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^{238}Pu FUEL FORM ACTIVITIES

MARCH 1 - SEPTEMBER 30, 1985

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**E. I. du Pont de Nemours & Co.
Savannah River Plant
Aiken, SC 29808**

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

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MARCH 1 - SEPTEMBER 30, 1985

Approved by

**J. F. Ortaldo
Superintendent
Separations Technology Department**

Publication Date: January 1986

MASTER

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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.

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CONTRACT MANAGEMENT SUMMARY REPORT

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CONTRACT MANAGEMENT SUMMARY REPORT

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1 CONTRACT IDENTIFICATION CPHS Production										2 REPORTING PERIOD June 1985										3 CONTRACT NUMBER 1.1.1.1																			
4 CONTRACT (NAME ADDRESS) E. I. du Pont de Nemours & Co. Aiken South Carolina																				5 CONTRACT START DATE										6 CONTRACT COMPLETION DATE									
7 IDENTIFI- CATION NO		8 REPORTING CATEGORY W-8- CONTRACT LINE ITEM OR WORK BREAKDOWN STRUC- TURE ELEMENT				9 FISCAL YEARS AND MONTHS												10 PERCENT COMPLETE																					
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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-1980 Projects				
Water Monitors	S-2199	110,000	11/79	120,860
FY-1982 Projects				
Spare Hot Press				
Vacuum Chamber, 235-F	S-1620	105,000	08/82	4,000
Provide Shield Windows				
PuFF, 235-F	S-3438	170,000	07/82	56,341
FY-1983 Projects				
Minor Projects				
(<75,000)	S-3943	40,000	10/82	21,097
Update Instrumentation,	S-3904	250,000	05/83	20,187
235-F				
Improve Breathing Air	S-3961	240,000	06/83	80,340
Capacity, 235-F				
Replace Instrument	S-2520	130,000	06/83	54,818
Air Compressors, 235-F				
FY-1984 Projects				
Minor Projects				
(<75,000)	S-3643	200,000	10/83	20,233
Replace Lead/Annealed				
Glass Windows, 235-F	S-4133	500,000	02/84	20,000
FY-1985 Projects				
Minor Projects				
(<75,000)	S-3747	50,000	10/84	0

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