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December 7, 1959

HANFORD ATOMIC PRODUCTS OPERATION - RICHLAND, WASHINGTON

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CONTINUITY OF OPERATIONS PROGRAM

PRIME SEPARATIONS AND URANIUM
CONVERSION FACILITIES

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Members of the

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December 7, 1959

CONTINUITY OF OPERATIONS PROGRAM

PRIME SEPARATIONS AND URANIUM CONVERSION FACILITIES

Classification Cancelled and Changed To

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By Authority of CG PR-2,

DS Kewin, 1-18-94.

By J. M. Allen, 2-1-94.

Verified By J. E. Savely 2-12-94

By

Members of the

Chemical Processing Department

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I. TITLE - Continuity of Operations, Prime Separations and Uranium Conversion Facilities.

II. CATEGORY - Continuity of Operation and Safety

This program is related to the Product Development, Palmolive, and Non-Production Fuels Programs under New and Special Products and Processes Category where the prime separations plants supply raw materials or processing support of these other programs. Likewise, Increased Plant Return Program items affecting the Purex, Redox, and UO_3 Plants must be integrated with the Continuity of Operations Program. Since the primary separations plants feed the 234-5 Facility, the 234-5 Program is also related to Continuity of Operation.

III. ASSIGNED RESPONSIBILITY - Chemical Processing Department

Irradiation Processing Department supplies the bulk of the feed material to be processed by Chemical Processing Department.

IV. DESCRIPTION AND STATUS

Program Objective - To maintain adequate capacity for the safe and economical processing of irradiated fuel from Hanford reactors while maintaining proper cognizance of the needs of related New or Special Products and Processes Programs.

Need - To maintain Hanford plutonium production capability consistent with the needs of the nation and to support other related defense and civilian applications programs.

Anticipated Production Requirements - Appendix I summarizes the production allocations, plant modifications and shift coverage needed in the Purex, Redox, and UO_3 Plants through FY-1966. Highlights of the summary on individual plant bases are as follows:

PUREX PLANT

Current Activity - Although the Purex Plant was recently converted to the two-cycle flowsheet and expanded to capacity, flowsheet changes made subsequently to

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aid in Palm recovery have reduced the capacity factor from 3.2 to 2.9 because of limitations in two major solvent extraction columns. However, other installations, currently underway to improve present facilities, include the following:

- a. Conversion of the prototype plutonium ion exchange unit to a manufacturing facility.
- b. A prototype demister system which is expected to permit single-stage waste concentration with resultant savings in equipment usage and water and steam consumption.
- c. A prototype formaldehyde treatment facility which will increase the capacity of the acid recovery system, increase acid recovery efficiency and reduce waste storage costs.
- d. A prototype titanium concentrator tube bundle which is expected to reduce materially certain concentrator tube bundle replacement costs.

Planned Activity - Appendix I shows the scheduled improvements to the Purex Plant needed to maintain adequate continuity of operations. A gradual increase in capacity factor from 2.9 to 4.3, with intermediate plateaus at 3.2 and 4.0 is required to keep pace with the projected Irradiation Processing Department output. In addition to this capacity increase and the items in progress as presented above in Current Activity, facilities for continuous Palm recovery and expanded silica gel treatment will be needed. The former is required to convert down-time now utilized for Palm recovery into available production time; past plant experience with process upsets has shown that continuous maximum capacity production cannot be guaranteed unless a silica gel facility of adequate capacity is available to process uranium product which slightly exceeds gamma activity specifications.

[REDACTED]

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The following table presents the schedules for these improvements:

<u>Improvement Item</u>	<u>Scheduled Completion Data</u>		
	<u>Prel. Design</u>	<u>Detail Design</u>	<u>Construction</u>
E-F6 Demister	Complete	Complete	3-60
Ion Exchange Conversion	Complete	Complete	3-60
Titanium Tube Bundle	Complete	Complete	1-61
3.2 C.F. Restoration	4-60	6-60	1-61
Formaldehyde Treatment	1-60	4-60	7-61
Single Stage Waste Conc.	3-60	7-60	7-61
Cont. Palm Recovery	Palmolive Program		10-61
4.0 C.F. Expansion	7-60	1-61	1-62
Silica Gel	7-60	1-61	1-62
4.3 C.F. Expansion	7-61	1-62	7-63*
Periodic Plant Modifications	As Needed	As Needed	As Needed

*Needed for IPD Expansion Case, Only.

The only item needed for the Expansion Case and not the base case is the 4.3 capacity factor expansion.

Technology in Support - Although the major portion of the technology in support of these improvements has been completed, further studies within Chemical Processing Department and Hanford Laboratories Operation will be required on the following items:

- a. Increased capacity stripping column cartridges.
- b. Increased life for HA Column cartridge.
- c. Plant demonstration of formaldehyde treatment of waste.
- d. Evaluation of prototype demister.
- e. Additional tube bundle corrosion studies.

Considered Alternates - No practical alternates. The production allocations were made to best satisfy the capabilities of the Purex and Redox Plants.

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Related Areas - Realization of continuous Palm recovery at Purex is needed by FY-1962 to relieve a production bottleneck in the plant. Changes in Hanford reactor power, efficiency, or exposure affecting uranium throughput in Chemical Processing Department facilities can create major changes to this program.

REDOX PLANT

Current Activity - The Redox Plant is currently processing E-Metal or normal uranium on a 3-shift, 5-day basis. E-Metal dissolving is being performed under batch nuclear safety control in standard dissolvers on a 4-shift, 7-day basis. A multipurpose dissolver, safe by geometry for E-Metal and NPR material, is scheduled for installation under Project CGC-772 by April 1, 1960. Prototypical plutonium ozonation recently installed, has permitted abandonment of permanganate feed treatment and use of an acidic codecontamination cycle for Palm recovery. Palm accumulation operations are being successfully performed; Palm load-out tests will be conducted during December 1959 or January 1960. Final plutonium and uranium gamma specifications are being met despite Palm accumulation operations.

Planned Activity - Appendix I shows the scheduled improvement to the Redox Plant needed for continuity of operations. Included are a slight increase in solvent extraction capacity, eventual installation of two additional multipurpose dissolvers, continuous Palm recovery facilities, plutonium ion exchange equipment, NPF plutonium storage facilities, procurement of NPR casks and railcars, and possible conversion to 4-shift operations by Fiscal Year 1965. The following table presents the schedules for the capital improvement items. All of these items are needed for either base or expansion cases.

[REDACTED]

<u>Improvement Item</u>	<u>Scheduled Completion Date</u>		
	<u>Prel. Design</u>	<u>Detail Design</u>	<u>Construction</u>
1st Multipurpose Dissolver	Complete	Complete	3-60
2nd Multipurpose Dissolver	Complete	Complete	10-60*
12 T/D. S.E. Expansion	3-60	6-60	1-61
NPF Pu Storage	1-61	7-61	7-62
Cont. Palm Recovery	Palmolive Program		10-62
Pu Ion Exchange	1-61	7-61	1-63
NPR Casks and Cars	1-61	9-61	7-63
3rd Multipurpose Dissolver	7-61	1-62	7-63
Periodic Plant Modifications	As Needed	As Needed	As Needed

* H Cell modifications not needed until 7-63.

Technology in Support - Research and development effort in support of the Redox portion of the Continuity of Operations Program will be focused on requirements for anion exchange purification of the final plutonium product. Primary points of concern will be selection of the most suitable resin and the evaluation of several mechanical concepts for the ion exchange equipment to minimize its complexity while concurrently improving its efficiency and operability.

Considered Alternates - No practical alternates. The production allocations were made to best satisfy the capabilities of the Purex and Redox Plants.

Related Areas - Realization of continuous Palm recovery at Redox is needed by FY-1963 to relieve a production bottleneck in the plant. Changes in Hanford reactor power, efficiency, or exposure affecting uranium throughput in Chemical Processing Department facilities can create major changes to this program. Developments in the NPF Program beyond the control of Chemical Processing Department created by reassignment of fuels by the AEC or private business entry into the field will also affect the Redox portion of this program.

[REDACTED]

[REDACTED]

29 2

Planned Activity - Appendix I shows the scheduled capital improvements in the UO_3 Plant needed for continuity of operations. An increase of 30 KW to each calciner furnace will increase the production rate by about 10%. This added capacity will be sufficient for the production requirements through FY-1966. A second powder system for the calciner presently equipped with the E-Metal feed system will be required, to increase reliability, when the enriched uranium feeds from NPR are processed.

The following table presents the schedule for these improvement items:

<u>Improvement Item</u>	<u>Scheduled Completion Date</u>		
	<u>Prel. Design</u>	<u>Detail Design</u>	<u>Construction</u>
30 KW Increase	3-60	7-60	7-61
Second Powder System	7-61	1-62	7-63
Periodic Plant Modification	As Needed	As Needed	As Needed

[REDACTED]

Considered Alternates _ Four-shift operation would eliminate the need for the furnace power increase, however, this alternate would result in increased cost as well as a reduction in reserve capacity. Studies of blending uranium of various isotopic compositions have indicated the economic need for segregating the normal uranium from the enriched feeds.

Related Areas - The NPF Program includes a completely separate calcination system for the more highly enriched fuel uranium.

NEW SEPARATION PLANT

Need - It is apparent from Appendix I that Hanford primary separations plants will be heavily committed to the processing of normal uranium, E-Metal, NPR and NPF by FY-1961, with further production increases scheduled each year thereafter. By FY-1965, the Redox and Purex Plants will be about 13 and 10 years old, respectively, and increased maintenance should be anticipated, to the detriment of sustained operations. If it becomes necessary to hold the exposure level at 640 MWD/T or less because of requirements for plutonium isotopic purity or because of slug rupture problems, the Purex and Redox Plants would be wholly incapable of handling uranium tonnages involved by 1964.

Should Purex be shut down through a gross contamination accident, failure of piping-in-concrete or other plant disaster, Redox, B, T, and TBP Plants might have to be converted or reactivated to normal production fuel processing, to the detriment of the Non-Production Fuels Program and to the detriment of neptunium recovery. Progress made at HAPO over the years in reducing unit Pu and U costs through development of the Purex process would be lost. Further, a gross accident at Redox would cause a serious crippling of Hanford's capacity to handle enriched fuels both from Hanford production reactors and atomic power reactors, and would result in a set-back to the development of economic nuclear power in the United States.

Current Activity — Work is currently in progress on a very modest scale on the development of promising conceptual architectural and process designs for new separation plants. Specialized equipment for handling enriched uranium has been developed under the NPF and NPR Programs.

Planned Activity - The definitive process design of a new Hanford separation facility would be prepared to permit completion of future detailed design and plant construction with minimum delay. The new plant would be designed to perform the scheduled duties of the Redox Plant at a capacity equivalent to the Purex Plant potential. Equipment would be provided for handling fuels of up to 1% enrichment. A 2-cycle Purex process would be employed and sufficient flexibility would be provided through installed alternate routings to permit conversion to a one-cycle process at a later date. Capability would be provided for the recovery of Palm and fission products and for improved processing of wastes.

<u>Improvement Item</u>	<u>Scheduled Completion Date</u>		
	<u>Prel. Design</u>	<u>Detail Design</u>	<u>Construction</u>
New Separation Plant	7-62	1-64	1-66

Considered Alternates - Alternate courses of action in the event of Purex Plant accident entail; 1) reactivation or reversion of Redox, B, T, and TBP Plants under a crash program to the processing of natural uranium, with resultant high operating costs and to the detriment of new programs for processing specialty enriched fuels, 2) shipment of natural uranium fuels to Savannah River for processing or 3) combinations of the above.

In the event of Redox Plant catastrophe, the alternate courses of action are, 1) conversion of Purex head-end equipment under a crash program to handle E-Metal and NPR fuel along with current natural uranium fuel, 2) reactivation of B, T, and TBP Plants to process natural uranium, 3) shipment of E-Metal to Savannah

[REDACTED]

River for processing, 4) temporary abandonment of the Commission's NPF Program for those types of fuels destined for Hanford or 5) combinations of the above alternates.

The proposed alternate of constructing a new multi-purpose separation plant would provide insurance against catastrophe either at Purex or Redox. Crash construction or reactivation programs would be avoided. The buildup of high inventories of irradiated unprocessed uranium would be avoided during interim periods prior to the implementation of emergency, uneconomic measures. Lastly, the new facility would provide a high degree of economic operating flexibility for new processing programs within the Commission as they arise.

[REDACTED]

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V. SUMMARY OF COSTS
PUREX, REDOX, AND UO₂ PLANT CONTINUITY OF OPERATIONS

<u>Item</u>	<u>Source of Funds</u>	<u>Capital Expenditure:</u>	<u>Change In Manpower Requirements</u>	<u>Change In Operating Expenses</u>
1. <u>Overall Capital Outlay</u>				
2. <u>Summary of Immediate Future Costs Related to This Program</u>				
<u>Authorized and Underway</u>				
1.				
<u>In Process</u>				
1. Redox Plant			4 Additional	\$60,000/yr ⁽⁴⁾
2. UO ₂ Plant			18 Additional	\$250,000/yr ⁽³⁾
3. <u>Detail of Cost Estimates</u>				
<u>Projects</u>				
<u>Authorized and Underway</u>				
1. Purex Plant	CGC-854			
	Ion Exchange Conv.	PA&C 59-i	\$68,000	
	Titanium Tube Bundle	Equip. A.R.	\$146,000	
		60-CPD-11		
	E-F6 Demister	R&D	\$39,000	
2. Redox Plant	CG-772			
	Multi-purpose Diss.	Equip.	\$265,000	
<u>In Process</u>				
1.				
<u>Planned for Future</u>				
1. Purex Plant	3.2 Capacity Factor			
	Restoration	PA&C 60-L	\$150,000	
	Silica Gel	PA&C 60-L	\$250,000	

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V. SUMMARY OF COSTS

III. REDOX, AND UO₃ PLANT CONTINUITY OF OPERATIONS

	<u>Item</u>	<u>Source of Funds</u>	<u>Capital Expenditures</u>	<u>Change in Manpower Requirements</u>	<u>Change in Operating Expenses</u>
<u>Planned for Future (cont.)</u>					
1. Purex Plant	4.0 Capacity Factor Expan.	PA&C 61-L	\$750,000		
	4.3 Capacity Factor Expan. (1)	PA&C FY-'62	\$1,500,000		
2. Redox Plant	Pu Ion Exchange	PA&C FY'62	\$300,000		
	NPF Pu Storage	PA&C FY'62	\$200,000		
	2nd Multi-purpose Diss. (including H Cell modifications)	PA&C 59-A-5	\$430,000		
3. UO ₃ Plant	30 KW Expansion	PA&C 61(L)	\$130,000		
	Third Powder System	PA&C 59-A-5	\$30,000		
<u>Equipment</u>					
<u>In Process</u>					
1. Purex Plant	Formaldehyde Treatment	FY-'60 P.T.	\$150,000		
<u>Planned for Future</u>					
1. Purex Plant	Periodic Plant Modif. Single Stage Waste Conc.	Equip. Equipment	(2) \$70,000		
2. Redox Plant	NPR Casks & Cars	Equipment	\$480,000		
	3rd Multi-purpose Dissolver	Equipment	\$350,000		
	Periodic Plant Modif. Solvent Extraction	Equipment	(2)		
	Expansion	Equipment	\$120,000		
3. UO ₃ Plant	Periodic Plant Modif.	Equipment	(2)		

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V. SUMMARY OF COSTS
PLANT REDOX AND UO₂ PLANT CONTINUITY OF OPERATIONS

- (1) Needed for expansion case, only.
- (2) Seven-year total, FY-1960 - 1966 inclusive.
- (3) This covers 4th shift in Redox required in expansion case, only, for 1965 and 1966. The change in operating expenses covers the increased manpower requirements only.
- (4) This covers 4th shift in UO₂ Plant held in reserve for base cases and expansion cases from FY-1964 on. The change in operating expenses, covering increased manpower, only, will not be experienced unless the 4th shift is needed.

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VI. SIGNIFICANT CHANGES IN PROGRAM SCOPE

Not applicable.

VII. MEASUREMENTS

The degree to which Chemical Processing Department is capable of meeting the demands of the Hanford reactors as defined by the production forecast and program objective. More specifically, adherence to the project schedules, costs and objectives developed for individual items under previous sections of this program. Also, the skill demonstrated in revising and executing program items to maintain conformity with broad program objectives under changing conditions beyond the direct control of the Department.

RATIONS PROGRAM

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- PUREX, REDOX, AND UO₃ PLANTS

REDOX PLANT			UO ₃ PLANT		
ID. ALLOC., TONS	TIME REQUIRED DAYS	NEW FACILITY REQUIRED	PROD. ALLOC., TONS	CALCINER DAYS/ NO. OF CALC.	NEW FACILITY REQUIRED
800	89	None	6500	1080/5	None
801	89 + 2 + 36 W.E.	Diss. E on Week End	801	133/1	
0		1st Multipurpose Diss.	0	0	
0		by 4-60	0	0	
--	40	Palm Rec. Initiated	0	0	
--	30 + 30 W.E.	11-59	--	20	Auto. Calc.
--	0	4th Shift in Reserve	--	267	
1601	250 + 66 W.E.	3 Shifts	7301	1500	3 Shifts
860	86	Ex. Solvent Extraction to	6490	1082/5	30 K.W. Exp.
		12 T/D. Inst. by 1-61			by 7-61
873	87 + 2	2nd Multipurpose Diss.	873	146/1	
0	0	by 10-60	0	0	
0	0		0	0	
--	40		--	--	
--	35 + 32 W.E.		--	90 for Conv.	
--	0	4th Shift in Reserve	--	182	
1733	250	3 Shifts	7363	1500	3 Shifts
860	86		7457	1131/5	
903	90 + 2	Pu Ion Exchange by	903	137/1	
0	0	1-63	0	0	
0	0		0	0	
--	40		--	--	
--	32 + 28 W. E.		--	Incl.	
--	0	4th Shift in Reserve	--	232	
1763	250 + 28 W. E.	3 Shifts	8360	1500	3 Shifts
0	0		7372	1117/5	
930	93 + 6		930	141/1	
0	0	NPR Casks & Cars by 7-63	0	0	
68	23 + 10	NPF Pu Storage by 7-62	68	NPF Calciner	
--	10	Cont. Palm by 10-62	--	--	
--	38 + 45 + 22 W.E.		--	Incl.	
--	25		--	242	
998	250 + 22 W. E.	3 Shifts	8302	1500	3 Shifts
0	0		7592	1150/5	
958	96 + 9	3rd Multipurpose Diss.	958	145 } 1	2nd Powder
456	46 + 6	by 7-63	456	69 }	System by
79	26 + 10		79	--	7-63
--	0		--	--	
--	32 + 28 W.E.		--	Incl.	4th Shift in
--	25		--	136	Reserve
1493	250 + 28 W.E.	3 Shifts	9085	1500	3 Shifts

NO

PROBLEM

AREAS

IN

FY-1965

CONTINUITY OF OPERATIONS PROGRAM

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NEW FACILITY FOR - PUREX, REDOX, AND UO₃ PLANTS

FACILITY REQUIRED	REDOX PLANT		NEW FACILITY REQUIRED	UO ₃ PLANT	
	PROD. ALLOC., TONS	TIME REQUIRED DAYS		PROD. ALLOC., TONS	CALCINER DAYS/ NO. OF CALC.
at 2.9 C. F. ster by 3-60	800 801 0 0 -- -- -- <u>1601</u>	89 89 + 2 + 36 W.E. 40 30 + 30 W.E. 0 <u>250 + 66 W.E.</u>	None Diss. E on Week End 1st Multipurpose Diss. by 4-60 Palm Rec. Initiated 11-59 4th Shift in Reserve 3 Shifts	6500 801 0 0 0 -- -- <u>7301</u>	1080/5 133/1 0 0 0 20 267 <u>1500</u>
3.2 C. F. by 1-61 tage Waste Conc 7-61 hyde Treatment 7-61 Tube Bundles 1-61	860 873 0 0 -- -- -- <u>1733</u>	86 87 + 2 0 0 40 35 + 32 W.E. 0 <u>250</u>	Ex. Solvent Extraction to 12 T/D. Inst. by 1-61 2nd Multipurpose Diss. by 10-60 4th Shift in Reserve 3 Shifts	6490 873 0 0 -- -- -- <u>7363</u>	1082/5 146/1 0 0 -- 90 for Conv 182 <u>1500</u>
..0 C.F. by -62 hel	860 903 0 0 -- -- -- <u>1763</u>	86 90 + 2 0 0 40 32 + 28 W. E. 0 <u>250 + 28 W. E.</u>	Pu Ion Exchange by 1-63 4th Shift in Reserve 3 Shifts	7457 903 0 0 -- -- -- <u>8360</u>	1131/5 137/1 0 0 -- Incl. 232 <u>1500</u>
F.	0 930 0 68 -- -- -- <u>998</u>	0 93 + 6 0 23 + 10 10 38 + 45 + 22 W.E. 25 <u>250 + 22 W. E.</u>	NPR Casks & Cars by 7-63 NPF Pu Storage by 7-62 Cont. Palm by 10-62 3 Shifts	7372 930 0 68 -- -- -- <u>8302</u>	1117/5 141/1 0 NPF Calcine -- Incl. 242 <u>1500</u>
F.	0 958 456 79 -- -- -- <u>1493</u>	0 96 + 9 46 + 6 26 + 10 0 32 + 28 W.E. 25 <u>250 + 28 W.E.</u>	3rd Multipurpose Diss. by 7-63 3 Shifts	7592 958 456 79 -- -- -- <u>9085</u>	1150/5 145 } 1 69 } -- -- Incl. 136 <u>1500</u>

NO

PROBLEM

AREAS

IN

FY-1965

APPENDIX I

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CONTINUITY OF C

TENTATIVE PRODUCTION ALLOCATIONS AND NEW FACILITY F

CASE	FISCAL YEAR	PRODUCTION OR ACTIVITY	PUREX PLANT		NEW FACILITY REQUIRED	F
			PROD. ALLOC., TONS	TIME REQ'D., DAYS		
BASE	1960	NORMAL	5700	260	Operation at 2.9 C. F. E-F6 Demister by 3-60	
		E-METAL	0	0		
		NPR	0	0		
		NPF	0	0		
		PALM	--	48		
		MAINTENANCE	--	52		
		RESERVE	--	0		
		<u>TOTAL</u>	<u>5700</u>	<u>360</u>		
BASE	1961	NORMAL	5630	246	Restore 3.2 C. F. by 1-61 Single Stage Waste Conc by 7-61 Formaldehyde Treatment by 7-61 Titanium Tube Bundles by 1-61	
		E-METAL	0	0		
		NPR	0	0		
		NPF	0	0		
		PALM	--	48		
		MAINTENANCE	--	52 + 14		
		RESERVE	--	0		
		<u>TOTAL</u>	<u>5630</u>	<u>360</u>		
BASE	1962	NORMAL	6597, (Incl. 300 C.O. From FY-61)	244	Ex. to 4.0 C.F. by 1-62 Silica Gel Cont. Palm by 10-61	
		E-METAL	0	0		
		NPR	0	0		
		NPF	0	0		
		PALM	--	12		
		MAINTENANCE	--	72 + 32		
		RESERVE	--	0		
		<u>TOTAL</u>	<u>6597</u>	<u>360</u>		
BASE	1963	NORMAL	7372	246	4.0 C. F.	
		E-METAL	0	0		
		NPR	0	0		
		NPF	0	0		
		PALM	--	0		
		MAINTENANCE	--	72		
		RESERVE	--	42		
		<u>TOTAL</u>	<u>7372</u>	<u>360</u>		
BASE	1964	NORMAL	7592	252	4.0 C. F.	
		E-METAL	0	0		
		NPR	0	0		
		NPF	0	0		
		PALM	--	0		
		MAINTENANCE	--	72		
		RESERVE	--	36		
		<u>TOTAL</u>	<u>7592</u>	<u>360</u>		
BASE	1965	NORMAL			NO PROBLEM AREAS IN FY-1965	
		E-METAL				
		NPR				
		NPF				
		PALM				
		MAINTENANCE				
		RESERVE				

PALM
MAINTENANCE
RESERVE
TOTAL

--
--
--
7592

72
36
360

BASE 1965 NORMAL
E-METAL NO
NPR PROBLEM
NPF AREAS
PALM IN
MAINTENANCE FY-1965
RESERVE
TOTAL

BASE 1966 NORMAL
E-METAL NO
NPR PROBLEM
NPF AREAS
PALM IN
MAINTENANCE PUREX
RESERVE
TOTAL

100 AREA 1963 NORMAL 7372 246 Operation at
EXPANSION E-METAL 0 0 Ex. to 4.3 C
NPR 0 0 7-63
NPF 0 0
PALM -- 0
MAINTENANCE -- 72 + 15
RESERVE -- 27
TOTAL 7372 360

EXPANSION 1964 NORMAL 8100 252 4.3 C. F.
E-METAL 0 0
NPR 0 0
NPF 0 0
PALM -- 0
MAINTENANCE -- 72
RESERVE -- 36
TOTAL 8100 360

EXPANSION 1965 NORMAL 7977(Incl. 252 T. 248 4.3 C. F.
C.O. From 1964) E-METAL 0 0
NPR 0 0
NPF 0 0
PALM -- 72
MAINTENANCE -- 40
RESERVE --
TOTAL 7977 360

EXPANSION 1966 NORMAL 8013 249
E-METAL 0 0
NPR 0 0
NPF 0 0
PALM -- 0
MAINTENANCE -- 72
RESERVE -- 39
TOTAL 8013 360

36
360

--
1493

25
250 + 28 W.E.

3 Shifts

10

PROBLEM

AREAS

IN

FY-1965

NO

PROBLEM

AREAS

IN

FY-1965

3

PROBLEM

AREAS

IN

PUREX

0
859
760
79
--
--
--
1698

0
86 + 9
76 + 6
26 + 10
0
37 + 23 W. E.
0
250 + 23 W.E.

4th Shift in Reserve
3 Shifts

246
0
0
0
0
72 + 15
27
360

Operation at 4.0 C. F.
Ex. to 4.3 C. F. by
7-63

SAME

AS

BASE

CASE

FY-1963

Redox
4th Shift in Reserve

252
0
0
0
0
72
36
360

4.3 C. F.

0
1054
456
79
--
--
--
1589

0
105 + 9
45 + 6
26 + 10
0
32 + 28 W. E.
17
250

4th Shift in Reserve
3 Shifts

2 T.
4)

248
0
0
0
0
72
40
360

4.3 C. F.

0
1033
732
79
--
--
--
1844

96 + 9
68 + 6
26 + 10
0
72
73
360

Convert to 4 Shift
Operation by 7-64

4 Shifts

249
0
0
0
0
72
39
360

0
1058
760
79
--
--
--
1897

0
98 + 9
70 + 6
26 + 10
0
72
69
360

4 Shifts

DECLASSIFIED

--	0	
--	32 + 28 W.E.	
--	25	
1493	250 + 28 W.E.	3 Shifts

--	Incl.	4th Shift in
--	136	Reserve
9085	1500	3 Shifts

NO
PROBLEM
AREAS
IN
FY-1965

0	0	
859	86 + 9	
760	76 + 6	
79	26 + 10	
--	0	
--	37 + 23 W. E.	
--	0	
1698	250 + 23 W.E.	4th Shift in Reserve 3 Shifts

SAME
AS
BASE
CASE
FY-1963

Redox
4th Shift in Reserve

0	0	
1054	105 + 9	
456	45 + 6	
79	26 + 10	
--	0	
--	32 + 28 W. E.	
--	17	
1589	250	4th Shift in Reserve 3 Shifts

None

0		
1033	96 + 9	
732	68 + 6	
79	26 + 10	
--	0	
--	72	
--	73	
1844	360	4 Shifts

Convert to 4 Shift
Operation by 7-64

0	0	
1058	98 + 9	
760	70 + 6	
79	26 + 10	
--	0	
--	72	
--	69	
1897	360	4 Shifts

NO
PROBLEM
AREAS
IN
UO₃ PLANT

SAME
AS
BASE
CASE
FY-1963

ABOUT
SAME
AS
FY-1966
EXPANSION
CASE

ABOUT
SAME
AS
FY-1966
EXPANSION
CASE

8013	1213/4½	
1058	160	
760	115	} 1½
79	--	
--	--	
--	Incl.	4th Shift in
--	12	Reserve
9910	1500	3 Shifts

SIFIED

**DATE
FILMED**

7/6/94

END