium; for enriched uranium it is 1000 pCi/gm if the uranium is soluble and 2500 pCi/gm if insoluble; and for depleted uranium it is 1000 pCi/gm if the uranium is soluble and 3000 pCi/gm if insoluble.

With respect to natural uranium with daughters present and in equilibrium, the concentration that may be buried under this option is 200 pCi/gm of U-238 plus U-234, i.e., 100 pCi/gm Ra-226. This concentration is based on a limited exposure of 2.4 hours per day to limit the radon dose to less than 0.5 working level month (WLM) which is equivalent to continuous exposure to 0.02 working level (WL). Depending upon local soil characteristics, burials at depths greater than 4 feet may be required.

SUMMARY OF MAXIMUM CONCENTRATIONS PERMITTED UNDER DISPOSAL OPTIONS

Kind of Material	Disposal Options			
	1 ¹	2 ²	3 ³	4 ⁴
Natural Thorium (Th-232 + Th-228) with daughters present and in equilibrium	10	80		800
Natural Uranium (U-238 + U-234) with daughters present and in equilibrium	10		40	800
Depleted Uranium:				
Soluble	36	100		1,000
Insoluble	36	800		3,000
Enriched Uranium:				
Soluble	30	100		1,000
Insoluble	50	250		2,500

¹ Based on EPA cleanup standards.

² Concentrations based on limiting individual doses to 170 mrem/yr.

³ Concentration based on limiting equivalent exposure to 0.02 working level or less.

⁴ Concentrations based on limiting individual doses to 800 mrem/yr and, in case of natural uranium, limiting exposure to 0.02 working level or less.

5. Storage of licensed concentrations of thorium and uranium onsite pending

the availability of an appropriate disposal site.

When concentrations exceed those specified in option 4, long term disposal other than at a licensed disposal site will not normally be a viable option under the provisions of 10 CFR 20.302. In such cases, the thorium and uranium may be permitted to be stored onsite under an NRC license until a suitable method of disposal is found. License conditions will require that radiation doses not exceed those specified in 10 CFR Part 20 and be maintained as low as reasonably achievable.

Before approving an application to dispose of thorium or uranium under options 2, 3, or 4, NRC will solicit the view of appropriate State health officials within the State in which the disposal would be made.

Dated at Silver Spring, Maryland this 18th day of October, 1981.

Richard E. Cunningham,

Director, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards.

[FR Doc. 81-40500 Filed 10-22-81; 8:45 am]

DELLAWH CORRE 7888-06-48

APPENDIX E
ANALYTICAL LABORATORY
ANALYSIS REPORTS

Westinghouse Electric Corporation
Advanced Energy Systems - Analytical Laboratory
Waltz Mill Site

REPORT

Request# 14496

TO: J.T. Flanigan Safety and Hygiene - ESBU
R.G. Kitzer Health Physics - Waltz Mill Site
A.T. Sabo Environmental Regulatory Affairs

Received: 11/12/91
Reported: 12/11/91

[RESULTS OF ANALYSIS]

LARGE SITE SAMPLES FOR URANIUM ISOTOPIC ANALYSIS
uCi/ gram (dry) +/- 2 sigma

LAB ID	HP ID	U-238	U-235
91-1924	Bldg #9- Tank #1	1.70E-05 +/- 1.3E-06	5.14E-04 +/- 7.4E-06
91-1925	Bldg #9- Tank #2	7.90E-05 +/- 2.5E-06	3.21E-04 +/- 5.5E-06
91-1926	Bldg #9- Tank #3	<1.4E-06	5.20E-05 +/- 1.9E-06
91-1927	Cut Pipe - Outside Bldg #5 & #6	<1.9E-05	<2.3E-05
91-1928	Sludge - Outside Bldg #5 & #6	<1.8E-06	<2.1E-06
91-1929	Bldg #9 Floor Drain South	<1.3E-08	<1.0E-08
91-1930	Bldg #9 Floor Drain North	<1.0E-06	<1.2E-06
91-1931	Soil Outside Between Bldg #5 & #6	<1.0E-06	<1.2E-06
91-1932	Soil Inside Next to Pit - Bldg #5	1.14E-07 +/- 1.1E-07	<1.0E-07
91-1933	Sludge Inside Next to Pit - Bldg #5	1.44E-06 +/- 3.0E-07	1.13E-05 +/- 8.9E-07
91-1934	Cut Pipe Inside Next to Pit - Bldg #5	3.91E-06 +/- 1.7E-06	4.22E-05 +/- 5.7E-06

Remarks:

References: AL File #14496
Procedures: A-529
Analyst: WTF, FRC, MRK

Approved: Mark R. Kawchak

Westinghouse Electric Corporation
Advanced Energy Systems - Analytical Laboratory
Waltz Mill Site

REPORT

Request# 14496

TO: J.T. Flanigan
R.G. Kitzer
A.T. Sabo

Safety and Hygiene - ESBU
Health Physics - Waltz Mill Site
Environmental Regulatory Affairs

Received: 11/12/91
Reported: 12/11/91

[RESULTS OF ANALYSIS]

LARGE SITE SAMPLES FOR URANIUM ISOTOPIC ANALYSIS
uCi/ gram (dry) +/- 2 sigma

LAB ID	HP ID	U-234	U-233
91-1924	Bldg #9- Tank #1	1.55E-03 +/- 1.2E-05	7.50E-06 +/- 1.3E-06
91-1925	Bldg #9- Tank #2	1.94E-02 +/- 3.9E-05	4.60E-05 +/- 3.0E-06
91-1926	Bldg #9- Tank #3	4.20E-03 +/- 1.6E-05	5.50E-06 +/- 9.0E-07
91-1927	Cut Pipe - Outside Bldg #5 & #6	<5.1E-05	<2.1E-06
91-1928	Sludge - Outside Bldg #5 & #6	4.15E-05 +/- 7.8E-06	<5.0E-07
91-1929	Bldg #9 Floor Drain South	4.70E-06 +/- 3.0E-07	<3.0E-08
91-1930	Bldg #9 Floor Drain North	<3.0E-06	<2.0E-7
91-1931	Soil Outside Between Bldg #5 & #6	<2.6E-06	<1.0E-07
91-1932	Soil Inside Next to Pit - Bldg #5	1.70E-06 +/- 3.0E-07	<1.0E-08
91-1933	Sludge Inside Next to Pit - Bldg #5	3.01E-04 +/- 4.3E-06	1.73E-06 +/- 5.3E-07
91-1934	Cut Pipe Inside Next to Pit - Bldg #5	1.27E-03 +/- 2.9E-05	4.91E-05 +/- 8.9E-06

Remarks:

References: AL File #14496
Procedures: A-529
Analyst: WTF, FRC, MRK

Approved: Mark R. Kucobak

RT

TO: J.T. Flanigan
R.G. Kitzer
A.T. Sabo

Safety and Hygiene - ESB
Health Physics - Waltz Mill Site
Environmental Regulatory Affairs

Received: 11/12/91
Reported: 12/11/91

[RESULTS OF ANALYSIS]

LARGE SITE SAMPLES FOR URANIUM ISOTOPIC ANALYSIS
grams

LAB ID	HP ID	Wet Weight	Dry Weight
91-1924	Bldg #9- Tank #1	67.3	30.4
91-1925	Bldg #9- Tank #2	56.5	55
91-1926	Bldg #9- Tank #3	55.7	52.9
91-1927	Cut Pipe - Outside Bldg #5 & #6	32.2	31.2
91-1928	Sludge - Outside Bldg #5 & #6	68.2	37.3
91-1929	Bldg #9 Floor Drain South	34.8	3.2
91-1930	Bldg #9 Floor Drain North	91.8	90
91-1931	Soil Outside Between Bldg #5 & #6	140	101
91-1932	Soil Inside Next to Pit - Bldg #5	90	68.7
91-1933	Sludge Inside Next to Pit - Bldg #5	47.9	15.2
91-1934	Cut Pipe Inside Next to Pit - Bldg #5	40.7	38.6

Remarks:

References: AL File #14496
Procedures: A-529
Analyst: WTF, FRC, MRK

Approved: Mark R. Kowchak

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

REPORT

Request# 14664

TO: Joe Nardi
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/5/92
Reported: 5/12/92

[RESULTS OF ANALYSIS]

ALPHA SPECTROMETRY ANALYSIS (DRY)

Lab.Spl#	92-1260	92-1261
ID	002-4 Bldg #5	003-4 Bldg #5
NUCLIDE	pCi/gram 2 sigma	pCi/gram 2 sigma
U-238	<3.7E-01	<2.5E-01
U-235	<1.7E-01	<2.6E-01
U-234	1.4E+00 +/- 6.5E-01	<3.3E-01
U-233	<3.4E-01	<2.5E-01

Lab.Spl#	92-1262	92-1263
ID	004-4 Bldg #5	005-5 Bldg #5
NUCLIDE	pCi/gram 2 sigma	pCi/gram 2 sigma
U-238	3.5E-01 +/- 2.9E-01	9.7E-01 +/- 3.0E-01
U-235	<2.0E-01	3.5E-01 +/- 1.5E-01
U-234	<3.6E-01	1.2E+00 +/- 3.5E-01
U-233	<2.9E-01	3.2E-01 +/- 2.5E-01

Remarks: Analysis performed on a dry weight basis

References: Request# 14664
Procedures: A-529
Analyst: FRC, MRK

Approved: 

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

REPORT

Request# 14664

TO: Joe Nardi
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/5/92
Reported: 5/12/92

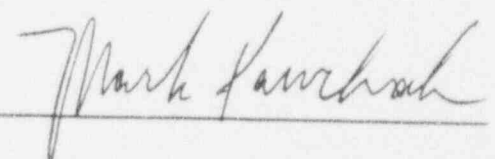
[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS

Originator ID	Lab.Spl#	U-235 (Wet Basis)		U-235 (Dry Basis)	
		pCi/gram	2 sigma	pCi/gram	2 sigma
002-4 Bldg #5 4/29/92	92-1260	<1.0E-01		<1.3E-01	
003-4 Bldg #5 5/1/92	92-1261	5.26E-02	+/- 4.6E-02	6.53E-02	+/- 5.7E-02
004-4 Bldg #5 5/5/92	92-1262	4.72E-02	+/- 2.9E-02	5.69E-02	+/- 3.5E-02
005-5 Bldg #5 5/5/92	92-1263	<1.3E-01		<1.6E-01	

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14664
Procedures: A-524
Analyst: FRC, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Reques # 14679

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/15/92
Reported: 5/21/92

[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS

Originator ID	Lab.Spl#	U-235 (Wet Basis)		Mn-54		Co-60	
		pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
006	92-1394	3.22E-01	+/- 3.0E-01				
007	92-1395	<5.4E-01					
008	92-1396	<3.2E-01					
5/15/92							
009	92-1397	<3.8E-01					
5/15/92							
010	92-1398	<3.6E-01					
5/15/92							
011	92-1399	<3.8E-01	} Duplicate				
7/15/92							
12	92-1400	<3.6E-01					
5/15/92							
013	92-1401	1.40E-01	+/- 6.2E-02	8.30E-02	+/- 4.2E-02	1.33E-01	+/- 7.1E-02
5/15/92							
014	92-1402	<3.3E-01					
5/15/92							
015	92-1403	<3.6E-01					
5/15/92							
016	92-1404	<2.4E-01					
5/15/92							
017	92-1405	<2.2E-01					
5/15/92							
018	92-1406	1.27E-01	+/- 6.7E-02			1.07E-01	+/- 3.9E-02
5/15/92							
019	92-1407	<2.2E-01					
5/15/92							
018	92-1408	<1.6E-01					
5/15/92							
019	92-1409	1.44E-01	+/- 1.4E-01				
5/15/92							

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14679
Procedures: A-524
Analyst: FRC, DZ, WTF, MRK

Approved: Mark Karcher

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request# 14679

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/15/92
Reported: 5/21/92

[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (@May 18, 1992)

Originator ID	Lab. Sp#	U-235 (Wet Basis)	
		pCi/gram	2 sigma
020	92-1408	<1.6E-01	
021	92-1409	1.44E-01 +/-	1.4E-01

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14679
Procedures: A-524
Analyst: TRK, DZ, WTF, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
 Advanced Programs - Analytical Laboratory
 Waltz Mill Site

Request# 14679

TO: Larry Smith
 Environmental & Regulatory Services
 Westinghouse Electric Corporation

Received: 5/15/92
 Reported: 6/15/92

[RESULTS OF ANALYSIS]

ALPHA SPECTROMETRY ANALYSIS (@ June 1, 1992)

Orig ID	Lab.Spl#	U-238 (Dry Basis)		U-235 (Dry Basis)		U-234 (Dry Basis)	
		pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
006	92-1394	5.37E-01	+/- 1.9E-01	1.00E-01	+/- 9.8E-02	1.50E+00	+/- 3.1E-01
007	92-1395	<1.5E-02		1.00E-01	+/- 5.9E-02	<8.9E-02	
008	92-1396	7.91E-01	+/- 1.1E-01	7.56E-02	+/- 4.0E-02	1.10E+00	+/- 1.4E-01
009	92-1397	5.3E-01	+/- 9.7E-02	2.00E-01	+/- 6.3E-02	8.00E-01	+/- 1.4E-01
010	92-1398	7.64E-01	+/- 1.7E-01	4.87E-01	+/- 1.4E-01	1.10E+00	+/- 2.6E-01
011	92-1399	5.05E-01	+/- 9.9E-02	3.40E-02	+/- 3.2E-02	7.00E-01	+/- 1.2E-01
012	92-1400	5.12E-01	+/- 1.1E-01	<1.9E-02		8.00E-01	+/- 1.3E-01
013	92-1401	9.14E-01	+/- 1.4E-01	<3.2E-02		8.00E-01	+/- 1.4E-01
014	92-1402	8.45E-01	+/- 1.4E-01	1.00E-01	+/- 4.7E-02	9.00E-01	+/- 1.3E-01
015	92-1403	9.82E-01	+/- 1.3E-01	3.00E-01	+/- 7.4E-02	2.00E+00	+/- 1.9E-01
016	92-1404	6.80E-01	+/- 1.4E-01	<3.4E-02		1.35E+00	+/- 1.4E-01
017	92-1405	5.78E-01	+/- 1.2E-01	<3.2E-02		7.00E-01	+/- 1.3E-01
018	92-1406	6.15E-01	+/- 9.3E-02	9.46E-02	+/- 4.5E-02	2.00E+00	+/- 1.7E-01
019	92-1407	4.90E-01	+/- 8.9E-02	<2.9E-02		6.00E-01	+/- 1.0E-01
020	92-1408	1.03E+00	+/- 1.0E-01	<2.7E-02		1.20E+00	+/- 1.1E-01
021	92-1409	1.04E+00	+/- 1.2E-01	<2.9E-02		1.40E+00	+/- 1.5E-01

Remarks: Alpha Spectrometry Analysis

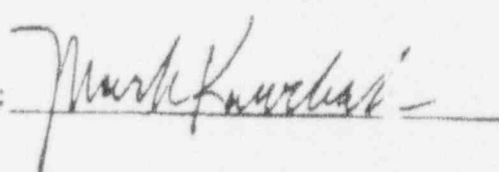
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References:

Procedures: Request# 14679

Analyst: WTF, MRK, TRK, FRC

Page 1

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request # 14679

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 6/15/92
Reported: 6/15/92

[RESULTS OF ANALYSIS]

ALPHA SPECTROMETRY ANALYSIS (@ June 1, 1992)

Orig ID	Lab.Spl#	U-233 (Dry Basis)	
		pCi/gram	2 sigma
006	92-1394	ND	
007	92-1395	3.98E-01	+/- 1.5E-01
008	92-1396	<2.8E-02	
009	92-1397	2.34E-01	+/- 1.0E-01
010	92-1398	5.70E-01	+/- 2.3E-01
011	92-1399	ND	
012	92-1400	<2.8E-02	
013	92-1401	<2.7E-02	
014	92-1402	<3.7E-02	
015	92-1403	8.32E-02	+/- 5.9E-02
016	92-1404	ND	
017	92-1405	<5.9E-02	
018	92-1406	ND	
019	92-1407	<2.0E-02	
020	92-1408	ND	
021	92-1409	<1.8E-02	

Remarks: Alpha Spectrometry Analysis

ND - Not Detected

References:

Procedures: Request# 14679

Analyst: WTF, MRK, TRK, FRC

Page 2

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request# 14686

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/22/92
Reported: 6/2/92

[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (@May 22, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)	
		pCi/gram	2 sigma
049	92-1468	<4.6E-01	
050	92-1469	2.78E-01	+/- 2.3E-01
051	92-1470	<2.8E-01	
052	92-1471	5.8E-01	+/- 3.1E-01
053	92-1472	<1.7E-01	
054	92-1473	<2.0E-01	
055	92-1474	<3.8E-01	
056	92-1475	<2.3E-01	
057	92-1476	<1.4E-01	
058	92-1477	<2.6E-01	
059	92-1478	<1.9E-01	
060	92-1479	<3.9E-01	
061	92-1480	<2.0E-01	
062	92-1481	<2.3E-01	
063	92-1482	2.15E-01	+/- 1.8E-01

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14686
Procedures: A-524
Analyst: TRK, DZ, WTF, MRK

Approved: 

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

REPORT

Request # 14686

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 6/22/92
Reported: 6/2/92

[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (@May 22, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)	
		pCi/gram	2 sigma
064	92-1483	<2.5E-01	
065	92-1484	<2.5E-01	
066	92-1485	<1.9E-01	
067	92-1486	<1.9E-01	
068	92-1487	<2.4E-01	
069	92-1488	1.29E+00	+/- 2.8E-01
070	92-1489	<1.9E-01	
071	92-1490	2.08E-01	+/- 1.5E-01
072	92-1491	<2.5E-01	

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14686
Procedures: A-524
Analyst: TRK, DZ, WTF, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request# 14693

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/29/92
Reported: 6/9/92

[RESULTS OF ANALYSIS]

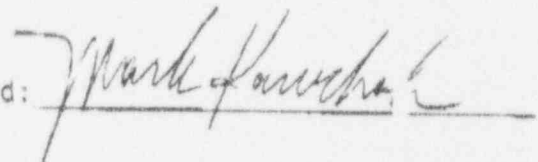
GAMMA SPECTROMETRY ANALYSIS (@ June 2, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)	
		pCi/gram	2 sigma
073	92-1523	<1.0E-01	
074	92-1524	<3.0E-01	
075	92-1525	<3.1E-01	
076	92-1526	<3.4E-01	
077	92-1527	9.57E-02	+/- 6.0E-02
078	92-1528	<2.8E-01	
079	92-1529	<2.6E-01	
080	92-1530	<2.9E-01	
081	92-1531	<2.9E-01	
082	92-1532	<2.7E-01	
083	92-1533	<2.7E-01	
084	92-1534	1.23E-01	+/- 1.6E-01
085	92-1535	1.26E+00	+/- 6.0E-01
086	92-1536	4.64E-01	+/- 3.2E-01
087	92-1537	<5.0E-01	
088	92-1538	<2.4E-01	

Duplicates

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14693
Procedures: A-524
Analyst: WTF, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request# 14700

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/2/92
Reported: 5/11/92

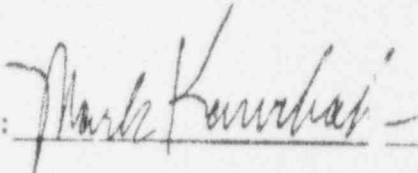
[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (@ June 2, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)		Np-239 (Wet Basis)		Eu-155 (Wet Basis)	
		pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
105	92-1579	<2.3E-01					
106	92-1580	<1.9E-01					
107	92-1581	<1.1E-01					
108	92-1582	<1.6E-01					
109	92-1583	<2.2E-01					
110	92-1584	<2.5E-01					
111	92-1585	<2.4E-01					
112	92-1586	<2.8E-01					
113	92-1587	<2.5E-01					
114	92-1588	<2.9E-01					
115	92-1589	<3.1E-01					
116	92-1590	<2.3E-01					
117	92-1591	<3.1E-01					
118	92-1592	<2.4E-01					
119	92-1593	1.30E-01 +/- 4.1E-02		1.77E+00 +/- 1.5E+00		1.53E-01 +/- 9.4E-02	

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14700
Procedures: A-524
Analyst: WTF, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request # 14700

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 5/2/92
Reported: 5/11/92

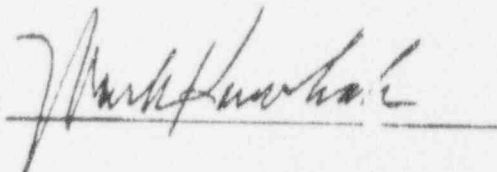
[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (@ June 2, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)		Cs-137 (Wet Basis)	
		pCi/gram	2 sigma	pCi/gram	2 sigma
120	92-1594	8.19E-02	+/- 4.1E-02		
121	92-1595	<2.9E-01			
122	92-1596	<2.2E-01			
123	92-1597	<3.5E-01			
124	92-1598	<3.9E-01			
125	92-1599	<5.9E-01			
126	92-1600	<3.5E-01			
127	92-1601	6.17E-01	+/- 4.7E-01		
128	92-1602	5.22E-01	+/- 4.0E-01	5.17E-01	+/- 2.7E-01
129	92-1603	<2.4E-01			

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14700
Procedures: A-524
Analyst: WTF, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Reque t# 14710

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 6/10/92
Reported: 6/10/92

[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (Ø June 2, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)	
		pCi/gram	2 sigma
172	92-1665	<2.3E-01	
173	92-1666	<1.5E-01	
174	92-1667	<2.3E-01	
175	92-1668	<2.2E-01	
176	92-1669	<2.3E-01	
177	92-1670	<1.8E-01	
178	92-1671	1.81E-01	+/- 1.3E-01
179	92-1672	3.47E-01	+/- 2.4E-01
180	92-1673	5.93E-01	+/- 3.3E-01
181	92-1674	7.89E-01	+/- 3.9E-01

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14710
Procedures: A-524
Analyst: WTF, MRK

Approved: Mark Kowchak

REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Request# 14729

TO: Larry Smith
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 6/19/92
Reported: 5/24/92

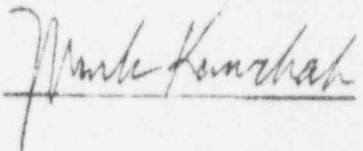
[RESULTS OF ANALYSIS]

GAMMA SPECTROMETRY ANALYSIS (@ June 19, 1992)

Originator ID	Lab.Spl#	U-235 (Wet Basis)		Pa-233 (Wet Basis)	
		pCi/gram	2 sigma	pCi/gram	2 sigma
205	92-1819	<2.6E-01			
206	92-1820	<3.4E-01			
207	92-1821	<3.8E-01			
208	92-1822	<2.1E-01			
209	92-1823	<3.8E-01			
210	92-1824	2.78E-01	+/- 2.6E-01		
211	92-1825	<4.6E-01			
212	92-1826	<3.9E-01			
213	92-1827	2.33E-01	+/- 2.3E-01		
214	92-1828	<1.6E-01		2.17E-01	+/- 2.1E-01
215	92-1829	<1.6E-01			
216	92-1830	<2.4E-01			
217	92-1831	<3.8E-01			
218	92-1832	4.11E-01	+/- 2.9E-01		

Remarks: Gamma Spectrometry Analysis for U-235

References: Request# 14729
Procedures: A-524
Analyst: WTF, MRK

Approved: 

REPORT

Westinghouse Electric Corporation
 Advanced Programs - Analytical Laboratory
 Waltz Mill Site

Reque t# 14700

TO: Larry Smith/Joe Nardi
 Environmental & Regulatory Services
 Westinghouse Electric Corporation

Received: 7/25/92
 Reported: 9/24/92

[RESULTS OF ANALYSIS]

ALPHA SPECTROMETRY ANALYSIS (DRY)

Lab.Spl# ID	92-1471 052		92-1488 069		92-1535 085	
NUCLIDE	pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
U-238	9.28E-01	+/- 1.2E-01	1.42E+00	+/- 1.7E-01	8.64E-01	+/- 8.3E-02
U-235	4.68E-02	+/- 3.9E-02	1.40E+00	+/- 1.8E-01	3.00E-01	+/- 6.0E-02
U-234	1.40E+00	+/- 1.7E+00	4.00E+00	+/- 3.2E-01	7.60E+00	+/- 2.6E-01
U-233	<1.1E-02		5.48E-01	+/- 1.7E-01	<1.4E-02	

Lab.Spl# ID	92-1536 086		92-1537 087		92-1593 119	
NUCLIDE	pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
U-238	7.2E-01	+/- 8.7E-02	1.14E+00	+/- 1.0E-01	1.05E-01	+/- 8.0E-02
U-235	1.89E-01	+/- 5.3E-02	4.00E-01	+/- 6.8E-02	<1.5E-02	
U-234	3.30E+00	+/- 2.0E-01	8.30E+00	+/- 2.8E-01	3.00E-01	+/- 1.0E-01
U-233	<2.2E-02		<1.1E-02		0.2	

Remarks: Uranium Alpha Spectrometry Analysis
 Large Facility Samples (5/19/92 to 6/24/92)
 92-1422 to be reanalyzed

References: Request# 14700
 Procedures: A-529
 Analyst: WTF, MRK, TRK

Approved: Mark Kowalski

REVISED
REPORT

Westinghouse Electric Corporation
Advanced Programs - Analytical Laboratory
Waltz Mill Site

Reques # 14700

TO: Larry Smith/Joe Nardi
Environmental & Regulatory Services
Westinghouse Electric Corporation

Received: 7/25/92
Reported: 10/12/92

[RESULTS OF ANALYSIS]

ALPHA SPECTROMETRY ANALYSIS (DRY)

Lab. Spl# ID	92-1601 127	92-1602 128	92-1672 179			
NUCLIDE	pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
U-238	5.51E-01	+/- 1.4E-01	7.73E-01	+/- 3.1E-01	8.03E-01	+/- 9.2E-02
U-235	2.00E-01	+/- 9.8E-02	1.00E+00	+/- 3.7E-01	1.00E-01	+/- 4.8E-02
U-234	1.10E+00	+/- 2.6E-01	2.00E+00	+/- 7.0E-01	2.70E+00	+/- 1.9E-01
U-233	1.75E-01	+/- 1.2E-01	1.43E+00	+/- 6.7E-01	<1.8E-02	

Lab. Spl# ID	92-1673 180	92-1674 181	92-1832 218			
NUCLIDE	pCi/gram	2 sigma	pCi/gram	2 sigma	pCi/gram	2 sigma
U-238	1.07E+00	+/- 1.1E-01	1.29E+00	+/- 1.1E-01	9.46E-01	+/- 1.2E-01
U-235	5.56E-01	+/- 8.7E-02	4.00E-01	+/- 7.2E-02	5.16E-02	+/- 4.2E-02
U-234	1.03E+01	+/- 3.4E-01	8.80E+00	+/- 3.0E-01	9.00E-01	+/- 1.5E-01
U-233	<1.9E-02		<1.2E-02		<2.5E-02	

Remarks: Uranium Alpha Spectrometry Analysis
Large Facility Samples (5/19/92 to 6/24/92)
92-1422 to be reanalyzed
This report has been revised to to correct the sample number for 92-1832.

References: Request# 14700
Procedures: A-524
Analyst: WTF, MRK, TRK

Approved: 