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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

AUG 01 1991

AUG 09 1991
CORRESPONDENCE CONTROL

Mr. Paul T. Day
Hanford Project Manager
U.S. Environmental Protection Agency
Region 10
712 Swift Boulevard, Suite 5
Richland, Washington 99352

Mr. Timothy L. Nord
Hanford Project Manager
State of Washington
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504-8711

9413436.0191

Dear Messrs. Day and Nord:

EVALUATION OF NEED FOR ACCELERATED TREATMENT OF PFP WASTEWATER

The attached report contains an evaluation of the need for accelerated treatment of wastewater from the Plutonium Finishing Plant (PFP) due to the potential for the wastewater to contain radionuclides in excess of the 10 CFR 20 Appendix B Table II Column 2 values (Table II values). This report concludes that appropriate engineered barriers are in place to prevent release of radionuclides in excess of the Table II values during routine operations and credible process upset conditions. The report further concludes that administrative controls are in place to ensure that the engineered barriers are properly maintained and to provide an early warning system so that process upset conditions are promptly detected and corrected. Accordingly, no acceleration of PFP wastewater treatment projects is necessary.

This report fulfills the Hanford Federal Facility Agreement and Consent Order milestone M-17-11 interim operating restriction requirement to "Complete a study by July 1991 to evaluate the need for accelerated wastewater treatment (relative to 10 CFR 20 Table II, Column 2) in the PFP Wastewater. If the study shows additional PFP Wastewater treatment is warranted, complete by April 1992 an engineering study to evaluate options for treatment and/or rerouting of suspected major contributors of transuranics".

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If you have any questions, please contact J.E. Mecca immediately on (509) 376-7471.

Sincerely,

Steven H. Wisness
Hanford Project Manager

Attachments (2)

cc w/att:
R.E. Lerch, WHC
W.G. Ruff, WHC
R. Stanley, Ecology
A.W. Conklin, Department of Health

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PLUTONIUM FINISHING PLANT WASTEWATER
EVALUATION OF POTENTIAL TO EXCEED 10 CFR 20 TABLE II VALUES

The wastewater discharged to the 216-Z-20 Crib (Z-20 Crib) during operation of the Plutonium Reclamation Facility (PRF) and the Remote Mechanical C-Line (RMC), two processing areas at the Plutonium Finishing Plant (PFP), was evaluated to determine whether accelerated treatment was necessary due to the potential for the wastewater to contain radionuclides in concentrations which exceed 10 CFR 20 Appendix B Table II Column 2 values (Table II values). Sampling data for the PFP wastewater stream discharged to the Z-20 crib since 1984 were reviewed for this study along with plant administrative discharge controls and engineered barriers. This evaluation concludes that appropriate engineered barriers are in place to prevent release of radionuclides in excess of the Table II values during routine operations and credible process upset conditions. Administrative controls are in place to ensure the engineered barriers are properly maintained and that process upsets are promptly detected and corrected. Thus, no acceleration of wastewater treatment projects is necessary.

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1.0 BACKGROUND

The Z-20 Crib was placed into service in September 1981 for disposal of potentially contaminated non-contact process cooling water from PRF and RMC operations, miscellaneous wastewater from laboratory activities, steam condensate, air conditioning condensate, and storm water runoff. These wastewater sources are shown in Figure 1. The Z-20 Crib does not receive process effluents which are known to be radioactively or chemically contaminated. Process effluents which are known to be contaminated are discharged to the 241-Z Tanks and managed in the Double-Shell Tank System. The wastewater discharged to the Z-20 Crib is routinely monitored at Manholes number 7 and 9 for flow, total alpha activity, and pH. Monthly composite samples are analyzed for strontium, cesium, ruthenium, plutonium, and americium.

2.0 WASTEWATER DATA ANALYSIS

Data from the Waste Stream Characterization Report (WHC-EP-0287) and the Annual Effluent Discharge Reports from 1987 to 1990 were reviewed to provide information on past PFP wastewater discharges to the Z-20 Crib. The review was limited to data from 1984 through 1990. This review period included 4 PRF operations campaigns and 7 RMC operations campaigns. This data is provided in Tables 1 and 2 of the Appendix.

Only one data point exceeded the Table II values. An equipment failure late in 1984 resulted in a release of Pu-239 and Am-241 to the Z-20 Crib in concentrations exceeding the Table II values. Corrective actions were taken to prevent recurrence. Additional details are provided later in this report.

PLUTONIUM FINISHING PLANT LIQUID EFFLUENT DIAGRAM

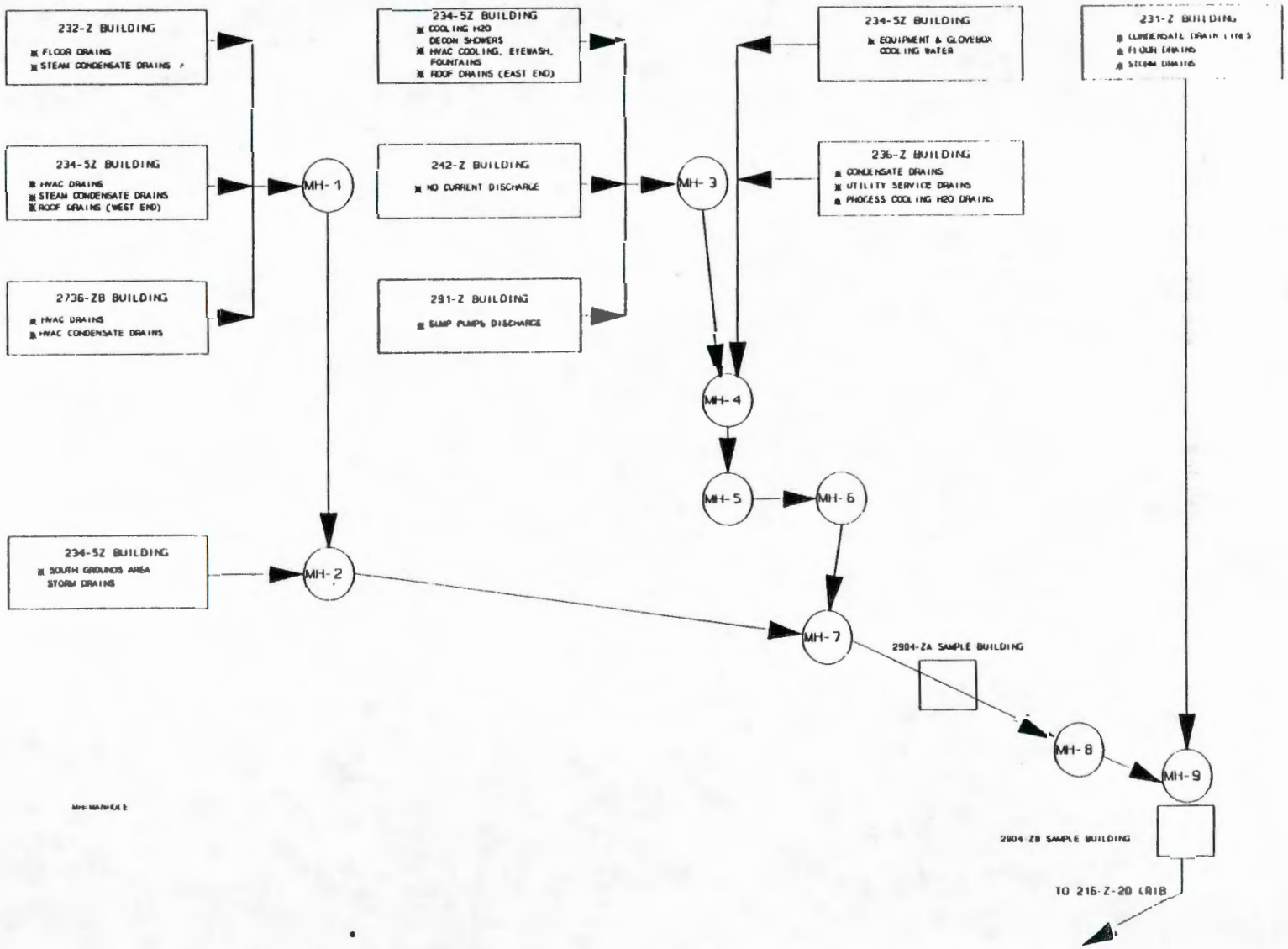

Figure 1: PFP Liquid Effluent Diagram

The remainder of the data points were below the Table II values. The fact that several operations campaigns have been conducted without resulting in wastewater discharges above Table II values indicates that wastewater discharges during the stabilization campaign should also be below the Table II values.

During this analysis, it was discovered that the Pu-239 data (1979 through 1984) from the Waste Stream Characterization Report was reported as pCi/L when the actual units were μg/L. The correct values are obtained by multiplying each data point by 6.14E+04. The correct Pu-239 values are shown in Table 3 of the Appendix.

3.0 ENGINEERED BARRIERS AND ADMINISTRATIVE CONTROLS

Wastewaters discharged to the Z-20 Crib from PRF consist of non-contact cooling waters from process vessel cooling jackets, cooling coils, and condensers. Filtrate generated from oxide production from the RMC line may be evaporated in the PRF filtrate evaporator during RMC operations. The cooling water from the filtrate evaporator condenser is discharged to the Z-20 Crib. This is the only Z-20 Crib wastewater generated during RMC operations.

Several engineered barriers have been provided to isolate the PRF cooling water systems from the process solutions. First, the cooling water system is physically isolated from the process vessels. Second, the process vessels and the cooling systems are constructed of 300 series stainless steel. The 300 series stainless steel was selected for its excellent corrosion resistant qualities, machinability and fatigue strength. Finally, all of the cooling systems are maintained at a higher pressure than the process vessels. This is done to ensure that if a leak should develop, cooling water would flow into the process vessel rather than having contaminated process solutions flow into the cooling water.

In addition, the differential pressure between the process tanks and cooling jackets is monitored continuously on the two PRF tanks which contain concentrated process solutions. If the differential pressure falls to less than 10 psi, the pump in the process tank will automatically shut off. This will increase the differential pressure between the cooling jacket and the process tank to minimize contamination of the cooling water with process solutions.

Administrative controls consist of preventative maintenance, instrument and equipment calibration, operating and administrative procedures, and an early warning system based on wastewater sample data.

Preventative maintenance and calibrations are performed on the process tanks and ancillary equipment on a regular schedule to ensure that all systems function correctly and that there are no leaks in the process tanks/ancillary equipment or in the cooling jackets. Pressure testing is currently scheduled for several PRF process tanks and cooling jackets (WHC, 1990) to ensure that there are no leaks. If any problems are noted, repairs will be completed prior to PRF restart.

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A study was performed by PFP Process Engineering in 1990 (WHC, 1991a) to evaluate the potential process upsets and their consequences. This study included a review of engineered and administrative barriers and concluded that systems were in place to prevent misrouting process solutions to the Z-20 Crib during a process upset.

Operating procedures have been prepared for all process equipment to ensure that the equipment is operated in an appropriate manner and that discharges to the environment are within internal limits. Administrative procedures have been developed for use in the event of upset conditions which cause effluent discharges to exceed Westinghouse Hanford Company (WHC) internal limits to correct problems before releases to the Z-20 Crib exceed regulatory limits or Table II values.

The internal limits and required response actions, which are summarized in Table 1, have been set well below any regulatory limits or the Table II values to provide an early warning system. Data from wastewater samples (WHC, 1991b) taken each shift at Manhole number 4 directly downstream of PRF and from Manhole number 7 and 9 at the point of discharge to the crib (see Figure 1 for locations) are reviewed against these internal limits so that prompt corrective action can be taken if necessary. Table 2 provides a summary of applicable discharge limits and the Table II values.

The internal limits from Table 1 are expressed as total alpha activity. Total alpha activity consists of all alpha-emitting radionuclides, including Pu-239. Thus, if the Pu-239 activity was 5.0 E-06 μCi/ml (the Table II value for Pu-239), the calculated total alpha activity would be 5.19 E-05 μCi/ml. Table 1 indicates that initial response actions are required when the total alpha activity in Z-20 Crib wastewater samples is 2.0 E-06 uCi/ml. This concentration is approximately 25 times below the calculated total alpha activity represented by Pu-239 at the Table II value. This early response action provides assurance that releases during PRF and RMC operations can be promptly detected and corrected.

4.0 PROCESS DISCHARGE HISTORY

Engineered barriers and administrative controls have been effective during past operations campaigns to ensure that process upsets are promptly detected and corrected. Although there has only been one process upset at PFP since 1984 which resulted in radionuclide release to the wastewater in excess of the Table II values, this review included an evaluation of the other three process upset events to show how the early warning system worked to prevent releases in excess of regulatory limits or Table II values. This review also provides information on the corrective actions taken to prevent recurrence.

Tank 38 Cooling Jacket Leak:

Increased alpha activity was observed in the wastewater discharged to the Z-20 Crib from February 27 through March 3, 1984. No internal or external release limits were violated. During this five day period, the event was evaluated and the source of increased activity was identified as the D-3 waste stream from the 236-Z Building. A small leak was discovered in the cooling water

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jacket on the Tank 38 recirculation line. The cooling water jacket was replaced on March 3, 1984, and alpha activity to the Z-20 Crib returned to normal.

Nitric Acid Tank Overflow:

On September 26, 1984, an estimated 4447 liters (1,175 gallons) of 57 percent nitric acid overflowed from nitric acid service Tank A-105 located in Aqueous Make Up (AMU) Room 40 of the 236-Z Building. The high level interlock system failed to shut off the nitric acid transfer pump at a preset high level alarm point. This acid was released to the Z-20 Crib through floor drains in the AMU. On October 26, 1984, approximately 92 liters (24 gallons) of 57 percent nitric acid were discharged to the Z-20 Crib when nitric acid service Tank A-105 again overflowed. These acid releases caused dissolution of radionuclides from the contaminated vitreous clay pipe which leads to the crib and resulted in Pu-239 discharges which exceeded RHO-MA-139 internal action limits (see Table 2).

A new catch tank (2735-Z) has been installed to receive any releases from the floor drains under the chemical product tanks in the AMU. Any future releases from these tanks will be collected in the catch tank and either returned to the product tank or properly disposed of.

Tank 120 Diaphragm Rupture:

On December 20, 1984, the eight hour composite wastewater sample contained Pu-239 at a concentration of 1.07 E-03 μCi/ml. This exceeded both internal (RHO-MA-139) limits and the Table II values. PRF operations were immediately suspended. A ruptured differential pressure transmitter diaphragm on Tank 120 was determined to be the source of the contamination to the cooling water jacket. The cooling jacket and differential pressure transmitter for Tank 120 were replaced and the contaminated piping leg from the cooling jacket to the D-3 drain header replaced. The differential pressure transmitter was replaced with a differential pressure transducer to further reduce the possibility of cross-contamination due to a ruptured diaphragm. This transducer is being moved outside the process glovebox to facilitate maintenance and operability. Installation of the transducer will be completed prior to PRF restart.

Tank C-4 Cooling Coil Leak:

On January 23, 1986, the total alpha average for a two week period was determined to exceed the internal limit. The source was determined to be the Tank C-4 cooling coil. The C-4 Tank cooling coil was replaced, the leak stopped, and the liquid effluent sample results returned to normal.

Tank 22 Condenser:

The Tank 22 condenser failed during the 1987 PRF campaign. This failure was detected and the condenser was replaced before any detectable release of radioactivity occurred to the Z-20 crib.

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5.0 CONCLUSIONS

Appropriate engineered barriers are in place to minimize the potential for releases of transuranic radionuclides in excess of the Table II limits during routine operations and credible process upset conditions. Administrative controls are in place to ensure the engineered barriers are properly maintained and that process upsets and leaks are promptly detected and corrected. Thus, no acceleration of wastewater treatment projects is necessary.

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TABLE 1: WHC INTERNAL RELEASE LIMITS AND RESPONSE ACTIONS

TOTAL ALPHA CONCENTRATION (μCi/ml)	SAMPLE FREQUENCY	RESPONSE
2×10^{-6}	SHIFT COMPOSITE SINGLE SAMPLE	RESAMPLE, INVESTIGATE
4×10^{-6} 2×10^{-6}	SHIFT COMPOSITE SINGLE SAMPLE SHIFT COMPOSITE TWO SUCCESSIVE SAMPLES	RESAMPLE, INVESTIGATE, SHUT DOWN PLANT IF NECESSARY
8×10^{-6} 4×10^{-6}	SHIFT COMPOSITE SINGLE SAMPLE SHIFT COMPOSITE TWO SUCCESSIVE SAMPLES	RESAMPLE, SHUT DOWN PLANT
4.5×10^{-5} 4×10^{-6} 2×10^{-6}	SHIFT COMPOSITE SINGLE SAMPLE MONTHLY COMPOSITE YEARLY AVERAGE	RESAMPLE, SHUT DOWN PLANT, ISSUE UNUSUAL OCCURRENCE REPORT
1.5×10^{-4}	INSTANTANEOUS	IMPLEMENT BUILDING EMERGENCY PLAN

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TABLE 2: LIQUID EFFLUENT DISCHARGE LIMITS AND TABLE II VALUES

RADIONUCLIDE	WHC-CM-7-5 [1]Interim Ctrl Value (μCi/ml)	WHC-CM-7-5 [2]DCG(μCi/ml)	[3]RHO-MA-139 DCG(μCi\ml)	10 CFR TABLE II (μCi/ml)
^{60}Co	5.0E-06	5.0E-06	5.0E-06	3.0E-05
^{90}Sr	2.0E-05	1.0E-06	1.0E-06	3.0E-07
^{103}Ru	5.0E-04	5.0E-05	5.0E-05	None
^{106}Ru	6.0E-05	6.0E-06	6.0E-06	None
^{134}Cs	2.0E-06	2.0E-06	2.0E-06	9.0E-06
^{137}Cs	3.0E-05	3.0E-06	3.0E-06	2.0E-05
^{238}Pu	4.0E-07	4.0E-08	4.0E-06	5.0E-06
^{239}Pu	2.0E-06	3.0E-08	3.0E-06	5.0E-06
^{240}Pu	SAME AS ABOVE	3.0E-08	3.0E-06	5.0E-06
^{241}Pu	2.0E-04	2.0E-06	2.0E-04	2.0E-04
^{241}Am	3.0E-07	3.0E-08	1.0E-07	4.0E-06

[1]Values taken from Table F-2, Interim Concentration Values for PFP Waste water to 216-Z-20, WHC-CM-7-5 Part F, Rev. 1.

[2]DCG - Derived Concentration Guidelines - A concentration of radioactive materials in water. DCG are used for controlling exposure to members of the public. "DCG-public are those concentrations of radionuclides in water that would result in a maximum effective committed dose equivalent of 100 mrem per year using ICRP 30 dose methodology under conditions of continuous exposure or use (i.e.,continuously.....drinking contaminated water)".

[3]These limits were applicable prior to 1988.

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7.0 REFERENCES

WHC, 1990, Pressure Check and Gradual Start Up of PRF Process Cooling Water Users, Workplan PFP-90-PRF-014, Westinghouse Hanford Company, Richland, Washington.

WHC, 1991a, 291-Z Sump and Z-20 Crib Routine Sample Schedules, FSS-Z-080-00003, Rev. C-1, Westinghouse Hanford Company, Richland, Washington.

WHC, 1991b, Reopen Plutonium Reclamation Facility Readiness Review Section 1.1.3, Question 22, Letter 15530-91-WSL-081, Westinghouse Hanford Company, Richland, Washington.

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8.0 BIBLIOGRAPHY

1. WHC-CM-5-8, Plutonium Finishing Plant Administrative Manual, "Non-Routine Release Response, " Westinghouse Hanford Company, Richland, Washington.

2. WHC-CM-7-5, Environmental Compliance, Westinghouse Hanford Company, Richland, Washington.

3. Title 10, Code of Federal Regulatory, Part 20, Appendix B, "Concentrations in Air and Water Above Natural Background", Table II, Col. 2-Water.

4. WHC-EP-041, Westinghouse Hanford Company Effluents Discharges and Solid Waste Management Report for Calendar Year 1987: 200/600/1100 Areas, Westinghouse Hanford Company, Richland, Washington.

5. WHC-EP-041-1, Westinghouse Hanford Company Effluents Discharges and Solid Waste Management Report for Calendar Year 1988: 200/600/1100 Areas, Westinghouse Hanford Company, Richland, Washington.

6. WHC-EP-041-2, Westinghouse Hanford Company Effluents Discharges and Solid Waste Management Report for Calendar Year 1989: 200/600/1100 Areas, Westinghouse Hanford Company, Richland, Washington.

7. WHC-EP-041-3, Westinghouse Hanford Company Effluents Discharges and Solid Waste Management Report for Calendar Year 1990: 200/600/1100 Areas, Westinghouse Hanford Company, Richland, Washington.

8. RHO-MA-139, Environmental Protection Manual, Rockwell Hanford Operations, Richland, Washington.

9. WHC-EP-0287, Waste Stream Characterization Report, Westinghouse Hanford Company, Richland, Washington.

10. WHC-EP-0342, Addendum 8, Plutonium Finishing Plant Wastewater Stream Specific Report, Westinghouse Hanford Company, Richland, Washington.

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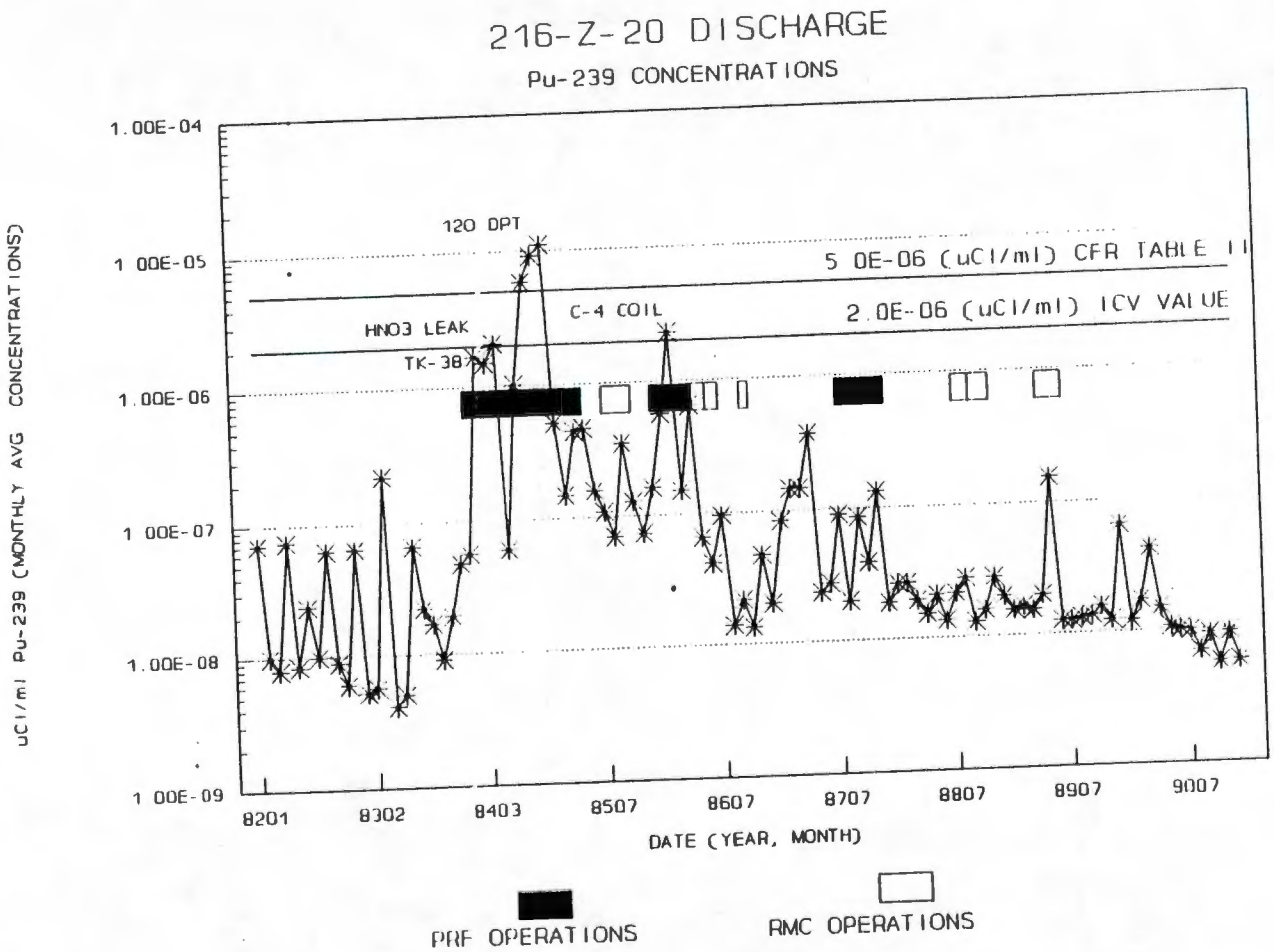
216-Z-20 DISCHARGE
Pu-239 CONCENTRATIONS
uCi/ml Pu-239 (MONTHLY AVG CONCENTRATIONS)
1.00E-04
1.00E-05
1.00E-06
1.00E-07
1.00E-08
1.00E-09
120 DPT
5.0E-06 (uCi/ml) CFR TABLE II
2.0E-06 (uCi/ml) ICV VALUE
HNO3 LEAK
C-4 COIL
TK-38
8201
8302
8403
8507
8607
8707
8807
8907
9007
DATE (YEAR, MONTH)
PRF OPERATIONS
RMC OPERATIONS

Figure 2

APPENDIX

TABLE 1
PFP WASTEWATER DATA FOR PU-239

DATE	µCi/ml
8402	1.68E-06
8403	1.50E-06
8405	2.11E-06
8407	6.01E-08
8410	1.03E-06
8411	5.81E-06
8412	9.15E-06
8501	1.10E-05
8502	5.21E-07
8503	1.49E-07
8504	4.50E-07
8505	4.70E-07
8506	1.59E-07
8507	1.10E-07
8508	7.10E-08
8509	3.57E-07
8510	1.29E-07
8511	7.36E-08
8512	1.63E-07
8601	5.76E-07
8602	2.33E-06
8603	1.52E-07
8604	6.56E-07
8605	6.60E-08
8606	4.20E-08
8607	9.60E-08

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APPENDIX

DATE	μCi/ml
8608	1.39E-08
8609	2.16E-08
8610	1.33E-08
8611	4.72E-08
8612	2.00E-08
8701	8.40E-08
8702	1.48E-07
8703	1.48E-07
8704	3.77E-07
8705	2.37E-08
8706	2.75E-08
8707	9.06E-08
8708	1.99E-08
8709	8.64E-08
8710	3.92E-08
8711	1.33E-07
8712	1.90E-08
8801	2.63E-08
8802	2.66E-08
8803	1.95E-08
8804	1.52E-08
8805	2.11E-08
8806	1.35E-08
8807	2.17E-08
8808	2.81E-08
8809	1.29E-08
8810	1.59E-08
8811	2.82E-08

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APPENDIX

DATE	µCi/ml
8812	2.01E-08
8901	1.57E-08
8902	1.66E-08
8903	1.55E-08
8904	2.00E-08
8905	1.55E-07
8906	1.27E-08
8907	1.26E-08
8908	1.32E-08
8909	1.37E-08
8910	1.60E-08
8911	1.24E-08
8912	6.56E-08
9001	1.23E-08
9002	1.73E-08
9003	4.33E-08
9004	1.52E-08
9005	1.07E-08
9006	1.03E-08
9007	1.00E-08
9008	7.03E-09
9009	9.38E-09
9010	5.75E-09
9011	9.58E-09
9012	5.90E-09

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APPENDIX

TABLE 2
PFP WASTEWATER DATA

DATE	Sr-90	Cs-137	Pu-238	Pu-241	Am-241
8401					
8402	4.49E-08	5.82E-08			2.14E-07
8403	1.81E-08	3.70E-08			8.95E-07
8404					
8405	7.00E-09	6.74E-08			1.78E-07
8406	8.00E-09	4.80E-08			
8407	1.00E-08	4.80E-08			
8408	1.50E-07	4.80E-08			
8409	1.00E-08	4.80E-08			
8410	1.00E-08	3.91E-08			1.65E-06
8411	2.40E-08	4.80E-08			6.35E-07
8412	1.00E-08	4.76E-08			1.25E-07
8501				4.22E-05	4.35E-06
8502				9.79E-07	1.68E-07
8503				3.10E-07	2.77E-07
8504				1.60E-06	2.20E-07
8505				1.54E-06	2.20E-07
8506				5.65E-07	2.39E-07
8507				3.41E-07	4.49E-07
8508				2.81E-07	9.44E-07
8509				1.03E-06	3.45E-07
8510				2.33E-07	3.47E-07
8511				1.30E-07	3.80E-07
8512				3.70E-07	1.63E-07
8601.				3.08E-06	1.63E-06
8602				2.89E-06	7.01E-07

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APPENDIX

DATE	Sr-90	Cs-137	Pu-238	Pu-241	Am-241
8603				3.04E-07	6.92E-07
8604				1.65E-06	4.76E-07
8605				2.08E-07	2.20E-07
8606				2.14E-07	3.53E-07
8607				4.68E-07	3.62E-07
8608				5.99E-08	4.80E-07
8609				8.98E-08	1.71E-07
8610				6.20E-08	1.46E-07
8611				1.93E-07	1.28E-06
8612				8.02E-08	5.45E-07
8701	2.70E-08	1.71E-08	1.40E-08	3.20E-07	4.26E-07
8702	2.20E-08	1.98E-08	1.88E-08	5.68E-07	3.20E-07
8703			1.78E-08	5.53E-07	2.81E-07
8704	2.01E-08	2.08E-08	8.40E-09	9.79E-07	1.36E-07
8705	2.30E-08	1.05E-08	2.62E-09	4.95E-08	3.26E-08
8706	1.79E-08	1.11E-08	6.24E-09	5.84E-08	3.10E-07
8707	1.64E-08	1.63E-08	1.19E-08	3.06E-07	1.24E-07
8708	9.29E-09	2.05E-08	4.93E-09	7.84E-08	2.87E-08
8709	2.50E-08	2.20E-08	1.46E-08	2.35E-07	3.83E-08
8710	1.78E-08	1.90E-08	4.55E-09	1.10E-07	1.61E-08
8711	1.73E-08	1.71E-08	3.72E-09	3.22E-07	1.29E-08
8712	2.70E-08	1.75E-08	2.43E-09	2.29E-08	4.59E-08
8801			4.55E-09	4.66E-08	9.42E-09
8802			2.20E-09	5.11E-08	1.21E-08
8803			8.77E-10	4.05E-08	1.75E-08
8804			1.28E-08	2.79E-08	1.90E-08
8805			3.33E-09	6.42E-08	1.52E-08
8806			5.07E-09	6.40E-08	2.45E-08

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APPENDIX

DATE	Sr-90	Cs-137	Pu-238	Pu-241	Am-241
8807			1.15E-08	7.63E-08	3.89E-08
8808			1.45E-08	1.02E-07	1.45E-08
8809			7.69E-09	1.35E-07	3.04E-08
8810			7.78E-09	5.72E-08	3.12E-08
8811			5.80E-09	6.84E-08	2.89E-08
8812			4.55E-09	6.65E-08	1.59E-08
8901	1.62E-08	1.82E-08	4.57E-09	3.93E-08	9.13E-09
8902	1.20E-08	1.61E-08	1.54E-09	3.58E-08	9.60E-09
8903	1.27E-08	3.76E-08	3.41E-09	7.23E-08	1.80E-08
8904	1.28E-08	1.97E-08	7.19E-09	5.51E-08	1.44E-08
8905	9.85E-09	2.29E-08	1.33E-08	5.14E-07	1.41E-08
8906	1.27E-08	2.18E-08	2.12E-09	4.30E-08	1.49E-08
8907	1.82E-07	2.74E-08	4.97E-09	3.60E-08	9.90E-09
8908	1.36E-08	2.89E-08	5.84E-09	2.81E-08	1.17E-08
8909	1.39E-08	2.62E-08	5.86E-09	6.09E-08	1.16E-08
8910	1.28E-08	2.06E-08	6.07E-09	3.45E-08	1.21E-08
8911	1.63E-08	2.72E-08	5.51E-09	2.54E-08	1.10E-08
8912	1.95E-08	3.14E-08	3.37E-09	1.11E-07	1.32E-08
9001	2.7E-08	6.1E-08	1.2E-08	5.7E-08	2.5E-08
9002	2.0E-08	6.2E-08		4.6E-08	2.5E-08
9003	2.3E-08	6.1E-08		1.6E-07	2.0E-07
9004	1.2E-08	6.2E-08	1.0E-08	5.8E-08	1.2E-08
9005	1.7E-08	7.2E-08	1.0E-08	4.1E-08	1.2E-08
9006	1.7E-08	4.1E-08	1.0E-08	3.9E-08	1.2E-08
9007	1.6E-08	7.4E-08	1.0E-08	4.6E-08	1.2E-08
9008	1.7E-08	6.9E-08	5.9E-09	3.7E-08	3.5E-09
9009	1.3E-08	7.1E-08	5.8E-09	5.0E-08	6.6E-09
9010	1.3E-08	7.1E-08	5.8E-09	2.9E-08	3.1E-09

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APPENDIX

DATE	Sr-90	Cs-137	Pu-238	Pu-241	Am-241
9011	1.5E-08	5.2E-08	5.7E-09	7.3E-08	1.1E-08
9012	1.5E-08	5.8E-08	5.9E-09	4.5E-08	1.2E-08

9413136.0510

APPENDIX

TABLE 3
CORRECTED Pu-239 VALUES

DATE	µCi/ml
7901	5.45E-07
7902	1.79E-07
7903	8.96E-08
7904	2.95E-07
7905	9.52E-08
7906	9.09E-08
7907	8.78E-08
7908	3.56E-08
7909	3.43E-09
7910	1.95E-08
7911	1.41E-08
7912	1.60E-08
8001	9.95E-09
8002	8.53E-08
8003	4.84E-09
8004	7.80E-09
8005	3.65E-09
8006	7.00E-09
8007	8.23E-09
8008	7.12E-09
8009	7.00E-09
8010	4.80E-09
8011	4.60E-09
8012	7.12E-09
8101	9.70E-01
8102	1.23E-08

9413136.0511

9413136.0512

APPENDIX

DATE	µCi/ml-07
8103	1.04E-07
8104	4.30E-09
8105	5.90E-08
8106	2.30E-08
8107	2.46E-08
8108	2.82E-08
8109	2.05E-08
8110	2.50E-08
8111	2.40E-08
8112	2.70E-08
8201	7.18E-08
8203	1.00E-08
8204	7.98E-09
8205	7.49E-08
8206	8.47E-09
8207	2.40E-08
8208	1.00E-08
8209	6.32E-08
8210	9.03E-09
8211	6.10E-09
8212	6.51E-08
8301	5.27E-09
8302	5.71E-09
8303	2.26E-07
8304	4.10E-09
8305	5.04E-09
8306	6.64E-08
8307	2.23E-08

APPENDIX

DATE	µCi/ml
8308	1.70E-08
8309	9.10E-09
8310	1.93E-08
8311	4.81E-08
8312	5.70E-08
8402	1.68E-06
8403	1.50E-06
8405	2.11E-05
8407	6.01E-08
8410	1.03E-06
8411	5.81E-06
8412	9.15E-06

NOTE: Appendix tables may include less than values which are reported at the detection limit. Values recorded in Table 2 for the calendar year 1990 are reported to two (2) significant figures per request of DOE to WHC Environmental Protection.

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9413136.0514

REFERENCES

PRESSURE CHECK AND GRADUAL START UP OF PRF PROCESS COOLING WATER USERS

GENERAL

This work will be done to prevent a high release of radioactivity to the 216-Z-20 crib during the initial start up of PRF. Each one of the users that has not operated recently will be started up one at a time, thief samples will be taken at manhole 4, and the effluent monitor will be checked. This will prevent a spike that could result from all the users going on at once and flushing residual contamination out that might have leaked in during the outage. The cooling jackets for TK 36, 37, 38, and 120 will be pressured up and checked for leaks prior to flushing them.

The following equipment will be checked:

- TK 37 Cooling Jacket
- TK 38 Cooling Jacket
- TK 36 Cooling Jacket
- TK 120 Cooling Jacket
- TK 44 (Product Concentrator Condenser)

SAFETY

There are no special hazards involved in this task.

PRESTART CONDITION

A work package will be required to obtain maintenance support to force open the solenoid valves on the water supply line to the cooling jackets. These valves normally open only when the pump is running, Reference H-2-29799.

Notify Facilities Services before beginning flushing so they can be prepared to look for monitor response and obtain manhole samples.

Calibration of the OLAM, PFP-89-FS-040, will be completed.

PROCEDURE

NOTE: Use valve verification checksheet, attach checksheet to this work plan when complete.

1. PRESSURE CHECK COOLING JACKETS

   1.1. Place the cooling water system for TKs 36, 37, 38, and 120 in service at back flow preventors. Open 3rd floor water valves.

   3434
   3403
   3403A
   3405
   3404
   3431
   3433

   1.2. Position Valves as follows:

9413136.0515

	TK 36	TK 37	TK 38	TK 120	
CLOSE 545		509	508	455	(2ND WEST)
OPEN	36-E1	37-1	38-1	120-B1	(3RD FLOOR)
	36-E2	37-2	38-2	120-B2	
		37-ST	38-ST		

1.3. Have Maintenance force open the inlet solenoid valve to open long enough to pressure up the jacket.

TK 36	TK 37	TK 38	TK 120
36-E		120-B 37-EV	38-EV

1.4. Record Initial pressure on data sheet from pressure gage on surge tank.

1.5. After 10 minutes record the pressure again.

2. FLUSH COOLING JACKETS

NOTE: Do jacket flushing one at a time. Let each jacket flush for 20 minutes and wait 1 hr between jackets so the lines will flush out and a difference in the monitor response can be noticed.

The jackets may be done in any order as long as they are done one at a time and the time is recorded.

2.0.1. Notify Facilities Service so the OLAM monitor can be observed for response and record initial monitor reading on data sheet. Also have prepare to begin thief sampling at manhole 4.

2.0.2. Open discharge valves for the selected cooling jacket.

TK 36	TK 37	TK 38	TK 120
545	509	508	455

2.0.3. Have the electrician force open the solenoid valve for the selected jacket. Record the flush start times on the data sheet.

TK 36	TK 37	TK 38	TK 120
36-E	120 B	37-EV	38-EV

2.0.4. Notify Facilities Services to pull a thief sample of the D-3 drain PRF stream from Manhole 4 when an increase in the flow is first detected and at 5 minute intervals while flushing. Label each bottle with seperate numbers and record the sample numbers and the times obtained on the data sheet. Refer to ZO-100-008 "Manhole Sampling"

2.0.5. Flush jacket for 20 minutes and then close solenoid valve. Record flush stop time on the data sheet.

2.0.6. Record highest OLAM monitor response on the data sheet. The average count of 20-30 may be 10 counts higher when PRF is operating.

9413136.0516

2.0.7. Close the valves that were opened for the jacket that was flushed. Wait at least 1 hr. Repeat the above steps until all of the cooling jackets have been flushed.

TK 36	TK 37	TK 38	TK 120	
545	509	508	455	(2ND WEST)
36-E1	37-1	38-1	120-B1	(3RD FLOOR)
36-E2	37-2	38-2	120-B2	
	37-ST	38-ST		

3. FLUSH TK 44.

NOTE: Let Tank 44 flush out for 20 minutes and wait 1 hr before doing other equipment so the lines will flush out and a difference in the monitor response can be noticed.

3.0.1. Open the third floor water valves at Backflow preventor station 2.

3292
3292A
3294A
3294

3.0.2. Open 3rd floor valves 44-B1,44-B2, and turn 44-SS-B to ON to start the cooling water flow. Record flush start time on the data sheet.

3.0.3. Notify Facilities Services to pull a thief sample of the D-3 drain PRF stream from Manhole 4 when an increase in the flow is first detected and at 5 minute intervals while flushing. Label each bottle with seperate numbers and record the sample numbers and the times obtained on the data sheet. Refer to ZO-100-008 "Manhole Sampling"

3.0.4. Flush TK 44 for 20 minutes and then turn 44-SS-B to OFF. Record flush stop time on the data sheet.

3.0.5. Record highest OLAM monitor response on the data sheet. The average count of 20-30 may be 10 counts higher when PRF is operating.

3.0.6. Close the valves opened steps 3.1 and 3.2.

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PFP-90-PRF-014

DATA SHEET

PRESTART FLUSH OF PRF EQUIPMENT

JACKET PRESSURE CHECK

	JACKET PRESSURE INITIAL	JACKET PRESSURE AFTER 10 MIN.
TK 36		
TK 37		
TK 38		
TK 120		

MANAGER _____ DATE _____

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PFP-90-PRF-014

DATA SHEET

PRESTART FLUSH OF PRF EQUIPMENT

FLUSHING TIMES FOR EQUIPMENT, MONITOR RESPONSE AND MANHOLE SAMPLING

(COMPLETE ONE DATA SHEET FOR EACH TANK)

INITIAL MONITOR READING _____

CIRCLE EQUIPMENT BEING FLUSHED TK36 TK37 TK38 TK120 TK44

TIME FLUSH STARTED _____

TIME FLUSH STOPPED_____

MAXIMUM RESPONSE ON ALPHA MONITOR_____

SAMPLE NUMBER OF INITAIL STREAM_____

SAMPLE NUMBER AFTER 5 MINUTES_____

SAMPLE NUMBER AFTER 10 MINUTES_____

SAMPLE NUMBER AFTER 15 MINUTES_____

SAMPLE NUMBER AFTER 20 MINUTES_____

MANAGER_____ DATE_____

RETURN TO PROCESS ENGINEERING WHEN DONE

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PFP-90-PRF-014

PRESSURE CHECK AND GRADUAL START UP OF PRF PROCESS COOLING WATER USERS

APPROVALS:

_____
Process Engineering

_____
Environmental Compliance

_____
Plutonium Operations

_____
Facilities Services

_____
Nuclear Facility Safety

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Title: 291-Z Sump and Z-20 Crib Routine Sample Schedules

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A-6400-176 (10/88)

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291-Z SUMP AND Z-20 CRIB ROUTINE SAMPLE SCHEDULES

SAMPLE POINT	LOCATION	FREQUENCY	SIZE (ML)	NO OF SAMPLES	ANALYSIS	OSR	RESULTS UNITS	REPORTING DIGITS	SPECIAL ACCURACY & PRECISION	PRIORITY	NORMAL OPERATING RANGE
Cooling Water Sump	291-Z	On Req (5)	250	1	Total Alpha		uCi/L	X.XX		24 Hr	Below $5X10^{-3}$
Z-20	2904-ZA or 2904-ZB	Shiftly (4)	1000 (6)	1	Total Alpha (2) Total Beta pH	(1)	uCi/L	X.XX		8 Hr (4) 8 Hr	Below $2X10^{-3}$
Manhole #2		On Req	250	1	Total Alpha		uCi/L	X.XX		24 Hr	Below $5X10^{-6}$
Manhole #3		On Req	250	1	Total Alpha		uCi/L	X.XX		24 Hr	Below $5X10^{-6}$
Manhole #4		On Req	250	1	Total Alpha		uCi/L	X.XX		24 Hr	Below .005
26" Vacuum Recirculating Seal Water	234-5Z Rm 308	Once (7) Every Week	30	1	Pu pH		g/L	.XXX XX.X	± 20% ± 10%	24 Hr 24 Hr	Below .005 Within 3.0 - 8.0

(1) If the 168 hour average limit is exceeded, an OSR Limiting Control Setting has been exceeded. Refer to WHC-CM-5-8, Procedure 1.5, paragraph 6.1.6 for actions to be taken. The 168 hour average OSR Limit Control Setting is $2 X 10^{-3}$ uCi/L, sampled at 2904-ZA or 2904-ZB.

(1) If the annual average limit is exceeded, an OSR Safety Limit has been exceeded. Refer to WHC-CM-5-8, Procedure 1.5, paragraph 6.1.6 for action to be taken. The annual average OSR Safety Limit Setting is $5 X10^{-3}$ uCi/L, sampled at 2904-ZA or 2904-ZB.

(2) The 222-S laboratory will sum the filtrate and solids results, report pH and total alpha content. Separate filtrate and solids results will be reported on request only.

(3) Manhole #4 and related streams will be sampled and analyzed once a shift when 236-Z Solvent Extraction Process is in operation, otherwise on request.

(4) Total Beta activity for the 2904-ZA/2904-ZB sample is performed on the monthly composite of the shiftly samples.

(5) Sampled and analyzed if 2904-ZA/2904-ZB sample $\geq 5.0 X10^{-3}$ MCi/L or on request.

(6) Taken together as 1000 ml sample.

(7) Only when 26" vacuum pump is operating.

NOTE: Manhole #2, #3, and #4 will be taken by grab sample method.

OFFICIALLY RELEASED ODM

Release Date	Expiration	Document No.	Revision	Page
04/08/91	-------	FSS-Z-080-00003	C-1	1 of 1

A-6400-183.1 (N-4-83)

9413136.0522

Westinghouse
Hanford Company

Internal
Memo

From: PFP Process Engineering 15530-91-WSL-081
Phone: 3-3488 T5-55 270-Z/200W
Date: June 18, 1991
Subject: REOPEN PLUTONIUM RECLAMATION FACILITY READINESS REVIEW SECTION 1.1.3, QUESTION 22

To: D. L. Sickle T5-20

cc: P. J. Certa T5-55
B. G. Faulk T5-56
M. W. Gibson T4-20
MWG/WSL File/LB
D. R. Groth T4-20
C. M. Kronvall R3-56
A. E. Schilling T5-51

Reference: (1) Internal Memo, B. G. Faulk to E. C. Vogt, "Investigation of Potential OSR Safety Limit Violation," dated June 15, 1990.

(2) Internal Memo, W. S. Lewis to D. L. Hallquist, "PRF Readiness Review Section 1.1.3, Question 22," dated July 27, 1989.

PRF SECTION: 1.1.3 QUESTION 22

Has a misrouting study been performed?

Acceptance Criteria:

Process engineering to perform a misrouting study. Review will consider safety and environmentally related systems. Operations will accept the residual risk.

Due to modifications in the CAW transfer system (TKs-19, 39, and WM1) section 1.1.3 question 22 was reopened. This letter replaces, in whole, the previous response to section 1.1.3, question 22 (Reference 2.1). An assessment of the PRF was performed to identify those areas where a misrouting could potentially result in a safety or environmental event. Those systems are listed in Attachment I. Each system was evaluated to asess what would have to happen for an event to occur (Attachment II). The Engineered and Administrative barriers that are presently in place have been evaluated. Alarm and detection device calibrations are maintained via the PISCES and PM system.

Transfer routes from TK-49 to TK-19 and TK-39 were identified in June 1990. These routes presented the potential for high Pu solution to be misrouted to a geometrically unfavorable tank (TK-D5). The routes were removed and the remainder of the CAW system was reviewed for similar transfer paths (Attachment III). No other potential misrouting paths were identified.

9413136.0523

A catch tank and spill basin have been installed at the bulk storage area. The catch tank will recieve solution that would overflow from the chemical preparation drains in both PRF and RMC. The spill basin is located underneath the bulk storage tanks for HNO3 and ANN.

Based on the potential events identified and the Engineered and Administrative barriers in place, the risks of a misrouting associated with the operation of the PRF are deemed acceptable.

This Internal Memo closes PRF Readiness Review Action Section 1.1.3, Question 22.

W S Lewis

W. S. Lewis, Advanced Engineer
Plutonium Facility Plant, Process Control

cse

Attachments: 3

Concurrence:

P. J. Certa, Senior Engineer, Readiness Review Board Member — Date

G. B. Chronister, Manager PRF Operations — Date

Approval:

Approved, Readiness Review Chairman — Date

9413136.0524

9413136.0525

POTENTIAL MISROUTE AREAS

Process Vacuum Filterbox

Room 40 Chemical Preparation Tanks

241-Z

241-Z (TK-D4)

242-Z

Z-20 Crib

Process vacuum filter box

Event

Solution overflows TK-50 (vacuum trap for 26" vacuum system) into filterbox in Rm 308

Engineered Barriers

High WF alarm and interlock at 20% of chart shuts off flow to TK-50

Liquid detection device upstream from filter box in Rm 308

Demisters in place between TK-50 and filterbox in room 308

Administrative Barriers

Liquid levels procedurally maintained below 20%

Surveillance of Engineered barriers

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Criticality

Chemical preparation tanks Rm 40

Event

Pu bearing solution backs up into chem prep tanks

Engineered Barriers

All chem addition lines to the gloveboxes have funnel breaks

Administrative Barriers

WA required to make any piping changes

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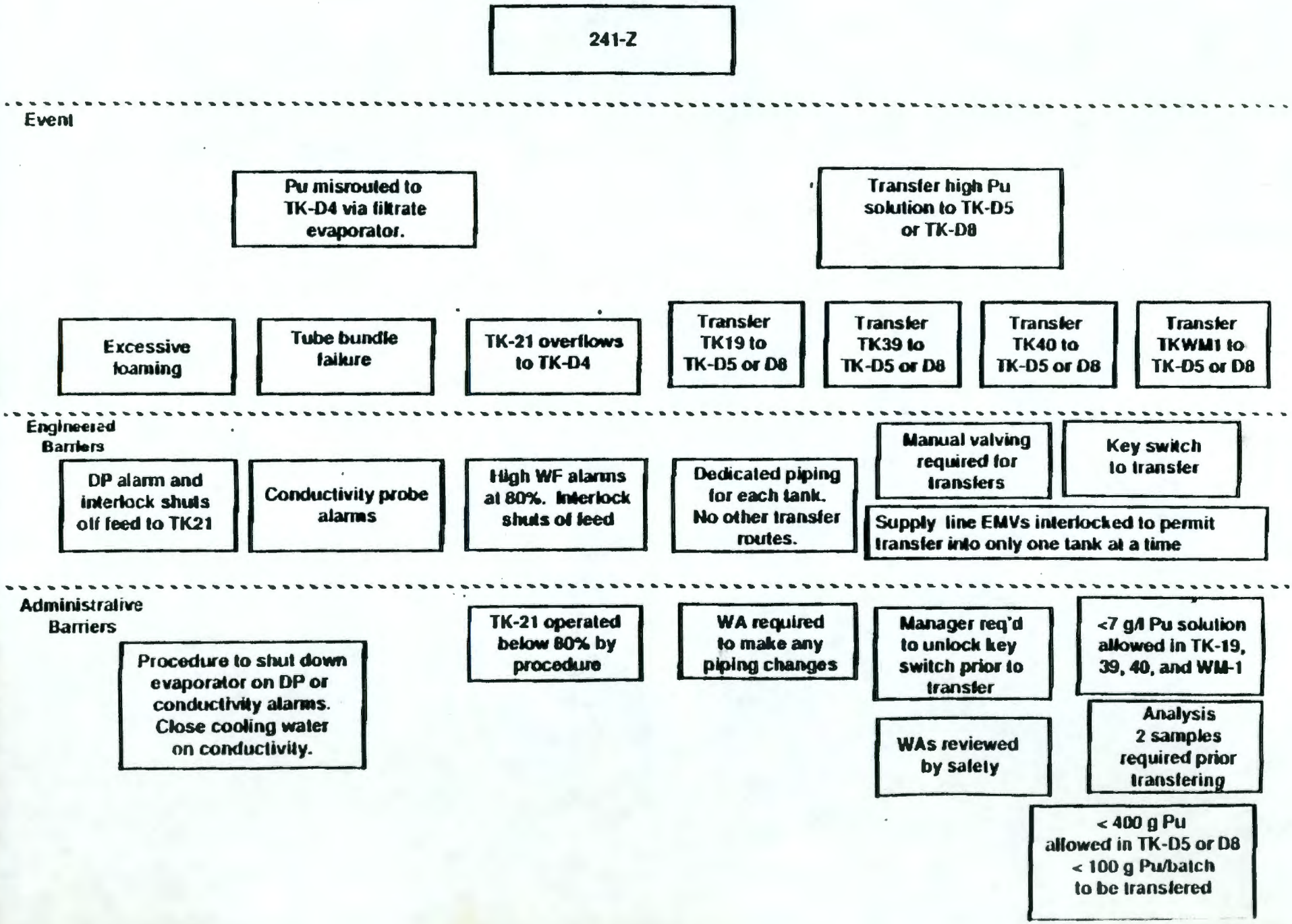
241-Z
Event
Pu misrouted to TK-D4 via filtrate evaporator.
Transfer high Pu solution to TK-D5 or TK-D8
Excessive foaming
Tube bundle failure
TK-21 overflows to TK-D4
Transfer TK19 to TK-D5 or D8
Transfer TK39 to TK-D5 or D8
Transfer TK40 to TK-D5 or D8
Transfer TKWM1 to TK-D5 or D8
Engineered Barriers
DP alarm and interlock shuts off feed to TK21
Conductivity probe alarms
High WF alarms at 80%. Interlock shuts of feed
Dedicated piping for each tank. No other transfer routes.
Manual valving required for transfers
Key switch to transfer
Supply line EMVs interlocked to permit transfer into only one tank at a time
Administrative Barriers
Procedure to shut down evaporator on DP or conductivity alarms. Close cooling water on conductivity.
TK-21 operated below 80% by procedure
WA required to make any piping changes
Manager req'd to unlock key switch prior to transfer
WAs reviewed by safety
<7 g/l Pu solution allowed in TK-19, 39, 40, and WM-1
Analysis 2 samples required prior transfering
< 400 g Pu allowed in TK-D5 or D8
< 100 g Pu/batch to be transfered

Criticality

241Z
TK-D4

Event

Pu leaks into D-1 or D-3 header

Solution from D-1 and D-3 headers transferred to TK-D4

Engineered Barriers

Stream alarms on high Pu or failure

Non essential drains from Gloveboxes to TK-D4 capped or have valving in place

Administrative Barriers

All flows stopped when monitor alarms

Amount of Pu allowed in TK-D4 limited to 400 grams

Alarms calibrated/ tested biannually by PISCES

Opening of any valving to TK-D4 requires Management approval

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Environmental/Criticality

242-Z

Event

Pu bearing solution transferred in Rm 242 (isolated room)

Engineered Barriers

Lines are all capped

Administrative Barriers

WA required to reconnect lines

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Environmental/Criticality

Z-20 Crib

Event

PRF and S&C cooling jackets without DP transmitters **(low Pu stream being cooled) fail Pu released to crib

** TK-C4 cooling coil, MT-6
Reflux condensers MT-5
TK-22 filtrate condenser
TK-37 CAX cooling jacket
TK-38 CAX cooling jacket
EC dissolver condenser

PRF and S&C cooling jackets with DP transducers * (high Pu stream being cooled) fail Pu released to crib

* TK-120 CAP cooling jacket
TK-38 cooling jacket
TK-12 EC recirc loop cooling jacket

Engineered Barriers

Favorable pressure in jackets

Crib monitor alarms on high Pu or failure

High DP alarms and interlocks

Administrative Barriers

Cooling jacket integrity verified at shutdown

Procedure in place to assure correct action on alarm

All flows stopped when monitor alarms

Alarms calibrated/tested by PISCES

DP transducers calibrated with PISCES once per year.

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Environmental/Criticality

Z-20 Crib

Event

- S&C acid preheaters jacket failure.
- TK21 and TK43 steam jacket failure
- Solution flows out chem prep drain line in Rm 40 to catch tank then spill containment basin at 2735-Z

Engineered Barriers

- Conductivity probes alarm on high conductivity
- Risers located in spill basin prevent sol'n from being released to catch tank
- Conductivity probes located in risers alarm on high conductivity

Administrative Barriers

- Steam Jackets are pressure tested prior to use
- Alarms and probes calibrated/tested by PISCES

9413136.0532

ATTACHMENT III

9413136.0533

CONTRACTOR : WHC EVENT FACT SHEET

1. Title: TK-49 TO TK-19 AND TK-39 TRANSFER ROUTES
2. Reporting Organization: 12364
3. Division/Department/Project: CHEM PROCESSING
4. Number: PFP-90-070 5. Rev.: 0
6. Date of Event/Time: (declared) 6-14-90 / 0945 Date Discovered: 4-16-90

7. Event Identification:

A) Location of Event: 236-Z Plutonium Reclamation Facility

B) Plant/Facility Status: Extended Outage

1. Alarm: Facility Type (False Fire, CAM, CAS, etc.)
2. Regulatory Requirement (CERCLA, RCRA, WDOE, DOE-RL, DOE-HQ, etc.)
3. Operating Requirements (OSR, CPS, Tech Spec., Procedure Administrative, etc.)
4. Release/Spread - Radioactive Contamination/Hazardous Material
5. Radiological - Personnel Contamination, Internal Deposition, Over Exposure, etc.
6. Industrial Safety, Personnel Injury, First Aid, etc.
7. Process Misrouting
8. Utility System - Electrical, Steam, Air, Water
9. Hoisting/Lifting
10. Other

C) Event Type: 3 Potential Safety Limit Violation

OSR/TS:	Nonconformance	[]	Violation	[]
CPS:	Infraction	[]	Violation	[]

8. Apparent Cause(s) of Event:

Design	[P]	Administrative Control	[]
Personnel Error	[S]	Procedure	[]
Material	[]	Other: []	

9. Description of Event:

On 4/16/90, while reviewing procedure ZO-180-010, Process Control Engineering identified a transfer route from TK-49 to TK-39 which could potentially exceed the CPS-Z-165-80701, Limit 1.2 of less than 7 g Pu/l in TK-39.

PFP Process Engineering made this discovery known to PFP Nuclear Safety, Operations and the PFP CSR.

The potential to exceed a CPS limit was immediately recognized by all concerned and actions were taken to remove the transfer route before restarting the Plutonium Reclamation Facility.

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PFP Process Engineering Issued a Non-event fact sheet to document that proactive corrective actions were taken to prevent a potential CPS infraction.

Drawings were reviewed by Process Control for similar routes. One other was identified (TK-49 to TK-19) and similar actions to remove it were taken.

On 6-13-90 DOE-RL inquired about the discovery during a post review of this activity and questioned the formal reporting of the discovery and the appropriateness of actions taken.

---

10. Consequences of Event:

A potential Safety Limit Violation was declared related to contingencies to prevent a criticality in TK-D5. An investigation into the event was initiated. At this time no impact is anticipated to scheduled operations, PRF is in an outage mode.

Tanks Tk-39 and Tk-19 are empty and no transfers are taking place and will not be performed until PRF resumes operation. However, a design deficiency was identified that may exceed the safety limit requirement: "two unlikely independent and concurrent changes in conditions must occur before an accidental criticality is possible."

---

11. Actions Taken (A) or Planned (B):

A) Immediate Recovery Actions taken on 4-16-90

- Reviewed the potential for similar conditions and identified a similar TK-49 to TK-19 transfer route.

- Assessed the need to curtail operations after initial discovery.

- Concluded that curtailed operations were not needed. TK-39 and 19 are empty and no transfers to these tanks are taking place and will not be performed until PRF resumes operation.

- Initiated required paper work to remove the routes prior to operation of PRF.

- Issued procedure modifications to ZO-180-010 and ZO-180-025 to reflect the route removal that prevents the transfer of Tk-49 solutions to Tk-39. Procedures did not authorize transfers of solution from Tk-49 to Tk-19.

On 6-14-90

- Initiated an investigation into the event and chartered the team to assess the discovered configuration against the OSR Safety Limit for criticality prevention.

- Prepared a written recovery plan as required by SD-HS-SAR-007 section 11.6.6.1 and WHC-CM-4-29 section 15.

9413136.0535

8) Planned Recovery Actions

-Complete an investigation into the event. Determine the impact on the OSR Safety Limit, any needed additional corrective actions and establish the proper reporting level.

Actionee: B. G. Faulk 06/19/90

-Verify closure of the work packages that removed the transfer routes in question.

Actionee: M. W. Gibson 06/19/90

---

12. **Tentative Disposition:**

Event meets criteria for a Unusual Occurrence Report (UOR)	[]
Event meets criteria for a Critique	[]
Undetermined: Revised EFS will be issued in 3 working days	[x]
Above criteria not met: no further report	[]

13. **Signatures:**

W B Lewis M. W. Gibson 6/14/90
Originator/Date

[illegible] 6/14/90
Approved/Date

[illegible] 6/14/90
ADC/UCNI Review Official Review date

DOES NOT CONTAIN CLASSIFIED OR
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NUCLEAR INFORMATION

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Recovery Plan PFP-90-17

EFS Number: PFP-90-070
Date: June 14, 1990
Time: 0945

References: SD-HS-SAR-007 section 11.6.6.1
WHC-CM-4-29, Nuclear Criticality Safety Manual section 15.

Description:

On 4/16/90, while reviewing procedure ZO-180-010, Process Control Engineering identified a transfer route from TK-49 to TK-39 which could potentially exceed the CPS-Z-165-80701, Limit 1.2 of less than 7 g Pu/l in TK-39.

PFP Process Engineering made this discovery known to PFP Nuclear Safety, Operations and the PFP CSR.

The potential to exceed a CPS limit was immediately recognized by all concerned and actions were taken to remove the transfer route before restarting the Plutonium Reclamation Facility.

PFP Process Engineering Issued a Non-Event Fact Sheet to document that we had taken pro-active corrective actions to prevent a potential CPS infraction. This discovery was included in the PFP Process Engineering monthly report for April. PFP Nuclear Safety Manager discussed the discovery with DOE-RL and SED engineer at Nuclear Safety/DOE-RL SED interface meeting in April.

On 6-13-90 DOE-RL inquired about the discovery during a post review of this activity and questioned the formal reporting of the discovery and the appropriateness of actions taken.

Assessment:

Tanks Tk-39 and Tk-19 are empty and no transfers are taking place and will not be performed until PRF resumes operation. No potential for criticality exists given the current plant configuration. However, a design deficiency was identified in a transfer route to TK-05 that may exceed the safety limit requirement: "two unlikely independent and concurrent changes in conditions must occur before an accidental criticality is possible."

Recovery Actions:

1. Place a hold on transfers to TK-39 and 19. (Tanks are empty and no transfers to these tanks are taking place and will not be performed until PRF resumes operation.) Hold tags placed on EMVs in transfer route.

2. Verify closure of the work packages that removed the transfer routes in question.

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3. Complete an investigation into the event. Determine the impact on the OSR Safety Limit, any needed additional corrective actions and establish the proper reporting level.

APPROVAL

06-14-90

PFP Nuclear Facility Safety

6/14/90

PFP Criticality Safety Representative

6/14/90

PFP Operations

6/14/90

Criticality Engineering and Analysis

6/14/90

PFP Process Control

6/14/90

OSR Representative

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CORRESPONDENCE DISTRIBUTION COVERSHEET

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Subject: EVALUATION OF NEED FOR ACCELERATED TREATMENT OF PFP WASTEWATER

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