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GENERAL ELECTRIC

HANFORD ATOMIC PRODUCTS OPERATION - RICHLAND, WASHINGTON

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TITLE

A PLANT WEEKLY SUMMARY - PUREX OPERATION
1-6-58 Through 12-29-58

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AUTHOR

O. C. Schroeder

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A PLANT WEEKLY REPORT PUREX OPERATIONS

Date 12-30-57 thru 1-5-58

1. Uranium to E-6	37.62 Tons
2. Maximum Operating Rate	18 T/D
3. Uranium Produced - Tons	20.85
4. Waste Losses	
Uranium	0.662 Percent
Plutonium	1.206 Percent

5. Operating Experience

The building was in a shutdown status until January 4, 1958; operations were resumed at a 2.16 CF.

6. Mechanical Experience

During the scheduled outage at the beginning of the week the following maintenance work was performed.

1. Steam tube bundles of the E6 and F11 waste concentrators and L3 and L4 plutonium concentrators were hydrostatically tested. No leaks were noted.
2. The 2A column was flushed and a blank installed in the top line to the interface float chamber.
3. Jumpers were installed to reroute nitric acid into the IBIP stream instead of the 2AF tank, J5.
4. The K2 empty-out jet which failed during the shutdown in early December was replaced.
5. Installation of jumpers on the prototype organic turbo-mixer was completed.
6. The broken bail on canyon cell cover block was repaired by bolting metal plates to the bail.

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A PLANT WEEKLY REPORT
PUREX OPERATIONS

DATE 1-6-58 - 1-12-58

1. Uranium to E-6	288,340 lbs.	Tons	144.17
Pu to E-6	63,397 units	Kg's	63.40
2. Maximum Operating Rate		T/D	18
3. Uranium Produced - Tons			148.79
4. Waste Losses			
	Uranium 420 lbs.	Percent	0.141
	Plutonium 494 units	Percent	0.814

5. Operating Experience

Operations were continuous through out the week at a 2.16 CF. Waste losses were good and all product produced met shipping specifications.

The simulated high acid flow sheet test of the precycle EA column proposed for two cycle operation was continued during the week. Decontamination efficiency of the column was further improved.

All of the waste solution produced and stored in F8 tank during December was successfully reworked and the plutonium recovered. Four tons of reworkUMH solution generated at the UO₃ plant were reprocessed through the final uranium cycle equipment without difficulty.

The pressure drop across the "A" dissolver silver reactor increased during the week indicating a growing restriction in the vessel. Flushing operations to remove the restriction are scheduled in the coming week.

Radio iodine stack emissions during the week were well below the daily and weekly permissible limits.

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A PLANT WEEKLY REPORT
PUREX OPERATION

1.	Uranium to E-6	145.02 Tons
2.	Maximum Operating Rate	21 T/D
3.	Uranium Produced - Tons	147.16
4.	Waste Losses	
	Uranium	0.103 Percent
	Plutonium	0.450 Percent
5.	<u>Operating Experience</u>	

Operations were continued at a nominal 2.40 CF throughout the week. Waste losses were good and all products were well within shipping specifications. The simulated high acid flowsheet tests for two-cycle operation were continued and performance of the precycle HA column with respect to decontamination efficiency and waste losses was favorable. Operation of the prototype organic turbo-mixer was initiated during the week. Improvement in decontamination efficiency of the solvent stream was noticeable.

Radio-iodine stack emissions increased at the beginning of the week and exceeded the daily Purex limit. The CPD limit for the week was not exceeded. Mercuric iodide was added to the dissolved metal feed stream to suppress the radio iodine. Preliminary tests indicate that the iodine is leaking through the vessel vent system.

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A PLANT WEEKLY REPORT PUREX OPERATION

1. Uranium to E-5 Column	157.94 Tons
2. Maximum Operating Rate	22 T/D
3. Uranium Produced - Tons	155.16
4. Waste Losses	
Uranium	0.062 Percent
Plutonium	0.40 Percent
5. <u>Operating Experience</u>	

The nominal 2.4 CF production rate was maintained throughout the week. Product quality and waste loss experience continued good. The prototype plutonium ion exchange unit was put on the line beginning January 23. About one-third of the plutonium is being diverted for processing through the ion exchange unit. Plutonium product purity of the material processed through the ion exchange is excellent, however waste losses are a little higher than is experienced through the L Cell package.

The A dissolver was taken out of service due to a partially plugged silver reactor. Attempts to unplug the unit by flushing are in progress.

Radio-iodine emissions averaged approximately one curie per day in spite of the addition of mercuric nitrate to the feed stream to suppress the evolution of iodine.

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A PLANT WEEKLY REPORT
PUREX OPERATION

1. Uranium to E-6 Column	152.84 Tons
2. Maximum Operating Rate	21 T/D
3. Uranium Produced - Tons	148.43
4. Waste Losses	
Uranium	0.061 Percent
Plutonium	0.237 Percent

5. Operating Experience

Feed rates of the previous week were continued. Waste losses were good except in the prototype ion exchange unit, in which plutonium losses exceeded one percent. Waste from this unit is being collected for rework. Product quality was good, including material produced through the ion exchanger. The ion exchange unit was shut down the latter part of the week to accomplish minor repairs.

Mercuric nitrate addition to the virgin feed stream for suppression of radio-iodine emission was discontinued early in the week when it was established that the origin of the emissions was not via the vessel vent system. Radio-iodine emissions continued to be higher than normal, but did not exceed the weekly permissible limit.

A repaired silver reactor was installed in the A dissolver position in place of the plugged unit. The plugged unit will be repaired and held as a spare. At the end of the week iodine began to break through the B dissolver reactor and the unit was reactivated.

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A PLANT WEEKLY REPORT
PUREX OPERATION

1. Uranium to E-6 Column	155.89 Tons
2. Maximum Operating Rate	21 T/D
3. Uranium Produced - Tons	151.09
4. Waste Losses	
Uranium	0.085 percent
Plutonium	0.396 percent

5. Operating Experience

Processing operations were normal throughout the period with the production rate constant at 2.6 CF. Waste losses were excellent and the quality of products produced was well within specifications.

Approximately 150 units of plutonium, collected during high waste loss (1%) experience from the ion exchange unit, was recovered by reworking through the extraction sections.

A box containing the old RA column, discarded jumpers, and hot waste was buried without incident.

Three two-cycle conversion jumpers were installed in the canyon and a fourth jumper was returned to the shops for alteration.

Radio-iodine emissions for the seven day period ending February 5 were 11.2 curies for CPD. Purex contributed 8.6 curies to this total amount.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

1. Uranium to E-6 Column	139.89 Tons
2. Maximum Operating Rate	21 T/D
3. Uranium Produced Tons	140.84
4. Waste Losses	
Uranium	0.057 Percent
Plutonium	0.290 Percent

5. Operating Experience

The production rate through the extraction cycles was continued at 2.6 CF. Product quality and product losses to waste were excellent.

The prototype plutonium ion exchange unit resumed operation on February 10 at a rate equal to approximately 35 percent of the plant flow. Modifications made during the outage resulted in an improvement in the waste loss analysis from the one percent prior experience to 0.3 percent. This waste stream is now being recycled back to the process on a continuous basis and all plutonium is recovered.

Faulty instrument control of the nitrite addition to the partition cycle feed tank resulted in high pu losses of short duration the latter part of the week. Waste collected during the period of abnormal processing was isolated for rework.

At approximately 2:30 a.m. on February 13, an explosion occurred in the A dissolver cell. The second dissolver out was being jetted out at the time. The dissolver cell was shut down immediately and since that time investigations have been conducted to determine the cause, extent, and location of the explosion. Observations through the remote crane optics indicate the explosion occurred in the off-gas silver reactor.

Radio-iodine stack emissions continued high in spite of mercuric nitrate addition to the feed on a continuing basis until the C reactor was reactivated early in the week. Emissions then dropped to less than one half of the previous rate. The total iodine emission for the seven-day period ending February 12 exceeded the CPD limit by 0.65 curies.

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**A PLANT WEEKLY REPORT
PUREX OPERATION**

1. Uranium to E-6 Column	145.5
2. Maximum Operating Rate	21 T/D
3. Uranium Produced - Tons	138.30
4. Waste Losses	
Uranium	0.039 Percent
Plutonium	0.204 Percent

5. Operating Performance

A nominal 2.6 CF rate was continued in the extraction cycles throughout the week. B and C dissolver cycles were maintained at optimum conditions and the amount of dissolved feed produced was approximately equal to the extraction cycle rate. Plutonium and uranium product quality was excellent.

On February 18 the total 2BP flow was routed to the prototype plutonium ion exchange unit when a leak developed in the piping between the L3 and L4 concentrators. This change resulted in temporary high waste losses (5.0%) in the 2BW stream due to the limitation of an ion exchange pump which supplies extractant to the 2B column. An increase in the sulfate molarity of the 2EX stream corrected the condition. During the period of high waste loss the 2BW stream was collected and isolated for future rework, and material collected from the LCell concentration package leak was reworked through the building. Uranium and plutonium waste losses (with the above exception) were excellent throughout the week.

On February 21 the precycle RA column feed pump drew high amps and kicked out. Operation of the pump was finally restored after three hours elapsed time. No adverse process conditions resulted. Complete failure of the pump is expected at any time.

Dismantling of the A dissolver equipment was begun early in the week to determine the location of the explosion and the extent of damage. Examination disclosed that the explosion occurred in the bottom of the silver reactor.

Radio-iodine emissions during the seven-day period ending February 19 exceeded the CPD permissible limit by .93 curies. Emissions from the Purex stack averaged approximately 0.6 curies per day, except for one day of tests when the backup facility was bypassed and emissions rose to 3.1 curies. Mercuric nitrate additions to the virgin feed were continued in an attempt to suppress iodine evolution.

A PLANT WEEKLY REPORT
PUREX OPERATION

February 24, 1958 thru March 2, 1958

1. Uranium to E-6 Column	133.82 Tons
2. Maximum Operating Rate	21 T/D
3. Uranium Produced - Tons	131.93
4. Waste Losses	
Uranium	0.026 Percent
Plutonium	0.406 Percent
5. <u>Operating Experience</u>	

The extraction cycle equipment was operated at a 2.4 CF rate throughout the week, and the B & C dissolvers were able to match this pace. Product quality and waste losses were excellent.

The precycle HA column feed pump again cut out, but operation of the pump was restored without adverse effect on extraction cycles.

Building salt waste was routed to underground storage tank 241-A-102 from 103-A tank at the suggestion of the Purex Technology group. The heat control of the 103-A tank is excessive. The leaky piping between the L Cell package L3 and L4 concentrators was replaced. The A dissolver cell silver reactor (damaged due to the explosion of February 13) was successfully buried without incident.

Radio-iodine emissions for the 7-day period ending February 26 were 6.92 curies or .92 curies over the weekly limit. The CPD emissions during the same period exceeded the limit by 3.2 curies. The Purex emission rate since this time has averaged .8 curies per day.

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A PLANT WEEKLY REPORT
PUREX OPERATION

March 3, 1958 through March 9, 1958

1. Uranium to E-6	126.96 Tons
2. Maximum Operating Rate	21 T/D
3. Uranium Produced - Tons	118.64
4. Waste Losses	
Uranium	0.078 Percent
Plutonium	0.162 Percent
5. <u>Operating Experience</u>	

The production rate was 2.4 CF throughout the week except for approximately 24 hours when the plant was shut down for equipment replacement. On March 3, the precycle HA column feed pump failed and an eight-hour unscheduled outage was required to replace the pump. On March 5, a planned shutdown of sixteen hours duration was made to replace the interface defective float jumper in the final plutonium cycle 2-A column. Process startup following the latter outage was rather rough and temporary high waste losses resulted in HA column. This high waste solution was isolated and reworked through the building by the end of the week. Product quality remained good in spite of the two shutdowns and startups, and actual product waste losses were quite nominal.

On March 8, a metal solution tank (D-4) boiled over (steam on tank coils, along with a defective temperature instrument) and approximately 1,000 gallons of solution was spilled on the cell floor. This solution was jettied to a tank and is being held for further rework.

On March 9 an air valve failure in the ion exchange facilities necessitated a shutdown of the unit. The plutonium concentrator package was started up at the time of the ion exchange shutdown to handle the plutonium production.

Iodine emissions during the seven-day period ending March 5 averaged 0.8 curies/day for a total emission of 5.63 curies during the period. An activity burst from the 291-A stack on 3-8 was a direct result of the D-4 tank overflow incident. Approximately 28 curies of radio-iodine emission was measured in the 24-hour period in which the incident occurred.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

March 10, 1958 through March 16, 1958

1. Uranium to E-6	51.93 Tons
2. Maximum Operating Rate	21 T/D
3. Uranium Produced - Tons	53.93
4. Waste Losses	
Uranium	0.251 Percent
Plutonium	1.15 Percent

5. Operating Experience

The building was in a scheduled shutdown status from 3-10-58 until 3-14-58, at which time operations were resumed at a 1.92 C.F.

Process startup was smooth with waste losses being good and all product produced meeting shipping specifications. Rework of metal solution from tank D-7, which boiled over, has been completed.

A change in flowsheet was initiated in the #1 solvent system and included changing the IO column scrub from 2½% Na_2CO_3 to 1½% HNO_3 . Gamma activity of the solvent increased significantly but is now dropping with no significant processing difficulties occurring. Although the HCM waste losses have been slightly higher than normal.

Operation of the L Cell plutonium concentration package was resumed pending scheduled repairs to the prototype plutonium ion exchange unit.

During the shutdown extensive flushing of both solvent systems and the waste systems were completed.

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A PLANT WEEKLY REPORT
PUREX OPERATION

March 17, 1958 through March 23, 1958

Uranium to E-6	122.59 Tons
Maximum Operating Rate	16 T/D
Uranium Produced - T/ons	117.09
Waste Losses Uranium	0.089 Percent
Plutonium	0.392 Percent

Operating Experience

Operation was continuous at 1.92 C.F. with all plutonium production routed through L Cell. The rework of off-standard dissolver solution, containing sodium nitrate, was processed without difficulty and the rework of material from F8, containing a conglomeration of wastes, was initiated without incident.

The gamma activity of the recovered acid and the #1 organic continued to be several times higher than normal, for unknown reasons, but product specifications were not affected.

The iodine emissions for the last report period were 11.09 curies. The organic centrifuges were bypassed on the theory that possibly some iodine was being emitted from the cell vents of the centrifuges and therefore was not passing through a silver reactor. The B Cell reactor was regenerated during the last shutdown period and a program has been initiated for sampling the vessel and condenser vent off-gas to trace down the source of the emissions.

A PLANT WEEKLY REPORT
PUREX OPERATION

March 24, 1958 through March 30, 1958

1.	Uranium to E-6	121.15 Tons
2.	Maximum Operating Rate	16 T/D
3.	Uranium Produced - Tons	114.70
4.	Waste Losses	
	Uranium	0.084 Percent
	Plutonium	0.409 Percent

5. Operating Experience

The production rate through the solvent extractant cycles was continued at 1.92 CF. Quality of products continued good and product losses to waste were low.

On March 27, the plutonium stream was routed through the ion exchange unit. Initially, some difficulty was encountered with the volume and timing of pushes through the resin bed. This condition was rectified and operation normalized by the end of the week.

The gamma activity of the building recovered acid has increased over the past several weeks. Efforts to reduce the activity by flushing the #2 acid fractionator tower F6, have been ineffective.

A total of 7.86 curies of radio-iodine were emitted during the seven day period ending March 27. Since this time the daily rate of emission has reduced to approximately 0.8 curies.

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A PLANT WEEKLY REPORT

PUREX OPERATION

March 31, 1958 through April 6, 1958

1.	Uranium to E-6	104.6 Tons
2.	Maximum Operating Rate	16 T/D
3.	Uranium Produced - Tons	114.35
4.	Waste Losses	
	Uranium	0.12 Percent
	Plutonium	0.36 Percent

5. Operating Experience

At the beginning of the week the solvent extraction cycles were operated at a 1.92 CF. A 17-hour planned outage was taken on April 3 to convert the extraction system to a modified 2-cycle operation. Some increase in fission product activity was apparent in the intermediate streams shortly after operations were resumed, but after equilibrium was reached the total gamma rise was slight and product quality was not adversely affected. Product losses remained satisfactory during the two cycle test, and the gamma activity of some uranium batches exceeded specifications initially, the fission products were of short half life and after a short decay period uranium met specifications.

On April 1 the master canyon crane was idled as a result of a failed wheel bearing and broken drive and wheel shafts. The crane was returned to service after an elapsed period of 32 hours to effect repairs. During the period of outage reserve feed storage was drawn upon and operation continuity was unaffected.

Radioiodine emissions for the seven-day period ending April 3 did not exceed the CPD limit of 10 curies.

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**A PLANT WEEKLY REPORT
PUREX OPERATION**

April 7, 1958 thru April 13, 1958

1.	Uranium to E-6	117.95 Tons
2.	Maximum Operating Rate	17 T/D
3.	Uranium Produced - Tons	108.15
4.	Waste Losses	
	Uranium	0.16 Percent
	Plutonium	0.18 Percent

5. Operating Experience

A nominal 1.92 CF was continued in the extraction cycles throughout the week. Uranium product and all N Cell product was in specification.

The ion exchange XAF pump failed on April 8 and the plutonium stream was routed through the package until April 10. The two product batches produced through the L Cell package were high in gamma activity. One of the batches was shipped to 2M-5 and the remaining batch is being held for rework.

Above normal waste losses were caused by failure of the #1 acid concentrator E-6 instrumentation. A special operating procedure was developed that corrected the operational troubles.

L Cell operation was interrupted for a short period because of a J-5 melatron failure, and K Cell was shut down for two hours following failure of a D.O.V. in the UO_3 acid line.

Radioiodine emissions for the seven-day period ending April 10 averaged 0.82 curies per day and did not exceed the Purex limit of 6 curies per week.

A PLANT WEEKLY REPORT
PUREX OPERATION

April 14, 1958 thru April 20, 1958

1. Uranium to E-6	40.44
2. Maximum Operating Rate	5.77 T/D
3. Uranium Produced - Tons	40.4
4. Waste Losses	
Uranium	0.584 Percent
Plutonium	0.105 Percent
5. <u>Operating Experience</u>	

A scheduled shutdown was begun Monday morning, April 14. Numerous repairs to equipment in N Cell (ion exchange unit) were completed and three canyon jumpers were installed for recycling the final plutonium and final uranium cycle aqueous waste streams to the precycle HA column continuously. Operations were resumed on April 18 at a 2.16 capacity factor rate.

On April 19 a shaft seal leak developed on the F-7 (A waste system feed pump) and later the pump drew high amps and kicked out. Following reversal of the wiring leads the pump was restarted. The pump is now operating with normal amps, but the leak continues.

Radioiodine emissions for the seven-day period ending at 8 a.m., April 17, were 12.11 curies. The emission rate for the first four days of the period were at a rate of less than one curie per day. However, the daily emission rate for the last three days exceeded the 1 curie daily limit, with a maximum emission of 4.40 curies on April 15. The plant was in a shutdown status at the time. The vessel vent reactor was regenerated in an effort to control emissions below 1 curie per day.

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A PLANT WEEKLY REPORT PUREX OPERATION

April 22, 1958 thru April 27, 1958

1. Uranium to E-6	133.66 Tons
2. Maximum Operating Rate	19.1 T/D
3. Uranium Produced	125.88 Tons
4. Waste Losses	
Uranium	0.057 Percent
Plutonium	0.012 Percent

5. Operating Experience

Extraction operations were continuous throughout the week on the pseudo two-cycle operation at a 2.16 CF rate. Early in the week the gamma activity of both product streams exceeded specifications, possibly due to the rework of waste material. Out-of-specification plutonium was recycled through the building and out-of-specification uranium is being satisfactorily decontaminated in the Purex silica gel facility. At the end of the week both product streams were within specification without additional treatment.

Product losses to waste were exceptionally low, reflecting product recovery by backcycling of the second plutonium and uranium aqueous waste streams in the two cycle flowsheet.

Mechanical difficulties in the ion exchange forced the use of the L Cell concentration package early in the week. Its use was shortlived, however, as an external product leak developed in the L-4 concentrator tube bundle assembly. Rapid repairs were made to the ion exchange unit and the unit returned to service. Subsequent operation has been satisfactory. Repairs to the L-4 concentrator are planned following flushing operations.

The leaky #1 waste system feed pump (F-7), which performed erratically the previous week, was replaced.

Radioiodine emissions for the seven-day period ending April 23 totaled 6.5 curies; just over the 6 curie per week limit for Purex. The GFD weekly limit of 10 curies was exceeded by 0.1 curies during the same period. The emission rate has since improved to approximately 0.6 curies per day.

A PLANT WEEKLY REPORT
PUREX OPERATION

April 28, 1958 thru May 4, 1958

1. Uranium to E-6	130.75 Tons
2. Maximum Operating Rate	18.67 T/D
3. Uranium Produced - Tons	134.5
4. Waste Losses	
Uranium	0.051 Percent
Plutonium	0.019 Percent

5. Operating Experience

A production rate of 2.16 CF was continued throughout the week, and in addition approximately 13.5 tons of rework material from the UC₂ Building was reprocessed. Waste losses of both products continued very low, and product quality met specifications. Rework was initiated on some high plutonium aqueous material accumulated and segregated in R Cell from an upset of the final plutonium cycle in March. No process difficulties have been encountered.

Numerous valve diaphragm failures and valve malfunctions occurred in the plutonium ion exchange and IR receiving tanks during the week, but continuity of operations was not affected.

Radioiodine emissions for the seven-day period ending April 30 averaged approximately 0.7 curies per day. A peak of 1.2 curies was reached on April 27 due to a breakthrough from the B reactor. The B reactor was promptly regenerated and emissions returned to normal.

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A PLANT WEEKLY REPORT PUREX OPERATION

May 5, 1958 thru May 11, 1958

1.	Uranium to HA Column	126.10 Tons
2.	Maximum Operating Rate	18 T/D
3.	Uranium Produced - Tons	122.91
4.	Waste Losses:	
	Uranium	0.027 Percent
	Plutonium	0.014 Percent
5.	<u>Operating Experience</u>	

Extraction operations continued during the week at a 2.16 CF rate. Re-work of the remaining portions of the UO_2 building waste was completed during the week by processing through the final uranium cycle columns. Product losses to waste were low and product quality was good.

The off-gas filter, damaged in the A dissolver cell incident, was removed and buried without incident.

A small fire, originating from spontaneous combustion, occurred in waste box in the Hot Shop lobby on the 4-12 shift, May 5. The fire was extinguished promptly by the 200 West Area Fire Department. Damage was negligible; however, some plutonium contamination was spread to the immediate environs. The contamination is under control and decontamination is in progress.

Radioiodine emissions for the seven-day period ending May 7 totalled 11.8 curies.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

May 12, 1958 through May 18, 1958

1. Uranium to HA Column	130.80 Tons
2. Maximum Operating Rate	18.68 T/D
3. Uranium Produced - Tons	132.35
4. Waste Losses	
Uranium	0.011 Percent
Plutonium	0.095 Percent
5. <u>Operating Experience</u>	

The extraction batteries continued to operate at a 2.16 CF throughout the week. Product losses to waste were unusually low, reflecting the benefit of recycling column aqueous waste streams for product recovery. Product quality was good until the latter part of the week when the decontamination efficiency of the columns decreased and borderline specification material was produced. This difficulty was experienced coincidental with the use of hydrazine on a test basis as a reductant in the columns instead of ferrous ammonium sulfate.

The plutonium ion exchange unit developed plugs in transfer piping and the L Cell concentrator package was reactivated.

Dissolving operations were completed by mid-week and the dissolver heels were removed by the end of the week in preparation for the two-cycle conversion shutdown.

A box of miscellaneous canyon jumpers and equipment were buried without incident during the week.

Radioiodine emissions for the seven-day period ending May 14 totalled 2.46 curies.

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A PLANT WEEKLY REPORT PURK OPERATION

May 19, 1958 through May 25, 1958

1.	Uranium to HA Column	9.05 Tons
2.	Maximum Operating Rate	1.29 T/D
3.	Uranium Produced - Tons 24.99	24.99
4.	Waste Losses	
	Uranium	0.469 Percent
	Plutonium	1.226 Percent

5. Operating Experience

The remaining virgin metal solution feed was processed through the extraction columns early in the week, after which borderline specification U and Pu, produced the previous week, was recycled for further decontamination. All rework was completed by May 22 and equipment flushes were begun in preparation for converting to the two-cycle flowsheet.

Radioiodine emissions for the week totaled 1.45 curies.

A PLANT WEEKLY REPORT
PUREX OPERATION

May 26, 1958 through June 1, 1958

1. Uranium to EA Column: 0 Tons
2. Maximum Operating Rate: 0 T/D
3. Uranium Produced - Tons: 0
4. Waste Losses:
 - Uranium: 39% Per Cent
 - Plutonium: 38 units Per Cent
5. Operating Experience:

The plant was down for the entire period for conversion to two cycle operation. The shutdown decontamination and maintenance work has proceeded on schedule. The 1-A partition column was buried without incident on 5-28-58. A fire of undetermined origin which was discovered in the burial trench on May 27, was extinguished without difficulty by the Fire Department. The contaminated area downwind from the blaze was backfilled and returned to normal on May 28.

Radioiodine emission for the week totaled 0.33 curies.

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A PLANT WEEKLY REPORT PURKY OPERATION

June 2, 1958 through June 8, 1958

1. Uranium to HA Column 0 Tons
2. Maximum Operating Rate 0 T/D
3. Uranium Produced 0 Tons
4. Waste Losses:

Uranium	29 lbs.	---Percent
Plutonium	21 units.	---Percent
5. Operating Experience

The plant was shut down during the period for conversion to two-cycle operation. The major equipment changes have been completed ahead of schedule. Operability tests are scheduled for the coming period.

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HA-54005

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A PLANT WEEKLY REPORT
FURKI OPERATION

June 9, 1958 through June 15, 1958

1. Uranium to HA Column	0 Tons
2. Maximum Operating Rate	0 T/D
3. Uranium Produced - Tons	0
4. Waste Losses	

Uranium 79 Lbs.

Plutonium 112 Units

5. Operating Experience

The plant continued in shutdown status during the period. The high activity plutonium, which was produced just prior to the shutdown, was reprocessed through the ion exchange unit. About half of the material was still out of specification after the rework. It will be blended in with normal feed after startup. The operation for recovery of Neptunium in the JWB solution stored in H-4 and J-1 began on June 15. A series of operability tests on the process equipment were carried out during the week.

Radioiodine emission for the week was .04 curies.

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A PLANT WEEKLY REPORT
PUREX OPERATION

June 16, 1958 through June 22, 1958

1.	Uranium to E-6	3.42 Tons
2.	Maximum Operating Rate	.49 T/D
3.	Uranium Produced - Tons	0
4.	Waste Losses	
	Uranium	15 lbs.
	Plutonium	19 Units

5. Operating Experience

Processing of the 3WB solution for recovery of Neptunium was discontinued at 1:25 p.m. on 6-17-58 due to holdup of neptunium in the partition cycles and the aqueous waste from the extraction columns. Approximately five grams of neptunium in four liters of solution were bottled out from the L cell package. The activity reading of this container was 300 mr/hr through the jacket. Repeated flushes of the L cell equipment were made to reduce the high radiation readings. Feed was started to HA column at 10:30 a.m. 6-22-58 but a leaking HAW valve forced a shutdown at 1:00 a.m., 6-23-58.

Operability tests were made on the ion exchange equipment in preparation for the startup.

Iodine emission for the week was 0.18 curies.

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A PLANT WEEKLY REPORT
PUREX OPERATION

June 23, 1958 through June 29, 1958

1. Uranium to HA Column	64.93 Tons
2. Maximum Operating Rate	9.27 T/D
3. Uranium Produced - Tons	31.96
4. Waste Losses	
Uranium	.092 Percent
Plutonium	4.869 Percent
5. <u>Operating Experience</u>	

An unusual number of equipment difficulties marked the operation during the week. After repair of the failed HAW jumper on June 23 the plant started up at 2255, 6-24-58. Another shutdown at 0300, 6-25 resulted from failure of the IBXF DOV. The plant started up at 1445, 6-25 and ran until 1700, 6-27, when it again was shut down because of failure of the J-1 (3WB) pump. The plant started up at 0345, 6-28 and continued through the week end. Performance of the extraction batteries and back cycle flowsheet has been excellent through all run periods. A nominal 2.16 CF rate was maintained during the run periods.

All plutonium produced exceeded G/AT specifications and has been recycled to E-6. Two uranium batches exceeded plutonium and gamma ratio specifications. Ten batches produced since 6-26 have met specifications.

The N Cell operation was excellent until 6-27, when the IAF pump's maximum output dropped to about two-thirds of the normal operating rate. At week end N Cell was down and product was processed through the L Cell package.

Iodine emission for the week was 0.17 curies.

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A PLANT WEEKLY REPORT PUREX OPERATION June 30 through July 6, 1958

1. Uranium to HA Column	136.91 Tons
2. Maximum Operating Rate	19.56 T/D
3. Uranium Produced - Tons	140.55
4. Waste Losses	
Uranium	.023 Percent
Plutonium	.193 Percent
5. <u>Operating Experience</u>	

Operation was continuous at 2.16 CF during the period, with the plutonium product being split between the ion exchange system and the L cell package. The IAF pump rate was insufficient to take all the output through N cell, possibly because of an airlock. N Cell product was within specifications beginning with Batch #2 and all material prior to this was recycled directly to E-6 or loaded out to be recycled later. The L cell material was recycled until batch #5, which was partly recycled and partly blended with N cell material to meet specifications. The uranium product met specifications except for several batches at the end of the period which were high in gamma. Adjustments were made to the HAX rate to bring the uranium back into specifications.

July
On ~~June~~ 5 the SLD sump overflowed as a result of water being left on in the PR decontamination hood. The overflow contaminated the hall and the floor of the L cell greenhouse and to the SLD sump. Initial cleanup and stripcoating of the floors permitted normal operation with the cleanup in process.

The iodine emission for the week was 0.43 curies.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

July 7 through July 13, 1958

1.	Uranium to HA Column (E-6)	118.17 Tons
2.	Maximum Operating Rate	17 T/D
3.	Uranium Produced - Tons	121.12
4.	Waste Losses	
	Uranium	.074 Percent
	Plutonium	.277 Percent

5. Operating Experience

Processing continued at a nominal 2.16 CF during the week except for an eight-hour shutdown on July 11 and 12 to replace the H-1 pump which was leaking at the seal. The total plutonium product stream was diverted through the ion exchange unit on July 9 and excellent product quality resulted.

Following the installation of the new H-1 pump, a leak was observed near the bottom of H-3 tank. The leak rate is about two gallons per hour. The source of the leak has not been pinpointed due to the difficulty in getting sufficient light in the area.

Iodine emission for the week was 0.84 curies.

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A PLANT WEEKLY REPORT PUREX OPERATION July 14 through July 20, 1958

1. Uranium to HA Column (E-6)	98.64 Tons
2. Maximum Operating Rate	14.09 T/D
3. Uranium Produced - Tons	86.45
4. Waste Losses	
Uranium	.031 Percent
Plutonium	.055 Percent
5. <u>Operating Experience</u>	

The plant was shutdown on July 17 for the by-passing of the H3 column which had developed a leak below the interface nozzle. The startup was delayed until July 18 to allow Z Plant to reduce the backlog of full PR cans. By-passing of the H3 column reduces the decontamination factor of the first cycle but will not effect the quality of the final products.

An attempt to rework the organic which had been accumulated from the H3 column leak raised the activity of both products. The U was routed to the silica gel facilities for tail-end treatment and the Pu was reworked. Both streams were approaching specification at week's end.

Neptunium started to show up in the IWW waste stream and it was necessary to segregate and hold for rework two batches of waste.

Iodine emission was 1.0 curies for the week.

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A PLANT WEEKLY REPORT
PUREX OPERATION
July 21 through July 27, 1958

1. Uranium to EA Column (X-6)	123.95 Tons
2. Maximum Operating Rate	17.99 T/D
3. Uranium Produced - Tons	127.60 Tons
4. Waste Losses	
Uranium	.063 Per Cent
Plutonium	.257 Per Cent

5. Operating Experience

Through out the week, operations were continuous at a nominal 2.16CF. All plutonium produced met specification, but several batches of uranium were segregated for processing through the silica gel facilities. The rework of the neptunium bearing IWW waste was begun by adding 200 gallons to each virgin feed batch.

Iodine emission was 0.8 curies for the week.

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**A PLANT WEEKLY REPORT
PUREX OPERATION
July 28 through August 3, 1958**

1. Uranium to HA Column (E-6)	106.57 Tons
2. Maximum Operating Rate	18 T/L
3. Uranium Produced - Tons	121.75
4. Waste Losses	
Uranium	0.037 Percent
Plutonium	0.073 Percent
5. <u>Operating Experience</u>	

Operations were continuous at a nominal 2.16 CF until the scheduled shutdown at 10:00 a.m. on August 3. All plutonium was processed through the ion exchange facility and met shipping specifications. All uranium produced was slightly high in gamma activity and was sent to the silica gel facility for cleanup. The process was shut down on August 3 to make preparations for a second attempt at neptunium recovery next week.

Total iodine emission during the week was 1.28 curies.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

August 4 through August 10, 1958

1. Uranium to RA Column (E-6)	0 Tons
2. Maximum Operating Rate	0 T/D
3. Uranium Produced Tons	6.0
4. Waste Losses	
Uranium	0.40 Percent
Plutonium	1.96 Percent *

* Waste loss high because of low production during shutdown period.

5. Operating Experience

The neptunium recovery run was started at 1700 hours on August 8 and ran until the hot feed was exhausted at 2100 hours on August 10. Neptunium losses were in the 10 - 15 percent range out of the 2A column. Buildup of neptunium in J-3, J-5, and L-3 streams has been about as expected. Apparently there was a holdup in the LIX column of some 100 units which will be removed in the final stripping.

A jumper was installed in L-Cell, which makes it possible to recycle 2BP back to the J-5 tank. A hydrostatic test indicates a leak in the RH tube bundle of the F-11 concentrator. It will be replaced at the conclusion of the neptunium runs. Began operational testing of the recently repaired and installed A-Cell equipment and found that the 10 inch DOV butterfly failed to operate properly.

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A PLANT WEEKLY REPORT
PUREX OPERATION

August 11 through August 17, 1958

1. Uranium to HA Column (E-6)	11.55 Tons
2. Maximum Operating Rate	0
3. Uranium Produced	0
4. Waste Losses	
Uranium	0.69 Percent
Plutonium	1.92 Percent

5. Operating Experience

The neptunium recovery run was successfully completed during the period and approximately 350 units were loaded out and shipped to the 222-S laboratory where further processing will be carried out.

The leaking RH tube bundle on the F-11 concentrator has been placed following completion of the Np runs. Startup of the plant in normal production was delayed by the discovery of a leak in the LH tube bundle of the F-6 concentrator. Flushing was carried out in preparation for replacement of the tube bundle. Both tube bundles in F-11 and F-6 have failed since plant startup.

The A-Cell dissolver was placed back in service during the week.

Iodine emission during the week totaled only 0.25 curies.

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**A PLANT WEEKLY REPORT
PUREX OPERATION**

August 18 through August 24, 1958

1. Uranium to E6 Column	68.80 Tons
2. Maximum Operating Rate	18 T/D
3. Uranium Produced - Tons	45.86
4. Waste Losses	
Uranium	0.12 Percent
Plutonium	9.436 Percent

5. Operating Experience

The extraction batteries started up at CF 2.16 at 2400 on August 20. Above-normal gamma levels and high initial 2AW losses were as expected following the Np run. Operations proceeded smoothly and product streams approached or met specifications by August 24. All accumulated high uranium or plutonium waste solutions have been concentrated in F-8 and are being prepared for rework. Organic decontamination flushes were completed in both R and G systems.

E Cell operation has been excellent. Use of the new capacitance probe has simplified operational control considerably.

Flushing and replacing of the failed F-6 left hand tube bundle was completed. Faulty IAF pump operation required extensive diagnosis and repair work.

Decontamination flushes of the failed H5 column are in progress at week end.

Extensive decontamination of the canyon and the PR room continues.

Iodine emission during the week amounted to 0.16 curies.

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A PLANT WEEKLY REPORT PUREX OPERATION

August 25 through August 31, 1958

1. Uranium to E6 Column	91.40 Tons
2. Maximum Operating Rate	20 T/D
3. Uranium Produced - Tons	86.70 Tons
4. Waste Losses	
Uranium	0.07 Percent
Plutonium	0.17 Percent

5. Operating Experience

Operations continued at a 2.14 CF until 0400 on 8-27-58 when the plant was shut down due to inability to maintain an adequate IEXF rate. The J-3 pump was first changed out without improving the situation. The DOV jumper was then changed without improvement. The new jumper was removed and a new DOV valve with 2" trim was installed. Adequate flow was obtained but excessive fluctuation was experienced. The DOV valve with 1½" trim was found partially plugged with small pieces of plastic, apparently from the HA column. The valve was cleaned and reinstalled and a screen basket was installed on pump inlet. The plant again was started up at 1345 on 8-29-58 at a 2.16 rate. Rates were raised to 2.4 CF at 0030 on 8-30-58 and continued at these rates until 2300 on 8-31-58 at which time IEXF plugging was again experienced. Rates were reduced to 2.04 CF and operations continued until the end of the period.

Plutonium product was recycled back to E-6 as the Q/AT was high. Uranium product was routed through the silica gel facility.

Decontamination flushes of the H5 column continued during the period and are approximately two-thirds complete.

Iodine emission during the week amounted to 1.64 curies.

Cleanup and painting of the PR Area was completed. The area was taken off masks on 8-29-58.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

September 1 through September 7, 1958

1. Uranium to E6 column	134.67 Tons
2. Maximum Operating Rate	22 T/D
3. Uranium Produced	142.70 Tons
4. Waste Losses	
Uranium	0.10 Percent
Plutonium	0.265 Percent

5. Operating Experience

During the period the processing rates varied between CF's of 2.04 and 2.52. This variance was due to erratic IHXF flow, presumably caused by faulty IHXF DOV operation. Product specifications were met for both final plutonium and uranium bearing streams.

Processing of approximately 7 Kg of Z Plant RR material was completed by 9-5-58. Waste losses (HAW) during this period were higher than normal but have since returned to normal. There was no appreciable change in dF for this period.

A test to study the effects of reduced H₂O on Kp loss was initiated on 9-3-58. To date no significant change has occurred.

Flashing and decontamination of the E6 Column is essentially complete and will permit checking column activity for future repairs.

The RR room was again placed on assault mask status. Extensive checking and repeated air sampling has failed to detect the source of the contamination. A series of tests to evaluate air flow into the room and hoods is being initiated to check possible air reversals with subsequent airborne contamination.

Total iodine emission during the week amounted to 4.74 curies.

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A PLANT WEEKLY REPORT
PUREX OPERATION

September 8 through September 14, 1958

1. Uranium to E6 Column	152.57 Tons
2. Maximum Operating Rate	22 T/D
3. Uranium Produced - Tons	147.91
4. Waste Losses	
Uranium	.04 Percent
Plutonium	.17 Percent

5. Operating Experience

Processing rates during the period were at 2.64 CF. A small amount of rework from F8 was combined with one feed batch to test its processing. The activity of both product streams rose sharply coincident with the processing of the batch containing rework. Uranium gammas reached a maximum of 11.8 and continued above specifications for the remainder of the period, requiring silica gel treatment. F-8 material is receiving further refluxing prior to another rework attempt.

Two batches of IWW waste with recoverable quantities of plutonium are being belnded into the feed stream for rework.

The HAO flow was stopped for several days in a process test to study the behavior of neptunium in the H2 Column. Results are inconclusive.

Sulfamic acid addition to the precycle feed was begun to stabilize neptunium extraction. Results are inconclusive.

Decontamination flushes of the H3 column were completed.

Occasional plugging of the IBXF control valve continued throughout the week.

Total iodine emission during the week amounted to 13.10 curies. Tests indicated that the excessive iodine emission was primarily from the vessel vent system. Mercuric nitrate additions were started on September 11 to help control the iodine emission.

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A PLANT WEEKLY REPORT
PUREX OPERATION

September 15 through September 21, 1958

1. Uranium to E6 Column	120.40
2. Maximum Operating Rate	25 T/D
3. Uranium Produced	113.50 Tons
4. Waste Losses	
Uranium	.05 Percent
Plutonium	.04 Percent

5. Operating Experience

Processing rates were 2.62 CF except for a shutdown of 48 hours from 0500 on 9-16 through 0500 on 9-18 due to plugging of the IBXF process line. During the outage the IBXF jumper was replaced, the trench piping flushed, and a fine mesh screen installed on the IBXF pump inlet.

The G-1 tank was flushed repeatedly and the pump pressure is now back to normal.

A plant test, using sulfamic acid (0.03 M) as a reductant in the plant feed was started on 9-15 and terminated when a gamma burst developed in the product streams. The test was restarted on 9-20 and is still in progress.

It was necessary for plant forces to fabricate four flexible hose jumpers before flushing of the IBXF in-cell lines could be accomplished.

All uranium was routed to silica gel due to high gamma ratio.

Total iodine emission during the week amounted to 11.8 curies. Mercuric nitrate additions were continued during the period to suppress iodine evolution from the vessel vent system.

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A PLANT WEEKLY REPORT

PUREX OPERATION

September 22 through September 28, 1958

1. Uranium to E6 Column	113.00 Tons
2. Maximum Operating Rate	25 T/D
3. Uranium Produced	109.04 Tons
4. Waste Losses	
Uranium	.06 Percent
Plutonium	.03 Percent

5. Operating Experience

Processing rates were at 2.64 CF until September 23 at which time rates were reduced to 2.42 CF. On September 25 rates were cut from 2.42 to 1.92 CF. in order to process high gamma rework.

On September 27 the F-7 pump failed, forcing a shutdown of the plant at 0700 on September 27. After installation of a new pump the plant was started up at 2115 hours on September 27.

A plant test, using sulfamic acid as a reductant in the plant feed, was discontinued on September 22. On September 23 nitrite additions to J-2 were begun to determine the effect on Palm recovery.

The gamma activity of the uranium product stream increased above specifications as a result of the rework material in the process. The gamma ratios steadily improved up to the shutdown. As usual the gamma ratios increased after the startup but have shown a downward trend up to the end of the period. Plutonium met specifications throughout the week.

The failed F-6 and F-11 tube bundles were buried on September 26 without incident. The radiation readings were 200 mr/hr at 300 feet.

The Wilfley pump in R Cell (solvent service) failed on September 25. Reason for the failure is not definitely established. Repairs were made and the pump returned to service on September 26. The pump operated satisfactorily until the plant was shut down due to the F-7 pump failure. The Wilfley pump failed again during the plant startup period. Cause of the failure is not yet determined.

The F-12 agitator was relocated in another tank opening in preparation for the LW ion exchange installation.

The RC hood and a spot on the floor outside of the hood were found highly contaminated on September 26. Cleamp of the area outside of the hood was accomplished promptly and work on cleamp inside the hood is progressing.

The crane impact wrench and one of the hooks was found contaminated to 500 rad/hr apparently from handling the flex jumpers in F Cell during previous week.

Total iodine emission during the week amounted to 10.06 curies.

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A PLANT WEEKLY REPORT
PUREX OPERATION
September 29 through October 5

1. Uranium to E6 Column	92.71 Tons
2. Maximum Operating Rate	16 T/D
3. Uranium Produced	102.71 Tons
4. Waste Losses:	
Uranium	.05 Per cent
Plutonium	.23 Per cent

5. Processing was continuous at 1.92 CF during the period, and results were generally excellent. Another attempt at rework of the F8 material resulted in a several fold increase in activity of both product streams, particularly Pu. Just before the shutdown at week's end for scheduled maintenance, all products were within specifications. Waste losses were all low.

Studies on the Palm recovery have continued but the sample results have been inconclusive. There is no buildup in the system at the present time.

Installation of the equipment for the IWW ion exchange unit has progressed satisfactorily and only two or three jumpers remain to be installed.

Iodine emission for the seven day period amounted to 4.5 curies.

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A PLANT WEEKLY REPORT
PURKX OPERATION

October 6 through October 12, 1958

1. Uranium to E6 Column,	6.85 Tons
2. Maximum Operating Rate	0 T/D
3. Uranium Produced	10.49 Tons
4. Waste Losses:	
Uranium	0.79 Per cent
Plutonium	1.27 Per cent
5. Operating Experience	

Processing remained shut down through the entire week. The E6 Column was decontaminated again with a series of chemical flushes. The 2D Column was flushed with acid and carbonate to clean the plates. The G-1 tank was flushed to remove a buildup of solids in the packing. The R-8 tank was also flushed. Waste previously accumulated in the R-5 tank was moved to F-Cell for concentration and future rework.

During the week, concentrator tube bundles were hydrostatically tested. The F-6 east bundle was found to be leaking. F-6 was decontaminated with chemical flushes and the bundle replaced. Tests also indicated that H-4 west tube bundle had failed. It was interchanged with the good F-6 west bundle. Retesting shows it to be free from leaks. Leakage tests were made through an experimental heat exchange jumper originally used in corrosion testing of metallurgical samples. This jumper apparently had corroded out.

The leaking F-2 vent gas heater was replaced with a reconditioned unit. The replacement heater leaked so a new F-2 heater was installed in F-2. At the same time the F-2 discharge vapor line was also replaced because of gasket failures.

In H Cell a test was completed to determine design pressure requirements for the XAF feed pump. Faulty valves were replaced. Piping changes were made to route the ISW flow into the waste stream. The hood filter was replaced with a spool-piece.

Concentrator traps were repaired or replaced during the week. The F-11 left trap and by-pass valve are still defective and plant startup will be delayed for additional maintenance on this equipment.

The total iodine emission during the week was 3.33 curies.

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A PLANT WEEKLY REPORT
PUREX OPERATION

October 13 through October 19, 1958

1. Uranium to E6 Column	136.32 Tons
2. Maximum Operating Rate	25 T/D
3. Uranium Produced	112.6g
4. Waste Losses:	
Uranium	.08 Percent
Plutonium	.186 Percent

5. Operating Experience

The extraction batteries were started up at 2230 on October 13 at 1.92 CF. After a leveling off period F-3 rework was processed without difficulty. The waste held in F-15 was moved to F-8 and is now refluxing.

An operating rate test was started and the following rate changes made:

1.92 to 2.40 CF at 1200	10-15-58
2.40 to 2.64 CF at 1700	10-16-58
2.64 to 3.00 CF at 1400	10-17-58

The capacity of the N-6 concentrator was reached at 3.00 CF and this rate has been held. Product stream gamma activity levels tripled and then leveled out. Nine out of fifteen uranium batches have had gamma ratios of three or above. Only the first product batch exceeded G/AT specifications after silica gel and this was blended with following batches.

The E6 column was pulled and placed in M Cell. When the lower section of the column was filled with water numerous pin-hole leaks were found in the welds joining the side chamber and the column. The radiation levels are now sufficiently low to permit repair of the column.

Four DW jumpers were installed. A fifth jumper proved to be too long and efforts are being made to decontaminate this jumper.

The N-6 concentrator developed a leak at the upper Sp.G. dip tube connector. Temporary repairs made with porcelain paste and glass tape have been holding so far.

The E-5 sampler pressurized. The contaminated area was cleaned up and the sampler returned to service.

Decontamination work continued in the canyon, E Cell, and on the S.G. pipe trench, where a recovered acid line leak continues to give trouble.

Iodine emission for the week amounted to 1.33 curies.

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A PLANT WEEKLY REPORT
PUREX OPERATION

October 20 through October 26, 1958

1. Uranium to E6 Column	162.35
2. Maximum Operating Rate	27 T/D
3. Uranium Produced - Tons	157.00
4. Waste Losses	
Uranium	.028 Percent
Plutonium	.11 Percent
5. <u>Operating Experience</u>	

Rates were raised to 3.2 CF on October 23 and continued for the remainder of the period. Decontamination of the product streams was approximately the same as at the 3.0 CF level. There was a breakthrough of fission product activity which sent the uranium gamma ratio to a maximum of 8.8. Two batches of uranium and one of plutonium were reworked through E6.

High RAW waste losses were experienced during a period from October 22 to October 24. The RAW waste collected during this period was segregated for subsequent rework.

As a result of a leak in the N6 concentrator the XCP product stream was rerouted to L4 while N6 was being replaced. The product stream was returned to N6 on October 23 following the installation of a new concentrator loop.

The H5 column was repaired and returned to position in the cell. Installation of the jumpers and operability tests are in progress at this time.

A dolly carrying a FR can was left unattended on the FR deck while loading the 234-5 truck. The dolly rolled off the deck into the truck and slightly injured the operator who was in the truck. A small amount of solution was spilled into the jacket. The incident was classified as a "Near-Serious" accident. Decontamination of the car and jacket is in progress.

The E-5 sampler was still "hot" from the blowback experienced last week. The readings have been reduced at the open door from 3000 mrad/hr to 350 mrad/hr and work is continuing.

Iodine emission for the week was 5.0 curies. Mercuric nitrate additions to the metal solution tanks were resumed on October 24 to help suppress iodine evolution.

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A PLANT WEEKLY REPORT
PURKI OPERATION

October 27 through November 2, 1958

1. Uranium to E6 Column	175.34 Tons
2. Maximum Operating Rate	27 T/D
3. Uranium Produced - Tons	171.00
4. Waste Losses	87.64
Uranium	0.032 Percent
Plutonium	0.153 Percent

5. Operating Experience

Processing continued at 3.2 CF except for a period of 6.25 hours when the HA column was shut down to permit the tie-in of the repaired ES column. Since the reactivation of the ES column on October 28, gamma activity in the 2BP stream has lowered until it is just within specifications.

Although the activity of the uranium streams is within specifications, raising the acidity of the ESS stream apparently caused an above-normal amount of plutonium to go with the uranium stream in the IBI column, resulting in the I6's getting out of specification in plutonium. ESS nitric molarity has been lowered and the situation appears to be correcting itself.

Rework of a F-15 batch, collected during over-saturation in the HA column, has progressed satisfactorily.

The process has been held at 3.2 CF and appears to be limited now by several situations. The IC column is very near the flooding stage, the IAF pump in N cell is close to capacity, and the 2DF DOV is wide open and the by-pass is partially open.

Iodine emission for the week was 5.75 curies.

6. Equipment Experience

Reinstallation of the ES column was completed and was put back in service on October 28.

New thermobin jumpers were installed in the F-7 and F-12 to replace failed units.

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A PLANT WEEKLY REPORT
PURKX OPERATION

November 3 through November 9, 1958

1. Uranium to E6 Column	172.91
2. Maximum Operating Rate	27 T/D
3. Uranium Produced - Tons	165.80
4. Waste Losses:	
Uranium	.046 Percent
Plutonium	.192 Percent

5. Operating Experience

Excessive plutonium continued to be reported in the final uranium batches until November 5, when the trouble was found to be in the laboratory analyses. All batches previously reported high in plutonium are now believed to be within specifications. Rates were reduced from 3.2 CF to 2.88 CF on November 4 to help smooth out operation.

An instrument air failure of two minutes duration on November 7 shut off all process flows. The process recovered quickly without adverse effects.

Testing of the IWW ion exchange equipment continued during the week. Alterations to the F-15 sampler for use with the ion exchange are under-way.

A leak in the plutonium ion exchange IC column has become increasingly severe. Clamps were devised but had little effect on slowing the leakage.

Iodine emission during the week was 5.85 curies.

A PLANT WEEKLY REPORT
PUREX OPERATION

November 10 through November 16, 1958

1. Uranium to E6 Column	175.90 Tons
2. Maximum Operating Rate	27 T/D
3. Uranium Produced-Tons	164.75
4. Waste Losses:	
Uranium	0.035 Percent
Plutonium	0.124 Percent

5. Operating Experience

Operations continued at a 2.88 CF throughout the week. All plutonium product was within specifications. The uranium product gamma ratio exceeded specifications during the entire period. Corrective action was not taken because of the probable adverse effect it would have on Palm retention in the system.

One high gamma burst developed in the extraction batteries as a result of inadvertent processing of 50-day cooled metal feed. Very high iodine I^{131} emission coincided with the dissolving and blending of this material.

Approximately one-half of the accumulated Palm slipped away to first cycle waste on 11-15-58. The loss may have resulted from a minor increase in the HA column saturation. The LW accumulated during the loss period has been isolated in F-15 and held for rework.

A program to test the effect of mercuric nitrate additions directly to the dissolvers as iodine suppression began on 11-14-58.

Iodine emission during the week was 4.58 curies.

6. Equipment Experience

The existing leak in the IC column increased due to an above normal pressure buildup. Some relief was obtained by splitting the XAW-X5W flow between F10 and J1. Plans are being made to replace the IC column during the next shutdown.

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A PLANT WEEKLY REPORT
PUREX OPERATION

November 17 through November 23, 1958

1. Uranium to E6 Column	101.53 Tons
2. Maximum Operating Rate	27 T/D
3. Uranium Produced	137.19 Tons
4. Waste Losses	
Uranium	0.029 Percent
Plutonium	0.14 Percent

5. Operating Experience

Operations continued at CF 2.88 until the scheduled shutdown at 2330 on November 22, 1958. The extraction columns were stripped and made ready for start of the Palm recovery run at 2115 on November 23.

The uranium gamma activities continued to be high during the week as a result of low saturation in 1A column, plus the residual effects of green material added to the process last week. K-6 gamma ratios averaged about 6.0 for the week with one batch as high as 10.4.

A batch of IWW, which was isolated with high Palm content, was routed to the prototype IWW ion exchanger on a test basis. The resin bed plugged almost immediately. The resin was removed for laboratory testing.

Iodine emission during the week totaled 31.3 curies.

6. Equipment Experience

A drop-out rate check on the F-5 nitric fractionator column during the shutdown revealed a leak near the bottom amounting to about 17 gal/hr.

Routine checks of the fire sensing elements in the cells revealed that three were defective. Repairs were completed successfully.

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**A PLANT WEEKLY REPORT
PUREX OPERATION**

November 24 through November 30, 1958

1. Uranium to E6 Column	0
2. Maximum Operating Rate	0 T/D
3. Uranium Produced	9.67 Tons
4. Waste Losses	

Uranium

*

Plutonium

*

* No production this week on which to base a waste loss percent.

5. Operating Experience

The Palm recovery run continued through the week with completion due on December 1. Approximately 100 units of Palm were lost when the acidity got too low in the 2AF. This will be reintroduced to the process for possible recovery at some later date. It is estimated that the Palm run should result in the recovery of approximately 100 to 150 units.

Iodine emission for the 7-day period amounted to 3.1 curies. During most of the period the dissolvers were not in operation due to the shutdown of the primary process.

6. Equipment Experience

A flange leak in the recirculation loop of the F-5 absorber and one in the tube bundle condensate line were repaired after decontamination of this unit. One badly corroded dunnage leg was replaced (approximately lower 4'). The overflow nozzle was replaced due to its face being badly grooved. The jumper head for this nozzle had its gasket very badly eaten away.

Replacement of the J-4 pulser is underway. This unit at the end of the Palm run drew high amperage and kicked out.

Fairly widespread corrosion of black iron metal in the H and J cells has been encountered. In H cell this could be the result of running H-4 at too low a vacuum.

Replacement of the sight glass section of the XC column in H Cell was accomplished.

A drive wheel and one idler wheel were replaced on the remote crane. The shaft on the drive wheel was broken and a bearing on the idler wheel appeared to be defective.

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of 2 copies. Series A.

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A PLANT WEEKLY REPORT
PUREX OPERATION
December 1 through December 7, 1958

Uranium to E6 Column	125.3 Tons
Maximum Operating Rate	T/D
Uranium Produced	89.9 Tons
Waste Losses	
Uranium	Percent
Plutonium	Percent

Operating Experience

The Palm recovery run was completed on December 1 and loaded into cans. Three flushes of the L-cell package were also loaded out for Palm recovery.

Flushes of the G-1 organic tank and the F-11 waste acid concentrator were completed prior to startup.

Normal processing was resumed on December 2, 1958, at a 2.64 CF. Rates were raised to 2.88 CF on December 4, 1958. Final uranium gamma ratios climbed to about 5.0 during the week. Apparently this is due to the failure of the A column to achieve a satisfactory dF. The reason is not known. The final Pu product reached specifications following startup after several flushes and one batch was recycled.

Iodine emission was 2.1 curies for the week.

A box of cell jumpers was buried and successfully covered with dirt in spite of extremely high radiation levels.

Practice evacuations were held on all shifts during the period.

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A PLANT WEEKLY REPORT
PURKY OPERATION

December 8 through December 14, 1958

1. Uranium to E6 Column	167.33 Tons
2. Maximum Operating Rate	22.4 T/D
3. Uranium Produced	156.50 Tons
4. Waste Losses	
Uranium	0.071 Percent
Plutonium	0.21 Percent

5. Operating Experience

Processing continued at 2.88 CF during the week with excellent waste losses and palm retention. The plutonium product was within specifications all week. The gamma ratio on the uranium product dropped to 2.0 on 12-10-58 and has remained in specification during the rest of the period.

N Cell operation has been smooth except for an IAF pump failure for a few hours on 12-8-58.

A revised 2D flowsheet that increased the scrub section L/V resulted in smoother operation and reduction of palm loss in the 2DW stream. The IBA nitric molarity was reduced to improve partition.

Iodine emission during the week amounted to 2.5 curies.

6. Equipment Experience

The failed F-6 tube bundle, H-1 pump and D-5 agitator were shipped to 221-U plant for decontamination and repair.

The IAX jumper is being decontaminated prior to revision. The initial radiation level which was above 15 rad/hr. has been reduced about 75 percent.

Extensive decontamination and hood cleamp work was performed in N Cell and the FR cage.

**A PLANT WEEKLY REPORT
PUREX OPERATION**

December 15 through December 21, 1958

1. Uranium to E6 Column	154.62
2. Maximum Operating Rate	22.5 T/D
3. Uranium Produced	155.65 Tons
4. Waste Losses:	
Uranium	0.04 Percent
Plutonium	0.16 Percent

5. Operating Experience

Processing continued at 2.88 CF during the week. The uranium product gamma ratios have averaged about 2.0 or below with all product shipped directly to P-3 without need for silica-gel treatment. The gamma ratio dropped to a low of 1.4 on December 15 and rose to a high of 2.29 on December 19.

Poor heat transfer in the H-4 backcycle concentrator was a problem during part of the week. This problem straightened out after the J-1 nitric concentrator was cut, and the IAW and ISW streams were routed to F-10 Tank.

N Cell operation has been very good. The resin has become more difficult to push and consequently the push times have gradually lengthened. A resin sample showed evidence of radiation damage.

Retention of palm in the system has reached an all-time high. As noted in previous runs, losses from the system via the HAW waste and K-6 uranium tend to go up with total quantities held in the system. A recovery run is planned after the quarterly commitments are met.

Iodine emission during the week amounted to 2.08 curies.

6. Equipment Experience

The A-4 crib, which normally receives low level waste from the dissolver scrubbers and stack drain, became plugged during the period. A temporary routing of the 216-A-2 tank contents to the 241-101A tank is planned, pending completion of a cross-tie to the A-21 crib. A new crib will be constructed to replace the plugged A-4 crib.

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**A PLANT WEEKLY REPORT
PUREX OPERATIONS**

DATE 1-6-58 - 1-12-58

1. Uranium to E-6	288,340 lbs.	Tons	144.17
Pu to E-6	63,397 units	Kg's	63.40
2. Maximum Operating Rate		T/D	18
3. Uranium Produced - Tons			148.79
4. Waste Losses			
Uranium	420 lbs.	Percent	0.141
Plutonium	494 units	Percent	0.814

5. Operating Experience

Operations were continuous through out the week at a 2.16 CF. Waste losses were good and all product produced met shipping specifications.

The simulated high acid flow sheet test of the precipitate EA column proposed for two cycle operation was continued during the week. Decontamination efficiency of the column was further improved.

All of the waste solution produced and stored in F8 tank during December was successfully reworked and the plutonium recovered. Four tons of reworkPUREX solution generated at the UO₃ plant were reprocessed through the final uranium cycle equipment without difficulty.

The pressure drop across the "A" dissolver silver reactor increased during the week indicating a growing restriction in the vessel. Flushing operations to remove the restriction are scheduled in the coming week.

Radio iodine stack emissions during the week were well below the daily and weekly permissible limits.

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