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²³⁸Pu FUEL FORM ACTIVITIES

April 1, 1986 - March 31, 1987

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Savannah River Laboratory
Aiken, SC 29808

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT DE-AC09-76SR00001

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Pu FUEL FORM ACTIVITIES

April 1, 1986 - March 31, 1987

Approved by:

J. F. Ortaldo, Superintendent
Separations Technology Department

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MASTER

E. I. du Pont de Nemours & Co.
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FOREWORD

This report for ^{238}Pu Fuel Form Activities has one main section: SRP-PuFF Facility. The SRL portion of this program has been completed. The program status, budget information, and milestone schedules are discussed.

The SRP portion of this report summarizes production of $^{238}\text{PuO}_2$ fuel forms for use in radioisotopic thermoelectric generators (RTG's) in the Plutonium Fuel Form (PuFF) Facility at the Savannah River Plant. The PuFF Facility was started up in December 1978 producing iridium-encapsulated, 100-watt $^{238}\text{PuO}_2$ spheres for MHW (multihundred watt) RTG's. This program was completed in April 1980. The PuFF Facility began producing iridium-encapsulated, 62.5-watt $^{238}\text{PuO}_2$ right circular cylinders for GPHS (General Purpose Heat Source) RTG's in June 1980. This program was completed in December 1983. The PuFF Facility has been placed in a production readiness mode of operation pending funding of additional heat source programs.

The Work Breakdown Structure (WBS) for this program is shown in Figure 1.

This program is funded under B&R AE-20-10-5-0.

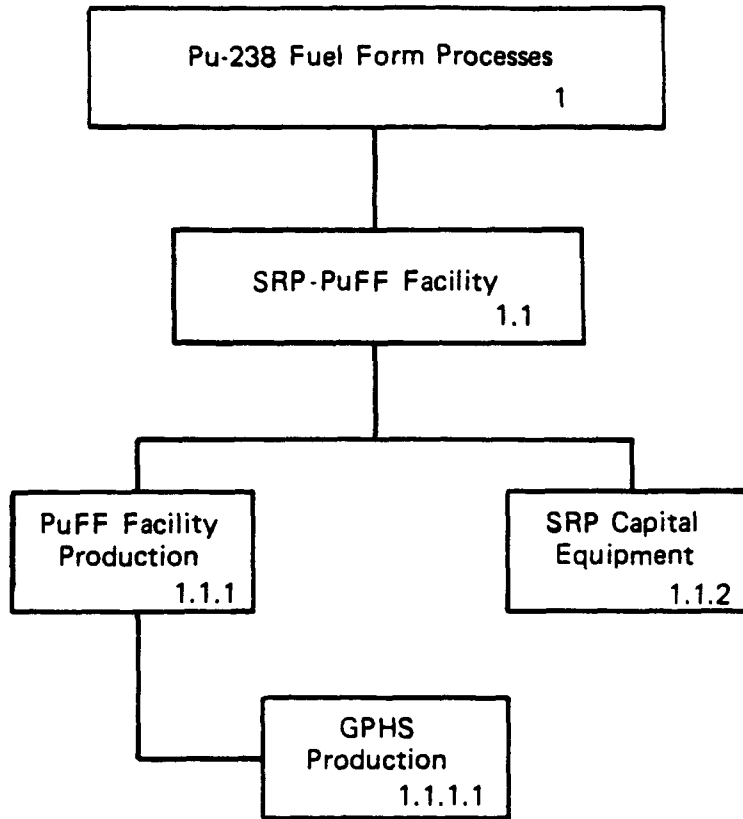


FIGURE 1. Work Breakdown Structure for Pu-238 Fuel Form Activities

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HIGHLIGHTS

SRP-PuFF FACILITY

- The PuFF Facility remains in a production readiness mode of operation.

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SRP-PuFF FACILITY (WBS 1.1)

PuFF FACILITY PRODUCTION (WBS 1.1.1)

GPHS Production (WBS 1.1.1.1)

Objective

The objective of this work is to maintain the facility and equipment so that the process can be restarted when additional space and/or terrestrial programs have been funded.

Narrative

Summary

- The PuFF Facility remains in a production readiness mode of operation.

GPHS Fabrication

Process. All essential equipment continues to be exercised and maintained so that the facility can be restarted with a minimum amount of effort. Preventative and periodic maintenance continues to be performed as needed. Spare parts inventory continues to be maintained at an acceptable level.

MILESTONE SCHEDULE AND STATUS REPORT

1 CONTRACT IDENTIFICATION CPHS Production		2 REPORTING PERIOD APRIL - SEPT. 1986		3 CONTRACT NUMBER 1.1.1.1																	
4 CONTRACT NAME AND ADDRESS E. I. du Pont de Nemours & Co. Aiken South Carolina				5 CONTRACT START DATE																	
				6 CONTRACT COMPLETION DATE																	
7 IDENTIFICATION NO	8 REPORTING CATEGORY (i.e. CONTRACT LINE ITEM OR WORK BREAKDOWN STRUCTURE ELEMENT)	9 FISCAL YEARS AND MONTHS FY-1986 & 1987												10 PERCENT COMPLETE							
		A	M	J	J	A	S	O	N	D	J	F	M	1	2	3	4	1989	1990	1991	
U.1	GPSH Flight																				
	Quality Production																				
11 REMARKS																					
12 SIGNATURE OF CONTRACTOR'S PROJECT MANAGER AND DATE											13 SIGNATURE OF GOVERNMENT TECHNICAL REPRESENTATIVE AND DATE										

FIGURE 2. Milestone Schedule and Status Report for GPSH Production

CONTRACT MANAGEMENT SUMMARY REPORT

1 CONTRACT IDENTIFICATION CPHS Production		2 REPORTING PERIOD APRIL - SEPTEMBER 1986		3 CONTRACT NUMBER 1.1.1.1												
4 CONTRACTOR NAME AND ADDRESS E. I. du Pont de Nemours & Co. Aiken South Carolina				5 CONTRACT START DATE												
				6 CONTRACT COMPLETION DATE												
7 MONTHS 1986-1987		A	M	J	J	A	S	O	N	D	J	F	M	TOTALS	8 FY 1986	
9 COST STATUS																
														10 SPIR DATE		
														11 PLANNED COSTS PRIOR FYS		
														12 ACTUAL COSTS PRIOR FYS		
														13 TOTAL ESTIMATE FY 1986 FOR CONTRACT		
														14 TOTAL CONTRACT VALUE 1900		
														15 UN FIL LFD ORDERS OUTSTANDING		
16 ACCRUED COSTS		C1 PLANNED	177	177	125	125	441	125	187	187	187	187	187	187	2292	17 ESTIMATE FOR SUBSEQUENT REPORTING PERIOD
		D1 ACTUAL	192	120	143	181	383	75								
		E1 VARIANCE	15	(57)	18	56	(58)	(50)								
		F1 CUM VARI	15	(42)	(24)	32	(26)	(26)								
18 REMARKS																
19 SIGNATURE OF CONTRACTOR'S PROJECT MANAGER AND DATE											20 SIGNATURE OF THE GOVERNMENT TECHNICAL REPRESENTATIVE AND DATE					

FIGURE 3. Contract Management Summary Report for PUFF Facility Production

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TABLE 1**Milestone Log for GPHS Production**

<u>Work Breakdown Structure Number</u>	<u>Description</u>	<u>Planned Completion Date</u>	
		<u>Current</u>	<u>Original</u>
1.1.1.1	<u>GPHS Production</u>		
1.1.1.1.1A	Supply 3 GPHS Fueled Clads (FC's) to LANL for Impact Attitude Series Tests.	Indefinitely Delayed	02/81
1.1.1.1.1B	Supply 88 Flight Quality GPHS FC's for GPHS/Galileo Orbiter Flight RTG (F-2)	Completed 11/82	09/82
1.1.1.1.1C	Installation and Operation of Vacuum Outgas Furnace.	Completed 02/83	10/81
1.1.1.1.1D	Supply 88 Flight Quality GPHS FC's for GPHS Backup RTG (F-3)	Completed 06/83	10/83
1.1.1.1.1E	Supply 88 Flight Quality GPHS FC's for GPHS/ISPM Flight RTG (F-4)	Completed 01/84	05/83
1.1.1.1.1F	Complete Galileo and ISPM GPHS FC Requirement, Total Required = 506	Completed	08/83

SRP CAPITAL EQUIPMENT (WBS 1.1.2)

Capital costs for the SRP Pu-238 program are shown in Table 2.

TABLE 2**SRP Pu-238 Capital Costs**

	<u>Project Number</u>	<u>Budget Amount, \$</u>	<u>Project Approval</u>	<u>Project \$</u>
FY-1982 Projects				
Spare Hot Press Vacuum Chamber, 235-F	S-1620	105,000	08/82	103,794 (closed prior to 9/86)
Update Instrumentation, 235-F	S-3904	250,000	05/83	186,432 (closed 1/87)
Improve Breathing Air Capacity, 235-F	S-3961	240,000	06/83	200,251
Replace Instrument Air Compressors, 235-F	S-2520	130,000	06/83	136,606
FY-1984 Projects				
Minor Projects (<75,000)	S-3643	22,000	10/83	20,233 (closed 1/87)
Replace Lead/Annealed Glass Windows, 235-F	S-4133	356,000	02/84	354,313
FY-1985 Projects				
Minor Projects (<75,000)	S-3737	200,000	10/84	35,408
FY-1986 Projects				
Minor Projects (<75,000)	S-2680	26,000	10/85	25,607 (closed 2/87)
Metallograph Facility	S-3253	170,000	5/86	196,743
FY-1987 Projects				
Minor Projects (<75,000)	S-2723	150,000	10/86	5,635

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20301 Century Blvd., Germantown, MD 20767

DOE-SR

D. B. Clemens, 703-62A
G. M. Nichols, Jr., 703-A

Wilm Montchanin Bldg.

H. S. Eleuterio, M-6600
J. E. Conaway, M-6600

SRP

J. T. Granaghan - R. Maher, 703-A
J. A. Kelley, 703-A
M. F. Sujka, 703-A
R. G. Garvin - F. B. Cavanaugh, 703-A
J. F. Ortaldo, 703-A
H. H. Lee, 703-42A

DOE-TIC (2)

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