Annual Operating Report 1976
Surry Power Station
Virginia Electric and Power Co.
Docket Nos. 50-280 and 50-281
License Nos. DPR-32 and DPR-37
Section 1A

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ANNUAL OPERATING REPORT

OF

SURRY POWER STATION

VIRGINIA ELECTRIC AND POWER COMPANY

FOR 1976

DOCKET NOS: 50-280 and 50-281

LICENSE NOS: DPR-32 and DPR-37

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SECTION 1

INTRODUCTION

Surry Power Station consists of two pressurized water reactors of 788 Maximum Dependable Capacity each, in MWe Net, owned by Virginia Electric and Power Company and located in Surry County, Virginia. Each unit incorporates a Westinghouse closed - cycle pressurized water nuclear steam supply system. The Architect/Engineer and Constructor was Stone and Webster Engineering Corporation.

The condenser cooling method is river water and the James River is the condenser cooling water source. Unit One is subject to License Number DPR-32 issued May 25, 1972 pursuant to Docket Number 50-280. Unit Two is subject to License Number DPR-37 issued January 29, 1973 pursuant to Docket Number 50-281. The date of initial reactor criticality of Unit One was at 0219, July 1, 1972 and commercial generation of power began at 1201, December 22, 1972. The date of initial reactor criticality of Unit Two was at 0613, March 7, 1973 and commercial generation of power begun at 1201, May 1, 1973.

Major personnel changes during the year included:

Name	Previous Position	New Position
E. M. Sweeney, Jr.	Manager-Surry Power Station	Coordinator-Nuclear Operations
T. L. Baucom	Superintendent-Station Operations, Surry Power Station	Manager-Surry Power Station
W. L. Stewart	Operating Supervisor	Superintendent-Station Operations
J. L. Wilson	Engineering Supervisor	Operating Supervisor

SUMMARY OF

OPERATING EXPERIENCE

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences that were experienced during this month that resulted in significant load reductions or non-load related incidents that may be of interest.

Unit No. 1

January 1 - This report begins with the unit at 100% power.

January 3 - At 0137 load was reduced to 75% power to perform PT-29.1 (Turbine Valve Freedom Test). The PT-29.1 was satisfactorily completed and the unit returned to 100% at 0240.

January 10 - At 0008 load was reduced to 75% power to perform PT-29.1 (Turbine Valve Freedom Test). At 0100 the PT-29.1 was satisfactorily completed and the unit returned to 100% at 0230.

January 18 - At 0127 load was reduced to 79% power to perform PT-29.1 (Turbine Valve Freedom Test). At 0140 the PT-29.1 was satisfactorily completed and the unit returned to 100% at 0255.

January 25 - At 0250 load was reduced to 75% power to perform PT-29.1 (Turbine Valve Freedom Test). The PT-29.1 was satisfactorily completed and the unit returned to 100% power at 0340.

January 31 - At 0045 load was reduced to 75% power to perform PT-29.1 (Turbine Valve Freedom Test). The PT-29.1 was satisfactorily completed and the unit returned to 100% power at 0245. This report period ends with the unit operating at 100% power.

Unit No. 2

January 1 - This report period begins with the unit at 80%. The reduced power resulting from having a condenser waterbox out of service for maintenance.

Unit No. 2 (continued)

January 2 - At 2340 the unit was returned to 100% with the maintenance on the condenser waterbox having been completed.

January 3 - At 2218 load was reduced to 75% power to perform PT-29.1 (Turbine Valve Freedom Test). At 2345 the PT-29.1 was satisfactorily completed and a load increase commenced.

January 4 - At 0150 the unit was returned to 100%. At 1100 load was reduced to 84% for repairs to a trash screen basket at the high level intake to the main condenser. At 1815 load was returned to 100% with the maintenance having been completed on the screen. At 2302 a rampdown was commenced to allow for maintenance on one of the half-sized main feed pumps.

January 5 - At 0140 load was stabilized at 50% and the feed pump removed from service. At 0515 load was returned to 100% with the maintenance having been completed on the feed pump.

January 7 - At 1720 a tube leak in "C" Steam Generator was confirmed and appropriate surveillance begun. Evaluation of leak data indicated continued plant operation was allowable.

January 14 - At 1320 Power Range Nuclear Indicator NI-43 failed resulting in a runback of the unit to 70% power. At 1520 the unit was returned to 100% and maintenance was completed on NI-43.

January 16 - At 2127 a rampdown was commenced to remove the unit from service. The primary-to-secondary leakage had reached the point where plant operation was no longer advisable.

January 17 - At 0045 the generator was taken off the line and at 0130 the reactor was manually shutdown. At 0545 a cooldown to cold shutdown conditions was commenced for maintenance in the steam generator.

Unit No. 2 (continued)

January 24 - The steam generator tube plugging completed and the plant having been heated and pressurized to normal operating conditions, the reactor was taken critical at 2215.

January 25 - At 0247 an automatic reactor trip occurred. The cause was a failure in the EHC Turbine Control System which resulted in a turbine trip and reactor trip. At 0935 the reactor was taken critical. The problem in the EHC System was corrected and at 1150 the turbine was synchronized to the system. A load ramp-up was commenced toward full load. At 1800 the unit was at 100% power. Another primary-to-secondary leak was suspected and appropriate surveillance begun. Evaluation of leak data indicated continued plant operation was allowable.

January 27 - At 0200 load was reduced to 85% to look for condenser tube leaks. At 1005 the load was returned to 100% with the maintenance having been completed in the waterboxes.

January 29 - At 0512 a 30% turbine runback occurred resulting from a dropped control rod. At 0615 load was reduced to 50% as required by T.S. - 3.12 regarding the reactor delta flux. At 0715 the control rod was returned to its proper position. However, power reduction to 50% was required for 24 hours as indicated in T.S. - 3.12.

January 30 - At 0620 a power increase toward full power was allowable. However, at 0857 with the load at 84% an indicated struck rod was observed. Load was reduced to 78% to investigate. At 0943 the problem was found to be only in Individual Rod Position Indication and a power increase was begun. At 1330 the load was increased to 98% power. This being the maximum power due to a Xenon oscillation in progress.

Unit No. 2 (continued)

January 31 - At 0705 the plant conditions allowed power to be increased to 100%. At 2326 a rampdown was commenced to perform PT-29.1 (Turbine Valve Freedom Test). At 2400 this report periods ends with the unit operating at 86% power reducing load to perform PT-29.1 and surveillance in progress to monitor the primary-to-secondary leakage in the "C" Steam Generator.

E. FUEL HANDLING

There were no new or spent fuel shipments during this month. However, sixteen (16) partially spent fuel assemblies were examined by binoculars. This examination is part of VEPCO's Nuclear Fuel Service Department Program and was conducted on fuel discharged during Unit 1's Cycle II refueling. Also, two BPRA inserts were relocated within the spent fuel pit as part of the forthcoming Unit 2 refueling loading pattern.

W. L. Stewart
Operating Supervisor

SHUTDOWNS, CURTAILMENT AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

February 1 - This report period begins with the unit at 100% power.

February 11 - At 2320 load was reduced to 82% to remove "A" condenser waterbox from service to look for tube leaks.

February 12 - At 0753 the waterbox having been returned to service, load was increased. The unit was returned to 100% at 0845.

February 13 - At 0000 load was reduced to 86% to remove condenser waterboxes from service to look for tube leaks. At 0500 the waterboxes having been returned to service, load was increased. The unit was returned to 100% at 0555. Again, at 2240 load was reduced to 84% to take a condenser waterbox out of service to look for tube leaks. At 2335 the waterbox having been returned to service, load was increased.

February 14 - At 0100 the load increase was stopped at 93% because there were indications a condenser tube leak was still present. At 0130 load was reduced to 86% to remove the waterbox from service. At 0330 the waterbox was returned to service and a load increase begun. At 0408 the unit was returned to 100%.

February 19 - At 1437 load was reduced to 84% to remove condenser waterboxes from service to look for tube leaks. At 2101 the waterboxes having been returned to service, load was increased. The unit was returned to 100% at 2156.

February 22 - At 1145 load was reduced to 88% to remove the condenser waterboxes from service to look for tube leaks.

February 23 - At 0035 the waterboxes having been returned to service, load was increased. The unit was returned to 100% at 0155.

February 28 - At 1440 a 50 MWe load reduction was necessitated due to fluctuations in #2 Governor Valve. At 1505 the unit was returned to 100% power. At 1815 load was reduced to 80% to maintain station ΔT less than $15^{o}F$. This reduction was necessary due to a low level intake screen malfunction. At 2223 load was raised to 86% which was commensurate with station ΔT limitations.

February 29 - This report period ends with the unit at 86% power.

UNIT NO. 2

February 1 - This report period begins with the unit at 100% power. At 0015 load was reduced to 74% to perform PT-29.1 (Turbine Valve Freedom Test). At 0050 the test was completed and at 0150 the unit was returned to 100%. At 2135 indications of a primary to secondary leak in "C" steam generator were received. Surveillance of steam generator primary to secondary leakage was commenced.

February 3 - At 1012 a normal unit shutdown was commenced to perform maintenance on "C" steam generator. At 1303 the generator output breakers were opened. At 1305 a reactor trip from turbine trip occurred. The trip resulted from a turbine trip during the turbine overspeed test. A plant cooldown to cold shutdown condition was commenced. For detail information about repair work, refer to appropriate section of this report.

February 7 - With the maintenance having been completed a plant recovery was begun this day.

February 9 - At 0215 the plant was returned to a hot shutdown condition. At 0330 the required primary overpressure test was satisfactorily completed. At 1200 it was found that "A" main steam trip valve would not operate. Therefore, a plant cooldown to cold shutdown condition was commenced to allow for maintenance on the valve.

February 11 - The maintenance having been completed, a plant recovery was commenced to 0730. At 1940 the plant having been returned to hot shutdown conditions, the reactor was taken critical. At 2140 the generator was synchronized to the system and a load increase was begun. At 2400 the unit was at 54% power.

February 12 - At 0335 the unit was returned to 100% power.

February 14 - At 1840 a cross-under safety valve lifted and load was reduced to 94% to stabilize the plant. With plant conditions normal load was increased to 100% at 1923.

February 15 - At 0150 load was reduced to 74% to perform PT-29.1 (Turbine Valve Freedom Test). At 0330 the test was satisfactorily completed and load returned to 100%. At 1728, a low level intake screen malfunction resulted in exceeding the station ΔT limit. A power reduction to 97% returned the ΔT to $<15^{o}F$. At 1812 the intake screen was returned to service and the load returned to 100%.

February 19 - At 2315 load was reduced to 74% to perform PT-29.1 (Turbine Valve Freedom Test). At 0110 load was increased to 86% following satisfactory completion of the test. At 0614 all waterboxes were in service and the unit was returned to 100%.

February 22 - At 0120 load was reduced to 74% to perform PT-29.1 (Turbine Valve Freedom Test). At 0321 the test was satisfactorily completed and the unit returned to 100%.

February 23 - At 1950 the "B" High Pressure Drain Pump motor tripped, load was reduced to 93% to stabilize the plant. At 2010 load was returned to 100% with the high pressure drain pump out of service.

February 25 - At 0925 the "B" High Pressure Drain Pump was returned to service.

February 28 - At 0716 load was reduced to 80% due to failure of the 2D Circulating Water Screen at the low level intake. At 0942 load was reduced to 77% to maintain station $\Delta T < 15^{o}F$ and again at 1220 load was reduced to 68% for the same reason. At 1340 a slow load increase was started as allowed by station ΔT. At 1915 the unit was returned to 100%.

February 29 - This report period ends with the unit at 100% power.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

March 1 - This report period begins with the unit at 86% power due to an intake screen malfunction. At 0000 a further load reduction to 82% was required to control station ΔT.

March 2 - At 0230 the unit was returned to 100% power following the completion of maintenance on the intake screen. At 1300, indications of a primary to secondary leak in "C" Steam Generator were received. Surveillance of steam generator primary to secondary leakage was commenced.

March 4 - At 2103 load was reduced to 80% to remove a condenser waterbox from service to look for tube leaks.

March 5 - At 0210 the unit was returned to 100% with waterbox maintenance having been completed.

March 10 - At 1927 a reactor trip and initiation of safety injection occurred. The signal that initiated the trip and safety injection was from a high differential pressure between the steam line and steam header. The cause was a bad fuse holder and fuse clip in the pressure reference circuitry.

March 11 - At 0450 the reactor was taken critical and at 1330 the generator synchronized to the system and a load increase commenced. At 1800 the unit reached 100% power. At 2130 a normal unit shutdown was commenced to perform maintenance on "A" Steam Generator.

March 12 - At 0108 the generator output breakers were opened. At 0139 the reactor was manually shutdown. A plant cooldown to cold shutdown condition was commenced. For detail information concerning repair work, refer to appropriate section of this report.

UNIT NO. 1 (continued)

March 15 - With the maintenance having been completed a plant recovery commenced during the day.

March 18 - At 0840 the plant was returned to a hot shutdown condition. At 1000 the primary overpressure test was satisfactorily completed. At 1237 the reactor was taken critical and at 1333 the generator was synchronized to the system. At 1348 a turbine trip and resultant reactor trip occurred due to a high level in "B" Steam Generator. At 1413 the reactor was again taken critical and at 1530 the generator was synchronized to the system. At 1942 load was reduced from 76% to 63% to allow for removal of one of the half-sized main feed pumps from service due to a bearing failure.

March 19 - At 1607 the "A" Main Feed Pump was returned to service and a load increase commenced. At 1745 the unit was returned to 100% power.

March 22 - At 0130 load was reduced to 95% to control station ΔT. At 0215 a power increase commenced. At 0800 the unit was returned to 100%.

March 24 - At 1753 load was reduced to 96% to control station ΔT. At 1935 the unit was returned to 100%.

March 25 - At 0100 load was reduced to 99% to control station ΔT. At 0130 the unit was returned to 100%. At 1230 load was again reduced to 98% to control station ΔT with a subsequent return to 100% at 1305.

March 26 - At 1615 a load reduction was commenced, the boron injection tank recirc. path had to be taken out of service to allow for maintenance on a valve in the recirculation line. At 1628 repairs were completed and the tank recirculation restored. At 1637 the unit was returned to 100%.

March 27 - At 2328 a rampdown was started to perform PT-29.1 (Turbine Valve Freedom Test).

March 28 - At 0053 load was reduced to 74%, the PT-29.1 was satisfactorily completed and the unit returned to 100% at 0425.

UNIT NO. 1 (continued)

March 29 - At 2055 a normal unit shutdown was commenced to perform maintenance on "C" Steam Generator.

March 30 - At 0055 the generator output breakers were opened and at 0115 the reactor was manually shutdown. A plant cooldown to cold shutdown condition was commenced. For detail information concerning repair work, refer to appropriate section of this report.

March 31 - This report period ends with the unit in a cold shutdown condition with tube plugging operations in progress and other plant maintenance being performed in both the primary and secondary systems.

UNIT NO. 2

March 1 - This report period begins with the unit at 100% power.

March 3 - At 1630 load was reduced to 97% to reseat a cross-under safety valve which was leaking. At 1652 the valve reseated and load was increased to 100%.

March 4 - At 0056 a normal unit shutdown was commenced to perform maintenance on "C" Steam Generator for a primary to secondary leak. At 0636 the generator output breakers were opened and at 0702 the reactor was manually shutdown. A plant cooldown to cold shutdown condition was commenced. For detail information concerning repair work, refer to appropriate section of this report.

March 8 - With maintenance having been completed a plant recovery commenced this day.

March 9 - At 1445 the primary overpressure test was satisfactorily completed. At 1935 the reactor was taken critical and at 2030 the generator was synchronized to the system. A load increase was begun.

March 10 - At 0410 a reactor and turbine trip occurred from 90% power. The trip resulted from a spike in loop flow instrumentation in "C" Reactor Coolant Loop although full core flow existed. The flow channels were re-

calibrated and at 0647 the reactor was taken critical. At 0754 the generator was synchronized to the system. A load increase was begun. At 1139 load was held at 80% power to allow for removal of a condenser waterbox to investigate for tube leaks. At 1403 the waterbox was returned to service and load increased to 100%. The unit reached 100% at 1430. At 2150 load was reduced to 86% to remove a waterbox to investigate for tube leaks.

March 11 - At 0200 the waterbox was returned to service and at 0245 the unit was returned to 100% power. Again, at 1344 load was reduced to 89% to remove a waterbox to investigate for tube leaks. At 1812 the unit was returned to 100% following the return of the waterbox to service. At 1743 load was reduced to 98% at Westinghouse's recommendation until a accident analysis was completed considering the maximum number of steam generator tubes that could be plugged.

March 13 - At 1644 the unit was returned to 100%. The accident analysis indicated the return to maximum load was allowable.

March 14 - At 0058 load was reduced to 75% to perform PT-29.1 (Turbine Valve Freedom Test). 0145 the PT having been satisfactorily completed the unit was returned to 100% at 0310.

March 18 - At 2135 load was reduced to 93% to remove the "B" High Pressure Drain Pump from service for maintenance.

March 19 - At 1645 the unit was returned to 100% following the return to service of the "B" High Pressure Drain Pump.

March 22 - At 0017 load was reduced to 95% to control station ΔT. At 0150 conditions allowed for the return to 100% power.

March 26 - A fire drill with simulated injuries was conducted this day.

UNIT NO. 2 (continued)

March 27 - At 1035 load was reduced to 93% to allow for removing 3B Feedwater Heater due to a tube leak. At 1245 the reactor was returned to 100% which now is 780 MWe with this reduced feedwater heating. At 1545 load was reduced to 98% due to problems with feedwater heater levels.

March 31 - This report period ends with the unit at 98% power due to a tube leak in 3B Feedwater Heater.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents:

UNIT NO. 1

April 1 - This report period begins with the unit in a cold shutdown condition with tube plugging operations in progress and other plant maintenance being performed in both the primary and secondary plants.

April 3 - With the maintenance having been completed, the reactor was taken critical at 1711. At 2015 the generator was synchronized to the system. At 2034 an automatic reactor and turbine trip was received from a low steam generator level during manual feedwater control. At 2105 the reactor was taken critical and at 2346 the generator was again synchronized to the system and a power increase begun.

April 4 - At 0505 the unit was returned to 100% power.

April 5 - At 2105 the unit was reduced to 97% to control station ΔT.

April 6 - At 0030 load was returned to 100% power. At 1522 load was again reduced to 97% to control station ΔT. At 1555 load was returned to 100%. At 2250 load was reduced to 99% to control station ΔT.

April 7 - At 0220 load was returned to 100%. At 0955 an emergency plan drill was held. At 1553 load was reduced to 97% to control station ΔT.

April 8 - At 0215 load was returned to 100% power.

April 11 - At 0132 load was reduced to 74% to perform PT-29.1 (Turbine Valve Freedom Test). Mechanical problems prevented satisfactory completion of the test. At 0220 the unit was returned to 100%.

April 12 - At 0720 load was reduced to 95% to control station ΔT. At 1042 the unit was returned to 100%.

April 13 - At 0330 load was reduced to 97% to control station ΔT. At 0430 load was further reduced to 94% in order to control station ΔT. At 0947 the unit was returned to 100% power.

April 14 - At 0330 load was reduced to 95% to control station ΔT. At 0708 the unit was returned to 100% power. Again, at 0825 load was reduced to 97% to control station ΔT. At 1028 the unit was returned to 100%. At 1747 load was reduced to 98% to control station ΔT.

April 15 - At 0230 load was returned to 100% power. At 0917 load was reduced to 98% to control station ΔT. At 1205 load was returned to 100% power. At 1800 load was reduced to 99% to control station ΔT.

April 16 - At 0230 load was returned to 100%.

April 24 - At 0145 load was reduced to 75% power to perform PT-29.1 (Turbine Valve Freedom Test). At 0212 the PT was satisfactorily completed and load increase begun. At 0330 the unit was returned to 100%.

April 27 - At 0840 a load reduction was begun to remove unit from the system. A primary to secondary S/G tube leak in "B" Steam Generator was the cause of the forced outage. At 1531 the generator was taken off the line. At 1542 the reactor was manually shutdown. A plant cooldown to cold shutdown condition was commenced. For detail information about repair work, refer to appropriate section of this report.

April 30 - This report period ends with the unit in a cold shutdown condition, with tube plugging operations in progress and other plant maintenance being performed in both the primary and secondary plants.

UNIT NO. 2

April 1 - This report period begins with the unit at 98% due to leak in 3B Feedwater Heater.

April 3 - At 1712 load was reduced to 85% to allow cycling of MOV-2585 (Loop Bypass) in an attempt to locate excessive primary leakage into the Primary Drain Transfer System. The MOV-2585 was not the source of leakage

however. Contained leakage from 2-RC-24 was the source. The valve was backseated and load returned to 98% at 2245.

April 19 - At 2150 load was reduced to 35% power due to gas binding of the bearing cooling system from a leak in a generator hydrogen cooler.

April 20 - At 0105 load increased to 50% as conditions permitted, at 0800 load was increased to 70% and at 1721 load was increased to 80% the maximum allowed with one H_2 cooler isolated.

April 21 - At 2110 a load reduction was commenced to remove the unit from service for refueling.

April 22 - At 0040 the unit was removed from the system and at 0128 the reactor was shutdown. A plant cooldown was commenced to place the unit in a refueling shutdown.

April 25 - At 0905 PT-16.3 (Containment Pressure Test) was commenced.

April 27 - At 2040 commenced depressurizing #2 containment.

April 28 - At 1230 the containment was at atmospheric conditions. Commenced primary maintenance. For detail information refer to other sections of this report.

April 30 - This report period ends with the unit in a refueling condition. RCS drained with the loops isolated and the part length control rods unlatched.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

May 1 - This report period begins with the unit at a cold shutdown condition with "B" Steam Generator tube plugging operations in progress and other plant maintenance being performed in both the primary and secondary plants. At 0145 maintenance and tube plugging was completed and plant recovery commenced.

May 2 - The reactor was taken critical at 1900 and the generator was loaded at 2140.

May 3 - At 0250 a rampdown was commenced because "A" Steam Generator chemistry was continuing with out of spec. pH. At 0446 the generator was taken off the line. The reactor was manually shutdown at 0613 and a cooldown commenced.

May 4 - At 1410 "A" Steam Generator was drained and refilled and plant recovery commenced.

May 5 - At 1135 the reactor was taken critical and the generator was synchronized to the system at 1513. Power level was restricted to 60% due to a failed seal on "B" Main Feed Pump.

May 6 - At 0555 "B" Main Feed Pump was returned to service and a load increase was started. Load was held at 85% while investigating "D" waterbox for tube leaks. At 1705 the unit was at 100% power. At 2215 load was reduced to 86% to remove "B" waterbox from service to look for tube leaks.

May 7 - At 0530 load was returned to 100% power.

May 9 - At 0010 load was reduced to 75% to perform PT-29.1 (Turbine Valve Freedom Test). PT-29.1 was satisfactorily completed and the unit returned to 100% at 0300.

May 10 - At 1730 load was reduced to 86% to remove waterboxes and investigate for tube leaks.

May 11 - The unit was returned to 100% power at 0525 following the return of the waterboxes to service.

May 12 - At 1250 began reducing load to 95% to investigate waterboxes for tube leaks.

May 13 - Further reduced load to 87% at 0052 to continue investigation of waterboxes for tube leaks. At 1015 load was returned to 100%, the waterboxes having been returned to service. At 2207 load was reduced to 92% to again remove waterboxes from service to test for tube leaks.

May 14 - At 0407 the waterboxes were returned to service and at 0440 the unit was at 100% power. At 0957 the load was reduced to 92% to again remove waterboxes from service for tube leak investigation.

May 15 - At 0545 load was returned to 100% upon completion of tube plugging in "B" and "D" waterboxes.

May 19 - At 1319 generator load was reduced to 790 MWe at 100% reactor power because of the loss of "B" Low Pressure Heater Drain Pump. At 1353 the pump was restarted and load returned to 800 MWe. At 2025 commenced reducing load to 780 MWe due to the loss of "B" Low Pressure Heater Drain Pump. The load was returned to 100% at 2040 after restarting the pump.

May 21 - At 1324 load was reduced to 790 MWe due to the loss of "B" Low Pressure Heater Drain Pump. At 1500 returned the load to 100% (805 MWe) after restarting the pump.

May 22 - At 2315 commenced reducing load to 75% for PT-29.1 (Turbine Valve Freedom Test).

May 23 - Returned load to 100% power at 0235 having completed PT-29.1.

May 31 - This report period ends with the unit at 100% power.

UNIT NO. 2

May 1 - This report period begins with the unit in a refueling condition. The reactor coolant system is drained with the loops isolated and the part length control rods unlatched.

May 2 - At 1440 the reactor vessel head was lifted and at 2332 unlatching of the full length CRDM's was completed.

May 4 - The upper core internals were removed and at 1700 fuel movement was begun.

May 10 - At 0930 core loading was completed.

May 11 - At 1211 latching of full length CRDM's was completed.

May 12 - At 1332 latching of part length rods was completed.

May 13 - At 1311 reactor standpipe level was increased to approximately 20 feet and overflow from the reactor head vent and the head flange filled some stud holes and entered the cavity.

May 14 - At 1845 completed tensioning reactor head studs after recleaning the stud holes and reactor flange area.

May 21 - At 1300 RCS boron concentration was found to be 1836 ppm during sampling. This constituted an unplanned dilution from 2395 ppm due to a leak from "A" steam generator. Tubes were inadvertently cut while removing a 7th tube support plate section for Westinghouse evaluation.

May 25 - At 1400 completed filling and venting the RCS and commenced unit recovery.

May 26 - At 0155 satisfactorily completed cold rod drop tests.

May 31 - At 0122 the unit was at hot shutdown and at 0409 the RCS Overpressure test was completed. At 1255 PT-7 (Hot Rod Drop Test) was completed. This report period ends with the unit at hot shutdown preparing for low power physics testing.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

June 1 - This report period begins with the unit at 100% power. At 2040 load was reduced to 99% due to a failure of the normal level control valve on the 1B Feedwater Heater.

June 2 - At 0430, by controlling the heater level manually, the unit was returned to 100%.

June 6 - At 1400 load was reduced to 96% because of further level control problems with the 1B Feedwater Heater. At 2027 the unit was returned to 100%. The 1B Feedwater Heater Level being controlled on the high level divert.

June 19 - At 2018 load was reduced to 74% to perform PT-29.1 (Turbine Valve Freedom Test). At 2350, with the satisfactory completion of the PT, a load increase was begun. At 2400 the load was 82%.

June 20 - At 0100 the unit was returned to 100% power.

June 23 - At 1837 load was reduced to 74% due to high groin temperature. At 1945 the conditions allowed for a return to 100% power. At 2205 the unit was returned to 100%.

June 24 - At 1830 load was reduced to 82% due to high groin temperature. At 1843 conditions allowed a return to 100% which was accomplished at 2130.

June 30 - This report period ends with the unit at 100%.

UNIT NO. 2

June 1 - This report period begins with the unit at hot shutdown preparing for Low Power Physics Testing following a refueling shutdown. At 0410 the reactor was taken critical. At 0720 Low Power Physics Testing was begun.

UNIT NO. 2 (continued)

At 1312 the reactor tripped from an automatic signal actuated from a low steam generator level coincident with a steam flow-feedwater flow mismatch. The reactor was returned critical at 1342.

June 2 - At 1322 the turbine was latched for a normal start-up, however, at 1350 a failure of the #4 bearing required the turbine to be shutdown for maintenance.

June 3 - At 1900 the reactor was manually shutdown awaiting repairs on the turbine bearing.

June 9 - At 1212 the reactor was taken critical with the maintenance on the turbine bearing having been completed. At 2109 the turbine generator was synchronized to the system. At 2115 the reactor and turbine tripped from a steam generator Lo-Lo Level during manual feedwater control. At 2155 the reactor was again taken critical and at 2337 the generator was synchronized to the system. However, at 2345 another reactor and turbine trip was received from a Lo steam generator level coincident with a steam flow - feedwater flow mismatch during manual feedwater control.

June 10 - At 0025 the reactor was taken critical and at 0135 the turbine was synchronized to the system and load increased. At 1440 load was being held at 60% awaiting completion of maintenance on one of the half-sized main feed pumps.

June 11 - At 0140, with maintenance completed on the main feed pump , load was increased toward 100%. At 0730 the unit was at 75% power and holding for physics testing. At 1115 load was reduced to work on the main feed pump. At 1250 the unit was at 54%. At 1515 the feed pump was returned to service and a load increase begun. At 2400 load was 81% power.

June 12 - At 0358 load was reduced to 60% to again perform maintenance on the "B" Main Feed Pump. At 0609 the main feed pump was returned to service and load increased to 100%. At 1900 the unit was at full load. Physics testing completed.

June 13 - At 0730 load was reduced to 86% to remove waterboxes to investigate for tube leaks. At 2345 the unit was returned to 100% with the maintenance having been completed on the condenser waterboxes.

June 14 - At 1100 load was reduced to 86% to remove waterboxes to investigate for tube leaks. At 2105 the unit was returned to 100% with the maintenance having been completed on the condenser waterboxes.

June 19 - At 0102 the load was reduced to 75% to perform PT-29.1 (Turbine Valve Freedom Test). At 0427 the reactor was returned to 100% with the satisfactory completion of the PT.

June 25 - At 0140 load was reduced to 90% to perform steam generator carry-over testing. At 0350 the unit was returned to 100% power. At 2143 load was reduced to 88% to clean condenser waterboxes.

June 26 - At 0345 the work was completed on the condenser waterboxes. However, when a load increase was begun the #4 Governor Valve on the turbine began to cycle. Load was held at 90% to correct the valve problem. Load was increased to 96% which was deemed the maximum permitted with this valve problem. At 1530 an inadvertent boration of the reactor coolant system occurred and load was reduced to 87% to stabilize the reactor coolant temperature. At 1647 load was retuned to 96%. At 1910 load was reduced to 86% to allow maintenance on #4 Governor Valve. At 1931 the repair of the controller for the #4 Governor Valve was completed and a load increase begun. At 2008 the unit reached 100%.

June 30 - This report period ends with the unit at 100% power.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

July 1 - This report period beings with the unit at 100% power.

July 7 - At 1420 load was reduced to 95% power to remove a waterbox to plug condenser tube leaks. At 1655 load was further reduced to 90% to further cool the waterbox for maintenance. At 1840 load was reduced to 83% power to further cool the waterbox. At 2010 the waterbox was returned to service and at 2055 load was returned to 100% power.

July 14 - At 2205 an orderly shutdown was commenced on the unit due to increased primary to secondary leakage in A,B & C steam generators. At 2400 load was 55% power.

July 15 - At 0022 an automatic reactor trip was received from Lo-Lo S/G Level while on manual feed control. At 0330 a unit cooldown to Cold Shutdown was commenced to allow maintenance on the S/G tube leaks.

July 20 - At 0135 the maintenance having been completed, the RCS was filled and venting operations begun.

July 21 - The system was brought to a Hot Shutdown Condition and at 0725 a successful overpressure test was conducted on the RCS. During the walkdown of the containment a leak was found on the RHR isolation, MOV-1700. This required returning the plant to the Intermediate Shutdown condition to allow for maintenance.

July 22 - With the maintenance having been completed, the unit was returned to a Hot Shutdown Condition. At 0650 the reactor was taken critical and at 0955 the turbine generator was synchronized to the system and power increase begun. At 2400 load was 97% power.

July 23 - At 0122 load reached 100% power. At 1400 a load reduction was begun toward 50% due to delta flux being out of the target band. At 1715 the reactor power reached 50% power.

July 24 - At 1804 a ramp-up toward 100% power was begun. At 2103 power was held at 92% for delta flux control.

July 25 - The unit reached 100% at 1115.

July 26 - At 0915 a reactor trip occurred during reactor protection logic testing with the reactor trip by-pass breaker not fully racked in. At 1005 the reactor was taken critical and at 1039 the unit was synchronized to the system. At 1450 the unit was at 100% power.

July 31 - This report period ends with the unit at 100% power.

UNIT NO. 2

July 1 - This report period begins with the unit at 100% power.

July 2 - At 2254 load was reduced to 89% power to remove condenser waterboxes from service to look for tube leaks.

July 3 - At 0515 load was returned to 100% following completion of maintenance on the condenser waterboxes.

July 9 - At 2237 load was reduced to 88% power to clean waterboxes.

UNIT NO. 2

July 10 - At 0400 load was returned to 100% following waterbox cleaning.

July 30 - At 0023 load was reduced to 90% to perform PT-29.1 (Turbine Valve Freedom Test). However, due to an indicated increased primary leakage, load was returned to 100% at 0125 to perform a more accurate leak rate measurement. At 0315 a load reduction was begun due to the excessive primary leak rate. At 0843 the turbine generator output breaker was opened and at 0912 the reactor was manually shutdown. The unit was cooled down to an Intermediate Shutdown Condition to allow maintenance to be performed.

July 31 - This report period ends with the unit in an Intermediate Shutdown condition awaiting repairs to RV-2203 (Low Pressure Letdown Relief).

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

August 1 - This report period begins with unit operating at 100% power.

August 3 - At 2353 load was reduced to 80% to allow removal of one waterbox to repair condenser tube leaks.

August 4 - At 0200 the waterbox was returned to service and load increased toward 100%. The unit was returned to 100% at 0323. At 2320 load was again reduced to 82% to remove a condenser waterbox from service for repair of tube leaks.

August 5 - At 0030 load was further reduced to 80% to work in waterbox. At 0040 the waterbox was returned to service and load increased toward 100%. The unit was returned to 100% at 0215.

August 13 - At 1800 a rampdown was begun due to increased primary to secondary leakage in the steam generators. At 2244 the output circuit breakers were opened and at 2248 the reactor was manually shutdown. A cooldown was begun toward cold shutdown.

August 18 - At 0250 the maintenance having been completed, the Reactor Coolant System was filled and venting operation begun.

August 19 - The system was brought to a Hot Shutdown Condition and at 0140 a successful overpressure test was conducted on the Reactor Coolant System. At 1320 the reactor was taken critical and at 1440 the turbine generator was synchronized to the system. However, at 1445 a turbine trip occurred due

August 19 (continued)

to a Hi Level in "B" Steam Generator. During the re-latching of the turbine a first stage impulse pressure spike resulted in a reactor trip at 1452. At 1515 the reactor was again taken critical and at 1550 the generator was synchronized to the system and a power increase begun. At 2400 the load was held at 38% power to allow steam generator activity to decrease with blowdown.

August 20 - At 1927 load was increased to 50%. At 2237 load was increased to 75% and at 2400 load was at 80% awaiting decreased activity in the steam generator.

August 21 - At 0400 conditions allowed the return to 100% operation.

August 22 - At 0820 load was reduced to 55% due to loss of vacuum in the turbine. The rupture discs on the low pressure turbine were found to be leaking. At 1905 a unit shutdown to hot standby was begun to allow maintenance on the turbine rupture discs. At 2112 the turbine generator output breakers were opened and the reactor maintained critical.

August 23 - At 0238 the generator was synchronzied to the system. However, at 0252 a reactor trip occurred from Lo Steam Generator Level in coincidence with steam flow/feed flow mismatch during startup. The level was restored and at 0327 the reactor taken critical and the generator synchronized to the system at 0426. However, again at 0446 another Lo Steam Generator in coincidence with steam flow/feed flow mismatch reactor trip occurred during startup feedwater control. The level was again restored and the reactor taken critical at 0520.

UNIT NO. 1

August 23 (continued)

The generator was synchronized to the system at 0606 and a power increase begun. At 0955 a reactor trip occurred when the static breaker failure relay failed on the GIT-240 breaker. This resulted in tripping the G-102 and GIT-240 breakers producing a reactor trip. At 1030 the reactor was taken critical and at 1125 the generator was synchronized to the system and load increased. At 1717 the unit was returned to 100%.

August 30 - At 2056 power was reduced to 60% to allow for maintenance on half-sized main feed pumps.

August 31 - At 0210 maintenance was completed on the main feed pumps and a load increase begun. The unit was returned to 100% at 0533. This report period ends with the unit at 100% power.

UNIT NO. 2

August 1 - This report period begins with the unit in an Intermediate Shutdown Condition awaiting repairs to the RV-2203 (Low Pressure Letdown Relief).

August 2 - At 1530 maintenance was completed on the RV-2203 and unit recovery begun.

August 3 - At 0408 the reactor was taken critical and at 0535 the generator was synchronized to the system and a load increase begun. At 0910 load was held at 75% due to a sheared shear pin in the "D" Hi-Level Travelling Screen requiring the "D" waterbox outlet valve to be closed. At 1008 the screen was returned to normal and a load increase begun. The unit was 100% at 1125. At 2005 load was reduced to 90% to control

UNIT NO. 2

August 3 (continued)

waterbox delta-T's during repairs to the travelling screen. At 2150 the unit was returned to 100%.

August 14 - At 2305 load was reduced to 67% power to perform PT-29.1 (Turbine Valve Freedom Test) and remove waterboxes from service for repair of tube leaks.

August 15 - At 0030 load was further reduced to 63% to allow work in the waterbox. At 0130 the PT-29.1 (Turbine Valve Freedom Test) was satisfactorily completed. At 1015 a load increase was possible to 79% power while continuing maintenance on waterboxes. At 1455 maintenance was completed and load increased. At 1618 the unit was returned to 100%.

August 22 - At 0115 the #2 Governor Valve cycled to 20% open, this resulted in 16% load reduction. The unit was stabilized and at 0122 load was returned to 100%.

August 23 - At 1435 commenced load reduction at 150MWe/hr. to repair 1-CH-125. The repair required stopping recirculation through the boron injection tank. At 1510 the repairs were complete, flow verified through the boron injection tank, and load increased to 100% at 1540.

August 24 - At 1427 load was reduced on the unit due to two (2) screen failures at the river. At 1615 the load was 72% and holding to maintain waterbox delta-T in specifications. At 1745 load could be raised to 83%. At 2400 load was at 90%.

August 25 - At 0643 the unit was returned to 100% following repair to one of the broken screens and being able to control waterbox and station delta-T's in specifications.

UNIT NO. 2 (continued)

August 29 - At 0522 a spike in the EHC System caused the #2 Governor Valve to again close to 20% open, resulting in a 4% loss in load. The unit was stabilized at 0550 returned to 100% power.

August 31 - At 2216 power was reduced to allow for taking out a condenser water box to look for tube leaks. At 2257 load was at 76% power. This report period ends with the unit at 76% power with the waterbox out of service.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

Sept. 1 - This report period begins with the unit operating at 100% power.

Sept. 5 - At 0145 load was reduced to 80% power to perform PT-29.1 (Turbine Valve Freedom Test). At 0200 PT-29.1 was completed and at 0345 the unit was returned to 100%.

Sept. 7 - At 1120 load was reduced to 86% to allow removal of a condenser waterbox to look for tube leaks. At 1355 the waterbox was returned to service and a load increase begun. At 1445 the unit was returned to 100% power.

Sept. 9 - At 0830 a ramp down was commenced due to the "C" SI Accumulator pressure being below specification. This was the result of a nitrogen gas leak in the containment on the accumulator pressurization line. At 0903 the pressure was returned to the specified valve and a load increase begun. At 0920 the unit was returned to 100% power.

Sept. 16 - At 1348 a ramp down was commenced due to a plugged line in the Boric Acid System that required securing the recirculation of the BIT. At 1353 recirculation of the BIT was restored. A load increase was begun and at 1357 the unit was returned to 100% power. At 1625 the normal level control valve (LCV-SD-103A) failed on the first point feedwater heater. The reactor remained at 100%, however, turbine output was reduced by about 15 MWe/Hr.

UNIT NO. 1 (CONTINUED)

Sept. 17 - At 0926 a ramp down was commenced when BIT recirculation was again secured while returning a portion of the Boric Acid System to service after repairs. At 0929 the BIT recirculation was restored and a load increase begun. At 0923 the unit was returned to 100%. At 1530 the LCV-SD-103A was repaired and returned to service. The turbine generator output was increased 15MWe/Hr. At 2246 the load was reduced to 87% power to allow removal of a condenser waterbox to look for tube leaks.

Sept. 18 - At 0143 the waterbox was returned to service and a load increase was begun. At 0400 the unit was returned to 100% power. At 1642 the routine F_Q survey results were unsatisfactory due to a faulty computer component. Therefore load was reduced to "P" threshold power of 96% at 1750. At 2345 after repair of the computer a power increase was possible and at 2400 the unit was at 98% power with F_Q surveillance in operation.

Sept. 19 - At 0045 the unit returned to 100% and the F_Q survey was satisfactory.

Sept. 24 - At 1045 a unit ramp down was commenced due to increased primary to secondary leakage in the steam generators. At 1520 an automatic reactor trip and generator trip occurred due to feedwater control system sensitivity while in manual feed control during the shutdown. A cooldown was commenced to a cold shutdown condition to allow for maintenance.

Sept. 29 - The maintenance was completed on the primary and a recovery was begun to fill and vent the primary system.

UNIT NO. 1 (CONTINUED)

Sept. 30 - At 1530 with the unit in hot shutdown condition, a satisfactory overpressure test was conducted. At 2230 the reactor was taken critical. This report period ends with the reactor critical and a turbine start-up in progress.

UNIT NO. 2

Sept. 1 - This report period begins with the unit at 76% with a condenser waterbox out of service to look for tube leaks. At 0035 load was reduced to 68% to limit ΔT across the unaffected waterboxes. At 0515 the waterbox was returned to service and a power increase begun. At 0720 the unit was returned to 100% power. At 2345 a load reduction was commenced to remove a waterbox from service due to tube leaks. At 2400 load was at 98%.

Sept. 2 - At 0125 load was at 76% power. At 0715 the waterbox was returned to service and a load increase begun. At 0915 the unit was returned to 100%.

Sept. 9 - At 2241 a ramp down was started to clean waterboxes. At 2400 load was at 80%.

Sept. 10 - At 0055 load was at 68% to allow waterbox cleaning. At 0406 load could be increased to 85%. At 0530 all waterboxes were back in service and load was returned to 100% power.

Sept. 15 - At 1345 the turbine and reactor were manually tripped and safety injection was manually initiated due to high reactor coolant leakage from a steam generator tube. A unit cooldown and depressurization was commenced to prevent any atmospheric leakage. There was no release to the atmosphere. The affected steam generator (2A) was identified and a cooldown to cold shutdown conditions was commenced to allow for repairs and evaluation

UNIT NO. 2 (CONTINUED)

of the leak.

Sept. 30 - This report period ends with the unit in a cold shutdown condition with major maintenance being performed on the "A" S/G to evaluate the S/G tube leak.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit, are shutdowns, curtailments and occurrences experienced during this month which required load reduction or resulted in significant non-load related incidents.

UNIT NO. 1

October 1 - This report period begins with the reactor critical and a turbine start-up in progress. At 0417 the generator was synchronized to the system and a load increase begun. At 0750 load was held at 70% due to broken shear pins on two of the traveling screens. At 0836 a slight power increase was possible, however, load had to be held at 86% to clean waterboxes. At 2400 load was 86%.

October 2 - At 0125 a load increase was begun, and at 0351 the unit was at 100%.

October 3 - At 0412 load was reduced to 84% due to a broken shear pin in one of the traveling screens which required reducing flow through the condenser. At 0710 load was increased commensurate with waterbox delta-T limits.

At 0840 the unit was returned to 100%. At 1620 load was reduced to <P-threshold due to failure of the computer and F_Q Surveillance required. At 1635 the power was at 96%. At 1907 power could be increased above P-threshold and at 1930 the unit was returned to 100%.

October 5 - At 0047 load was reduced to 86% to allow removing of a waterbox from service to inspect for tube leaks. At 0332 load was returned to 100% after the waterbox was returned to service. At 0840 load had to be reduced due to decreasing vacuum in

UNIT NO. 1 (continued)

the condenser. At 1055 power was at 96%. At 1120 power was returned to 100%.

October 17 - At 0940 a unit shutdown was commenced for scheduled refueling outage. At 1411 the turbine was taken off the line and at 1525 the reactor was manually shutdown. After which a normal cooldown was commenced to place the unit in a refueling condition.

October 23 - At 1805 the part-length control rod unlatching was completed as part of the refueling sequence.

October 27 - At 1535 the reactor vessel head was removed as part of the refueling sequence.

October 28 - At 0052 full-length control rod unlatching was completed.

October 29 - At 2223 fuel movement was commenced as scheduled.

October 31 - This report period ends with the plant in a refueling condition with fuel movement in progress. Major maintenance in the primary and secondary systems was in progress; consult other sections of this report for more detailed information.

UNIT NO. 2

October 1 - This report period begins with the unit in a cold shutdown condition with major maintenance being performed in the "A" Steam Generator to determine the cause of the October tube failure.

UNIT NO. 2 (continued)

October 20 - Completed plugging 402 tubes in 2A, 2B & 2C Steam Generators as a result of the evaluation of recent primary to secondary leaks.

October 31 - The report period ends with the unit still in a cold shutdown condition with major maintenance in progress and evaluation still being done on steam generator tube material. For detailed information about maintenance items refer to other sections of this report.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT 1

Nov. 1 - This report period begins with the unit in a refueling condition with fuel movement in progress. Also, major maintenance is in progress in the primary and secondary systems; other sections of this report provide detailed maintenance information.

Nov. 15 - At 1720 fuel movement for loading Unit 1- Cycle 4 Core was completed.

Nov. 20 - The full length control rods were latched at 2200.

Nov. 22 - The reactor vessel head was set in place at 1915 and remained unbolted.

Nov. 23 - At 1720 the latching of the part length control rods was completed.

Nov.30 - This report ends with the plant in a refueling condition with major maintenance still in progress in the primary and secondary systems.

UNIT 2

Nov. 1 - This report period begins with the plant in a cold shutdown condition, with major maintenance in progess. Also, evaluation of the steam generator tube stress cracking in progress.

Nov. 30 - This report period begins with the plant still in a cold shutdown condition with major maintenance in progress in the primary and secondary systems.

SHUTDOWNS, CURTAILMENTS AND OCCURRENCES

Listed below in a chronological sequence by unit are shutdowns, curtailments and occurrences experienced during this month which required load reductions or resulted in significant non-load related incidents.

UNIT NO. 1

December 1 - This report period begins with the plant in a refueling condition with major maintenance still in progress in the primary and secondary systems.

December 3 - Reactor Vessel Head bolted in place.

December 31 - This report period ends with the plant in a refueling shutdown condition with major maintenance still in progress in the primary and secondary systems.

UNIT NO. 2

December 1 - This report period begins with the plant in a cold shutdown condition with major maintenance in progress in the primary and secondary systems.

December 11 - At 0510 the plant went above 350°F, heatup continued. At 1220 the plant was in a hot shutdown condition and a satisfactory overpressure test was completed at 1411.

December 12 - Full Length Control Rod at position D-6 would not move while conducting rod withdrawal for criticality. Several attempts were made to move the rod and plant cooldown to various temperatures proved unsuccessful. At 1800 the plant was cooled below 350°F.

December 13 - Several more attempts were made at various plant temperatures to move the rod. Results were still unsuccessful.

UNIT NO. 2 (CONTINUED)

December 14 - The decision was made to replace the CRDM and the unit was cooled down to a cold shutdown condition at 1305 and drained to allow maintenance.

December 15 - Replacement was completed on CRDM Rod D-6, the RCS was filled, vented and the rod tested satisfactory and plant heat-up begun.

December 16 - The unit was returned >350°F at 1015 and heat-up was in progress when a plant cooldown was begun to await the results of the Unit 1 S/G Eddy Current data evaluation. The unit was reduced to <350°F at 2000.

December 18 - At 1642 a plant heat-up was begun; preliminary results of the evaluation of the eddy current data were received. At 1715 the plant was >350°F. At 2341 the unit was returned to a hot shutdown status and a satisfactory overpressure test was performed.

December 19 - At 0030 a satisfactory rod drop test was performed on Rod D-6. At 0914 the reactor was taken critical. At 1035 the reactor was manually shutdown pending further Unit 1 S/G eddy current results. The unit was borated to cold shutdown concentration. After further eddy current evaluation a dilution to critical concentration was performed at 1711 and at 1727 the reactor was taken critical. At 1915 the generator was paralled to the system. At 2400 the unit was at 50% power.

UNIT NO. 2 (CONTINUED)

December 20 - At 0237 the unit was at 100%.

December 22 - At 1414 an orderly shutdown was commenced to correct a steam generator tube leak. At 1744 the turbine was taken off the line and at 1757 the reactor was manually shutdown. At 2300 the plant was < 350°F.

December 24 - At 1440 the maintenance was completed and recovery begun.

December 25 - At 1740 the unit went above 350°F.

December 26 - At 0400 a overpressure test was satisfactorily completed. At 1020 the reactor was taken critical. At 1239 the generator was paralleled to the system. At 1241 an automatic reactor trip was received from Rx Power Lo Setpoint - operator failed to block as per procedure. The reactor was returned critical at 1301, however, a reactor trip occurred at 1335 from a spike in first stage pressure during turbine latch resulting in a reactor trip from turbine trip. At 1350 the reactor was again taken critical and the turbine paralleled to the system at 1511. However, at 1524 a reactor trip occurred from a Low Steam Generator Level with flow mismatch due to feed control sensitivity during manual feed control. At 1550 the reactor was taken critical. At 1643 the generator was paralleled to the system. However, at 1650 another reactor and turbine trip resulted from a failure of the speed channel in the turbine EHC System. At 1710 the reactor was taken critical again and the turbine paralleled to the line at 1828. At 2325 the unit was at 100%.

UNIT NO. 2 (CONTINUED)

December 28 - At 0510 both high pressure drain tank pumps were inoperable and load was reduced to 98%. At 0300 load was reduced to 90% to allow waterbox to be removed from service. At 0719 load was returned to 99% (High Pressure Drain Pump's still out of service).

December 30 - At 1200 sampling indicated boron injection tank boron concentration was lower than the limiting condition of operation in Technical Specifications and a load reduction begun. At 1513 load was at 52% and the sampling results indicated the tank had been restored to specification, a rampup was started. At 65% a load reduction was again begun due to high condenser waterbox temperature, this started at 1645. Load was reduced as required to maintain ΔT's in specification. At 2400 load was at 40%.

December 31 - At 0430 a load increase was begun and at 0900 the unit was returned to 100%. This report period ends with the unit at 100%.

PLANT OR PROCEDURE CHANGES, TESTS, EXPERIMENTS, AND SAFETY RELATED MAINTENANCE

1. Amendments to Facility License or Technical Specifications
2. Procedure Changes that Change to Operating Mode As Described in The FSAR
3. Facility Changes Requiring NRC Approval
4. Facility Changes Not Requiring NRC Approval
5. Tests and Experiments Requiring NRC Approval
6. Tests and Experiments Not Requiring NRC Approval
7. Other Changes, Tests and Experiments
8. Periodic Tests Not Completed Within Limits
9. Corrective Maintenance of Safety Related Equipment During Outages and Reductions in Power

AMENDMENTS TO FACILITY LICENSE

OR TECHNICAL SPECIFICATIONS

AMENDMENTS TO FACILITY LICENSE OR TECHNICAL SPECIFICATIONS

On January 7, 1976, the Nuclear Regulatory Commission issued Amendment No. 14 to the Technical Specifications for the Surry Power Station, Unit Nos. 1 and 2. The changes are of major significance relative to Station reporting requirements.

On January 26, 1976, the Nuclear Regulatory Commission issued Amendment No. 15 to the Technical Specifications for the Surry Power Station, Unit Nos. 1 and 2, which is designated Change No. 30. Of significance are the following changes:

1. A reorganization of system management relative to the Station Manager.
2. An updating of experience and training requirements to meet the latest ANSI Standard.
3. A major reorganization of the System Committee.
4. Additional approvals required to make procedure changes.

On March 31, 1976, the Nuclear Regulatory Commission issued Amendment No. 17 to the Operating License for the Surry Power Station, Unit Nos. 1 and 2, which is designated as Technical Specification Change No. 31. The change is the result of our request to make a change to the gaseous release rate specification. Of significance is the following change:

1. An increase in the gaseous release rate from 8% to 10% when averaged over any 12 consecutive months.

On April 16, 1976, the Nuclear Regulatory Commission issued Amendment No. 18 to the Operating License for the Surry Power Station, Unit Nos. 1 and 2, which is designated as Technical Specification Change No. 32. The change is the result of our request to increase the allowable river water ΔT during periods of circulating water pump repairs. Of significance are the following changes:

1. An increase in the permitted ΔT limit to $23^{\circ}F$ for 24 hours.
2. An increase in the permitted ΔT limit to $17.5^{\circ}F$ for 14 days.

On May 13, 1976, the Nuclear Regulatory Commission issued Amendment No. 19 to the Operating License for the Surry Power Station, Unit Nos. 1 and 2, which is designated as Technical Specification Change No. 33. The change is the result of our request to operate with a slightly positive moderator coefficient in the power range. Of significance are the following changes:

1. An increase in the moderator coefficient to 3 pcm/^{o}F at power levels less than 50% power.

2. An increase in the moderator coefficient to 3 pcm/^{o}F at 50% power and decreasing to 0 pcm/^{o}F at 100% power.

On May 25, 1976, the Nuclear Regulatory Commission issued changes to the Technical Specification for the Surry Power Station, Unit Nos. 1 and 2. Of major significance are the following changes:

1. An updated allowable fuel residence time for Unit 2.

2. An increase in F ΔH to 1.55.

3. The deletion of the F_{xy} monitoring requirement.

On June 25, 1976, the Nuclear Regulatory Commission issued Amendment No. 21 to the Operating License for the Surry Power Station, Unit Nos. 1 and 2, which is designated as Technical Specification Change No. 35. The change is the result of our request to increase the allowable condenser cooling water discharge temperature because of higher than expected river water temperatures. Of significance are the following changes:

1. An increase, during the normal operations, in the permitted discharge temperature to 103^{o}F.

2. An increase, during circulating pump maintenance, in the permitted discharge temperature to 105.5^{o}F.

On July 12, 1976, the Nuclear Regulatory Commission issued Amendment No. 22 to the Operating License for the Surry Power Station, Unit Nos. 1 & 2, which is designated as Technical Specification Change No. 36. The changes are the result of our request to reorganize the Chemistry and Health Physics

Group. Of significance are the following changes:

1. The creation of a new supervisory position.

2. The division of responsibility between the Chemistry Supervisor and the Health Physics Supervisor.

On July 27, 1976, the Nuclear Regulatory Commission issued Amendment No. 23 to the Operating License for the Surry Power Station, Unit Nos. 1 & 2, which is designated as Technical Specification Change No. 37. The changes are the result of our request to clarify the "monitoring requirements" for certain radiation monitors. In addition, our request to modify T.S.-3.11A 4,5, and 9 to allow continuous discharge was found unacceptable by the NRC Staff. Of significance are the following changes:

1. The clarification of the component cooling radiation monitor "monitoring requirements".

2. The clarification of the air ejector radiation monitor "monitoring requirements".

On September 13, 1976, the Nuclear Regulatory Commission issued Amendment No. 24 to the Operating License for the Surry Power Station, Unit Nos. 1 & 2, which is designated as Technical Specification Change No. 38. The changes are the result of our request to provide a more realistic reduction of the maximum permissible concentration (MPC) to account for doses to personnel in unrestricted areas through the terrestrial food chain. Of significance are the following changes:

1. Deletion of the 700 reduction factor for any radioisotope except halogens and particulates with half-lives greater than eight days.

2. Redefinition of the release rate for radioiodine and radioactive materials in particulate form with half-lives greater than eight days.

3. Addition of new surveillance requirements to monitor the location of nearest milk producing animals.

Included in this distribution is the correction of a typographical error on Page 6.4-2 which was made in Change No. 36.

On September 14, 1976, the Nuclear Regulatory Commission issued Amendment No. 25 to the Operating License for the Surry Power Station, Unit Nos. 1 & 2, which is designated as Technical Specification Change No. 39. The change is the result of an NRC requirement to modify the license to include shock suppressor specifications. Of significance are the following changes:

1. The addition of limiting conditions for operation of shock suppressors.
2. The addition of surveillance requirements for shock suppressors.

On November 26, 1976, the Nuclear Regulatory Commission issued Amendment No. 26 to the Operating License for the Surry Power Station, Unit Nos. 1 & 2, which is designated as Technical Specification Change No. 40. The change is primarily the result of a NRC requirement to submit a reevaluation of the LOCA-ECCS analysis and accompanying Technical Specifications in accordance with the Order For Modifications of License (August 27, 1976). In addition to including the effect of the higher upper head temperature, the analysis includes the effect of steam generator tube plugging up to a maximum of 12%. Of significance are the following changes:

1. An increase in accumulator level to 1089 cubic foot maximum and 1075 cubic foot minimum.
2. An increase in the total peaking factor (FQ) to 2.00.
3. The addition of APDM type surveillance.

In addition to the Technical Specifications, the NRC has stipulated the following license amendment:

Steam Generator Inspection: In order to perform an inspection of the steam generators, the plant shall be brought to cold shutdown condition with 61 equivalent days of operation from the effective date of issuance of this amenment. For the purpose of this requirement, equivalent operation is defined as operation with a primary coolant temperature greater than 350°F. Nuclear Regulatory approval shall be obtained before resuming power operation following this inspection.

PROCEDURE REVISIONS THAT

CHANGE THE OPERATING MODE AS DESCRIBED IN THE FSAR

LIST OF PROCEDURE REVISIONS THAT CHANGE THE OPERATING MODE AS DESCRIBED IN THE FSAR

There were no procedure revisions that change the operating mode as described in the FSAR.

FACILITY CHANGES

REQUIRING NRC APPROVAL

FACILITY CHANGES REQUIRING NRC APPROVAL

There were no facility changes which required NRC approval.

FACILITY CHANGES THAT DID NOT REQUIRE NRC APPROVAL

Design Change	Unit
1. DC 73-23 - Accumulator Level Transmitters	1,2

Description - This change replaced the Masoneilon 12500 level transmitters with Rosemount Model 1152 DP liquid level transmitters on the Safety Injection Accumulators.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased since the Rosemount transmitters has a higher degree of accuracy and a greater dependability.

b. The possibility for an accident or malfunction of a different type than any previously evaluated in the Safety Analysis Report has not been created. Normal operation of this system is unchanged. Only the reliability and accuracy of the instrumentation has been improved.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The replacement of the level transmitters only enables the accumulator volumes to be monitored more accurately.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
2. DC 73-89 - Boric Acid Transfer Pumps Non-Auto Control Annunciator Modification	1,2

Description - This change revised the logic of the Annunciator "Boric Acid Transfer Pumps Non-Auto Control" from an alarm when any pump is in the off to an alarm when neither pump is in automatic. New pump control switches were also added to provide contacts for the auto position.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased by this change. The Boric Acid Pumps and control circuits are unaffected.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. This modification will help prevent accidents by having the subject annunciator alarm only when a real alarm condition exists.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The Boric Acid Pumps and their control circuits are unaffected by this change.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
3. DC 73-111 - The Removal of Control and Indication Circuitry For SOV-MS-103A through D and SOV-MS-203A through D	1

Description - This change was to disconnect and remove electrical components of the containment spray pump steam turbine drive. The turbine drive steam piping and control has been previously removed in accordance with Design Change 73-102.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to the safety previously evaluated in the Safety Analysis Report is not increased; since the steam turbines drives have been disabled, this modification will not increase the probability of occurrence.

b. The possiblity for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. Since the subject components are a part of a previously disabled safety system, their removal will not create a possibility for an accident.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The removal of this equipment will only affect the Containment Spray Pump Turbine Drives, which have been previously removed.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
4. DC 73-127 - Containment Escape Hatch	2

Description - The existing 18" diameter manway locking device was modified to prevent inadvertent opening. A locking pin and plate assembly, a pressure equalizing assembly and an instruction plate were installed.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The manway locking device is not evaluated in the Safety Analysis Report.

b. The possibility of an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The manway operation was not affected. The locking device was improved without disturbing manway integrity.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The manway locking device is not the basis for any Technical Specification. Additionally, the manway leakage was not affected.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any Technical Specification.

Design Change	Unit
5. DC 74-14 - Reroute Oil Drains	1,2

Description - This change involved rerouting of the various lube oil drains so that all oil leakage could be captured, reprocessed in the lube oil conditioner, and reused thereby significantly reducing the oil consumption of the station.

Summary of Safety Evaluation

a. The probability of an occurrence important to safety is not increased since this modification only provides a means of collecting waste oil.

b. There is no possibility of a malfunction of a different type occurring due to the change because the basic function of the system involved remains unchanged.

c. The margin of safety has not been decreased since no safety related equipment is involved.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis for any technical specification.

Design Change	Unit
6. DC 74-21 - Containment Instrument Air - Redundant Piping	2

Description - The modification consists of installing four (4) check valves - two (2) in the discharge lines of the compressors and two (2) in the inlet lines of the receivers. In the event that one compressor develops a leak to atmosphere, the discharge line check valves prevent the other compressor from discharging through this leak instead of into the receivers. The check valves in the receiver inlet lines, in conjunction with the discharge line check valves, protect system pressure in the event of a receiver leak to atmosphere.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The modification improved performance of the system.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The design of the system was improved by this change. Normal operation of this system is unaffected by this modification.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The

Design Change

6. DC 74-21 - Containment Instrument Air - Redundant Piping

Summary of Safety Evaluation (continued)

containment instrument air compressors are not contained in the basis of any Technical Specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any Technical Specification.

Design Change	Unit
7. DC 74-54 - Emergency Diesel Generator 1,2 & 3 Audio Alarm Monitoring EFI-TX Relay	1,2

Description - This change involved adding an audio alarm to the Emergency Diesel Generator Protection to monitor the EGI-TX relay which trips J3 or H3 breakers.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report would not be increased. The EG (1,2,3)-TX relays have spare mechanical type contacts which open when the relay is energized. This alarm will remind the operator that the "H3" breaker is being held open because the EG(1,2,3)-TX relay is energized.

b. A possibility for an accident or malfunction of a different type than any evaluation previously in the Safety Analysis Report would not be created. The alarm would be a redundant indication of relay coil status (energized or deenergized).

c. The margin of Safety as defined in the basis for technical specifications would not be reduced.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any Technical Specification.

Design Change	Unit
8. DC 74-97 - Addition of High-Low Level Alarm to Emergency Diesel Generator Auxiliary Fuel Oil Tank	2

Description - The change added a level switch to the auxiliary fuel oil tank. This switch activates an alarm which alerts the operator to the fact that the tank level is abnormal. A low level alarm helps prevent a violation of Technical Specifications; a high level alarm helps prevent tank overflow and environmental pollution.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The alarm switch action is independent of any control function.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The alarm switch does not affect the operation of the fuel oil supply system.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The addition of the alarm helps to ensure an adequate fuel oil supply.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
9. DC 75-7 - Modification to Component Cooling Heat Exchanger Radiation Monitoring System	1,2

Description - Replace existing radiation sampling pump RM-SW-107 with four (4) positive displacement type pumps, one sampling each component cooling heat exchanger.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report is decreased.

The continuous monitoring of the service water from each of the component cooling water heat exchangers will be more reliable and more representative with the one pump per cooler arrangement.

b. The possibility for an accident or malfunction of a different type than any previously evaluated in the FSAR is not created. The change to the method of obtaining the flow through the radiation monitor (RM-SW-107) will only improve the reliability of this system and not affect any other system.

c. The margin of safety as defined in the basis for any technical specification is not reduced. This change does not affect the basis for any technical specification.

Design Change	Unit
9. DC 75-7 - Modification to Component Cooling Heat Exchanger Radiation Monitoring System (continued)	1,2

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
10. DC 75-10 - Removal of Turbine "Fast Valving" Feature	2

Description - The "Fast Valving" feature (CIV) was disabled during start-up. This change provided for the disabling using the method recommended by Westinghouse, thus utilizing the most effective method and allowing for the units to be identical in this respect.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The "Fast Valving" feature was not evaluated in the Safety Analysis Report.

b. The possiblity for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. This change did not affect the safety of the unit since disabling the feature will not prevent the operation of any turbine protection functions.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The turbine "Fast Valving" feature is not the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any Technical Specification.

Design Change	Unit
11. DC 75-25 - Steam Generator Blowdown Trip Valves Interlock Modifications	1,2

Description - In order to sample the Steam Generators in wet layup or cold shutdown, the use of jumpers was necessary to bypass certain interlocking features to open the trip valves. This has led to a Reportable Occurrence in the past for one reason or another. To prevent this from happening three (3) administratively controlled key switches were installed to bypass the interlocks and allow the operation of the three trip valves. The use of a key switch would also light a permissive light on the bypass status board.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The key switches are administratively controlled to be used only at cold shutdown or wet layup.

b. The possiblity for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The containment integrity is not required at cold shutdown.

c. The margin of safety is not reduced because containment integrity is not required at cold shutdown.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
12. DC 75-34 - Emergency Turbine Oil Pump Auto Start Modification	1,2

Description - This change added a relay to the Emergency Turbine Oil Pump (ETOP) start circuit. It will initiate an ETOP start if the Turning Gear Oil Pump (TGOP) suffers a loss of A.C. power or a thermal overload. In addition, a pressure switch was installed to sense decreasing oil pressure. This switch will prevent false starts of the ETOP whenever the TGOP is removed from service for maintenance.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of the equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The new start function is independent of any previously installed start function.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. This change does not introduce any function not previously discussed in the Safety Analysis Report.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The additional start function increases the margin of safety.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
13. DC 75-37 - Condensate Water Truck Station	1,2

Description - This change installed a concrete pad, two electric driven pumps, and associated piping and valves. The system permits pumping of condensate water from two trucks to either condensate tank or from either condensate tank to the trucks.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The condensate tanks are not evaluated in the Safety Analysis Report.

b. The possibility of an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The truck station does not affect any system involved in the Safety Analysis Report.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The truck station is not the basis for any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
14. DC 75-38 - Reactor Coolant Pump Underfrequency Relay Circuit Modification	1,2

Description - This design change implemented a wiring modification so as to deter an underfrequency relay trip to ICS coil failure by excessive ambient temperature. The underfrequency relay is designed for momentary energization only and this modification will remove power from the ICS coil after if operates thus eliminating the possibility of overheating and the need for a timely manual reset of the circuit at the Reactor Coolant Pump cubicles.

Summary of Safety Evaluation

a. The probability is not increased because the modification does not alter the actual tripping function of the underfrequency relay.

b. The possibility is not created because the modification only affects the circuit operation after the pump has been tripped.

c. The margin of safety is not reduced because the modification does not alter the actual tripping function of the underfrequency relay.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
15. DC 75-39 - Lube Oil Vapor Extractor Separator	2

Description - This change installed a Peerless separator in the discharge line from the vapor extractor. This was necessary because the present collector does not adequately remove all oil vapors.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. This equipment was not evaluated in the Safety Analysis Report.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. This change did not affect the safety of the unit.

c. The margin of safety as defined in the basis of any technical specification is not reduced. This equipment is not the basis of any Technical Specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any Technical Specification.

Design Change	Unit
16. DC 75-41 - Main Steam Trip Valve Modification (Schutte & Koerting)	1,2

Description - This design change improved the operational reliability of the Main Steam Trip Valves by installing positive stops for the discs to bear against in the open position. The actuating cylinders were also replaced with larger ones to provide the necessary force to keep the disc firmly seated against the stop.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction or equipment important to safety and previously evaluated in the Safety Analysis Report will not be increased.
By performing the Schutte & Koerting modification on the main steam trip valves their operational reliability will be greatly improved. The positive stop and larger air operating cylinders will eliminate the possibility of the valve sticking in the open position. In addition, the possibility of rock shaft failure will be greatly reduced by the elimination of the cyclical torsion load which the valves now experience.

b. A possibility for an accident or malfunction or a different type than previously evaluated in the Safety Analysis Report has not been created since basic system design has remained unchanged. The purpose of the Schutte & Koerting modification is to improve the existing components operation and

16. DC 75-41 - Main Steam Trip Valve Modification (Schutte & Koerting)(continued) 1,2

Summary of Safety Evaluation

b. reliability.

c. The margin of safety is not reduced. Any steam line rupture will involve a high flow of steam which will cause the main steam valves to close considerably faster than the cold shutdown rate of closure due to the force exerted on the disc by the steam flow. This force has been increased since the disc projects down into the line of flow more than before due to the positive stop (79^{o} open versus 80^{o} open before modification) which will result in improved closure time.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
17. DC 75-43 - Charging Pump Miniflow Orifice Replacement	2

Description - The installed miniflow orifices and orifice bypasses were replaced with Westinghouse furnished Pacific eleven stage orifices. The replacement was necessary due to a severe erosion problem which had been attributed to the miniflow orifice performance characteristics.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The system basic design remains unchanged and all material used in the modification was equal to or superior to that used in original construction.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The basic system design remains unchanged. System operating parameters (temperature and pressure) are the same as before the modification.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The elimination of the orifice bypass improved system reliability because of the elimination of welds and mechanical joints.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
18. DC 75-44 - Replacement of Recirc. Spray Valves (MOV-RS-155(255) A & B)	1,2

Description - The modification accomplished by this design change removed existing solid wedge, 12", weld end, gate valves and replaced them with 12" flanged end plug valves. Remote operators were also replaced with larger operators with reduction gear drives to accomodate the greater break-away torque and the 90 degree actuation required by the new plug valves.

Summary of Safety Evaluation

a. The probability is not increased since the new valves will be designed and installed according to present system limitations and requirements and no safety system function will be changed.

b. The possibility is not increased since no new system function is created and present system safety functions remain unchanged.

c. The margin of safety is not reduced since the functions of the system remain unchanged.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
19. DC 75-50 - High Pressure Drain Pump Cavity Dewatering System	1,2

Description - This modification eliminated sources of water in leakage to the H.P. Heater Drain Pump cavity by increasing the length of a vent pipe, capping off a 2" standpipe, and completely sealing the pump casing to the cavity to eliminate ground water.

Summary of Safety Evaluation

a. The probability of an occurrence important to safety is not increased due to the fact that the cavity will now remain dry as originally intended.

b. There is no possibility of a malfunction of a different type occuring due to the modification since no change in system design is involved.

c. The margin of safety is not decreased since no system boundaries are involved.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
20. DC 75-51 - Low Head Safety Injection	1,2

Description - The suction header from the Refueling Water Storage Tank to the Low Head Safety Injection pumps was split with a suction valve and check valve in each line thus providing redundant suction supply. In addition, the recirc. lines from each pump were made independent. The above action insures that a spurious single component failure will not render the entire Low Head Safety Injection System inoperable. This action was initiated to comply with the Nuclear Regulatory Commission Document, BTP EICSB18 (Single Failure Criteria).

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR is not increased. The "undesirable function" failure mode as stipulated in the new requirements of 10 CFR 50.46; 10 CFR 50 Appendix K, and BTP EICSB18 was not previously evaluated. Hence, this failure mode was analyzed and the proposed modifications will provide redundancy for the Low Head Safety Injection System and the previous evaluation will not be affected, except that the scope is increased as required by NRC directives.

Design Change	Unit
20. DC 75-51 - Low Head Safety Injection (continued)	1,2

Summary of Safety Evaluation (continued)

b. The possibility for an accident or malfunction of a different type than ay previously evaluated in the FSAR is not created. The accident analyses as stated in Section 14 will not be affected. Meeting the new single failure requirements of 10 CFR 50.46 by performing the modifications will insure redundancy of Low Head Safety Injection System and provide added assurance that the system can perform its intended function.

c. The margin of safety as defined in the basis for any technical specification is not reduced since the modifications provide increased assurance that the Low Head Safety Injection System will perform its intended function.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
21. DC 75-52 - Containment Instrument Air Compressor Interstage Cooling	2

Description - This change installed water cooled interstage cooling on the compressors as an interim solution to the compressor failure problem.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. A failure in the component cooling water system or the instrument air system is not considered in the accident analysis in FSAR Section 14.5.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The addition of the cooler and components will be designed and installed to present system requirements, thus assuring that component cooling capabilities are not disturbed.

c. The margin of safety as defined in the basis for any technical specification is not reduced. Since no safety function is changed.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
22. DC 75-53 - Steam Generator 2.0 Inch Inspection Openings	2

Description - This change installed inspection ports in the secondary shell of the steam generators, near the tube sheets. These openings also permit a more thorough sludge removal procedure.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The probability of failure of the 2.0 inch inspection port is less than that of the already installed 6.0 inch diameter handholes. This is discussed thoroughly in Westinghouse Safety Review NS-MFSE-379.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The steam generator shell is the only component affected by this change. The only accident that could possibly result from this change is a steam or feedline break. The Westinghouse safety review shows that inspection port failure is well within the boundaries of existing analysis presented in the FSAR.

c. The margin of safety as defined in the basis for any technical specification is not reduced. Steam generator pressure/temperature requirements addressed in

Design Change	Unit
22. DC 75-53 - Steam Generator 2.0 Inch Inspection Openings (continued)	2

Summary of Safety Evaluation (continued)

c. the Technical Specifications are not affected by this modification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
23. DC 76-1 - Secondary Drains - Flow Transmitter Flexible Hose Connections	1,2

Description - Piping connecting isolation valves 1-SD-51 and 1-SD-52 to line 10" WID-4-301 failed at point approximately 2" from the 10" pipe. The cause of the problem was due to extreme stress conditions due to the cyclical translation of the 10" pipe and the torsional and control lever loading imposed by the 1" globe valve and its associated piping. This change eliminated the problem by changing the 1" globe valve to 1/2" Whitey valve and installing a length of flexible metal hose between the Whitey valve and the existing 1/2" O.D. tubing.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. This portion of the Secondary Drain System is not addressed in the Safety Analysis Report.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. This change is only to the piping of the flow transmitters which will not adversely affect the performance of the system. A piping failure possibility is not increased by this modification. As

Design Change	Unit
23. DC 76-1 - Secondary Drains - Flow Transmitter Flexible Hose Connections (continued)	1,2

Summary of Safety Evaluation (continued)

b. no other changes will be made to the system, no other possibilities for a different accident exist.

c. The margin of safety as defined in the basis for any technical specification is not reduced. Flow transmitter piping for this system is not the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
24. DC 76-03 - Westinghouse Independent Fuel Evaluation System Design Package	1,2

Description - This change provided for the installation of the Westinghouse Independent Fuel Evalaution System. The system is composed of the following: Fuel Assembly Examination System, Fuel Rod Examination System, Fuel Rod Handling System, and a Fuel Examination Bridge System. This system was incorporated to provide a capability for fuel examination which would be independent as possible of the fuel building bridge and assembly handling tool.

Summary of Safety Evaluation

a. The probability of occurrence of an accident analyzed in the safety analysis report will not be increased since fuel assemblies will be handled with the fuel bridge. The design of the IFE bridge and rod handling tool is such that the probability of a rod handling accident has not been increased. The consequences of such an accident are not increased since the amount of radioactivity released by the rupture of a single rod would be normal when compared with a fuel assembly handling accident as previously analyzed in the Safety Analysis Report.

b. The possibility for an accident or malfunction of a different type than any previously evaluated in the Safety Analysis Report has not been created.

Design Change	Unit
24. DC 76-03 - Westinghouse Independent Fuel Evaluation System Design Package	1,2

Summary of Safety Evaluation (continued)

b. A fuel handling accident is analyzed in section 14.4 of the FSAR.

c. The margin of safety as defined in the basis of the technical specifications is not reduced since all applicable technical specification requirements have been met.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
25. DC 76-4 - Steam Generator J-Tube Modification	2

Description - The scope of this change was to install vents (J-Tubes) on the steam generator feed ring and plug existing holes on the bottom of the feed ring. This change was designed to eliminate the possibility of secondary system fluid flow instability (water hammer) under certain operating conditions.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to the safety previously evaluated in the Safety Analysis Report is not increased. The modifications made to the steam generator further decreased the probability of an undesirable occurrence.

b. The possibility of an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. This change will further decrease the possibility of a malfunction.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The design change does not affect the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
26. DC 76-5 - Pump Overhead Clearance for "A" High Pressure Feedwater Heater Drain Pump	1,2

Description - The modification was made to eliminate having to remove "B" H.P. Feedwater Heater Drain Pump each time the "A" H.P. Feedwater Heater Drain Pump was removed for maintenance. The change consisted of relocating the feedwater heater drain pump recirculation line.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The additional material required to relocate the pipe will not provide any additional stresses or flow restrictions to the system.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The rerouting of this pipe does not alter the functions of the system.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The routing of the pipe is not a basis for any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
27. DC 76-08 - Fuel Tool Examination Hoist	1,2

Description - This change installed a one ton electric chain hoist on the rear of the fuel building 125 ton crane. The purpose of the hoist is to lift fuel handling tools clear of the fuel for inspection prior to use during refueling.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The spent fuel crane operation is not evaluated in the Safety Analysis Report.

b. The possibility of an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The fuel tool hoist does not affect any system involved in the Safety Analysis Report.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The spent fuel crane is not the basis for any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
28. DC 76-10 - Emergency Escape Hatch in Equipment Hatch	1,2

Description - The purpose of this design change was to install a secondary means of egress from the containment. The modifications included the installation of 5'-6" diameter personnel air lock in the existing machinery hatch. The 12' length of the new personnel air lock is designed to accomodate a stretcher.

Summary of Safety Evaluation

a. The probability of occurrence or consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report has not increased. The emergency escape hatch is similar in construction to the existing personnel hatch and is designed to maintain containment integrity equal to the existing hatch requirements.

b. The modification does not create the possibility for an accident or malfunction of a different type than any evalauted previously in the Safety Analysis Report. The emergency escape hatch is under administrative control and is only to be used under emergency conditions when escape through the personnel hatch cannot be accomplished. Any release of airborne contamination resulting from the use of the emergency escape hatch is not considered to be significant because of the small volume of the hatch. The emergency escape hatch represents 1.6×10^{-2}% of the containment volume. Therefore,

Design Change | Unit

28. DC 76-10 - Emergency Escape Hatch in Equipment Hatch | 1,2

Summary of Safety Evaluation (continued)

the amount of airborne contamination that could be trapped in the emergency air lock is not considered to be significant.

c. The margin of safety as defined in the basis for any Technical Specification is not reduced. This change does not affect the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
29. DC 76-11 - Steam Generator Tube Support Plate Removal	2

Description - This change involved removing a small portion of the tube support plate with some tubes still intact. The purpose of this evolution was to obtain a speciman for the investigation of the tube denting phenomenon. In addition to the support plate removal the following work was also performed: crud collecting, measurements of annulus width between secondary shell, and wrapper and eddy current testing.

Summary of Safety Evaluation

This work was determined not to provide an unreviewed safety question therefore:

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report is not increased.

b. A possibility for an accident or malfunction of a different type than any previously evaluated in Safety Analysis Report is not increased.

c. The margin of safety as defined in the basis of the technical specification is not increased.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
30. DC 76-13 - Control Room Air Conditioning Modification	1,2

Description - This change modified the ductwork to computer rooms 1 & 2 to supply air directly to the computer cabinets in order to reduce the temperature of the computers and improve their availability.

Summary of Safety Evaluation

This design change does not constitute an unreviewed safety question because:

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report is not increased because the failure of ducting in the Control Room ventilation is not evaluated.

b. A possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created because the only modification is to ducting which will not adversely affect the performance of the system. A ducting failure possibility is not increased by this modification. As no other changes will be made to the system, no other possibilities for a different accident exist.

c. The margin of safety as defined in the basis for any technical specification is not reduced because no margin of safety for the control room ventilation system is addressed in Technical Specifications.

Design Change	Unit
30. DC 76-13 - Control Room Air Conditioning Modification Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.	1,2

Design Change	Unit
31. DC 76-16 - Turbine Load Rate Modification	1,2

Description - In order to prevent raising the temperature of the water at the discharge control structure the turbine load rates of 6% per minute and 8% per minute were changed to 0.3% per minute and 0.5% per minute. This change was accomplished by changing the value of two resistors on the "Clock Rate Driver 2" card of the EHC System.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report is not increased. The circuitry being changed is not required to perform a protective function.

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created. The proposed design change does not change the role of the circuit being modified, only the output signal in the designed role.

c. The margin of safety as defined in the basis for any technical specification is not reduced. The circuitry involved is not the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
32. DC 76-33 - M.G. Set Varmeters & Modifications	1,2

Description - This change installed a varmeter on each of the control rod drive motor generators (4). In addition, neoprene vibration absorbers were installed to reduce the amount of vibration previously transmitted to the directional overcurrent trip relays.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety that was previously evaluated in the Safety Analysis Report is not increased because the varmeters and vibration modification do not affect present control levels, and are only for more clarification of reactive loads and isolating vibrations.

b. A possibility for an accident or malfunction of a different type than one evaluated previously in the Safety Analysis Report isn't created because the modification does not affect the control rod generators, but only monitors reactive loads which does not adversely affect the performance of the system.

c. The margin of safety as defined in the basis for any technical specifications is not reduced because no margin of safety for control rod MG varmeters and vibration modification is addressed in technical specifications.

Design Change	Unit
32. DC 76-33 - M.G. Set Varmeters & Modifications	1,2

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
33. DC 76-34 - Replacement of RV-1203 & 2203	1,2

Description - This change replaced existing relief valves in the letdown line of the chemical volume control system (RV-1203 & 2203) with a superior valve suited for the intended service.

Summary of Safety Evaluation

a. The probability of occurrence or consequences of an accident or malfunction of euqipment important to safety and previously evaluated in the Safety Analysis Report has not increased. The capabilities of the replacement valve as evaluated in the Stone & Webster letter of September 13, 1976, are acceptable for installation in the system.

b. The modification does not create the possibility of an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report. The new valve meets the pressure retaining capabilities of the existing valve, therefore, the integrity of the system will be maintained.

c. The margin of safety as defined in the basis for any technical specification is not reduced. This change does not affect the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
34. DC 76-39 - Removal of S/G Tube R1 C7, S/G A,	2

Description - The basic purpose of this design change was to locate a 3" diameter hole in the secondary shell of the generator so that a leaking tube from Steam Generator "A", Unit No. 2 could be removed for analysis to determine the cause of the failure. In addition several other tubes were removed and visual inspections were conducted to provide data for the continued evaluation of the steam generators.

Summary of Safety Evaluation

The repair of the three (3) inch opening will be in accordance with the requirements of Section III of the ASME Code, just as the original vessel; therefore, all design criteria are maintained. Therefore, all analyses remain valid and the consequences or probability of occurrences are not affected.

Since the welded plug satisfies Code requirements, failure is not expected. Even if failure of the weld did occur and the plug is hypothesized to blow out and become a missle, the shield wall around the steam generator would contain the plug.

The proposed modification does not affect the heatup and cooldown limitations of the steam generator.

34. DC 76-39 - Removal of S/G Tube R1 C7, S/G A, | 2

Summary of Safety Evaluation (continued)

In the unlikely event of the plug being blown out, the flow out of the hole would be less than the feedwater make-up rate. It should be noted that the rupture of the plug accident would affect the core in the same manner as a small feedwater line break. It should be noted that at the time Surry 1 and 2 was licensed a feedwater line break accident analysis was not required; therefore, it is not analyzed in FSAR.

The proposed change does not effect the basis of any technical specification.

In summary, the proposed modification will meet applicable Code requirements and the same design criteria as was used in the initial design of the steam generator.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
35. DC 76-40 - Hot Head Issue - Installation of Thermocouples	1

Description - The purpose of this design change was to install three (3) thermocouples in the reactor vessel head region to gather emperical information with respect to the actual temperatures in this area.

Summary of Safety Evaluation

a. The probability of occurrence or consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report has not increased.

b. The modification does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report.

c. The margin of safety as defined in the basis for any technical specification is not reduced. This change does not effect the basis of any technical specification.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
36. DC 76-42 - Isolating Reserve Station Service Transformers	1,2

Description - The purpose of this modification was to install knife blade switches to isolate the differential and pilot wires on the lock out relays to avoid possible tripping of bus feeder breakers during reserve station service transformer testing.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety that was previously evaluated in the Safety Analysis Report is not increased because the circuit is not affected with switches closed. Switch design and administrative control will insure that the switch is closed during normal operations. Knife blade switches are a better method of isolating circuits for testing than lifting wires, which could be advertently shorted causing harm to equipment and personnel. Also, they do not affect present control level.

b. A possibility for an accident or malfunction of a different type than one evaluated previously in the Safety Analysis Report isn't created; because, as above, the circuit is not affected during normal operations. With the modification, isolation of RSS transformer, no other components are in jeopardy; hence, the system performance isn't adversely affected.

Design Change	Unit
36. DC 76-42 - Isolating Reserve Station Service Transformers	1,2

Summary of Safety Evaluation (continued)

c. The margin of safety as defined in the basis for any technical specifications is not reduced, because the required "dependable alaternate source" is maintained during testing by back feeding from the opposite unit.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
37. DC 76-45 - Steam Generator Support Upper Restraint Anchor System Studs	1,2

Description - During an inservice inspection a broken Vascomax stud and several cracked studs were found on the steam generator upper support girth straps. The studs and nuts were redesigned to minimize stress and corrosion.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report is not increased.

   1. The redesign of the Vascomax studs and nuts will reduce the probability of failure of the studs.

   2. The new coating will give more protection to the studs from the environment.

b. A possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created.

   1. The same material will be used in the upper restraint anchor system studs.

   2. Manufacturing processes will be used to reduce stresses in the Vascomax studs.

c. The margin of safety is not reduced because the proposed modification will meet the station design criteria.

Design Change	Unit
37. DC 76-45 - Steam Generator Suppport Upper Restraint Anchor System Studs(continued)	1,2

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
38. DC 76-46 - Accumulator Level Transmitters	1,2

Description - In order to allow for more volume in Safety Injection Accumulator the top tap of the level transmitter was relocated. The tap was connected to the nitrogen supply line at the top of the accumulator.

Summary of Safety Evaluation

a. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety and previously evaluated in the Safety Analysis Report is not increased because the function of the accumulator is not changed, only the path to the level transmitters.

b. A possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created because basic system arrangement and function is not changed.

c. The margin of safety as defined in the basis for any technical specification is not reduced, the Safety Injection System function is not affected by this change.

Conclusion - This design change does not constitute an unreviewed safety question or change the basis of any technical specification.

Design Change	Unit
39. DC 76-47 - Recirculation Spray System	1,2

Summary of Safety Evaluation (continued)

b. A possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report is not created.

These changes have been evaluated and it has been determined that they will have no appreciable effect on the recirculation spray system coverage or operation. This can be demonstrated by the following comparisions:

1. Flow through one level switch cage and associaged tubing and fittings is 8 gpm during system operation and flow through two drain lines is 30 gpm (15 gpm each). Total recirculation spray pump capacity is 3,500 gpm; therefore, the cumulative effect of two drain lines and one vented level switch is approximately one percent of total pump capacity.

2. Pressure drop through the new 8.75 in. I.D. pipe penetration sleeve is less than 0.5 psi. Total system dynacmic pressure drop (including the DP across the nozzles) is approximately 50 psi; therefore, the change due to the decreased penetration I.D. is less than one percent.

TESTS AND EXPERIMENTS

REQUIRING NRC APPROVAL

TESTS AND EXPERIMENTS REQUIRING NRC APPROVAL

There were no tests or experiments which required NRC approval.

TESTS AND EXPERIMENTS

NOT REQUIRING NRC APPROVAL

TESTS AND EXPERIMENTS THAT DID NOT REQUIRE NRC APPROVAL

ST-21 - Special Test for Investigation of Erosion of Charging Pump Miniflow Line and Orifice

The purpose of this test was to provide information to determine if cavitation or erosion existed in the charging pump miniflow lines. The test required valve lineups and operations which are normally expected and therefore created no new accidents. In addition, the nature of the test did not reduce the margin of safety or increase the consequences of any previously analyzed accident. The test was performed four times on Unit One - 1-20-76, 2-26-76 (B and C Pumps), 4-20-76 (A Pump), and 5-11-76 (B Pump); and once on Unit Two - 7-7-76. The test results were satisfactory; however, further testing is anticipated to monitor the performance of the miniflow line.

ST-40 - Steam Generator Narrow Range Level Indication

The purpose of this test was to record steam generator narrow range level indications during full power steady state operation. Since the test involved the use of normal station instrumentation, the consequences of any accident previously analyzed in the safety analysis report were not increased and no new accidents were created. The margin of safety was not decreased. The test was successfully completed on Unit One on 1-4-76 with the acquisition of the required data.

ST-41 - BFD Relay Drop Out Times

This test was used to evaluate the drop out times for all BFD relays which are normally energized during power operation on the DC bus and provide reactor trip functions or safeguards initiation. The test was performed at cold shutdown conditions and therefore had no safety implications or affects on new or previously analyzed accidents. The test was completed on Unit One on 3-13-76 and Unit Two on 3-7-76. Only one relay exceeded the acceptable value of 30 msec. This relay has subsequently been replaced.

ST-42 - Main Steam Trip Valve Modification Verification

The purpose of this procedure was to verify that the cold closure time of the main steam trip valves was still less than the five second Technical Specification requirement after the installation of larger air cylinders per Design Change 75-41. The test was performed at cold shutdown conditions and had no affect on any margin of safety. The test proved that the consequences of previously analyzed accidents would not be increased since the modified valves retained closure times of less than five seconds. With the station at cold shutdown conditions no new accidents were created. The test was satisfactorily completed on Unit Two on 4-24-76 (TV-MS-201B) and 5-17-76 (TV-MS-201 A,C).

ST-43 - Turbine Runback Troubleshooting

The purpose of this test was to provide the sequence of testing necessary to troubleshoot portions of the Unit One turbine runback circuit. Since the test was performed at cold shutdown conditions which do not require the operability of the turbine runback circuit, the consequences of previously analyzed accidents were not increased, no new accidents were created, and the margin of safety was not decreased. The test identified no problems with the protection rack circuitry on 4-7-76.

ST-45 - Main Steam Trip Valve Rockshaft Stress Evaluation

This procedure was utilized to evaluate the stresses on a main steam trip valve during Unit One power operation. The test equipment employed measured strain and vibrations in the valve rockshaft and body. This equipment did not impair the performance of the trip valves and, hence, did not affect any previously analyzed accident which required use of the valves. Neither did the test and equipment affect the margin of safety or create any new accidents. The results of the test performed on 5-26-76 indicated high strains in the rockshaft which could be alleviated by valve modifications.

ST-46 - Load Measurement for Main Steam Trip Valve

The purpose of this test was to obtain field measurements of loads imposed on the main steam trip valves at cold and operating conditions after the valevs had been modified in accordance with design change 75-41. The test required the use of strain gauge instrumentation to monitor rockshaft performance.

ST-46 - Load Mesurement for Main Steam Trip Valve (continued)

The test setup was such that main steam trip valve performance was not affected, thereby assuring that the margin of safety was not reduced, the consequences of previously analyzed accidents were not increased, and no new accidents were created. Preliminary analysis of the data obtained on 7-7-76 indicated a successful reduction of strain in the main steam trip valve rockshaft after modification.

ST-47 - Service Air Fitting Leakage

This procedure was used to measure the air leakage through a sweated fitting in line 2"-ASC-CD21B downstream of 2-SA-82 at the containment boundary. A test was necessary to quantify leakage experienced during the containment integrated leak rate test on Unit Two. With the station in cold shutdown conditions which do not require containment integrity, the testing imposed no restrictions on previously analyzed accidents and did not reduce the margin of safety. Since all testing equipment was later removed no new accidents were created. The leakage rate was determined on 5-26-76. Subsequent repair of the fitting eliminated the leakage.

ST-48 - Leak Check BD-TV-200E and F

The purpose of this test was to measure the air leakage through steam generator blowdown trip valves BD-TV-200E and BD-TV-200F. The test was necessary to quantify leakage experienced during the containment integrity leak rate test on Unit Two. To preclude reducing the margin of safety and affecting any new or previously analyzed accident, the valves were tested in the cold shutdown condition. The leakage rate was established

ST-48 - Leak Check BD-TV-200E and F (continued)

on 5-26-76 and the valves were later repaired to reduce the leakage to zero.

ST-49 - Leak Check Recirculation Spray Heat Exchanger

This test procedure has been utilized on several occasions to meaure the air leakage from the recirculation spray heat exchangers on both units. Neither new or previously analyzed accidents were created or increased in probability as a result of this testing, since the units were in the cold shutdown condition which did not require the use of the recirculation spray system. Likewise, the margin of safety was not reduced. The procedure was utilized on the following dates on the noted heat exchanger - 5-27-76 (1A), 11-6-76 (2D), 11-7-76 (2C), 11-7-76 (2D), 11-7-76 (1A), 11-7-76 (1B), 11-7-76 (1C) and 11-23-76 (2D). Repairs as necessary were made to any heat exchanger which exhibited air leakage.

ST-50 - Containment Heat Load Determination

The purpose of this procedure was to collect data from station instrumentation to determine the heat load on the containment recirculation air coolers during normal full power operation. Use of existing instrumentation insured that no new accidents were created, while the nature of the test did not reduce the margin of safety or increase the consequences of any previously analyzed accident. Data was collected on both units on 6-18-76 and Unit One only on 9-24-76.

ST-51 - 2A Steam Generator 900 PSI Leak Test

This procedure was used to provide the testing sequence and equipment setup to conduct a 900 psig leak test on the 2A steam generator shell following the installation of a three inch inspection port. The test was performed at cold shutdown conditions to insure that the margin of safety was not reduced and the consequences of any previously analyzed accident were not increased. Special precautions were taken to prevent the creation of any new accident. The test was successfully completed on 10-28-76.

OTHER CHANGES,

TESTS, AND EXPERIMENTS

OTHER CHANGES, TESTS, AND EXPERIMENTS

There were no tests, changes or experiments requiring NRC approval.

PERIODIC TESTS

NOT COMPLETED WITHIN TIME LIMITS

PERIODIC TESTS NOT COMPLETED WITHIN TIME LIMITS

The following Periodic Tests (PT) required by Technical Specifications were not completed within the specified interval. In each case the PT was subsequently run satisfactorily.

PT NO.	TITLE	TECHNICAL SPECIFICATION
PT-17.2	Containment Inside Recirculation Spray Pump	4.5
PT-19.1	RWST Chemical Addition Tank Performance	4.5
PT-22.2C	Diesel No. 3 Fuel Supply	4.1
PT-23.2	Station Batteries (Due 1st quarter 1976)	4.6-2
PT-23.2	Station Batteries (Due 2nd quarter 1976)	4.6-2
PT-23.3	Station Batteries (Due 1st half 1976)	4.6-2
PT-31.3	Seismic Instrumentation Check (Due September, 1976)	4.1
PT-31.3	Seismic Instrumentation Check (Due October, 1976)	4.1
PT-38.5	Secondary Coolant Beta and Gamma Tritium Activity	4.1

CORRECTIVE MAINTENANCE

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 1

JANUARY, 1976

TOTAL NUMBER OF MAINTENANCE ORDERS COMPLETED 77

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
12-22-75	Containment Vacuum Pump	Electrical Penetration Plug Burned Out	None	Installed new Electrical Penetration MR-S1-6530	NA	16 hrs.
1-6-76	Traveling Water Screens Hi-Level 1-CW-S-1D	Loose Baskets-Bolting	None	Tightened all baskets, inspected unit. MR-S1-6648	NA	2 hrs.
1-6-76	Blowdown/Charging Pump Service Water Piping	Erosion	None	Renewed section of pipe 8" WBTB-2-151 MR-S1-6023 & 4801	NA	18 hrs.
1-9-76	EHC System Pump	Broken Vane	None	Renewed pump MR-S1-6618	NA	5 days
1-13-76	Primary Grade Water Pump 1-PG-P-1B	Mechanical Seal	None	Rebuilt mechanical seal MR-S1-6317	NA	4 hrs.
1-14-76	Traveling Water Screens Lo-Level 1 & 2-CW-S-1A B,C,D.	None - Preventative	None	Tightened all baskets, inspected all units. MR-S1-6673	NA	13 hrs.
1-15-76	Traveling Water Screens Hi-Level 1 & 2 CW-S-1A B,C,D,	None - Preventative	None	Tightened all baskets, inspected units, replaced (1) basket on 2C MR-S1-6676	NA	15 hrs.
1-15-76	Gaseous Waste Valves 1-GW-104B, 1-GW-5	Diaphragm	None	Inspected FCV-GW-104B, renewed diaphragm on 1-GW-5 MR-S1-6684	NA	9 hrs.
1-24-76	Vacuum Priming Pump Heat Exchanger on 1-VS-P-1C	Erosion	None	Installed new heat exchanger MR-S1-5154	NA	20 hrs.

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 1
JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-26-76*	Chemical & Volume Control Valve 1-CH-88	Diaphragm	None	Installed new diaphragm & Bonnet MR-S1-6354	NA	2 hrs.
1-26-76*	Chemical & Volume Control Valve 1-CH-106	Diaphragm	None	Renewed Diaphragm MR-S1-6756	NA	1 hr.
1-27-76*	Boric Acid Transfer Pump 1-CH-P-2A	Bearing	None	Renewed bearings and mechanical seal MR-S1-6755	NA	7 hrs.
1-29-76*	Containment Vacuum Pump - Spare	Vanes & Bearings	None	Rebuilt Pump MR-S1-6789	NA	5 hrs.
1-29-76*	Boron Recovery Pump 1-BR-P-6A	Mechanical Seal	None	Renewed mechanical seal MR-S1-6786	NA	14 hrs.

D. S. Taylor

D. S. TAYLOR- SUPERVISOR
MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 1

FEBRUARY, 1976

TOTAL NUMBER OF MAINTENANCE ORDERS COMPLETED 78

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-15-76*	Component Cooling Pump 1-CC-P-1B	None - Preventative	None	Performed Annual Preventative Maintenance MR-S1-6689	NA	26 hrs.
2-3-76*	Gaseous Waste Valve PCV-GW-107	Worn - Parts	None	Rebuilt Valve MR-S1-6838	NA	1 hr.
2-6-76	Traveling Water Screens - Lo Level 1-CW-S-1A	Screen drive motor control switch found in off position causing High Delta P.	None	Renewed three (3) baskets MR-S1-6877	NA	10 hrs.
2-9-76	Traveling Water Screens Hi & Lo Level 1 & 2 -CW-S-1A,B,C,D	None - Preventative	None	Tightened all screen baskets and renewed inserts MR-S1-6904	NA	7 hrs.
2-12-76	Main Condenser Water Box 1-CN-SC-1A	Erosion - 31 leaking tubes	None	Plugged 31 tubes MR-S1-6916	NA	3 hrs.
2-14-76	Main Condenser Water Box 1-CN-SC-1A	Erosion - 3 leaking tubes	None	Plugged 3 tubes MR-S1-6930	NA	2 hrs.
2-16-76	Traveling Water Screens Lo Level 1-CW-S-1D	Chain broken by binding baskets	None	Renewed 2 links of chain and 3 baskets MR-S1-6943	NA	13 hrs.
2-19-76	Main Condenser Water Box 1-CN-SC-1D	Erosion-2 leaking tubes	None	Plugged 2 tubes MR-S1-6989	NA	3 hrs.
2-19-76	Main Condenser Water Box 1-CN-SC-1B	Erosion - 2 leaking tubes	None	Plugged 2 tubes MR-S1-6990	NA	2 hrs.

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 1
FEBRUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
2-22-76	Main Condenser Water Box 1-CN-SC-1C	Erosion -	None	Tested with sound equipment. Plugged 217 tubes and 89 one end only, due to lack of plugs will plug other end later. MR-S1-7009	NA	2 hrs.

D. Taylor

D.S. TAYLOR - SUPERVISOR
MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT #1

FEBRUARY & MARCH, 1976

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
2-24-76	Charging Pump Service Water to Lube Oil Coolers.. 1-CH-P-1A	None - Preventative	None	Renewed piping with 90-10 Cu-Ni. MR-S1-7015	N/A	16 hrs.
3-3-76	Gaseous Waste Compressor GW-C-2B	None - Investigative	None	Disassembled compressor and checked for wear, found no wear, Inst. Tech, Operations and Mechanics resolved problem with valves. MR-S1-6481	N/A	24 hrs.
3-13-76	Charging Pump Service Water to Lube Oil Coolers. 1-CH-P-1B	None - Preventative	None	Renewed piping with 90-10 Cu-Ni. MR-S1-7047	N/A	16 hrs.

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 1

1 of 3 TOTAL NUMBER OF MAINTENANCE ORDERS COMPLETED 200

	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-14-76	Main Steam Non-Return Valve NRV-MS-101A	Severe erosion of valve stem & bonnet gland area - Normal wear	None	Renewed bonnet, stem & seal ring. MR-S1-6564	Cold Shutdown	32 hrs.
3-14-76	Containment Inst. Air Compressors 1-1A-C-2B	Piston rings & valves normal wear	None	Renewed piston rings & valves. MR-S1-7137	Cold Shutdown	24 hrs.
3-14-76	Boron Recovery Bottom Tank. 1-BR-P-9	Boron in pump motor windings-Bearings	None	Renewed pump. MR-S1-7187	Cold Shutdown	3 hrs.
3-14-76	Safety Injection System Relief Valve RV-1857	Lifting early - valve seat-needed cleaning.	None	Disassembeled, cleaned, reassembeled and tested valve. MR-S1-7179	Cold Shutdown	9 hrs.
3-14-76	Charging Pump Service Water to Lube Oil Coolers. 1-CH-E-5C	Erosion of Carbon Steel piping.	None	Repiped with 90-10 Cu.-Ni. MR-S1-7107	Cold Shutdown	16 hrs.
3-15-76	Steam Generator 1-RC-E-1A	Tube Leak	None	Westinghouse Explosive plugged 24 tubes. MR-S1-7073	Cold Shutdown	3-1/3 days
3-15-76	Cont. Inst. Air Compressor 1-1A-C-2A	Piston rings & valves-Normal wear.	None	Renewed piston rings & valves. MR-S1-7135	Cold Shutdown	3-1/2 hrs.
3-15-76	Reactor Coolant System 1-RC-138	Packing - Normal use	None	Repacked with Graphoil packing. MR-S1-7198	Cold Shutdown	3 hrs.
3-16-76	Gaseous Drains Valve 1-DG-14	Diaphragm - Normal	None	Renewed Diaphragm. MR-S1-7205	Cold Shutdown	6 hrs.

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-16-76	Chemical & Volume Control Valves LCV-1460 A & B	Gaskets - Cyclic	None	Renewed cage & bonnet gaskets. MR-S1-7208	Cold Shutdown	7 hrs.
3-16-76	Chemical & Volume Control Valve HCV-1200C	Gasket - Cyclic	None	Renewed bonnet gasket. MR-S1-7210	Cold Shutdown	4-1/2 hrs.
3-16-76	Reactor Coolant Valve 1-RC-95	Gasket - Cyclic	None	Renewed bonnet gaskets & repacked valve. MR-S1-7211	Cold Shutdown	2 hrs.
3-16-76	Reactor Coolant Valve 1-RC-90	Packing - Normal use	None	Repacked with Graphoil packing. MR-S1-7212	Cold Shutdown	5 hrs.
3-16-76	Reactor Coolant Valve 1-RC-58	Packing - Normal use	None	Repacked with Graphoil packing. MR-S1-7214	Cold Shutdown	4-1/2 hrs.
3-16-76	Reactor Coolant Valve PCV-1473	Diaphragm	None	Removed nitrogen regulator and hard piped system. MR-S1-7217	Cold Shutdown	3 hrs.
3-16-76	Pressurizer Line Hydraulic Snubbers	Loose fittings	None	Tightened fitting & filled with oil. MR-S1-7219	Cold Shutdown	4 hrs.
3-16-76	Chemical & Volume Control Valve 1-CH-365	Packing - Normal use	None	Repacked valve. MR-S1-7220	Cold Shutdown	6-1/2 hrs.
3-16-76	Reactor Coolant Valve 1-RC-17	Packing - Normal use	None	Repacked valve. MR-S1-7221	Cold Shutdown	6-1/2 hrs.

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #1

PAGE 3 of 3

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-16-76	Reactor Coolant Valve HCV-1549	Valve internals needed cleaning	None	Cleaned valve internals. MR-S1-7224	Cold Shutdown	3 hrs.
3-16-76	Bergen-Patterson Hydraulic Snubbers	None - Preventative	None	Inspected snubbers - no deficencies MR-S1-7234	Cold Shutdown	2 hrs.
3-17-76	Residual Heat Valve. MOV-1700	Boron eroding the bonnet to limitorque spacer	None	Renewed bonnet to limitorque extension spacer. MR-S1-7233	Cold Shutdown	9 hrs.
3-17-76	Reactor Coolant Valve PCV-1455 A & B	Gaskets - Cyclic	None	Renewed all gaskets in A & B, renewed cage stem & bellows in A. MR-S1-7209	Cold Shutdown	12 hrs.

D. S. TAYLOR, SUPERVISOR - MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #1

APRIL, 1976

PAGE 1 of 1 NUMBER OF M.R. COMPLETED 192

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-1-76	Residual Heat Pump 1-RH-P-1A	Gasket	None	Renewed Gland Seal Gasket MR-S1-7264	Cold Shutdown	2 HRS.
4-2-76	Steam Generator 1-RC-E-1C	Tube Leak	None	Explosively plugged 42 tubes. MR-S1-7374	Cold Shutdown	16 HRS.
4-2-76	Reactor Coolant Relief Valve RV-1203	Bellows	None	Renewed internals reset to 600 psi. MR-S1-7276	Cold Shutdown	20 HRS.

D. S. TAYLOR, SUPERVISOR MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT 1

MAY 1976

TOTAL NUMBER OF M.R. WORKED 118

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-2-76	TV-MS-101A,B,C, Main Steam Trip Valves	Actuator pins not making contact.	None	Fabricated and installed new pins. MR-S1-12183	Cold Shutdown	6 hrs.
5-2-76	1-VS-F-1B Containment Recirc. Fan	Blading sheared from hub - exact cause undetermined.	None	Installed blade & hub assembly. MR-S1-12179	Cold Shutdown	7 hrs.

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 1

MAY, 1976

TOTAL NUMBER OF M.R. COMPLETED 118

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-29-76	CH-P-2C Boric Acid Xfer Pump	Mechanical Seal Normal-wear	None	Renewed mechanical seal.MR-S1-7351	NA	6 hrs.
4-14-76	1-BR-E-9 Piping	Pin Hole Leak on Pipe	None	Pad welded line. MR-S1-7535	NA	1 hr.
4-27-76	1-CN-SC-1C Main Condenser Waterbox	2 existing plugs loose	None	Renewed Plugs MR-S1-12062	NA	3 hrs.
5-3-76	1-CN-SC-1B Main Condenser Waterbox	Tube Leak - Erosion	None	Plugged (1) Tube MR-S1-12188	NA	2 hrs.
5-3-76	1-CN-SC-1C Main Condenser Waterbox	Tube Leak - Erosion	None	Plugged (3) Tubes MR-S1-12198	NA	3 hrs.
5-5-76	1-BD-5 Blowdown Valve	Gasket - Cyclic	None	Renewed Gasket. MR-S1-12409	NA	4 hrs.
5-9-76	#1 Emer. Diesel	#1 Cylinder Head cracked from overheating	None	Renewed #1 cylinder	NA	10 hrs.
5-10-76	1-CN-SC-1B Main Condenser Waterbox	Tube leak - Erosion	None	Plugged (1) Tube MR-S1-12438	NA	3 hrs.
5-12-76	1-CS-SC-1A Main Condenser Waterbox	Tube leak - Erosion	None	Plugged (1) Tube MR-S1-12452	NA	3 hrs.
5-14-76	1-1A-C-2B Containment Inst. Air Compressor	Valves & Piston rings	None	Rebuilt the compressor. MR-S1-12447	NA	2 days

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 1

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-15-76	1-CN-SC-1B Main Condenser Waterbox	Tube leak - Erosion	None	Plugged (1) Tube. MR-S1-12463	NA	3 hrs.
5-26-76	1-SW-P-1B Emergency Service Water Pump	None - Preventative	None	Performed Preventative Maintenance check.	NA	30 hrs.

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT #1

JUNE, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 102

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 14

MONTHLY TOTAL 116

3. DESIGN CHANGES BEING WORKED 76-7, 74-68,74

4. PERIODIC TEST PERFORMED 0

M. S. Taylor
MECHANICAL SUPERVISOR

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT #1

JUNE, 1976

PAGE 1 of 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Requir for Maint
4-2-76	1-DG-P-1B Primary Drains Transfer Pump	Bearings failed,allowed rotor to penetrate stator.	None	Rebuilt Pump. MR-S1-7239	NA	17 hrs.
4-18-76	Number (1) Emergency Diesel	Cracked head.	None	Renewed head, liner, piston assy. on #17 cylinder, renewed rod rings and seals on #17 cylinder. Checked crankshaft deflection. MR-S1-12023	NA	2 days
4-26-76	1-1A-C-2B Containment Instrument Air Compressor	Valves	None	Renewed suction and discharge valves. MR-S1-7512	NA	6 hrs.
4-28-76	1-1A-C-2A Containment Instrument Air Compressor	Valves	None	Renewed suction and discharge valves and hyraulic unloader. MR-S1-12072	NA	6 hrs.
4-30-76	1-CH-169 & 194 CVCS System	Diaphragm	None	Renewed Daiphragms. MR-S1-12148	NA	8 hrs.
4-30-76	8-WBTD-21-151 Steam Generator Blowdown Piping	Erosion	None	Implemented Design Change 76-7 MR-S1-12055	NA	16 hrs.
5-1-76	1-1A-C-2A & B Containment Instrument Air Compressor	Valves & Piston rings	None	Renewed suction & Discharge valves, piston rings. MR-S1-12034	NA	2 days
5-26-76	Nitrogen System	None-Design Change 74-68	None	Implemented Design Change 74-68. MR-S1-12520	NA	24 hrs.

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT #1

JUNE, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Requir for Maint
5-27-76	River Circ. Water Pump 1-CW-P-1D	Bearings	None	Reworked pump. MR-S1-12439	NA	17 days
6-11-76	#1 Emergency Diesel	None-Preventative	None	Tested for cracked heads - found 3 cracked, Added chromates. MR-S1-12492 & 12485	NA	4 days
6-15-76	1-CS-P-1B Containment Vacuum Pump	Vanes	None	Installed rebuilt pump and overhauled spare pump. MR-S1-12617 & 12627	NA	6 hrs.
6-16-76	1-FCV-GW-104B	Worn parts - normal use.	None	Renewed seat ring, stem, packing and gaskets. MR-S1-6919	NA	8 hrs.
6-16-76	Containment Vacuum Pump - Spares	Vanes	None	Rebuilt spare pump. MR-S1-12626 & MR-12628	NA	6 hrs.
6-21-76	Nitrogen Truck Supply	None-Preventative	None	Installed Design Change 74-68 MR-S1-12620	NA	24 hrs.

D. S. Taylor

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT No. 1

JULY, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 147

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 23

MONTHLY TOTAL 170

3. DESIGN CHANGES BEING WORKED _____

4. PERIODIC TEST PERFORMED 0

D. Taylor
MECHANICAL SUPERVISOR

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 1

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
7-19-76	Steam Generator 1-RC-E-1C	Tube Leak	None	Plugged (1) leaking tube and (21) tubes as preventative measure. MR-S1-12852	Cold Shutdown	2 days
7-19-76	Steam Generator 1-RC-E-1A & B	Tube Leak	None	Plugged (1) Tube each generator. MR-S1-12856 & 12839	Cold Shutdown	2 days
7-19-76	Pressurizer Relief Tank	Rupture Disc	None	Renewed rupture disc. MR-S1-12738	Cold Shutdown	12 hrs.
7-19-76	Letdown Relief Valve 1-RV-1203	Valve destroyed internally by continual relieving.	None	Rebuilt, tested and reinstalled valve. MR-S1-22477	Cold Shutdown	10 hrs.
7-20-76	Hydraulic suppressors	None-Preventative	None	Inspected Bergen-Patterson Snubbers no deficiencies. MR-S1-12733	Cold Shutdown	6 hrs.
7-20-76	Reactor Coolant Pump 1-RC-P-1A	Standpipe alarm-could find no problems with pump seals to cause this condition.	None	Inspected all 3 seals-found no indications of problem area. Renewed #2 seal as a preventative measure. Details in W Trip Report. MR-S1-12555	Cold Shutdown	4 days
7-20-76	Containment Instrument Air Compressors 1-1A-C-2A & B	Normal wear	None	Renewed valves & rings - each compressor. MR-S1-12734 & 12735	Cold Shutdown	3 days

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 1

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Requir for Maint
7-1-76	Component Cooling Radiation Monitoring Pumps 1-SW-P-6B & C	Bent Shaft	None	Rebuilt pumps. MR-S1-12076	NA	3 days
7-2-76	Emergency Diesel 1-EM-G-1	Cracked head - previous overheating of engine.	None	Renewed #19 cylinder head. MR-S1-12759	NA	10 hrs.
7-7-76	Main Condenser Waterbox 1-CN-SC-1B	Erosion	None	Plugged (1) Tube. MR-S1-12789	NA	3-1/2 hrs.
7-14-76	Reactor Coolant Filter 1-CH-FL-2	High Delta-P-Normal	None	Changed filters. MR-S1-6419	NA	20 hrs.
7-14-76	Chemical & Volume Control Valve 1-CH-192	Valve stem	None	Renewed bonnet assembly. MR-S1-12166	NA	6 hrs.
7-15-76	Spent Fuel Pit Filter 1-FC-FL-2	High Delta-P-Normal	None	Changed filters. MR-S1-5505	NA	20 hrs.
7-16-76	Reactor Coolant Letdown Filter 1-CH-FL-5	High Delta-P-Normal	None	Changed filters. MR-S1-12562	NA	10 hrs.
7-17-76	Seal Water Injection Filter 1-CH-FL-4A	High Delta-P-Normal	None	Changed filters. MR-S1-12562	NA	10 hrs.
7-18-76	Boric Acid Filter. 1-CH-FL-1	High Delta-P-Normal	None	Changed filters. MR-S12558	NA	10 hrs.
7-20-76	Main Condenser Waterboxes 1-CN-SC-1D	Erosion	None	Plugged (1) tube. MR-S1-12896	NA	4 hrs.

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 1

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Requir for Maint
7-22-76	Main Condenser Water-boxes. 1-CN-SC-1A & B	Erosion	None	Plugged (1) Tube in A waterbox. MR-S1-12926	NA	6 hrs.
7-23-76	Emergency Diesel 1-EM-G-1	Cracked head - previous overheating of engine.	None	Renewed #7 cylinder head. MR-S1-12949	NA	12 hrs.
7-24-76	Containment Instrument Air Compressor 1-1A-C-2A&B	Piston rings	None	Renewed HP & LP Piston rings. MR-S1-12953	NA	10 hrs.
7-24-76	Main Condenser Water-box 1-CN-SC-1C	Erosion	None	Plugged (1) Tube. MR-S1-12956	NA	4 hrs.
7-27-76	Containment Instrument Air Compressor 1-1A-C-2B	Rings and valves	None	Renewed piston rings & valves. MR-S1-12977	NA	10 hrs.
7-30-76	Boron Recovery Valve 1-BR-206	Stem sheared-diaphragm ruptured.	None	Renewed bonnet and diaphragm MR-S1-12931	NA	4 hrs.

D. Taylor

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT NO. 1

AUGUST, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 144

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 13

MONTHLY TOTAL 157

3. DESIGN CHANGES BEING WORKED DC-75-36, DC-75-55, DC-76-2

4. PERIODIC TESTS PERFORMED PT-41

MECHANICAL MAINTENANCE
SUPERVISOR

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 1

AUGUST, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
8-15-76	Reactor Coolant Valve 1-RC-77	Packing	None	Repacked valve on backseat. MR-S1-12904	Cold Shutdown	4 hrs.
8-16-76	Chemical & Volume Control System 1-CH-314	Packing	None	Repacked valve. MR-S1-12903	Cold Shutdown	4 hrs.
8-16-76	Residual Heat Valve MOV-1700	Packing - Preventative	None	Repacked valve. MR-S1-12929	Cold Shutdown	4 hrs.
8-17-76	Steam Generator 1-RC-E-1A	None - Preventative	None	Hydrostatic test of generator-no leaks. MR-S1-13095	Cold Shutdown	3 days
8-17-76	Steam Generator 1-RC-E-1B	Tube Leak	None	Plugged (1) Tube. MR-S1-13096	Cold Shutdown	3 days
8-17-76	Steam Generator 1-RC-E-1C	Tube Leak	None	Plugged (1) Tube. MR-S1-13097	Cold Shutdown	3 days
8-17-76	Containment Instrument Air Compressor. 1-1A-C-2B	Rings - Valves	None	Rebuilt compressor. MR-S1-13144	Cold Shutdown	14 hrs.
8-17-76	#1 Emergency Diesel	None - Preventative	None	Replaced #3,4,5,6,8,9 & 10 cylinder heads. MR-S1-13063	Cold Shutdown	4 days
8-23-76	Chemical & Volume Control System. 1-CH-125	Diaphragm - Grinnell	None	Renewed diaphragm. MR-S1-13020	Hot Shutdown	35 mins.

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 1

AUGUST, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
7-29-76	Containment Instrument Air Compressor 1-1A-C-2B	Valves & piston rings	None	Rebuilt & installed spare compressor. MR-S1-12939	NA	2 days
8-5-76	Main Condenser Waterbox. 1-CN-SC-1B	Erosion	None	Plugged (1) Tube. MR-S1-13038	NA	5 hrs.
8-12-76	Instrument Air Compressor. 1-1A-C-1	Valves & piston rings	None	Rebuilt compressor. MR-S1-13050	NA	3 days
8-18-76	Main Condenser Waterboxes. 1-CN-SC-1A, B, C & D.	Erosion	None	Plugged (1) Tube "C" Waterbox. MR-S1-13159	NA	8 hrs.

Dean S. Taylor

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT #1

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 123

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 44

MONTHLY TOTAL 167

3. DESIGN CHANGES BEING WORKED DC-75-51, Low Head Safety Injection Pre-fab.

DC-75-36, Boron Recovery Modification.

4. PERIODIC TESTS PERFORMED

Dean Taylor
MECHANICAL MAINTENANCE
SUPERVISOR

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-24-76	Chemical/Volume Control System Filter 1-CH-FL-4B	Clogged filter - Normal use	None	Renewed filter element. MR-S1-12561	NA	5 hrs.
9-26-76	Containment Vacuum System Valve 1-HCV-1310A	Gasket - Cyclic	None	Renewed gasket. MR-S1-13432	NA	6 hrs.
9-27-76	Safety Injection System Valve, 1-HCV-1898	Gasket - Cyclic	None	Renewed gasket. MR-S1-13435	NA	6 hrs.
9-27-76	Chemical/Volume Control System Valve 1-CH-416	Diaphragm - Cyclic	None	Renewed diaphragm. MR-S1-13735	NA	2 hrs.
9-28-76	Safety Injection System Valve. 1-HCV-1936	Gasket, seal - Cyclic	None	Renewed gasket & seal. MR-S1-13436	NA	8 hrs.
9-28-76	Reactor Coolant System Steam Gen. 1-RC-E-1B	Possible tube leak	None	Found no leak, renewed manway gasket. MR-S1-13737	NA	6 days
9-28-76	Reactor Coolant System Steam Gen. 1-RC-E-1A	Possible tube leak	None	Found no leak, renewed manway gasket. MR-S1-13736	NA	6 days
9-28-76	Chemical/Volume Control System Valve 1-CH-RV-1203	Seat, disc - Normal wear	None	Renewed complete valve. MR-S1-13261	NA	10 hrs.
9-29-76	Containment Vacuum System Valve 1-LCV-1460B	Air line - Normal wear	None	Renewed air line. MR-S1-13379	NA	2 hrs.
9-29-76	Safety Injection System Valve. 1-HCV-1549	Diaphragm - Cyclic	None	Renewed diaphragm. MR-S1-13434	NA	2 hrs.
9-29-76	Containment Vacuum System Valve 1-HCV-1200B	Air line - Normal wear	None	Renewed air line. MR-S1-13351	NA	2 hrs.

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-29-76	Reactor Coolant System Valve. 1-PCV-1455A	Packing - Normal wear	None	Renewed packing. MR-S1-13299	NA	3 hrs.
9-29-76	Safety Injection System Valve 1-HCV-1550	Diaphragm - Cyclic	None	Renewed diaphragm. MR-S1-13433	NA	4 hrs.
9-29-76	Reactor Coolant Steam Gen. 1-RC-E-1C	Tube - Erosion	None	Plugged (1) tube. MR-S1-1-734	NA	6 days
9-29-76	Reactor Coolant System Tank 1-RC-TK-2	Rupture disc gasket - Cyclic	None	Renewed (1) rupture disc & gasket. MR-S1-13300	NA	20 hrs.
9-30-76	Containment Instrument Air Compressors 1-IA-C-2A,B,	Piston rings - Normal wear	None	Renewed piston rings. MR-S1-13714	NA	20 hrs.

UNIT NO. 1

MECHANICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-3-76	Containment Instrument Air Compressors 1-1A-C-2A,B	Rings and valves	None	Renewed piston rings, valves and gaskets. MR-S1-13312	NA	10 hrs.
9-7-76	Main Condenser Water-box 1-CW-SC-1D	Tube leak - Erosion	None	Plugged (1) tube. MR-S1-13376	NA	4 hrs.
9-9-76	Boron Recovery Steam Feed Heaters 1-BR-E-10A,B,	Tube Leak 10A	None	Plugged (1) tube. MR-S1-13309	NA	4 days
9-10-76	Chemical & Volume Control System valve 1-CH-29	Grinnel diaphragm valve - Diaphragm	None	Renewed diaphragm. MR-S1-13403	NA	2 hrs.
9-12-76	Traveling Water Screens Lo-Level 1-CW-S-1B	Baskets & chain	None	Renewed 4 baskets & 3 links of chain. MR-S1-13409	NA	10 hrs.
9-15-76	Chemical & Volume Control System Valve 1-CH-132	Grinnell diaphragm valve-Diaphragm	None	Renewed diaphragm. MR-S1-12505	NA	2 hrs.
9-18-76	Main Condenser Water-box	Tube Leak - Erosion	None	Plugged (1) tube. MR-S1-13457	NA	4 hrs.
9-27-76	Circ. Water System Traveling Screens 1-CW-S-1C	Wire bottom torn on six (6) baskets.	None	Renewed 6 baskets. MR-S1-13719	NA	10 hrs.
9-28-76	Heating Steam Boiler "B" Boiler	Leaking tubes - Normal wear.	None	Rolled 60 floor tubes & renewed gaskets. MR-S1-12713	NA	80 hrs.

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

UNIT 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-20-76	Circulating Water 1-CW-S-1C and 1D	High Delta-P	None	Repaired or replaced 18 baskets. MR-S1-13780	Cold Shutdown	20 hrs.
10-23-76	Main Steam MSR A-B-C-D	Tube Leaks	None	Tested for leaks, found none. MR-S1-114084	Cold Shutdown	3 days
10-24-76	Safety Injection 1-SI-171	Valve plugged.	None	Unclogged valve. MR-S1-13940	Cold Shutdown	6 hrs.
10-24-76	Reactor Coolant MOV 1535 & 1536	Packing leaks	None	Tightened Packing. MR-S1-13901	Cold Shutdown	2 hrs.
10-24-76	Safety Injection Valves.	Packing leaks	None	Repacked 1SI4-10, 12 & 77. Adjusted 1-SI71. MR-S1-13944	Cold Shutdown	6 hrs.
10-25-76	Feedwater MOV-FW-151C	Body to bonnet leak	None	Replaced bonnet gasket. MR-S1-13920	Cold Shutdown	6 hrs.
10-25-76	Feedwater MOV-FW-151E	Packing leak	None	Repacked valve. MR-S1-13919	Cold Shutdown	4 hrs.
10-25-76	CVCS 1-CH-166	Bonnet leak	None	Replaced diaphragm. MR-S1-13864 Grinnell	Cold Shutdown	1 hr..
10-25-76	CVCS 1-CH-314	Packing leak	None	Repacked valve. MR-S1-13910	Cold Shutdown	3 hrs.
10-25-76	Safety Injection MOV-1866 A,B,C,D,E,F	Packing leak	None	Repacked valve. MR-S1-13929	Cold Shutdown	20 hrs.
10-25-76	Refueling 1-RL-F-1	High delta-P	None	Replaced filter. MR-S1-14134	Cold Shutdown	2 hrs.
10-25-76	Feedwater MOV-151A	Would not engage.	None	Operated valve satisfactorily. MR-S1-13752	Cold Shutdown	2 hrs.
10-25-76	Safety Injection 12 SI Valves	Packing leaks	None	Repacked valves. MR-S1-13930	Cold Shutdown	20 hrs.
10-25-76	Heating Steam 1A Boiler	Tube leak	None	Plugged 4 tubes. MR-S1-13895	Cold Shutdown	2 days

UNIT 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-26-76	Reactor Coolant 1-RC-61	Packing leak.	None	Adjusted packing. MR-S1-13925	Cold Shutdown	2 hrs.
10-27-76	CVCS MOV-1275A	Packing leak.	None	Adjusted packing. MR-S1-14231	Cold Shutdown	2 hrs.
10-27-76	CVCS MOV-1275B	Packing leak.	None	Adjusted packing. MR-S1-14232	Cold Shutdown	2 hrs.
10-28-76	Spray Nozzles - Hi & Lo Level Intakes	Nozzles plugged.	None	Cleaned nozzles. MR-S1-13396	Cold Shutdown	10 hrs.
10-28-76	Hydraulic suppressors 1-RC-HSS-109-118-112-9-6 11-13-14-124-143.	Low on fluid.	None	Refilled to normal level. MR-S1-14165	Cold Shutdown	10 hrs.
10-28-76	Circulating Water 1D Screen Low Level	Screen inoperative.	None	Installed 6 baskets. MR-S1-13716	Cold Shutdown	20 hrs.
10-28-76	Circulating Water 1A Screen Low Level	Screen inoperative.	None	Installed 4 baskets. MR-S1-13463	Cold Shutdown	10 hrs.
10-29-76	Radiation Monitor Pump	Low flow	None	Renewed vanes. MR-S1-14294	Cold Shutdown	2 hrs.
10-30-76	Steam Generator Sample System	Malfunctioning valve.	None	Renewed valve. MR-S1-13704	Cold Shutdown	2 hrs.
10-30-76	Containment Spray MOV-CS-101A & B	Valve leaks through	None	Lapped valve - test satisfactory. MR-S1-14221	Cold Shutdown	30 hrs.
10-30-76	Circulating Water 1-CW-S-10	Screen inoperative	None	Replaced 8 baskets. MR-S1-13458	Cold Shutdown	30 hrs.
10-31-76	Primary Grade Water 1-PG-10	Valve leaks through	None	Renewed diaphragm. MR-S1-12475 (Grinnell)	Cold Shutdown	2 hrs.
10-31-76	Gaseous Waste 1-GW-115-116-126	Diaphragms leaking	None	Renewed diaphragms. MR-S1-13444 (Grinnell)	Cold Shutdodn	4 hrs.

UNIT 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-31-76	Containment Vacuum TV-CV-150B	Excessive leak through	None	Lapped seat to disc - tested satisfactory. MR-S1-14313	Cold Shutdown	10 hrs.
10-31-76	Containment Vacuum TV-CV-150C	Excessive leak through	None	Lapped seat to disc - tested satisfactory. MR-S1-14314	Cold Shutdown	10 hrs.
10-31-76	Containment Vacuum TV-CV-150D	Excessive leak through	None	Lapped seat to disc - tested satisfactory. MR-S1-14315	Cold Shutdown	10 hrs.
10-31-76	Containment Vacuum TV-CS-150A	Excessive leak through	None	Lapped seat to disc - tested satisfactory. MR-S1-14312	Cold Shutdown	10 hrs.
10-31-76	Safety Injection 1-SI-9	Valve clogged.	None	Unclogged line and valve. MR-S1-13454	Cold Shutdown	3 days
10-31-76	Sample System 1-SS-1A	Valve stuck shut	None	Cleaned valve internals. MR-S1-14025	Cold Shutdown	3 hours
10-31-76	Safety Injection 1-SI-166	Valve clogged.	None	Unclogged line and valve. MR-S1-13941	Cold Shutdown	10 hrs.

UNIT 1

MECHANICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-1-76	Circulating Water D Waterbox	Tube leak	None	Plugged 5 tubes. MR-S1-13401	NA	4 hrs.
10-1-76	Instrument Air 1-IA-C-2A & 2B	Low amps	None	Replaced valves. MR-S1-13769	NA	20 hrs.
10-3-76	Circulating Water all Low Level Screens	Grinding noise.	None	Replaced 4 baskets. MR-S1-13793	NA	10 hrs.
10-3-76	Circulating Water 1-CS-S-1C	Screen would not rotate.	None	Replaced 6 baskets. MR-S1-13805	NA	10 hrs.
10-5-76	Circulating Water A Waterbox	Tube leak	None	Plugged 1 tube. MR-S1-13819	NA	5 hrs.
10-11-76	Boron Evaporator 1-BR-E-2A	Tube leak.	None	Checked for leaking tubes - found none. MR-S1-13863	NA	20 hrs.
10-15-76	Circulating Water 1-CW-S-1C	Screen would not rotate.	None	Replaced foot sprocket. MR-S1-13822	NA	40 hrs.
10-17-76	Refueling Canal Gate	Inflatable seal leak.	None	Replaced seal. MR-S1-13914	NA	6 hrs.

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-1-76	Reactor Coolant Valve TV-1519A	Valve Leaking through. (Cyclic)	None	Renewed valve diaphragm (Grinnell) MR-S1-14326	NA	4 hours
11-2-76	Gaseous Waste Valves 1-BR-67 & 68	Diaphragm leakage. (Cyclic)	None	Renewed valve diaphragms (Grinnell) MR-S1-13197	NA	3 hours
11-4-76	Chemical & Volume Control System Valves MOV-1287A,B & C	Valves leak through. (Normal use)	None	Lapped valve disc to seat.	NA	20 hours
11-4-76	Chemical & Volume Control System Valves MOV-1286A,B & C	Valves leak through. (Normal use)	None	Lapped valve disc to seat. MR-S1-13989	NA	20 hours
11-5-76	Chemical & Volume Control System Valve FCV-1160	Valve leak through. (Normal use)	None	Installed new valve internals. MR-S1-14318	NA	20 hours
11-7-76	Main Steam L.P. Turbine	Rupture disc leaking. (Cyclic)	None	Replaced rupture disc. MR-S1-13897	NA	10 hours
11-7-76	Ventilation System 1-VS-F-1A-B-C	Refueling (PM)	None	Performed Liquid Penetrant test on all blades - satisfactory. Checked blade settings. MR-S1-19233	NA	20 hours
11-7-76	Gland Steam L.P. Turbine	Labrinth seal leaking at #6 bearing.	None	Replaced labrinth seals. MR-S1-14363	NA	100 hours
11-7-76	Service Air 1-SA-C1	Annual Inspection (PM)	None	Performed annual inspection. MR-S1-14363	NA	20 hours
11-7-76	Main Steam L.P. Turbine	Rupture disc leaking. (Cyclic)	None	Replaced rupture disc. MR-S1-13896	NA	10 hours
11-3-76	Containment Escape Hatch	DC-76-10	None	Chicago Bridge and Iron installed Escape Hatch. MR-S1-14356	NA	120 hours

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-8-76	Emergency Diesel #3	Air side of radiator dirty. (PM)	None	Cleaned radiator. MR-S1-13188	NA	4 hours
11-9-76	Containment Vacuum Valve TV-CV-150D	Valve leaks through. (Normal Use)	None	Lapped valve disc.to seat. MR-S1-14431	NA	10 hours
11-10-76	Emergency Diesel #1	Air side of radiator dirty. (PM)	None	Cleaned radiator. MR-S1-13187	NA	4 hours
11-11-76	Instrument Air 1-IA-C-2B	Annual Inspection (PM)	None	Performed Annual Inspection. MR-S1-14224	NA	20 hours
11-11-76	Instrument Air 1-IA-C-2A	Annual Inspection (PM)	None	Performed Annual Inspection. MR-S1-14223	NA	20 hours
11-11-76	Liquid Waste Pump 1-LW-P-6A	Mechanical seal leak. (Normal wear)	None	Replaced mechanical seal. MR-S1-13491	NA	10 hours
11-12-76	Radiation Monitor Pump CC-P-6A-C & D	Pumps not pumping. (Normal wear)	None	Replaced gaskets - bushings & adjusted packing. MR-S1-13492	NA	10 hours
11-12-76	Safety Injection valve HCV-1936	Body to bonnet leak. (Cyclic)	None	Replaced bonnet gasket. MR-S1-14348	NA	6 hours
11-12-76	Safety Injection valve MOV-1885C	Packing leaking.(Cyclic)	None	Repacked valve. MR-S1-14447	NA	4 hours
11-12-76	Containment Spray valves. MOV-CS-101C & D	Valves leak through. (Normal use)	None	Lapped valve discs to seats. MR-S1-14321	NA	12 hours
11-13-76	Instrument Air valve 1-IA-446	Valve leaks through. (Normal use)	None	Lapped valve disc to seat. MR-S1-14452	NA	6 hours
11-13-76	Instrument Air valve 1-IA-939	Valve leaks through. (Normal use)	None	Lapped valve disc to seat. MR-S1-14451	NA	6 hours

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-16-76	Circulating Water Traveling Screen 1-CW-S-1C	Loose baskets. (Cyclic)	None	Replaced two (2) screens baskets. MR-S1-14493	NA	4 hours
11-17-76	Chemical and Volume Control System Pump 1-CH-P-1B	Casing gasket leak. (Normal use)	None	Replaced casing gasket. MR-S1-14083	NA	20 hours
11-19-76	Chemical and Volume Control System line 2-CH-5-1502	Indication found during ISI PT inspection.	None	Buffed indication subsequent PT satisfactory. MR-S1-14510	NA	6 hours
11-19-76	Chemical and Volume Control System Pump 1-CH-P-1B	Mechanical seal leak. (Cyclic)	None	Replaced mechanical seal. MR-S1-14511	NA	10 hours
11-20-76	Safety Injection line, 6-SI-49	Indication found during ISI PT Inspection.	None	Lightly surface ground indication, subsequent PT satisfactory.	NA	6 hours
11-20-76	Safety Injection line,2-SI-74	Indication found during ISI PT Inspection.	None	Lightly surface ground indication, subsequent PT satisfactory.	NA	6 hours
11-22-76	Refueling System Transfer Car	Damage to car and up-ender. (Casualty)	None	Replaced Transfer Car. MR-S1-14358	NA	400 hours
11-22-76	Reactor Coolant 1-RC-E-1C	Tube removal from Steam Generator	None	Westinghouse removed tube R2-C42 for inspection. MR-S1-14544	NA	200 hours
11-24-76	Reactor Vessel ISI Inspection	None	None	Westinghouse performed ISI Inspection of Reactor Vessel Nozzles, etc. MR-S1-14218	NA	400 hours
11-24-76	Circulating Water Traveling Screen 1-CW-S-2D	Broken Baskets	None	Rebuilt screen. MR-S1-12942	NA	40 hours

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-24-76	Chemical & Volume Control System line 1-CH-56-152	Suspect line plugged with boron.	None	Verified line not plugged. MR-S1-14351	NA	3 hours
11-30-76	Boron Recovery Filter 1-BR-FL-3B	High D/P (Cyclic)	None	Replaced filter assembly. MR-S1-12886	NA	4 hours
11-30-76	Boron Recovery Filter 1-BR-FL-3A	High D/P (Cyclic)	None	Replaced filter assembly. MR-S1-5525	NA	4 hours

D. S. TAYLOR, SUPERVISOR - MECHANICAL MAINTENANCE

UNIT NO. 1

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

DECEMBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 116

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 32

MONTHLY TOTAL 148

3. DESIGN CHANGES BEING WORKED DC-73-23, 74-14, 76-31

4. PERIODIC TESTS PERFORMED

MECHANICAL MAINTENANCE
SUPERVISOR

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-6-76	Reactor Coolant Pipe 4" RC-151502	Indication found during ISI Inspection	None	Lightly ground weld crown, subsequently UT satisfactory. MR-S1-14548	NA	10 hours
12-8-76	Snubbers 2-WFPD HSS-8-10 & 3	Leaking fittings and reservoirs	None	Installed repair kits and refilled MR-S1-14644	NA	40 hours
12-12-76	Reactor Coolant Check Valve 1-RC-160	Leaks through (Normal use)	None	Lapped disc to seat. Tested satisfactory. MR-S1-14327	NA	10 hours
12-13-76	Sample System Valve TV-SS-102B	Leaks through (Normal use)	None	Replaced valve internals. MR-S1-14199	NA	10 hours
12-13-76	Sample System Valve TV-SS-104B	Leaks through (Normal use)	None	Replaced valve internals. MR-S1-14208	NA	10 hours
12-13-76	Sample System Valve TV-SS-104A	Leaks through (Normal use)	None	Adjusted valve stroke and spring tension. MR-S1-14209	NA	3 hours
12-17-76	Reactor Coolant T_h Nozzles	Inspect nozzles (3) for ISI Inspection	None	Performed PT and visual inspection of all three (3) Reactor T_h Nozzles. MR-S1-14559	NA	20 hours
12-19-76	Reactor Coolant Line 4" RC-15502	Support weld indication	None	Reinspected weld, found satisfactory. MR-S1-14442	NA	4 hours
12-19-76	Safety Injection Valve ISI-109	Leaks through (Normal use)	None	Lapped disc to seat, tested satisfactory. MR-S1-12760	NA	10 hours
12-19-76	Safety Injection Valve ISI-147	Leaks through (Normal use)	None	Lapped disc to seat, tested satisfactory. MR-S1-14616	NA	10 hours
12-20-76	Safety Injection Valve ISI-130	Leaks through (Normal use)	None	Lapped disc to seat, tested satisfactory. MR-S1-14614	NA	10 hours

UNIT NO. 1

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-20-76	Recirculating Spray Sump Penetration Welds	Welds leak	None	Ground out welds and rewelded, tested satisfactory. MR-S1-15940	NA	60 hours
12-22-76	Reactor Coolant Valve 1-RC-160	Leaks through (normal use)	None	Lapped disc to seat, tested satisfactory. MR-S1-14724	NA	10 hours
12-22-76	Reactor Coolant Valve PCV-1455 A & B	Packing leaks (Cyclic)	None	Repacked both valves. MR-S1-13746	NA	6 hours
12-27-76	Safety Injection Valve MOV-1869B	Body to bonnet leak (Cyclic)	None	Renewed bonnet gasket. MR-S1-13990	NA	6 hours
12-27-76	Residual Heat Removal Valve MOV-RH-1700	Packing leaks (Cyclic)	None	Repacked valves. MR-S1-14789	NA	4 hours
12-28-76	Chemical and Volume Control Valve RV-1203	Valve lifts low and leaks through (Cyclic)	None	Repaired valve internals and set lift pressure at 600 PSI. MR-S1-13867	NA	20 hours
12-29-76	Reactor Coolant Valve PCV-1456	Valve leaks through (Normal use)	None	Machined seat and disc, lapped disc to seat, tested satisfactory. MR-S1-13366	NA	20 hours
12-29-76	Reactor Coolant Valve PCV-1455C	Leaks through (normal use)	None	Machined seat and disc, lapped disc to seat, tested satisfactory. MR-S1-13368	NA	20 hours
12-30-76	Vents Gaseous Valve TV-VG-109B	Leaks through (normal use)	None	Lapped disc to seat, tested satisfactory. MR-S1-14429	NA	10 hours
12-30-76	Safety Injection Valve ISI-129	Leaks through (normal use)	None	Lapped disc to seat, tested satisfactory. MR-S1-14615	NA	20 hours

UNIT NO. 1

MECHANICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-3-76	Liquid Waste Filter 1LW-FL-3	High D/P (Normal use)	None	Replaced filter element. MR-S1-12885	NA	4 hours
12-6-76	Main Steam Valve PCV-MS-102	Leaks through (Normal use)	None	Rebuilt valve internals. MR-S1-13323	NA	80 hours
12-6-76	Main Steam #1 L.P Turbines	Routine inspection of blading - manway cover removal.	None	Inspection satisfactory, replaced covers. MR-S1-14186	NA	40 hours
12-13-76	Circulating Water "A" Waterbox	Eddy Current (Routine)	None	Eddy Current of 10% of tubes. MR-S1-14449	NA	70 hours
12-13-76	Circulating Water "B" Waterbox	Eddy Current (Routine)	None	Eddy Current of 10% of tubes. MR-S1-14364	NA	70 hours=
12-14-76	Circulating Water Traveling Water Screen Low Level "1C"	Will not rotate (Cyclic)	None	Rebuilt screen. MR-S1-13788	NA	100 hours
12-14-76	Safety Injection Access Platforms	None Installed	None	Manufactured platforms for all three (3) accumulators. MR-S1-14440	NA	100 hours
12-19-76	Ventilation System PT-16.4 of VS-100A B, C and D	Manufacture Test Blank	None	Manufactured test blank. MR-S1-12849	NA	10 hours
12-22-76	Component Cooling Pump 1-CC-P-1A	Mechanical Seal Leak (Normal use)	None	Replaced mechanical seal. MR-S1-14638	NA	20 hours
12-29-76	Circulating Water Traveling Screen Low Level "1C"	Loose baskets (Cyclic)	None	Replaced one (1) basket. MR-S1-14796	NA	4 hours

UNIT NO. 1

MECHANICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-29-76	Circulating Water Traveling Screen High Level "1D"	Broken Inserts (Cyclic)	None	Replaced eleven (11) inserts and five (5) baskets. MR-S1-14788	NA	10 hours

D. S. TAYLOR, SUPERVISOR-MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 2

JANUARY, 1976

TOTAL NUMBER OF MAINTENANCE ORDERS COMPLETED 173

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
12-26-75*	Charging Pump 2-CH-P-1B	Erosion - Restriction orifice	None	Repair weld - Pin hole leak MR-S2-5229	NA	3½ hrs.
1-2-76	Main Condenser Water Box 2-CN-SC-1D	Suspect - Tube to Tube Sheet Roll	None	Plugged 57 tubes MR-S2-5257	NA	3 hrs.
1-2-76	Main Condenser Water Box 2-CN-SC-1D	Suspect - Tube to Tube Sheet Roll	None	Plugged 60 tubes MR-S2-5259	NA	2½ hrs.
1-2-76	Steam Generator Blow-down Piping 2" WGCB-601	Erosion	None	Pad welded discharge pipe near 2-BD-14 MR-S2-5252	NA	5 hrs.
1-2-76	Main Condenser Water Box 2-CN-SC-1C	Suspect-Tube to Tube Sheet Roll	None	Plugged 81 tubes MR-S2-5247	NA	3 hrs.
1-3-76	Containment Vacuum Pump 2-CS-P-1B	Condensation in line	None	Removed water from suction line MR-S2-5246	NA	2½ hrs.
1-4-76	Traveling Water Screens Hi-Level 2-CW-S-1D	Overload of trash against baskets	None	Replaced 5 baskets MR-S2-5264	NA	7 hrs.
1-7-76	Steam Generator Blow-down Tank 2-BD-TK-8	Erosion - Steam impingment	None	Welded patch on tank MR-S2-5122	NA	10 hrs.
1-10-76	Bearing Cooling Heat Exchanger 2-BC-E-1A	Erosion	None	Plugged 5 tubes, cleaned drain valve. MR-S2-5289	NA	20 hrs.

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 2
JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-17-76	Containment Inst. Air Compressors 2-1A-C-2B	Gasket	None	Renewed gasket on oil cover changed oil in 2-1A-C-2A,B, MR-S2-5331	NA	1 hr.
1-17-76	Main Feedwater Reg. Valve FCV-2498	Packing - Normal use	None	Repacked with Grafoil packing MR-S2-5297	Cold Shutdown	1 hr.
1-18-76	Main Steam Trip Valve TV-MS-201C	Packing - Normal use	None	Repacked valve MR-S2-4890	Cold Shutdown	2½ hrs.
1-18-76*	Reactor Coolant System Valve 2-RC-20	Packing - Normal use	None	Repacked with Grafoil packing MR-S2-5335	Cold Shutdown	11 hrs.
1-18-76	Steam Generator Blow-down Trip Valve TV-BD-200B	Gasket - Cyclic	None	Installed Fisher recommended Gasket Set. MR-S2-4547	Cold Shutdown	8 hrs.
1-18-76	Steam Generator Blow-down Valve 2-BD-18	Gasket - Cyclic	None	Renewed Bonnet Gasket MR-S2-5291	Cold Shutdown	1 hr.
1-18-76*	Reactor Coolant System Hydraulic Snubbers	None - Preventative	None	Inspected Bergen-Patterson Snubbers MR-S2-5342	Cold Shutdown	2 hrs.
1-18-76	High Press. Heater Drains Pump 2-SD-P-1B	Press. Breakdown sleeve - allowed packing erosion	None	Renewed pressure breakdown sleeve and packing sleeve MR-S2-5321	Cold Shutdown	28 hrs.
1-18-76	Main Steam Flow Transmitter Root Valves 2-MS-96,130,131,167, 170	Packing - Normal use	None	Repacked valves MR-S2-5334	Cold Shutdown	6 hrs.
1-18-76*	RWST Overflow	None - Design Change 74-1	None	Implemented Design Change 74-1 MR-S2-3803	Cold Shutdown	8 hrs.
1-18-76*	Chemical & Volume Control System	Line clogged with Boron, FT 2110 Leaking	None	Cleared line of Boron and renewed Flow Transmitter 2110 MR-S2-5062 & 4377	Cold Shutdown	3 hrs.

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 2

JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-19-76	Secondary Drains Level Control Valve LCV-SD-206	Type of Trim. Needs to be changed to Stellite Guide.	None	Renewed valve stem, MFG. Guide Bushings and sleeved plug guides MR-S2-4232	Cold Shutdown	24 hrs.
1-19-76	Pressurizer Relief Valve PCV-2455C	Solenoid Valve	None	Renewed Solenoid Valve MR-S2-5349	Cold Shutdown	3½ hrs.
1-19-76*	Steam Generator 2-RC-E-1C	Erosion	None	Explosive plugged (2) Tubes Row 1 Column 62, Row 2 Column 48 MR-S2-5333	Cold Shutdown	48 hrs.
1-19-76	Hydraulic Snubbers Grinnell Safeguards Area	Gasket on Reservoir	None	Renewed gaskets on reservoir MR-S2-5347	NA	5 hrs.
1-19-76	Feedwater Valve MOV-FW-251A	Valve was jammed on backseat - possible over-torque	None	Removed motor - operated valve by hand - reinstalled motor MR-S2-5354	Cold Shutdown	3 hrs.
1-20-76	Main Steam Dump Valve TV-MS-205B	Packing - Normal use	None	Repacked valve MR-S2-5376	Cold Shutdown	1 hr.
1-20-76	Main Condenser Water Box 2-CN-SC-1B	None	None	Investigated could find no indication of leaks. MR-S2-5375	NA	3 hrs.
1-20-76*	Residual Heat Valve MOV-2700	Packing-Temp. packing from construction had not been changed	None	Repacked valve with Graphoil ribbon pack. MR-S2-5360	Cold Shutdown	7½ hrs.
1-22-76*	Reactor Coolant Valve 2-RC-16	Packing - Normal use	None	Repacked with Graphoil MR-S2-5428	Cold Shutdown	2 hrs.
1-23-76*	Main Steam Trip Valve TV-MS-201B	Rockshaft was cracked on end near actuator	None	Renewed Rockshaft and sent broken shaft to Battelle Lab. MR-S2-5386	Cold Shutdown	30 hrs.
1-23-76*	Main Steam Trip Valve TV-MS-201A	None - Preventative	None	Removed Rockshaft and sent to Battelle Lab. MR-S2-5419	Cold Shutdown	30 hrs.

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 2
JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-23-76*	Main Steam Trip Valve TV-MS-201C	None - Preventative	None	Inspected valve MR-S2-5420	Cold Shutdown	30 hrs.
1-23-76*	Main Steam Trip Valves 2-MS-100,101,133,134, 171, 172	None - Preventative Valves no longer needed.	None	Removed valves and capped lines MR-S2-5427	Cold Shutdown	20 hrs.
1-23-76	Traveling Water Screens Lo-Level 1 & 2-CW-S-1A, B C, D	None - Preventative	None	Tightened all baskets and inspected all units MR-S2-5438	NA	5 hrs.
1-23-76	Traveling Water Screens Hi-Level 1 & 2-CW-S-1A, B,C,D,	None - Preventative	None	Tightened all baskets and inspected all units. MR-S2-5439	NA	5 hrs.
1-23-76*	Feedwater Valve 2-FW-33	None - Preventative	None	Installed new valve MR-S2-5426	Cold Shutdown	4 hrs.
1-23-76*	Steam Generator Blowdown valves 2-BD-21,22,24	None - Preventative	None	Installed new valves MR-S2-5425	Cold Shutdown	5 hrs.
1-23-76*	Steam Generator Blowdown valves 2-BD-11, 12, 14	None - Preventative	None	Installed new valves MR-S2-5445	Cold Shutdown	15 hrs.
1-27-76	Main Condenser Water Box 2-CN-SC-1B	Suspect tube to tube-sheet roll.	None	Plugged 106 tubes MR-S2-5476	NA	5 hrs.
1-27-76*	Containment Vacuum Pump 2-CV-P-1B	Elect. penetration plug shorted	None	Installed new elect. penetration plug. MR-S2-5477	NA	12 hrs.
1-28-76*	Containment Vacuum Pump 2-CV-P-1A	Vanes	None	Installed rebuilt pump MR-S2-5490	NA	4 hrs.
1-31-76*	Instrument Air Compressor 2-1A-C-1	None - Preventative	None	Performed annual P.M. MR-S2-5308	NA	13 hrs.

D. S. TAYLOR-SUPERVISOR
MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 2

FEBRUARY, 1976

TOTAL NUMBER OF MAINTENANCE ORDERS COMPLETED 151

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req For Main
1-13-76	Instrument Air Compressor 2-1A-C-1	None - Preventative	None	Performed Annual Preventative Maintenance MR-S2-5306	NA	12 hrs.
1-18-76	Blowdown Trip Valve TV-BD-200D	Gasket - Cyclic	None	Renewed gasket set with new type graphite impregnated flexitallic. MR-S2-4536	NA	4 hrs.
2-4-76	Traveling Water Screens Hi- Level 2-CS-S-1B	Strainer - High ΔP	None	Cleaned strainer & replaced (3) nozzles MR-S2-5616	NA	2 hrs.
2-5-76*	Containment Access Emergency Hatch	None - Preventative DC 73-127	None	Implemented Design Change 73-127 MR-S2-5522	Cold Shutdown	16 hrs.
2-6-76	Blowdown System Valves 2-BD-1-2 & 4	None - Preventative	None	Renewed valves with sealed Bonnet Valves (Conoval) MR-S2-5527	Cold Shutdown	12 hrs.
2-6-76 *	Main Steam Trip Valve TV-MS-201A	Packing	None	Renewed stuffing box gasket & repacked. MR-S2-5614	Cold Shutdown	11 hrs.
2-6-76	Reactor Coolant System Orifice	Gasket - Cyclic	None	Renewed flange gaskets MR-S2-4861	Cold Shutdown	1 hr.
2-6-76	"B" Reactor Coolant Pump Seal Water By-pass line	Gasket - Cyclic	None	Renewed flex gasket. MR-S2-4862	Cold Shutdown	1½ hrs.

MECHANICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 2
FEBRUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
2-7-76*	Main Steam Non-Return Valve MS-NRV-201A	Steam cut in Bonnet Seal ring area	None	Repaired steam cut & renewed bonnet seal ring. MR-S2-5523	Cold Shutdown	40 hrs.
2-7-76	Safety Injection Check Valve 2-SI-79 & 85	Gasket - Cyclic	None	Renewed flexitallic gasket MR-S2-5619 and 5627	Cold Shutdown	4 hrs.
2-7-76*	Safety Injection Check Valves 2-SI-240 & 238	Gasket - Cyclic	None	Renewed flexitallic gasket MR-S2-5615 & 4867	Cold Shutdown	4 hrs.
2-7-76*	Bergen-Patterson Hydraulic Snubbers	None - Preventative	None	Inspected snubbers - no defiencies MR-S2-5528	Cold Shutdown	3½ hrs.
2-8-76*	Steam Generator 2-RC-E-1C	Tube Leak - Denting Tube Wall thinning	None	Explosively plugged 42 tubes MR-S2-5525	Cold Shutdown	5 days
2-10-76	Service Water Pumps 2-SW-P-4A,B,	None-Preventative Design Change 73-76	None	Implemented Design Change 73-76 MR-S2-5068	NA	8 hrs.
2-10-76*	Main Steam Trip Valve TV-MS-201A	Linkage adjustment	None	Adjusted linkage MR-S2-5672	Hot Shutdown	5 hrs.
2-11-76	Reactor Coolant Valve 2-RC-24	Packing	None	Replaced valve MR-S2-5660	NA	1 hr.
2-11-76	Residual Heat Valve MOV-RH-2700	Packing	None	Repacked valve MR-S2-5661	NA	5 hrs.
2-17-76*	Liquid Waste Pump LW-P-8	Mechanical Seal	None	Renewed mechanical seal MR-S2-5351	NA	8 hrs.
2-23-76	Traveling Water Screens Hi-Level 2-CW-S-1D	Baskets	None	Renewed (2) baskets tightened all bolts. MR-S2-5852	NA	5½ hrs.

D.S. TAYLOR - SUPERVISOR
MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 2

OUTAGE TUBE LEAK C STEAM GENERATOR

TOTAL NUMBER OF MAINTENANCE ORDERS COMPLETED 123

	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-6-76	Reactor Coolant Valve 2-RC-77	Packing - Normal use	None	Repacked valve. MR-S2-5931	Cold Shutdown	7 hrs.
3-7-76	2-RC-E-1C Steam Generator	Tube Leak - cause not yet determined	None	Westinghouse Explosive plugged 115 tubes. MR-S2-5928	Cold Shutdown	40 hrs.
3-7-76	Reactor Coolant Valve 2-RC-9	Packing - Normal use	None	Repacked valve. MR-S2-4856	Cold Shutdown	4 hrs.
3-7-76	Cont. Inst. Air Compressor 2-1A-C-2B	Valves - Normal wear	None	Renewed suction and discharge valves and piston rings. MR-S2-5948 & 5941	Cold Shutdown	3 hrs.
3-7-76	Sampling System Trip Valve. 2-TV-SS-201A	Bellows ruptured - normal use.	None	Rebuilt valve. MR-S2-5914	Cold Shutdown	8 hrs.
3-7-76	Reactor Coolant Valve 2-RC-95	Packing - Normal use	None	Repacked valve. MR-S2-5668	Cold Shutdown	3 hrs.
3-7-76	Reactor Coolant Valve MOV-2535	Packing - Normal use	None	Repacked valve. MR-S2-5666	Cold Shutdown	1 hr.
3-7-76	Reactor Coolant Valve 2-RC-60	Packing - Normal use	None	Repacked valve. MR-S2-4857	Cold Shutdown	2 hrs.
3-8-76	Charging Pumps 2-CH-P-1B	Service Water Line to Coolers - Erosion	None	Renewed piping with 90-10 Cu-Ni MR-S2-5657	Cold Shutdown	16 hrs.
3-9-76	Charging Pumps 2-CH-P-1A	Service Water Line to Coolers - Erosion	None	Renewed piping with 90-10 Cu-Ni MR-S2-5971	Cold Shutdown	16 hrs.

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-10-76	Charging Pumps 2-CH-P-1C	Service water line to Coolers - Erosion	None	Renewed piping with 90-10 Cu-Ni MR-S2-5954	Cold Shutdown	16 hrs.
3-11-76	Cont. Inst. Air Compressor 2-1A-C-2A	Valves - Normal wear	None	Renewed suction & discharge valves. MR-S2-6009	Cold Shutdown	2-1/2 hrs.

D. S. Taylor

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT 2

MAY, 1976

PAGE 1 of 4

TOTAL NUMBER OF M.R. COMPLETED 245

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-28-76	2-CH-FL-2	Normal use. High delta P.	None	Changed filters. MR-S2-5688	NA	6 hrs.
5-8-76	TV-BD-200E Blowdown Trip Valve	Bonnet Gasket - Cyclic	None	Renewed gasket set. MR-S2-5633	Refueling Shutdown	9 hrs.
5-11-76	MOV-RS-256A Recirc. Spray System	Failed PT-16.4. Seat leakage	None	Reseated valve. MR-S2-12333	Refueling Shutdown	4 days
5-11-76	FCV-2113B CVCS System	Diaphragm	None	Renewed diaphragm. MR-S2-4125	Refueling Shutdown	3 hrs.
5-12-76	TV-BD-200F Blowdown Tirp Valve	Gasket - Cyclic	None	Renewed gasket set. MR-S2-12392	Refueling Shutdown	10 hrs.
5-12-76	2-CH-21 CVCS System	Diaphragm	None	Renewed diaphragm. MR-S2-5506	Refueling Shutdown	2 hrs.
5-12-76	MOV-CS-200B Containment Spray System.	PT 16.4 seat leakage	None	Reseated valve. MR-S2-3994	Refueling Shutdown	3 days
5-12-76	BR-P-4B Primary Drain Tank Pump	None - Preventative	None	Performed semi-annual PM. MR-S2-5720	Refueling Shutdown	17 hrs.
5-13-76	2-EE-EG-1 Emergency Diesel	None - Preventative	None	Performed semi-annual PM. MR-S2-6187	Refueling Shutdown	3 days
5-13-76	TV-MS-201A,B,C, Main Steam Trip Valves	None - Preventative	None	Accomplished Design Change 75-41 MR-S2-12302 & 12089	Refueling Shutdown	18 days

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-14-76	TV-2519 A & B Primary Grade Water System	Diaphragm	None	Renewed diaphragm. MR-S2-12436 & 6129	Refueling Shutdown	4 hrs.
5-15-76	FCV-2177 CVCS System	None- Preventative	None	Inspected valve internals. MR-S2-12396	Refueling Shutdown	6 hrs.
5-15-76	2-RC-160 Reactor Coolant System	PT-16.4 - seat leakage	None	Reseated valve. MR-S2-12437	Refueling Shutdown	10 hrs.
5-15-76	2-RS-11 Recirc. Spray System	PT-16.4 - seat leakage	None	Reseated valve. MR-S2-12374	Refueling Shutdown	20 hrs.
5-16-76	TV-SS-201B Sampling System	Bellows	None	Renewed bellows. MR-S2-5747	Refueling Shutdown	10 hrs.
5-16-76	TV-SI-201B Safety Injection System	PT-16.4 - seat leakage	None	Reseated valve. MR-S2-12410	Refueling Shutdown	20 hrs.
5-16-76	FCV-2160 CVCS System	PT-16.4 - seat leakage	None	Reseated valve. MR-S2-12408	Refueling Shutdown	10 hrs.
5-16-76	MOV-CS-201C & D Containment Spray System	PT-16.4 - seat leakage	None	Reseated valve MR-S2-12372	Refueling Shutdown	120 hrs.
5-20-76	HCV-2500 Safety Injection System	PT-16.4 - seat leakage	None	Reseated valve MR-S2-12435	Refueling Shutdown	10 hrs.
5-20-76	2-RC-60, 2-PG-132, TV-PG-2519A	PT-16.4 - seat leakage	None	Reseated 2-RC-160, renewed diaphragm on 2-PG-132 & adjusted stroke on TV-PG-2519A. MR-S2-12482	Refueling Shutdown	30 hrs.

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-20-76	TV-MS-201C Main Steam Trip Valves	None - Special Eng. Test.	None	Installed linkage containing strain gage. MR-S2-12496	Refueling Shutdown	6 hrs.
5-20-76	Accumulator Level Transmitters	None - Design Change	None	Installed Design Change 73-23. MR-S2-6159	Refueling Shutdown	200 hrs.
5-20-76	MOV-CS-201A & B Containment Spray System	PT-16.4 - Seat leakage	None	Reseated valve MR-S2-12385	Refueling Shutdown	120 hrs.
5-21-76	PCV-2456 Reactor Coolant System	Suspected seat leakage	None	Inspected valve internals - reseated MR-S2-5091	Refueling Shutdown	30 hrs.
5-21-76	#3 Emergency Diesel	None - Design Change 74-97	None	Performed mechanical function on Design Change 74-97. MR-S2-12507	Refueling Shutdown	6 hrs.
5-21-76	PCV-2455C Reactor Coolant System	Suspected seat leakage	None	Inspected valve internals- MR-S2-5108	Refueling Shutdown	30 hrs.
5-22-76	2-RC-E-1B Steam Generator	Gasket	None	Repaired handhole gasket seating area by machining. MR-S2-12499	Refueling Shutdown	60 hrs.
5-23-76	2-CH-P-1A,B,C, Charging Pumps	None - Preventative DC 75-43	None	Installed miniflow orifices as per Design Change 75-43- MR-S2-12380	Refueling Shutdown	15 days
5-24-76	2-RC-E-1B Steam Generator	Tube Thinning	None	Explosive plugged 102 tubes. MR-S2-12085	Refueling Shutdown	25 days

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-25-76	Safety Injection Check Valves 2-SI-79,82,85, 91,88,94, 241, 242, 243, 109, 147	None - Preventative	None	Renewed bonnet gaskets. MR-S2-12443	Refueling Shutdown	8 days
5-25-76	2-RC-E-1A Steam Generator	Tube leak - Erosion	None	Explosive plugged 101 tubes and assisted Westinghouse in obtaining a tube support plate sample. MR-S2-12083, 12413 & 12514	Refueling Shutdown	25 days
5-25-76	2-RC-E-1C Steam Generator	None - Preventative	None	Explosive plugged 21 tubes. MR-S2-12091	Refueling Shutdown	25 days
5-25-76	TV-SI-200 Safety Injection System	Lower cage gasket cut.	None	Renewed gaskets, packing & adjusted stroke. MR-S2-12424	Refueling Shutdown	10 hrs.
5-25-76	2-DG-10 Gaseous Drains System	Diaphragm	None	Renewed diaphragm MR-S2-12368	Refueling Shutdown	2 hrs.
5-26-76	2-VS-F-1A,B,C Containment Recirc. Fans	None	None	Reset fan blades for pressure test and restored to normal. MR-S2-5888 12361, 12519	Refueling Shutdown	20 hrs.
5-26-76	TV-SI-201A Safety Injection System	PT-16.4 - seat leakage	None	Reseated valve MR-S2-12523	Refueling Shutdown	20 hrs.
5-26-76	2-SI-229 Safety System	Gasket - Cyclic	None	Renewed bonnet gasket. MR-S2-12356	Refueling Shutdown	10 hrs.
5-26-76	FIC-2155 Reactor Coolant Flow Transmitter	Boron Blockage on float	None	Cleaned Transmitter. MR-S2-12560	Refueling Shutdown	10 hrs.

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-1-76	2-CW-P-1A River Circ. Pump	None - Preventative	None	Renewed bearing, reworked shaft to shaft coupling & aligned. MR-S2-5818	NA	55 days
5-24-76	2-LO-E-1A & B Main Lube Oil Cooler	Tube Leak - Erosion	None	Plugged 114 tubes 2-LO-E-1A. Plugged 41 tubes 2-LO-E-1B. MR-S2-5704	NA	10 days
5-25-76	2-FW-E-3B Feedwater Heater	Tube Leak - Erosion	None	Plugged 5 tubes. MR-S2-5434	NA	30 hrs.

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT #2

JUNE, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 186

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 35

MONTHLY TOTAL 221

3. DESIGN CHANGES BEING WORKED 75-22, 76-4, 74-21, 75-52, 75-111, 75-21

4. PERIODIC TEST PERFORMED 2

Dean Taylor
MECHANICAL SUPERVISOR

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #2

JUNE, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-22-76	2-RC-E-2 Pressurizer	None	None	Stenciled bolts for inservice inspection requirements. MR-S2-12044	Refueling Shutdown	10 hrs.
4-22-76	Steam Generator Main Steam Safety Valves	None - PT-13.0	None	Performed PT-13.0. MR-S2-5722	Refueling Shutdown	5 hrs.
5-8-76	2-1A-C-2A & B Containment Instrument Air Compressors	None-Preventative	None	Overhauled Compressors. MR-S2-12395	Refueling Shutdown	24 hrs.
5-8-76	Pressurizer Safety Valves	None-PT-12.0	None	Performed PT-12.0. MR-S2-5716	Refueling Shutdown	6 hrs..
5-15-76	Auxiliary Feed Pump 2-FW-P-3A	None-Preventative	None	Performed Annual P.M. Renewed thrust shoes and liner. MR-S2-6178	Refueling Shutdown	5 days
5-18-76	Auxiliary Feed Pump 2-FW-P-2 & 2-FW-T-2	None- Preventative	None	Performed Annnual P.M. Renewed inboard & outboard thrust shoes. MR-S2-6177 & MR-S2-6179	Refueling Shutdown	2 weeks
5-18-76	Steam Generator 2-RC-E-1B & C	None-Design Change 75-22 & 76-4	None	Performed Design Changes 75-22 & 76-04. MR-S2-12093 & 12094	Refueling Shutdown	19 days
5-20-76	Feedwater Flow Venturi	None-Preventative	None	Flushed Venturi Nozzles. MR-S2-12425	Refueling Shutdown	6 days
5-21-76	2-CH-P-1C Charging Pump.	None-Preventative	None	Performed Annual P.M. check. MR-S2-5714	Refueling Shutdown	11 days

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #2

JUNE, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-21-76	Boron Evap. Pump 1-BR-P-1A	None-Preventative	None	Performed Annual P.M. MR-S2-5717	Refueling Shutdown	4 days
5-23-76	Sampling System valve TV-SS-201A	Ruptured bellows	None	Renewed bellows. MR-S2-5744	Refueling Shutdown	6 hrs.
5-25-76	Containment Instrument Air Compressor 2-1A-C-2A,B,	None - Preventative Design Change 74-21 & 75-52	None	Implemented Design Change 74-21 & 75-52 MR-S2-12375	Refueling Shutdown	21 days
5-25-76	Reactor Coolant Pump 2-RC-P-1C	None - Preventative	None	Inspected #1,2 & 3 Mechanical Seals. MR-S2-12348	Refueling Shutdown	5 days
5-25-76	Reactor Coolant Pump 2-RC-P-1B	None - Preventative	None	Inspected #2 & 3 Mechanical Seals. Renewed #2 Seal Assy. MR-S2-12347	Refueling Shutdown	6 days
5-25-76	Reactor Coolant Pump 2-RC-P-1A	None - Preventative	None	Inspected #2 & 3 Mechanical Seals. MR-S2-12346	Refueling Shutdown	5 days
5-25-76	Safety Injection Check Valves	None - Preventative	None	Renewed Flexatialic Gaskets in (9) 6" and (3) 12" check valves. MR-S2-12443	Refueling Shutdown	3 days
5-26-76	Safety Injection Trip Valve. TV-S1-201A	Seat and Disc marred.	None	Machined, lapped and blued. MR-S2-12523	Refueling Shutdown	2 days
5-26-76	Mechanical portion of Refueling	None - Refueling	None	Performed work as per OP-4.1. MR-S2-12353	Refueling Shutdown	29 days

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #2
JUNE, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-28-76	Recirc. Spray System Valve 2-RS-255A & B	None - Preventative	None	Installed new valves per Design Change 75-111. MR-S2-12341,12570 & 12571	Refueling Shutdown	30 days
5-28-76	Containment Instrument Air Compressor. 2-1A-C-2A & B	Packing	None	Renewed Packing. MR-S2-12575 & 12576	Refueling Shutdown	2 hrs.
5-28-76	Hydraulic Snubber	None - Preventative	None	Inspected hydraulic snubber as per MMP-P-G-014. MR-S2-12301	Refueling Shutdown	10 days
5-29-76	Safety Injection Valve MOV-S1-2860A &B	Slight scoring	None	Lapped, blued & tested. MR-S2-12336 & 12237	Refueling Shutdown	30 hrs.
5-29-76	Main Steam Power Operated Relief Valve RV-MS-201C	Seat scored	None	Renewed seat, lapped & blued. MR-S2-5637	Refueling Shutdown	48 hrs.
5-29-76	Recirc. Spray Heat Exchanger 2-RS-E-1A	Erosion	None	(1) Tube Leaking, plugged a pattern of 7 tubes. MR-S2-12542	Refueling Shutdown	24 hrs.
5-30-76	Steam Generator Feed Pump 2-FW-P-1A	None - Preventative	None	Performed annual P.M. MR-S2-6181	Refueling Shutdown	12 days
5-30-76	Low Head Safety Injection System	None - Design Change 75-51	None	Completed Design Change 75-51. MR-S2-6105	Refueling Shutdown	36 days
5-31-76	Containment Vacuum Pump 2-CV-P-1A,B	Vanes	None	Installed rebuilt pumps. MR-S2-12587 & MR-S2-12588	NA	4 hrs.

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #2

JUNE, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
6-24-76	Reactor Purification System 1-RL-P-1B	Mechanical Seal	None	Renewed Mechanical Seal.. MR-S2-12378	NA	6 hrs.
6-25-76	Safety Injection System Flow Transmitter FI-2942	Erosion	None	Renewed Flow Transmitter. MR-S2-12817	NA	7 hrs.

D. S. Taylor

D. S. TAYLOR - SUPERVISOR, MECHANCIAL MAINTENANCE

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT #2

JUNE, 1976

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Requir for Maint
4-29-76	Traveling Water Screens Lo-Level	Normal Use	None	Cleaned piping and nozzles, and renewed rubber deflector lips. MR-S2-5715	NA	5 days
5-26-76	Extraction Steam Safety Valve SV-MS-206A	Gasket	None	Renewed flange gasket. MR-S2-6158	Refueling Shutdown.	1 day
6-2-76	Main Condenser Water Boxes, 2-CS-SC-1A,B, C & D	Erosion	None	Plugged (1) Tube in C & D. MR-S2-12603	NA	10 hrs.
6-10-76	Main Turbine #4 Bearing	Bearing wiped during startup.	None	Renewed #4 Bearing. MR-S2-12618	NA	7 days
6-13-76	Main Condenser Water Box 2-CW-SC-1C	Erosion	None	Plugged (3) tubes. MR-S2-12730	NA	3 hrs.
6-14-76	Main Condenser Water Box 2-CW-SC-1B	Erosion	None	Plugged (1) Tube. MR-S2-12740	NA	3 hrs.

D. S. Taylor

D. S. Taylor, Supv. Mech. Maint.

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT NO. 2

JULY, 1976

1.	MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS	72
2.	MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS	2
	MONTHLY TOTAL	74
3.	DESIGN CHANGES BEING WORKED	
4.	PERIODIC TEST PERFORMED	0

MECHANICAL SUPERVISOR

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 2

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
7-15-76	Chilled Water Pump 1-CD-P-1B	Mechanical seal	None	Rebuilt outboard mechanical seal. MR-S2-12967	NA	10 hrs.
7-20-76	Boric Acid Filter 2-CH-FL-1	High Delta-P-Normal	None	Changed filters. MR-S2-12628	NA	10 hrs.

D. Taylor

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT NO. 2

AUGUST, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 50

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 5

MONTHLY TOTAL 55

3. DESIGN CHANGES BEING WORKED DC-75-55, DC-76-2

4. PERIODIC TESTS PERFORMED PT-41

Dean Taylor

MECHANICAL MAINTENANCE
SUPERVISOR

MECHANICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 2

AUGUST, 1976

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
7-31-76	10"-SI-362-153 10"-SI-363-153	None - Preventative	None	Ground area by weld number 15 & rewelded as per L.H.S.I. Design Change Report. MR-S2-13066	Cold Shutdown	2 days
8-2-76	Pressurizer Relief Tank	Rupture disc had minute crack.	None	Renewed rupture disc. MR-S2-13095	Cold Shutdown	12 hrs.
8-2-76	Letdown Relief Valve. RV-2203	Seat damage.	None	Reworked, tested and reinstalled valve. MR-S2-13092	Cold Shutdown	12 hrs.

MECHANICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 2

AUGUST, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
8-11-76	Liquid Waste Pump 1-LW-P-2B	Mechanical seal	None	Renewed mechanical seal. MR-S2-13108	NA	2 days
8-20-76	Main Condenser Waterbox. 2-CN-SC-1C	Erosion	None	Plugged (2) tubes. MR-S2-13177	NA	6 hrs.

Dean Taylor

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

UNIT NO. 2

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 107

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 33

MONTHLY TOTAL 140

3. DESIGN CHANGES BEING WORKED DC- 76-39, 2A Steam Generator Tube Removal, DC-76-4, J. Tube Modification 2A Steam Generator.

4. PERIODIC TESTS PERFORMED

Dean Taylor
MECHANICAL MAINTENANCE
SUPERVISOR

UNIT NO. 2

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-17-76	Steam Generator Blow-down Trip Valve. TV-BD-200C	Gasket - Cyclic	None	Renewed gasket set. MR-S2-13077	Cold Shutdown	10 hrs.
9-18-76	Pressurizer Spray Valve PCV-1455B	Packing - Normal use	None	Repacked valve. MR-S2-13329	Cold Shutdown	2 hrs.
9-19-76	Feedwater valve MOV-FW-251 E & F	Packing - Normal use	None	Repacked valve. MR-S2-13346	Cold Shutdown	8 hrs.
9-19-76	Reactor Coolant System valve. HCV-2557A	Packing - Normal use	None	Repacked valve. MR-S2-13342	Cold Shutdown	2 hrs.
9-19-76	Reactor Coolant System valve. LCV-2460A	Packing - Normal use	None	Repacked valve. MR-S2-13341	Cold Shutdown	2 hrs.
9-19-76	Chemical & Volume Control System valve HCV-2311	Packing - Normal use	None	Repacked valve. MR-S2-13330	Cold Shutdown	2 hrs.
9-19-76	Bergen Patterson Hydraulic Snubbers	None - Preventative	None	Inspected snubbers & checked fittings. MR-S2-13326	Cold Shutdown	4 hrs.
9-20-76	Residual Heat Valve MOV-2700	None - Preventative	None	Repacked valve. MR-S2-13323	Cold Shutdown	2 hrs.
9-21-76	Chemical & Volume Control System value HCV-2310A	Gasket - Cyclic	None	Renewed bonnet gasket & repacked valve. MR-S2-13350	Cold Shutdown	10 hrs.
9-22-76	Sampling System Trip Valve SS-201A	Bellows assembly packing gaskets - Cyclic	None	Renewed bellows assembly, packing, gaskets. MR-S2-13331	NA	12 hrs.
9-23-76	Chemical & Volume Control System RV-2203	Seat, disc, bellows assembly - Cyclic	None	Renewed complete valve. MR-S2-12454	NA	4 hrs.

UNIT NO. 2
MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-23-76	Reactor Coolant System Valves 2-RC-12, 2-RC-13	Packing - Normal use	None	Renewed packing. MR-S2-13357	NA	6 hrs.
9-27-76	Chemical/Volume Control System Valves. 2-CH-208 2-CH-210	Diaphragm - Cyclic	None	Renewed diaphragm. MR-S2-12901	NA	2 hrs.

UNIT 2

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

OCTOBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 38

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 12

MONTHLY TOTAL 50

3. DESIGN CHANGES BEING WORKED DC-76-08, DC-76-04, DC-76-03, DC-76-44, DC-73-23, DC-76-46

4. PERIODIC TESTS PERFORMED

MECHANICAL MAINTENANCE
SUPERVISOR

UNIT 2

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

Page 1 of

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-1-76	Polar Crane	Galled gearing	None	Replaced gears in #1 Gear Box. MR-S2-12096	Cold Shutdown	100 hrs.
10-4-76	Steam Generator 2-RC-E-1B	Tube plug leaking.	None	Welded leaking plug. MR-S2-13324	Cold Shutdown	3 days
10-6-76	Steam Generaotr 2-RC-E-1C	Tube leak.	None	Plugged 4 tubes. MR-S2-13325	Cold Shutdown	3 days
10-11-76	Decay Heat Release. HCV-MS-204	Bonnet leak	None	Welded steam cut. MR-S2-12869	Cold Shutdown	3 days
10-11-76	Air Compressor. 2-SA-C-1A	Gasket leak.	None	Replaced head gasket. MR-S2-13483	Cold Shutdown	4 hrs.
10-13-76	Reactor Coolant Orifices "B" FE-2491 "C" FE-2482	Flange leaks	None	Replaced gaskets. MR-S2-13455	Cold Shutdown	6 hrs.
10-14-76	Reactor Coolant Valves. 2-RC-90, 2-RC-91, 2-RC-41, 2-RC-51	Packing leaks, flange leak.	None	Adjusted packing, tightened flange. MR-S2-13454	Cold Shutdown	2 hrs.
10-14-76	Chemical & Volume Control System 2-CH-P-1C	Pump casing leak.	None	Replaced gasket. MR-S2-13394	Cold Shutdown	3 days
10-16-76	Recirc. Spray System 2-RC-E-1A	Chloride Stress Corrosion	None	Hydrolasered piping. MR-S2-13521	Cold Shutdown	10 hrs.
10-20-76	Circulating Water 2-CW-P-2B	Pump low discharge pressure.	None	Rebuilt pump. MR-S2-13211	Cold Shutdown	5 days
10-22-76	Fuel Handling Crane	Design Change	None	Implemented.D.C. MR-S2-12664	Cold Shutdown	3 days
10-27-76	Steam Generator 1-RC-E-1A	Design Change	None	Implemented D.C. MR-S2-13389	Cold Shutdown	10 days

D. S. TAYLOR - SUPERVISOR, MECHANICAL MAINTENANCE

UNIT NO. 2

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

NOVEMBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 74

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 17

MONTHLY TOTAL 91

3. DESIGN CHANGES BEING WORKED DC-76-31

4. PERIODIC TESTS PERFORMED

MECHANICAL MAINTENANCE
SUPERVISOR

UNIT NO. 2

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-3-76	Main Steam System Valves PCV-MS-202 MOV-MS-207	Seat, Disc leakage (Normal wear)	None	Lapped disc to seats & renewed gaskets. MR-S2-13497	NA	10 hours
11-3-76	Safety Injection System Tank 2-SI-TK-2 & valve 2-SI-9	Solidified boric acid and scale.	None	Opened tank and removed scale and boric acid. Cut valve out to remove boric acid plug & rewelded. MR-S2-13425	NA	60 hours
11-11-76	Chemical & Volume Control System Pump 2-CH-P-1A	Gasket - Cyclic	None	Renewed head gasket. MR-S2-13438	NA	40 hours
11-14-76	Chilled Water System Air Ejector Condensers 1-CD-EJ-2A & 2B	Tube leaks - Corrosion	None	Replaced tube bundles. MR-S2-6130	NA	40 hours
11-16-76	Chemical & Volume Control System Pump 2-CH-P-1A	Mechanical seal leaks. (Normal wear)	None	Replaced mechanical seal. MR-S2-13592	NA	20 hours
11-16-76	Feedwater valves FCV-255A,B & C	Packing leakage (Cyclic)	None	Repacked valves. MR-S2-13579	NA	10 hours
11-17-76	Chemical & Volume Control System RV-2203	Relief valve leaking through.	None	Tested valve to 500 psi, no leakage noted. MR-S2-13584	NA	6 hours
11-17-76	Reactor Coolant 2-RC-E-1-C Steam Generator	Opened primary manways for suspected tube leaks.	None	Leak tested and closed S/G. MR-S2-13502	NA	10 hours
11-18-76	Reactor Coolant 2-RC-E-1B Steam Generator	Opened primary manways for suspected tube leaks.	None	Leak tested and closed S/G. MR-S2-13503	NA	10 hours

UNIT NO. 2

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS)

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-19-76	Reactor Coolant 2-RC-E-1A Steam Generator	Opened primary manways for tube plugging.	None	Leak tested, W plugged 5 tubes. MR-S2-13552	NA	10 hours
11-19-76	Chemical & Volume Control System Pump. 2-CH-P-1C	Mechanical seal leaks. (Cyclic)	None	Replaced mechanical seal. MR-S2-13556	NA	10 hours
11-19-76	Recirculating Spray System 2-RS-E-1D Cooler	Tube leakage.	None	Plugged two (2) Tubes. MR-S2-13585	NA	100 hours
11-19-76	Reactor Coolant 2-RC-E-1B Steam Generator	Diaphragm retaining screws broken.	None	Drilled out and replaced broken 1/4" - 20 screws. MR-S2-13608	NA	6 hours
11-21-76	Reactor Coolant 2-RC-E-2 Pressurizer Relief Tank	Rupture disc leaking.	None	Replaced rupture disc. MR-S2-13637	NA	10 hours
11-25-76	Circulating Water Screen 2-CW-S-1A	Drive pin sheared.	None	Replaced one (1) basket & one (1) drive pin. MR-S2-13655	NA	4 hours
11-25-76	Reactor Coolant 2-RC-E-1A-1B-1C	Tube leaks.	None	Westinghouse performed preventative plugging (402 tubes). MR-S2-13499	NA	100 hours
11-26-76	Safety Injection Relief Valve RV-2885C	Valve leak through.	None	Lapped valve disc to seat. Tested satisfactory. MR-S2-13661	NA	10 hours

D. S. TAYLOR, SUPERVISOR - MECHANICAL MAINTENANCE

UNIT NO. 2

MONTHLY OPERATING SUPPLEMENT SHEET
MECHANICAL MAINTENANCE

DECEMBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 149

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 32

MONTHLY TOTAL 181

3. DESIGN CHANGES BEING WORKED DC-76-31

4. PERIODIC TESTS PERFORMED

MECHANICAL MAINTENANCE
SUPERVISOR

UNIT NO. 2

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-2-76	Service Water System 1-SW-P-1C	None-Annual Preventative Maintenance	None	PM performed in accordance with MMP-P-SW-006 MR-S2-6185	NA	20 hours
12-4-76	Chemical and Volume Control System	Solidification of Boron	None	Rodded out solidified boron. MR-S2-13613	NA	20 hours
12-4-76	Safety Injection System	Lines plugged with solidified boron	None	Cut lines and removed solidified boron and rewelded. MR-S2-13618	NA	30 hours
12-4-76	Seal Water Injection Filter 2-CH-FL-4A	Normal usage	None	Renewed filter elements. MR-S2-12630	NA	10 hours
12-6-76	Safety Injection Accumulators	Design Change 73-23	None	Modified sensing lines. MR-S2-13615	NA	30 hours
12-7-76	Seal Water Injection Filter 2-CH-FL-4B	Normal usage	None	Renewed filter elements. MR-S2-12631	NA	10 hours
12-7-76	"C" Stm. Generator Support Straps	Bolts over stressed	None	Renewed existing Vascomax bolts with new ones. MR-S2-13744	NA	40 hours
12-7-76	Safety Injection System SI-TK-2	Gasket deteriorated	None	Cleaned gasket surfaces and renewed gaskets. MR-S2-13736	NA	10 hours
12-7-76	"B" Stm. Generator Support Straps.	Bolts over stressed.	None	Renewed existing Vascomax bolts with new ones. MR-S2-13785	NA	40 hours
12-7-76	Service Water System 1-SW-P-1A	None-Annual Preventative Maintenance	None	PM performed in accordance with MMP-P-SW-006. MR-S2-6184	NA	20 hours
12-7-76	"A" Stm. Generator Support Straps	Bolts over stressed	None	Renewed existing Vascomax bolts with new ones. MR-S2-13746	NA	40 hours
12-8-76	Hydraulic Snubbers 2-WFPD-HSS 5 & 2	Normal usage	None	Rebuilt both snubbers. MR-S2-13740	NA	20 hours

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-8-76	Hydraulic Snubbers SHP-HSS-14A & 14B	Normal usage	None	Installed new "O" ring kits in reservoirs and filled with oil. MR-S2-12871	NA	10 hours
12-8-76	"A" Main Steam Line Hydraulic Snubber Reservoir	Normal usage	None	Installed new "O" ring kit in reservoir and filled with oil. MR-S2-12907	NA	10 hours
12-8-76	Grinell Snubbers SHP-HSS-16,17,18,19, 20	Normal usage	None	Installed new "O" ring kits in reservoirs and filled with oil MR-S2-12867	NA	10 hours
12-9-76	Reactor Coolant Sys. HVC-2522-B	Normal usage	None	Replaced diaphragm MR-S2-13739	NA	5 hours
12-9-76	Reactor Coolant Sys. Steam Generator Manways	None	None	Retorqued primary manway bolts to 1600 foot pounds. MR-S2-13765	NA	10 hours
12-9-76	Containment Access Door	Normal usage	None	Replaced two bearings and adjusted door. MR-S2-13713	NA	10 hours
12-9-76	Main Steam System Steam Generator Manways	None	None	Retorqued secondary manways to 500 foot pounds and handholes to 250 foot pounds. MR-S2-13766	NA	10 hours
12-9-76	Snubber 2-HSS-RH-20	Normal usage	None	Install new "O" ring kit and filled reservoir with oil. MR-S2-13781	NA	8 hours
12-11-76	Circulating Water Sys. Main Condensers	Normal usage	None	Plugged one tube - "A" Box Plugged one tube - "B" Box Plugged two tubes- "D" Box MR-S2-13788	NA	20 hours
12-15-76	Charging System FE-1127	None - Inspection	None	Inspected orifice and verified no blockage. MR-S2-13815	NA	5 hours

UNIT NO. 2

MECHANICAL MAINTENANCE

(SAFETY RELATED SYSTEMS DURING OUTAGE OR REDUCED POWER PERIODS).

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-15-76	Reactor Coolant System Control Rod Drive Mechanism D-6	Stuck Rod	None	Disassembled Control Rod Drive Mechanism, replaced latching mechanism and reassembled. MR-S2-13808	NA	20 hours
12-17-76	Reactor Coolant System Plug Leaking Tubes in "A" S/G	Design Problem	None	One hundred-fifty-one Tubes (151) plugged by Westinghouse. MR-S2-13318	NA	4 days
12-19-76	Main Steam Generator "A"	None-Inspection	None	Opened secondary side for inspection of Top Support Plate and tube bundle. MR-S2-13344	NA	40 hours
12-24-76	Chemical and Volume Control System RV-2203	Recurring problem with this valve.	None	Removed valve and replaced with one from Unit #1. MR-S2-13854	NA	20 hours
12-24-76	Reactor Coolant System Steam Generator Tubes 2A Steam Generator	Design Problem	None	Removed manways, plugged two (2) tubes, closed manways. MR-S2-13912	NA	15 hours

UNIT NO. 2

MECHANICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-15-76	Chemical and Volume Control System FIC 2158	Normal usage	None	Removed flow element, cleaned and reassembled. MR-S2-13813	NA	
12-15-76	Main Steam System 2-TV-MS-201A-B-C	Packing Cyclic	None	Repacked and adjusted packing as necessary. MR-S2-13805	NA	
12-19-76	Bearing Cooling System Heat Exchangers A & B	Unknown	None	Plugged nine (9) tubes in "B" and two (2) tubes in "A". Replaced expansion joint in "B". MR-S2-13711	NA	
12-20-76	High Level Intake Screen 2-CW-SID	Normal usage	None	Replaced two (2) baskets. MR-S2-13877	NA	
12-23-76	Gaseous Drain 2-DG-14	Normal usage	None	Renewed valve bonnet and diaphragm. MR-S2-13913	NA	

D. S. TAYLOR, SUPERVISOR - MECHANICAL MAINTENANCE

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 1

JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-2-76*	MOV-CS-101A	Dirty Contacts on torque switch	None	Cleaned torque switch contacts MR-S1-6613	EMP-C-MOV-18	3 hrs.
1-2-76*	1-CV-P-1B	Electrical Penetration and motor shorted	None	Replaced penetration & motor MR-S1-5964	EMP-C-EPL-27	10 hrs.
1-5-76*	MOV-CS-102A	Defective Limit switch for valve open indicating light	None	Replaced limit switch assembly MR-S1-6623	EMP-C-MOV-18	4 hrs.
1-7-76	Personnel Hatch Inner Door	Door lock pin mechanically stuck	None	Freed pin MR-S1-6645	NA	1 hr.
1-7-76	Auxiliary Building Elevator	Car leveling limit switch out of adjustment	None	Adjusted leveling limit switch MR-S1-6651	NA	1 hr.
1-7-76	Auxiliary Feedwater Valve PCV-MS-102	Open Coil	None	Replaced coil MR-S1-6650	NA	2½ hrs.
1-8-76	Unit Heater HS-HV-22B	Defective motor and overload relay	None	Replaced motor, and overload relay MR-S1-5638	NA	17½ hrs.
1-12-76	Acid and Caustic Tank level switches WT-108, WT-109	Micro switch contacts not making contact	None	Adjusted tension on micro-switches MR-S1-6152	NA	1 hr.
1-21-76	Fire Water Initiated alarm	Deluge pressure switches wet	None	Dried out deluge pressure switches MR-S1-6695	NA	1/2 hr.

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 1

JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-22-76	Electrical Penetration B-18	Low Pressure on penetration	None	Charged penetration to specs.	NA	1½ hrs.
1-22-76	Security Gate 4	Close limit switch out of adjustment	None	Adjusted limit switch MR-S1-6507	NA	1½ hrs.
1-23-76	Flash Chamber High Level Alarm LS-WT-105	Micro switch out of adjustment	None	Adjusted micro switch MR-S1-6702	NA	1 hr.
1-23-76	Auxiliary Steam Drain Rec. LS-AS-100	Micro switch out of adjustment	None	Adjusted micro switch MR-S1-6554	NA	2 hrs.
1-27-76	Bearing Cooling BC-P-1A	Open on B Phase	None	Removed all tape from motor leads and retaped MR-S1-6769	NA	8 hrs.
1-27-76	Breaker for 1-VS-F-28C	Insulation on wires from Bus to Breaker Brittle and burnt	None	Replaced wire and contacts on assembly and tightened. all connections MR-S1-6475	NA	6 hrs.
1-29-76	Security TV Cameras	Camera heaters inoperative	None	Checked all heaters, replaced A & E heaters MR-S1-6622	NA	8 hrs.

R. E. NICHOLLS-SUPERVISOR
ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

FEBRUARY, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 25

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 31

MONTHLY TOTAL 56

3. DESIGN CHANGES BEING WORKED 73-129, Personnel Hatch Modification, 74-1, RWST, 74-97, Diesel Wall Tank Modification, 75-7 Component Cooling Heat Exchanger Radiation Monitor

ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT

FEBRUARY, 1976

UNIT NO. 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req For Main:
2-2-76	Air Conditioning VS-E-FDR-B	Insufficient discharge pressure	None	Repaired leak in unit and had system recharged. MR-S1-6967	NA	4 hrs.
2-3-76	Air Compressor IA-C-3B	Defective overload assembly	None	Replaced overload assembly. MR-S1-6850	NA	2½ hrs.
2-3-76	Heat Tracing Line 1-CH-148, 149	Thermostat's out of adjustment	None	Readjusted thermostats MR-S1-6845	NA	2 hrs.
2-6-76	Electrical Penetrations 18B,17E,16E,2D, 2E	Low Nitrogen pressure	None	Recharged penetrations MR-S1-6880	NA	1½ hrs.
2-6-76	Seismic Instrumentation Test PT-31.3	None	None	Performed PT-31.3	NA	4 hrs.
2-6-76	Fire Protection System PT-24.4	None	None	Performed PT-24.4	NA	8 hrs.
2-16-76	Fire Protection Halon 1301 System PT-24.6	None	None	Performed PT-24.6	NA	4 hrs.
2-18-76	Heat Tracing System PT-27	None	None	Performed PT-27	NA	8 hrs.
2-20-76	Refueling Water Storage Tank	Floats not adjusted according to Revision 74-1	None	Adjusted floats as per Design Change 74-1 MR-S1-6612	NA	2 hrs.

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 1
FEBRUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
2-24-76	Electrical Penetrations D-2,E-16, E-17	Low Nitrogen pressure	None	Recharged penetrations MR-S1-6994	NA	½ hr.
2-26-76	Electrical Penetration B-18	Low Nitrogen pressure	None	Recharged penetration MR-S1-7031	NA	10 min.
2-27-76	Air Conditioning VS-E-FDR-C	Defective control transformer	None	Replaced control transformer MR-S1-6965	NA	3 hrs.
2-29-76	Station Batteries PT-23.1	None	None	Performed PT-23.1	NA	8 hrs.

R. E. Nicholls

R. E. NICHOLLS - SUPERVISOR
ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

MARCH, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS — 46

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS — 11

MONTHLY TOTAL — 57

3. DESIGN CHANGES BEING WORKED. Diesel Wall Tank Modification, Flood Control, Low Head Safety Injection, RS 255A & B, Emergency Turbine Oil Pump Modification 75-34

4. PERIODIC TEST PERFORMED — 16

ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE

(Safety ~~Related~~ Systems during Outage or Reduced Power Periods.)

UNIT 1

MARCH 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-14-76	Reactor Coolant Pump Motors 1-RC-P-1A, 1-RC-P-1B, 1-RC-P-1C	None	None	Took oil samples from motors and had analyzed. Test satisfactory. MR-S1-6971	N/A	3 hrs.
3-15-76	1-NRV-MS-101A	None	None	Disconnected valve for mech. maint. Reconnected and tested, test satisfactory. MR-S1-6970	EMP-C-MOV-11	5 hrs.
3-15-76	Boron Recovery Bottoms Pump 1-BR-P-9	Motor grounded	None	Replaced motor and tested, test satisfactory. MR-S1-6972	EMP-C-EPL-12	8 hrs.
3-15-76	CLS Relay CR-CLS-1B6	Defective Coil	None	Replaced coil and tested, test satisfactory. MR-6979	EMP-C-RT-24	3 hrs.
3-17-76	Containment Sump Pump 1-DA-P-4A	Motor grounded	None	Disassembled, cleaned and dried motor, repacked bearings. Reassembled and tested, test satisfactory. MR-S1-6961	EMP-C-EPL-27	10 hrs.
3-18-76	MOV-FW-151A	Defective agastat timer.	None	Replaced agastat and tested, test satisfactory. MR-S1-7263	EMP-C-MOV-18	2 hrs.
3-18-76	MOV-RH-1700	Defective packing ring.	None	Disconnected MOV for Mech. Maint. Reconnected and tested, test satisfactory. MR-S1-7246	EMP-C-MOV-11	4 hrs.

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 1

MARCH, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-24-76	Heat Tracing Ckt. 1-CH-P-2D	Defective Strip Heaters	None	Replaced strip heaters. MR-S1-7121	EMP-C-HT-37	5 hrs

R. E. NICHOLLS - SUPERVISOR ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(Safety Releated Systems during Outage or Reduced Power Periods.)

UNIT 1

APRIL, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-29-76	Motor Operated Valve MOV-1381	Torque Switch Contact not making	None	Adjusted Torque Switch Contact. MR-S1-12143	EMP-C-MOV-18	1hr.
4-30-76	Containment Air Recirc. Fan. 1-VS-F-1B	Defective Motor Bearing.	None	Replaced outboard motor bearing. MR-S1-012165	EMP-C-EPL-27	16 hrs.

R. E. NICHOLLS, SUPERVISOR ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 89

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 19

MONTHLY TOTAL 108

3. DESIGN CHANGES BEING WORKED 74-55, 73-127, 75-21 (completed) 75-43 (completed) 73-111, 75-51 (Completed Unit #2) 75-44 (completed on Unit 2) 74-97 (completed)

4. PERIODIC TEST PERFORMED 16

ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 1

MAY, 1976

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-4-76	Personnel Hatch	Ground on outer door circuitry.	None	Replaced defective wiring. MR-S1-12184	NA	NA
5-5-76	Boron Stripper Pump BR-P-7A	Pump tripped on over-load	None	Checked motor.All checks normal. Started motor. Motor drew excessive amperage. Had Control Room notify Mechanical Dept. MR-S1-12412	NA	NA
5-9-76	Containment Vacuum 1-CV-P-1A	Defective overloads	None	Replaced overloads. MR-S1-12434	NA	NA
5-25-76	Charging Pump Lube Oil Pump 1-CH-P-1B	Trips on overload	None	Motor grounded. Installed new motor. Replaced overloads. MR-S1-12522	NA	NA

R. E. NICHOLLS - SUPERVISOR, ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

JULY, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS — 128

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS — 08

MONTHLY TOTAL — 136

3. DESIGN CHANGES BEING WORKED 74-55 (Flood Control)

4. PERIODIC TEST PERFORMED — 16

UNIT 1	UNIT 2
(4) PT-34	(5) PT-34
(1) PT-24.4	(1) PT-23.2
(1) PT-24.6	(1) PT-27
(1) PT-27	
(1) PT-31.3	
(1) PT-23.2	

ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 1

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
7-6-76	BR Heat Rracing, Circuit 21, Panel I	Defective Heat Tape	None	Replaced 24 ft. Heat Tape, MR No. S1-012130	EMP-C-HT-20	8 Hrs.
7-17-76	1-RC-P-1A	None-Preventative Maintenance	None	Drained oil flushed pots and refilled with oil, MR No. S1-012117.	EMP-P-LU-28	10 Hrs.
7-17-76	1-RC-P-1B	None-Preventative Maintenance	None	Drained oil flushed pots and refilled with oil, MR No. S1-012118.	EMP-P-LU-28	10 Hrs.
7-17-76	1-RC-P-1C	None-Preventative Maintenance	None	Drained oil flushed pots and refilled with oil, MR No. S1-012119.	EMP-P-LU-28	10 Hrs.

R. E. Nicholls, Supervisor
Electrical Maintenance

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 121

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 7

MONTHLY TOTAL 128

3. DESIGN CHANGES BEING WORKED 75-34, 75-44, 75-51, 74-97 and 75-43.

4. PERIODIC TEST PERFORMED 7

ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

JUNE, 1976

UNIT #1

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
6-16-76	1-SW-P6	DC-75-7	None	Completed DC 75-7. MR-S1-4603	DC-75-7	NA
6-21-76	#3 Emergency Diesel Wall Tank Level Transmitter	DC 74-97	None	Completed DC-74-97. MR-S1-6482	DC-74-97	NA
6-21-76	Reactor Coolant Pump Bus 1B Undervoltage alarm	Open coil in relay BFO 485	None	Replaced relay. MR-S1-12662	EMP-C-RT-24	NA

R. E. NICHOLLS, SUPERVISOR-ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

September, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 81

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 9

MONTHLY TOTAL 90

3. DESIGN CHANGES BEING WORKED DC 75-51, 75-45, 75-36

4. PERIODIC TEST PERFORMED 15

UNIT 1		UNIT 2	
PT-34	(5)	PT-34	(5)
PT-23.1	(1)	PT-23.1	(1)
PT-31.3	(1)	PT-27	(1)
PT-27	(1)		

H. Wayne Libby for R.E. Nichols
ELECTRICAL SUPERVISOR

UNIT 1

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-3-76	Heat Tracing Mark No. 2-CH-148 Panel 8, Circuit 17A	Defective Heat Tape	None	Replaced 2 ft. of Heat Tape. MR-S1-13073	EMP-C-HT-20	4 hrs.
9-3-76	Heat Tracing Panel 9, Circuit 17	Defective Heat Tape	None	Replaced 25 ft. of Heat Tape. MR-S1-13279	EMP-C-HT-20	10 hrs.
9-7-76	Heat Tracing Panel 8, Circuit 21	Defective Heat Tape	None	Replaced 48 ft. of Heat Tape. MR-S1-13280	EMP-C-HT-20	14 hrs.
9-8-76	Emergency Diesel No.1 Annunciator	Defective NVR Relay	None	Replaced NVR Relay. MR-S1-12026	EMP-C-EE-21	6 hrs.
9-9-76	Heat Tracing Mark No. 2-CH-143, 147 & 40.	Low Temp. caused by thermostat out of position.	None	Re-positioned thermostat. MR-S1-13293	EMP-C-HT-20	2 hrs.
9-13-76	Reactor Coolant Pump Bus Alarm	BFD Relay 48S failed.	None	Replaced BFD Relay. MR-S1-13407	EMP-C-RT-24	3 hrs.
9-30-76	Instrument Air Dryer	Thermostat failed.	None	Replaced thermostat. MR-S1-13289	EMP-C-1A-31	6 hrs.

H. Wayne Hilton for R. E. Nicholls

R. E. NICHOLLS, SUPERVISOR-ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

UNIT NOS. 1 & 2

AUGUST, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS — 68

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS — 6

MONTHLY TOTAL — 74

3. DESIGN CHANGES BEING WORKED 74-55, 75-45, 75-36

4. PERIODIC TEST PERFORMED — 12

UNIT 1	UNIT 2
PT-34 (4)	PT-34 (4)
PT-23.1 (1)	PT-23.1 (1)
	PT-23.3 (1)
	PT-23.4 (1)

N. Wayne Ribley
ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT NO. 1

AUGUST, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
8-4-76	CH-34 Heat Tracing Circuit 2B,Panel 9	Misadjusted thermostats	None	Reset thermostats. MR-S1-12916	EMP-C-HT-20	6 hrs.
8-4-76	Lines 1-CH-38, 148 and 149 Heat Tracing Panel 8, Circuit 17.	Defective Heat Tape	None	Replaced 3 ft. Heat tape. MR-S1-12918	EMP-C-HT-20	10 hrs.
8-11-76	Emergency Diesel #2	Not Applicable	None	Reset louver control to open at 160°F vice 175°F. MR-S1-13002	Engineering Study 76-09	4 hrs.
8-13-76	2-CH-148 & 149 Heat Tracing Panel 8 & 9.	Misadjusted thermostats	None	Reset thermostats. MR-S1-13086	EMP-C-HT-20	5 hrs.
8-13-76	Emergency Diesel #1	Not Applicable	None	Reset louver control to open at 160°F vice 175°F. MR-S1-13064	Engineering Study 76-09	4 hrs.

H. Wayne Libby

R.E. NICHOLLS, SUPERVISOR - ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

OCTOBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 163

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 1

MONTHLY TOTAL 164

3. DESIGN CHANGES BEING WORKED 75-51, 75-45, 75-36, 76-08, 75-38, 75-44, and 76-27.

4. PERIODIC TEST PERFORMED 15

UNIT 1		UNIT 2	
PT-23.4	(1)	PT-34	(4)
PT-34	(4)	PT-23.1	(1)
PT-23.1	(1)	PT-27	(1)
PT-27	(1)		
PT-24.6	(1)		
PT-23.2	(1)		

ELECTRICAL SUPERVISOR

UNIT NO. 1

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

PAGE 1 of 1

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-7-76	Charging Pump Oil System (1-CH-P-1C)	Motor would not stop	None	Replaced overload contactor and main contact coil. MR-S1-13810	EMP-C-EPL-07 and EMP-C-EPL-12	6 hrs.

R. E. NICHOLLS - SUPERVISOR, ELECTRICAL MAINTENANCE

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 106

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 47

MONTHLY TOTAL 153

3. DESIGN CHANGES BEING WORKED 76-33; 76-08; 76-38; 75-44; 75-51; 73-111; 76-31; 75-34; 75-21; 73-23; 75-36

4. PERIODIC TEST PERFORMED 14

UNIT I	UNIT II
(4) 34	(4) 34
(1) 23.1	(1) 23.1
(1) 31.3	(1) 27
(1) 31.2	
(1) 27	

ELECTRICAL SUPERVISOR

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 1

NOVEMBER 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11/9/76	EPDC Single Phase Inverter	Preventative Maintenance	None	Performed Procedure EMP-C-EPDC-9 (MR S1-014111)	Procedure EMP-C-EPDC-9	3 hours
11/9/76	CW MOV-CW-100C	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014144)	Procedure EMP-P-MOV-45	2 hours
11/9/76	SW MOV-SW-101A	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014155)	Procedure EMP-P-MOV-45	2 hours
11/9/76	SW MOV-SW-101B	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014154)	Procedure EMP-P-MOV-45	1.5 hours
11/9/76	SW MOV-SW-103A	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014156)	Procedure EMP-P-MOV-45	2 hours
11/9/76	SW MOV-SW-103D	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014159)	Procedure EMP-P-MOV-45	2 hours
11/9/76	SW MOV-SW-103B	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014158)	Procedure EMP-P-MOV-45	1.5 hours
11/9/76	SW MOV-SW-103C	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014157	Procedure EMP-P-MOV-45	2 hours
11/9/76	SW MOV-SW-102A	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014160)	Procedure EMP-P-MOV-45	2 hours
11/9/76	CH MOV-CH-1286B	Disconnect and Reconnect for Mechanical Dept.	None	Disconnected and Reconnected (MR S1-014304)	Procedure EMP-C-MOV-11	1 hour
11/9/76	CH MOV-CH-1287B	Disconnect and Reconnect for Mechanical Dept.	None	Disconnected and Reconnected (MR S1-014302)	Procedure EMP-C-MOV-11	1 hour
11/9/76	CH MOV-CH-1287C	Disconnect and Reconnect for Mechanical Dept.	None	Disconnected and Reconnected (MR S1-014303)	Procedure EMP-C-MOV-11	1 hour

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 1
NOVEMBER 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11/9/76	CH MOV-CH-1286C	Disconnect and Reconnect for Mechanical Dept.	None	Disconnected and Reconnected (MR S1-014306)	Procedure EMP-C-MOV-11	1 hour
11/10/76	CW MOV-CW-106D	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014153)	Procedure EMP-P-MOV-45	2 hours
11/11/76	VS MOV-VS-100B	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014249)	Procedure EMP-P-MOV-45	2 hours
11/11/76	SW MOV-SW-102B	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014236)	Procedure EMP-P-MOV-45	1.5 hours
11/12/76	VS 1-VS-F-1A	Preventative Maintenance	None	Performed Procedure EMP-C-EPL-40 (MR S1-014018)	Procedure EMP-C-EPL-40	6 hours
11/12/76	EPH Main Generator, Main Transformers, and Station Service Transformers Relays	Preventative Maintenance	None	Cleaned and Checked All Relays (MR S1-014399)	Procedures-EMP-RT-01 EMP-RT-02 EMP-RT-03 EMP-RT-04 EMP-RT-05 EMP-RT-06 EMP-RT-07 EMP-RT-08 EMP-RT-09 EMP-RT-11	18 hours
11/12/76	Screen Well #1 Transformer	Preventative Maintenance	None	Cleaned and Checked Relays (MR S1-014375)	Procedures-EMP-RT-01 EMP-RT-07 EMP-RT-12	6 hours
11/12/76	EPH Circuit Breaker 1SG7	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014081)	Procedures-EMP-P-EPH-43 EMP-P-RT-12	6 hours
11/12/76	EPH Bus 1A, 1B, and 1C	Preventative Maintenance	None	Performed Procedure EMP-RT-04 (MR S1-1-400)	Procedure EMP-RT-04	3 hours

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 1
NOVEMBER 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11/15/76	CH MOV-CH-1286A	Disconnect and Reconnect for Mechanical Dept.	None	Disconnected and Reconnected (MR S1-014305)	Procedure EMP-C-MOV-11	1 hour
11/15/76	CH MOV-CH-1287A	Disconnect and Reconnect for Mechanical Dept.	None	Disconnected and Reconnected (MR S1-014301)	Procedure EMP-C-MOV-11	1 hour
11/15/76	EPH Circuit Breaker 15H10	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014064)	Procedures-EMP-P-EPH-43 EMP-P-RT-18	6 hours
11/15/76	EPH Circuit Breaker 15H1	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014056)	Procedures-EMP-P-EPH-43 EMP-P-RT-13	6 hours
11/15/76	EPH Circuit Breaker 15J3	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014067)	Procedures-EMP-P-EPH-43 EMP-P-RT-35	6 hours
11/15/76	EPH Circuit Breaker 15J8	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014071)	Procedures-EMP-P-EPH-43 EMP-P-RT-23A	6 hours
11/15/76	EPH Circuit Breaker 15H3	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014057)	Procedures-EMP-P-EPH-43 EMP-P-RT-33	6 hours
11/15/76	EPH Circuit Breaker 15H8	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014062)	Procedures-EMP-P-EPH-43 EMP-P-RT-19A	6 hours
11/15/76	EPH Circuit Breaker 15H11	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014065)	Procedures-EMP-P-EPH-43 EMP-P-RT-17	6 hours
11/17/76	VS 1-VS-F-1B	Preventative Maintenance	None	Inspected, Bridged, and Meggered (MR S1-014019)	Procedure EMP-C-EPL-40	4 hours
11/17/76	EPH Circuit Breaker 15H9	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014163)	Procedures-EMP-P-EPH-43 EMP-P-RT-16	6 hours
11/17/76	EPH Circuit Breaker 15J11	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014074)	Procedures-EMP-P-EPH-43 EMP-P-RT-15	6 hours

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 1

NOVEMBER 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11/17/76	EPH Circuit Breaker 15J9	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014072)	Procedures-EMP-P-EPH-43 EMP-P-RT-14	6 hours
11/18/76	CLS Relay CR-CLS-1A12	Inspect and Test	None	Installed New Relay (MR S1-006977)	Procedure EMP-C-RT-24	2 hours
11/18/76	CLS Relay CR-CLS-1A13	Inspect and Test	None	Installed New Relay (MR S1-006978)	Procedure EMP-C-RT-24	2 hours
11/18/76	EPH Circuit Breaker 15J10	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014073)	Procedures-EMP-P-EPH-43 EMP-P-RT-22	6 hours
11/24/76	EPH Circuit Breaker 15D1	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014082)	Procedures-EMP-P-EPH-43 EMP-P-RT-47	6 hours
11/27/76	EPH Circuit Breaker 15F1	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014017)	Procedures-EMP-P-EPH-43 EMP-P-RT-49	6 hours
11/27/76	EPH Circuit Breaker 15E1	Preventative Maintenance	None	Dismantled, Cleaned, and Inspected (MR S1-014016)	Procedures-EMP-P-EPH-43 EMP-P-RT-48	6 hours
11/29/76	FW MOV-FW-151B	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014290)	Procedure EMP-P-MOV-45	2 hours
11/29/76	FW MOV-FW-151E	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014297)	Procedure EMP-P-MOV-45	2 hours
11/29/76	FW MOV-FW-151D	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014296)	Procedure EMP-P-MOV-45	2 hours
11/29/76	FW MOV-FW-151F	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014298)	Procedure EMP-P-MOV-45	2 hours
11/29/76	FW MOV-FW-151A	Preventative Maintenance	None	Performed Procedure EMP-P-MOV-45 (MR S1-014289)	Procedure EMP-P-MOV-45	2 hours

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 1

NOVEMBER 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11/29/76	EPCR Part Lengtn Control Rod	Disconnect and Reconnect for Refueling	None	Disconnected and Reconnected (MR S1-013974)	Procedure EMP-C-EPCR-17	10 hours

R. E. NICHOLLS, SUPERVISOR-ELECTRICAL MAINTENANCE

UNIT NO. 1

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

DECEMBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS 80

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 18

MONTHLY TOTAL 98

3. DESIGN CHANGES BEING WORKED DC-76-33, 76-27, 75-44, 75-51, 76-31, 73-23, 73-89.

4. PERIODIC TEST PERFORMED 8

(5) PT-34
(1) PT-23.1
(1) PT-27
(1) PT-31.3

ELECTRICAL SUPERVISOR

UNIT NO. 1

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-2-76	EPH Circuit Breaker 15J2	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14066	EMP-P-EPH-43 EMP-P-RT-32	2 hrs.
12-2-76	EPH Circuit Breaker 15J5	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14052	EMP-P-EPH-43 EMP-P-RT-26	3 hrs.
12-13-76	EPH Circuit Breaker 15A3	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14032	EMP-P-EPH-43 EMP-P-RT-51	3 hrs.
12-13-76	EPH Circuit Breaker 15H5	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14059	EMP-P-EPH-43 EMP-P-RT-25	3 hrs.
12-14-76	EPH Circuit Breaker 15H6	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14060	EMP-P-EPH-43 EMP-P-RT-31	3 hrs.
12-17-76	EPCR Rod Drive Motor Generator #1	Preventative Maintenance	None	Cleaned, inspected and changed bearings MR-S1-14137	EMP-C-EPCR-8 EMP-C-EPL-40	16 hrs.
12-17-76	EPH Circuit Breaker 15B3	Preventative Maintenance	None	Cleaned & inspected. MR-S1-14041	EMP-P-EPH-43 EMP-P-RT-53	4 hrs.
12-17-76	EPH Circuit Breaker 15C3	Preventative Maintenance	None	Cleaned & inspected. MR-S1-14046	EMP-P-EPH-43 EMP-P-RT-37	4 hrs.
12-17-76	EPCR No. 2 Motor Generator Circuit Breaker	Preventative Maintenance	None	Cleaned & inspected. MR-S1-13964	EMP-P-EPCR-34	2 hrs.
12-17-76	EPCR No. 1 Motor Generator Circuit Breaker	Preventative Maintenance	None	Cleaned & inspected. MR-S1-13954	EMP-P-EPCR-34	2 hrs.
12-17-76	EPH Circuit Breaker 15J4	Preventative Maintenance	None	Cleaned & inspected. MR-S1-14068	EMP-P-EPH-43 EMP-P-RT-30	3 hrs.
12-17-76	EPCR Rod Drive Motor Generator #2	Preventative Maintenance	None	Cleaned, inspected & changed bearing. MR-S1-14138	EMP-P-EPCR-8 EMP-P-EPL-40	16 hrs.

UNIT NO. 1
ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-23-76	EPL Circuit Breaker 14H6	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14734	EMP-P-EPL-42	2 hrs.
12-23-76	EPH Circuit Breaker 15H7	Prevenative Maintenance	None	Cleaned and inspected. MR-S1-14061	EMP-P-EPH-43 EMP-P-RT-21	3 hrs.
12-23-76	EPL Circuit Breaker 14H1	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14733	EMP-P-EPL-42	2 hrs.
12-23-76	EPL Circuit Breaker 14H10	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14735	EMP-P-EPL-42	2 hrs.
12-29-76	EPCR CRDM	Boric Acid Buildup	None	Disconnected and reconnected the CRDM's.	EMP-P-EPCR-14 EMP-P-EPCR-16	36 hrs.
12-30-76	EPH Circuit Breaker 15H4	Preventative Maintenance	None	Cleaned and inspected. MR-S1-14058	EMP-P-EPH-43 EMP-P-RT-20	3 hrs.

R. E. NICHOLLS , SUPERVISOR ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT

UNIT NO. 2

JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-2-76*	Containment Radiation Monitor GW-101	Pump indicating light inoperative, loose wire.	None	Reconnected wire MR-S2-5130	EMP-C-EPL-07	2½ hrs.
1-3-76	Gland Steam Exhaust Fan A	Motor Grounded	None	Replaced motor. MR-S2-4815	NA	1 hr.
1-5-76	D Water Box LS-VP-200E	Level switch full of water	None	Drained water, and dried contacts MR-S2-4664	NA	3 hrs.
1-6-76	Gia-tonics Unit #2 Containment Personnel Hatch	Defective speaker	None	Replaced speaker MR-S2-5268	NA	1 3/4 hrs.
1-8-76	MOV-MS-202	Bolt missing.	None	Replaced missing bolt. MR-S2-5129	NA	35 min.
1-8-76	Slow speed indicating light for 2-CH-P-2D Auxiliary Shutdown Panel	Loose connection on light socket	None	Tightened loose connection.	NA	2 hrs.
1-10-76	Auxiliary Boiler #2 Transfer Pump	Defective Start-Stop switch	None	Replaced Start-Stop switch MR-S2-4753	NA	4 hrs.
1-12-76	LS-VP-201	Magnetrol switch full of mud and rust.	None	Cleaned switch and reinstalled. MR-S2-5294	NA	4 hrs.

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 2

PAGE 2 JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-12-76	LS-VP-204	Magnetrol switch full of mud and rust.	None	Cleaned switch and reinstalled. MR-S2-5293	NA	4 hrs.
1-13-76	Plant drinking water chlorine pump	Control circuit disconnected	None	Connected control circuit and checked manual and automatic operation. MR-S2-5282	NA	2 hrs.
1-17-76	Main Generator Ground Detector	Ground detection system grounded.	None	Found shorted splice, removed old tape and retaped. MR-S2-5168	NA	4 hrs.
1-17-76	Hydrogen seal filter timers	Timers incorrectly set and wired wrong. Run continuously	None	Changed timer setting from 50% to 2.5% changed contacts from N.O. to N.C. MR-S2-4916	NA	4 hrs.
1-17-76*	NRV-MS-201B	Torque switch contacts dirty	None	Cleaned torque switch contacts MR-S2-5327	NA	2 hrs.
1-19-76*	2-RC-P-1A	None	None	Took oil samples from upper and lower oil pots and cooler for lab analysis MR-S2-5165	NA	2 hrs.
1-19-76*	2-RC-P-1B	None	None	Took oil samples from upper and lower oil pots and cooler for lab analysis. MR-S2-5166	NA	2 hrs.
1-19-76*	2-RC-P-1C	None	None	Took oil samples from upper and lower oil pots and cooler for lab analysis. MR-S2-5167	NA	2 hrs.
1-19-76*	MOV-FW-251A	None	NOne	Disconnected valve for mechanical department reconnected and set limits. MR-S2-5169	EMP-C-MOV-11	5 hrs.
1-20-76	Power Operated Relief Valve RV-MS-201A	Limit switch for open indication out of adjustment.	None	Adjusted limit switch MR-S2-5345	NA	1 hr.

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 2
JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-20-76*	Safety Injection Valve. 2-SI-9	Defective heat tracing	None	Replaced heat tape MR-S2-5356	NA	1.5 hrs.
1-20-76	Fire Water Alarms: Fire Water System initiate interior hose system.	Deluge pressure switches wet.	None	Dried out deluge pressure switches	NA	1 hr.
1-21-76	2-FW-P-1B	Defective inboard bearing	None	Replaced bearing. MR-S2-5324	NA	15 hrs.
1-23-76	Blowdown Trip Valve TV-BD-200F	Cam Switch for light indication out of adjustment.	None	Adjusted cam switch MR-S2-5436	NA	1 hr.
1-23-76*	NRV-MS-201B	Defective torque switch	None	Replaced torque switch.MR-S2-5435	EMP-C-MOV-18	2 hrs.
1-24-76*	2-VS-F-60C	Motor bearings bad	None	Removed motor,replaced bearings, reinstalled and tested. MR-S2-5180	EMP-C-EPL-27	13.5 hrs.
1-24-76*	2-VS-F-60F	Motor bearings bad	None	Removed motor, replaced bearings, reinstalled and tested MR-S2-4441	EMP-C-EPL-27	13.5 hrs.
1-25-76	2-SD-P-1B	Motor stator shorted	None	Had motor rewound off-site, re-installed and tested. MR-S2-5132	NA	80 hrs.
1-26-76	Electrical Penetration A-3	Low Pressure on penetration	None	Charged penetration to 12 PSIG	NA	1 hr.
1-30-76	Intercom System, Health Physics unit.	Defective intercom unit.	None	Replaced unit. MR-S2-5489	NA	½ hr.

R. E. NICHOLLS-SUPERVISOR
ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT

FEBRUARY, 1976

UNIT NO. 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req For Main
2-2-76	Heat Tracing Line 1-CH-245, 246	Thermostat's out of adjustment	None	Readjusted thermostat's MR-S2-5511	NA	1½ hrs.
2-3-76	Turbine Trip Valves SV-1, SV-3	Limit switches out adjustment	None	Adjusted limit switches MR-S2-5513	NA	1 hr.
2-4-76	Charging Pump Motor 2-CH-P-1A	None	None	Inspected motor and changed oil. MR-S2-5559	EMP-P-LU-28	5½ hrs.
2-4-76	Reactor Coolant Pump Motor 2-RC-P-1B	None	None	Took oil samples from oil pots and cooler, test satisfactory. MR-S2-5558	NA	2½ hrs.
2-5-76	Charging Pump Motor 2-CH-P-1C	None	None	Inspected motor and changed oil MR-S2-5561	EMP-P-LU-28	2 hrs.
2-5-76	Charging Pump Motor 2-CH-P-1B	None	None	Inspected motor and changed oil MR-S2-5560	EMP-P-LU-28	1½ hrs.
2-6-76	Residual Heat Removal Motor 2-RH-P-1B	None	None	Inspected motor and changed oil MR-S2-5557	EMP-P-LU-28	8 hrs.
2-7-76	Component Cooling Motor 2-CC-P-1D	None	None	Inspected motor and changed oil MR-S2-5563	EMP-P-LU-28	7 hrs.
2-7-76	Shroud Cooling 2-VS-F-60B	Defective motor	None	Replaced motor MR-S2-5141	EMP-C-EPL-27	35 hrs.
2-7-76	Component Cooling Motor 2-CC-P-1C	None	None	Inspected motor and changed oil MR-S2-5562	EMP-P-LU-28	6 hrs.

ELECTRICAL MAINTENANCE MONTHLY OPERATING REPORT
UNIT NO. 2
FEBRUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
2-9-76	Main Steam Valve 2-MS-NRV-201A	None	None	Disconnected for mechanical maintenance, reconnected and tested satisfactory.MR-S2-5565	EMP-C-MOV-11	10 hrs.
2-11-76	Main Steam Trip Valve 2-TV-MS-201A	Limits out of adjustment	None	Adjusted limits and tested. MR-S2-5567	EMP-C-MS-32	4 hrs.
2-11-76	Charging Pump Breaker 2-CH-P-1A	Tripped on time over-current	None	Bridged, meggered and reset. Tested satisfactory. MR-S2-5674	NA	1½ hrs.
2-20-76	Refueling Water Storage Tank	Floats not adjusted according to Revision 74-1	None	Adjusted floats as per Design Change 74-1. MR-S2-5251	NA	3 hrs.
2-23-76	Heat Tracing System PT-27	None	None	Performed PT-27	NA	8 hrs.
2-26-76	Electrical Penetration A-3	Low Nitrogen pressure	None	Recharged penetration MR-S2-5876	NA	10 min.
2-26-76	Electrical Penetration A-18	Low Nitrogen pressure	None	Recharged penetration MR-S2-5875	NA	10 min.
2-29-76	Station Batteries PT-23.1	None	None	Performed PT-23.1	NA	8 hrs.

R. E. NICHOLLS - SUPERVISOR
ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(Safety Releated Systems during Outage or Reduced Power Periods.)

UNIT 2

MARCH 1976

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-8-76	Electrical Penetration 17A for 2-RCP-1A	Penetration appeared to be overheating.	None	Disconnected penetration and performed insulation test, test satisfactory. Reconnected penetration. MR-S2-5572	EMP-C-PE-35 EMP-C-PE-21	15 hrs.

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 2

MARCH, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-19-76	2-SD-P-1B	Upper Thrust Bearing defective	None	Replaced bearing. MR-S2-6045	N/A	15 hrs
3-31-76	Pressurizer Heater Breakers Panels #1 & #2	Defective Breakers	None	Replaced breaker #1 on panel #1. Replaced breaker #5 on panel #2. Tested, test satisfactory. MR-S2-6149	N/A	4 hrs.

R. E. NICHOLLS - SUPERVISOR ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(Safety Releated Systems during Outage or Reduced Power Periods.)

UNIT 2

APRIL, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-7-76	Motor Operated Valve MOV-SW-206B	Motor grounded	None	Disassembled, cleaned and dried motor. Reassembled and tested. MR-S2-6192	EMP-C-MOV-19	16 hrs.
4-22-76	Motor Operated Valve MOV-SW-202B	Defective Torque and Limit Switch Assembly	None	Replaced Torque and Limit Switch Assembly. MR-S2-12067	EMP-C-MOV-18	2 hrs.

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 2

APRIL, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-7-76	Motor Operated Valve MOV-SW-206A	Motor Grounded	None	Disassembled, cleaned and dried motor. Reassembled and tested. MR-S2-006191	EMP-C-MOV-19	16 hrs.
4-7-76	Motor Operated Valve MOV-SW-206B	Motor Grounded	None	Disassembled, cleaned and dried motor. Reassembled and tested. MR-S2-006192	EMP-C-MOV-19	16 hrs.
4-13-76	Motor Operated Valve MOV-CW-200A	Motor Grounded	None	Disassembled, cleaned and dried motor. Reassembled and tested. MR-S2-005759	EMP-C-MOV-19	16 hrs.

R. E. NICHOLLS, SUPERVISOR ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(Safety Releated Systems during Outage or Reduced Power Periods.)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-1-76	Pressurizer Heaters Control	None	None	Perform preventative maintenance. MR-S2-12234	NA	
5-6-76	Radiation Monitor RM-259	Filter will not advance.	None	Cleaned and Lubricated. MR-S2-12388	NA	
5-6-76	Instrument Air 2-IA-C-2B	None	None	Preventative Maintenance. MR-S2-12127	EMP-C-EPL-27	
5-6-76	Ventilation 2-VS-F-3A	None	None	Preventative Maintenance. MR-S2-12136	EMP-C-EPL-27	
5-6-76	Ventilation 2-VS-F-3B	None	None	Preventative Maintenance. MR-S2-12137	EMP-C-EPL-27	
5-10-76	Motor Operated Valve MOV-2275C	None	None	Completed Design Change 75-43. MR-S2-12268	EMP-C-MOV-11	
5-10-76	Electrical Penetration	None	None	Preventative Maintenance. Performed Leak Test. MR-S2-12282	EMP-C-PE-21	
5-10-76	Motor Operated Valve MOV-2275B	None	None	Completed Design Change 75-43. MR-S2-12269	EMP-C-MOV-11	
5-14-76	Feedwater MOV-251 A,B & C	None	None	Disconnected, reconnected & tested for Mechanical Department. MR-S2-12267	NA	
5-15-76	Service Water MOV-SW-203A & B	Leak through	None	Adjusted limit switches. MR-S2-12440	EMP-C-MOV-18	

ELECTRICAL MAINTENANCE

(Safety Releated Systems during Outage or Reduced Power Periods.)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-15-76	Service Water MOV-SW-206A & B	Valve failed to operate remotely.	None	Checked limit switches, everything appeared in order. Had Control Room cycle valve. Tested satisfactorily. MR-S2-12441	NA	
5-17-76	Service Water MOV-CS-201C	Limit Switches out of adjustment.	None	Adjusted limit switches. MR-S2-12278		
5-18-76	Service Water MOV-CS-201D	Limit switches out of adjustment.	None	Adjusted limit switches. MR-S2-12275	NA	
5-21-76	Containment Spray MOV-CS-201B	Limit switches out of adjustment.	None	Adjusted limit switches. MR-S2-12277	NA	
5-21-76	Containment Spray MOV-CS-201A	Check adjustment of Limit switch.	None	Adjusted limit switches. MR=S2-12276	NA	

R. E. NICHOLLS, SUPERVISOR-ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(Safety Related Systems during Outage or Reduced Power Periods.)

UNIT #2

JUNE, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
6-3-76	Main Steam Trip Valve TV-MS-201B	Valve indicates intermediate position when shut.	None	Replaced snap lock switch. Adjusted for proper indication. MR-S2-12087	NA	NA
6-3-76	MOV-RS-255A & B	Design Change - 75-44	None	Disconnect & reconnected motor for Design Change 75-44. MR-S2-12297	DC 75-44	NA
6-7-76	MOV-CS-202B	Faulty return spring	None	Replaced torque limit switch. MR-S2-12660	EMP-C-MOV-18	NA
6-8-76	BR-P-4B	Water Leaking into motor	None	Replaced motor. MR-S2-4990	EMP-C-EPL-27	NA

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 2

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
7-6-76	CH Heat Tracing 1-CH-B1-1, Ckt. 23B, Panel 8	Defective Heat Tape	None	Replaced 8 ft. Heat Tape, MR No. S2-012839.	EMP-C-HT-20	10 Hrs.
7-6-76	CH Heat Tracing 2-CH-358, Panel II	Defective Heat Tape	None	Replaced 15 ft. Heat Tape, MR No. S2-012875.	EMP-C-HT-20	6 Hrs.
7-30-76	S.I. Heat Tracing, Panel 11, Circuit 1A	Defective Heat Tape	None	Replaced Heat Tape, MR No. S2-012929.	EMP-C-HT-20	8 Hrs.
7-30-76	CH Heat Tracing, 1-CH-230, Circuit 5, Panel 8	Defective Heat Tape	None	Replaced 14 ft. Heat Tape, MR No. S2-012926.	EMP-C-HT-20	6 Hrs.

R. E. Nicholls, Supervisor
Electrical Maintenance

UNIT 2

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-3-76	Emergency Diesel #2	Battery cell blew.	None	Replaced battery check out battery charger. MR-S1-13223	EMP-C-EPDC-22	12 hrs.
9-16-76	Main Gnerator Protection System	KD-41 Relay out of adjustment.	None	Adjusted KD-41 Relay. MR-S1-13206	EMP-P-RT-02	2 hrs.

R. E. NICHOLLS, SUPERVISOR-ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 2

AUGUST, 1976

PAGE 1 of 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
8-11-76	Emergency Diesel #2	Defective louver control.	None	Replaced louver control. MR-S2-6093	EMP-C-EE-31	6 hrs.

H. Wayne Nichols

R.E. NICHOLS, SUPERVISOR - ELECTRICAL MAINTENANCE

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 11
NOVEMBER 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11/30/76	Heat Tracing Panel 10 and 11 Circuit 4	Defective Heat Tape	None	Replaced Defective Heat Tape (MR S2-013633)	Procedure EMP-C-HT-20	3 hours

R. E. NICHOLLS, SUPERVISOR - ELECTRICAL MAINTENANCE

UNIT NO. 2

MONTHLY OPERATING SUPPLEMENT SHEET
ELECTRICAL MAINTENANCE

DECEMBER, 1976

1. MAINTENANCE ORDERS COMPLETED NON-SAFETY RELATED ITEMS — 39

2. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS — 6

MONTHLY TOTAL — 45

3. DESIGN CHANGES BEING WORKED — DC-73-89

4. PERIODIC TEST PERFORMED — 6

(4) PT-34
(1) PT-23.1
(1) PT-27

ELECTRICAL SUPERVISOR

UNIT NO. 2

ELECTRICAL MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-1-76	CLS BFD 445 Relay	Coil failed.	None	Replaced defective relay. MR-S2-13543	EMP-C-RT-24	4 hrs.
12-1-76	Heat Tracing Panel 8 Circuit 5	Heat tape failed.	None	Replaced 10 ft. heat tape. MR-S2-13635	EMP-C-HT-20	6 hrs.
12-7-76	Heat Tracing Panel 10 & 11, Circuit 1	Valve leaked, causing heat tape failure.	None	Replaced 44 ft. heat tape. MR-S2-13636	EMP-C-HT-20	10 hrs.
12-17-76	Heat Tracing for line 2-CH-358	Valve leaked, causing heat tape failure.	None	Replaced 1 ft. heat tape. MR-S2-13793	EMP-C-HT-20	2 hrs.
12-28-76	Heat Tracing Panel 8 &9, Circuit 21D	Heat tape failed.	None	Replaced 17 ft. heat tape. MR-S2-13434	EMP-C-HT-20	6 hrs.
12-28-76	Heat Tracing on Emergency Borate Line	Leak in line, caused heat tape failure.	None	Replaced 12 ft. heat tape. MR-S2-13689	EMP-C-HT-20	8 hrs.

R. E. NICHOLLS, SUPERVISOR-ELECTRICAL MAINTENANCE

INSTRUMENT MAINTENANCE

SURRY POWER STATION

UNIT NO. 1

JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-20-76	Steam Flow Multiplier Divider FM-1-485	Electronic component failure	Caused an error in steam flow of ≃ 32,000 LB/HR.	Replaced module with a spare unit, calibrated to proper values and returned to service.	Placed channel in Test. Used approved procedures Redundant instruments normal.	1 hour

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

MARCH 1976

UNIT NO. 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
03-15-76	Containment Inst. Air Compressors	B1 & B2 Pressure switches had slipped setpoint	Safe operation not adversely affected.	Adjusted pressure switches to proper setpoint. Checked for proper operation. Returned to service.	Reactor at cold shutdown. Used approved procedures.	2 hrs.
3-16-76	Residual Heat Removal System RHR Pump Disch. Temp. RTD. T-1-604.	Element failure	Safe operation not adversely affected.	Replaced RTD with one from spare parts. Checked for proper operation. Returned to service.	Reactor at cold shutdown. Used approved procedures.	2 hrs.
3-22-76	"B" Feedwater Reg. Valve FCV-1488	Positioner Feedback Linkage became disconnected from valve due to vibration.	Would have caused reactor trip on S/G if unit conditions had called for a change in valve position.	Replaced linkage	Maintained steady state conditions during repair. Alerted shift supervisor and reactor operator of conditions.	1 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

APRIL, 1976

UNIT 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
4-2-76	Incore Moveable Flux Detectors D & E	Detector failed internally.	Reactor Safety not affected.	Replaced detectors with spare units.	Used approved procedures.	5 hrs.
4-5-76	Reactor Coolant Temp Control Loop "B" TM-1-421A Low Level Amplifier.	Electronic failure output failed low.	Reactor Safety not affected.	Replaced Low Level Amplifier with spare unit. Calibrated and returned to service.	Used approved procedures. Redundant channels normal.	1 hr.
4-12-76	Feedwater Control Transmitter Selector Switch 1/FM-1/498B Defective.	Suspect dirty contacts or internal switch defect.	Reactor Safety not affected. Switch caused mismatch between actual flow and flow error signal when selecting the alternate flow transmitter.	Submitted M.O. S1-007540 to Electrical Dept. Switch was replaced 4-30-76.	Reactor at shutdown conditions during switch replacement on 4-30-76.	2 hrs
4-15-76	N-44 Overpower Trip Bistable S.P. 1% high.	Electronic Drift.	Reactor Safety not impaired. 2/4 required for Reactor trip.	Adjusted to proper trip and reset setpoints 107% and 105% respectively.	Used approved procedures. 3 redundant channels in service and operating normally.	1 hr.
4-29-76	N-44 Overpower Trip Bistable S. P. drifted 1.5% high.	Electronic Drift.	Reactor Safety not impaired. 2/4 required for Reactor trip.	Replaced bistable card with spare unit adjusted to proper setpoint and returned to service.	Used approved procedures. 3 redundant channels in service and operating normally.	1 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

JUNE, 1976

UNIT NO. 1

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Requi for Mai
6-10-76	N-42 High Range and Overpower Rod Stop Bistable P.C.'s	Electronic Drift	The high range trip and overpower rod stop would have operated at the proper set-point, but both were capable of immediate reset rather than the normal 2%	Replaced both bistable printed circuit cards, calibrated. Checked for proper operation and returned to service.	Used approved procedures. Placed channel in test. Redundant instruments in service & operating normally.	1 hr

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 1

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maintenance
7-11-76	Rx Protection Relay 272XP	Electrical Coil failure	Partial Rx Trip signal	Relay was replaced by Electrical Dept.	Rx Protection Train "B" Bypass breaker was inserted during replacement of relay and returned to normal following repairs. Used approved procedures.	5-1/2 hrs.
7-15-76	NIS (P-6) Bistable card. N-35 detector	Electronic Drift	Would have energized source range detectors .05 decade early at 5.5×10^{-11} rather than 5×10^{-11}.	Adjusted to proper trip and reset points. Returned to service.	Placed channel in test. Used approved procedures.	1/2 hr.
7-16-76	N-42 High Voltage Power Supply	Electronic Drift and Electrical noise.	Causing bistable setpoints to drift.	Replaced power supply with station spare unit. Checked for proper alignment & operation. Returned to service	Channel in test. Used approved procedures. Redundant channels operating normally.	3 hrs.
7-17-76	F-962 Safety Injection Cold Leg Flow Loop "B"	Electronic Component failure.	Indicating flow with no flow conditions.	Replaced P.C. board with spare unit. Caibrated transmitter and returned to service.	Used approved procedures. Rx at cold shutdown conditions.	2 hrs.

AUGUST, 1976

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 1

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
7-16-76	NIS	Setpoint too close to Tech. Specs.	Moved setpoint away from T.S in conservative direction.	Completed SP-76-7. Changed Low Level Trip from 25% to 23%.	Reactor shutdown. Used approved procedures.	2 hrs.
8-18-76	NIS	Dropped rod bistable tripping during load changes.	Allows larger changes in load with respect to time without tripping dropped rod bistable.	Completed DC-76-8. Changed time constant in rod drop circuit from 5 seconds to 2 seconds.	Reactor shutdown. Used approved procedures.	4 hrs.
8-30-76	RWST Level Transmitter LT-CS-100B	Electronic drift.	Redundant instruments did not agree. LT-CS-100B was reading 1.25% high.	Calibrated transmitter and checked for proper operation.	Used approved procedures. Redundant instrument operating normally.	2 hrs.
8-31-76	#1 Emergency Diesel	Hi Temp Alarm set to high.	Sporadic alarms.	Reset Hi Temp Alarm from 200°F to 190°F. (Eng. Study 76-09).	Insured both #2 & #3 diesels are operational and in service.	6 hrs.

UNIT NO. 1

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-11-76	Reactor Protection Logic Reactor Coolant Pump "B" undervoltage relay.	Coil failure	Had one channel of reactor trip locked in.	Assisted Electrical Dept. in replacing relay. Completed PT. & returned to service.	Placed reactor trip bypass breaker in service while replacing relay.	4 hrs.
9-23-76	Reactor Coolant Temp. Temp. Comparator TC-1-412B Output #2 O.P. Rod Stop.	Electronic Drift	Out of calibration. 25MV in conservative direction.	Replaced comparator, checked for proper operation and returned to service.	Placed channel in test. Used approved procedure. Redundant channels operating normally.	1 hr.
9-23-76	Reactor Coolant Temp. Comparator TC-1-412B Output #1 failed to de-energized state.	Electronic Drift	Received one channel of delta T. Reactor trip.	Replaced comparator, checked for proper operation. Returned to service.	Placed channel in test. Used approved procedures. Redundant channels operating normally.	1 hr.

UNIT NO. 1

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-4-76	CVCS Boric Acid Tank Level Transmitter LT-1-161 Tank "A" Channel II	Electronic Drift	Indicated level was 5.63% high.	Calibrated transmitter, checked for proper operation & returned to service.	Used approved procedures. Redundant channel in service.	1 hr.
10-4-76	CVCS Boric Acid Tank Level Transmitter LT-1-108 Tank "B" Channel I	Electronic Drift	Indicated level was 2.63% high.	Calibrated transmitter, checked for proper operation & returned to service.	Used approved procedures.	1 hr.
10-17-76	First Stage Press. Transmitter PT-1-446 Channel III.	Electronic Drift	Would have energized turbine runback 1% early. (conservative)	Calibrated transmitter. Checked loop for proper operation. Returned to service.	Used approved procedures. Reactor at refueling shutdown.	1 hr.
10-18-76	Steam Header Press. Transmitter PT-1-464 Channel IV	Electronic Drift	Transmitter output was 1.25% high. (conservative)	Calibrated transmitter. Checked loop for proper operation. Returned to service.	Used approved procedures. Reactor at refueling shutdown.	1 hr.
10-18-76	Steam Line Press. Transmitter PT-1-474 Channel II	Electronic Drift	Transmitter output was 1% low (conservative)	Calibrated transmitter. Checked for proper operation. Returned to service.	Used approved procedures. Reactor at refueling shutdown.	1 hr.
10-18-76	Steam Line Press. Transmitter PT-1-494 Channel II	Electronic Drift	Transmitter output 2.5% low (conservative)	Calibrated transmitter. Checked loop for proper operation. Returned to service.	Used approved procedures. Reactor at refueling shutdown.	1 hr.
10-21-76	Steam Generator Level Transmitter Channel II LT-1-475	Electronic Drift	Transmitter output 1% low (conservative on Low Level Trip). Unconservative on High Level Trip.	Calibrated transmitter. Checked loop for proper operation. Returned to service.	Used approved procedures. Redundant transmitters operating normally. Reactor at refueling shutdown.	2 hrs.

UNIT NO. 1

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

NOVEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
11-1-76	Rx Coolant Temp Protection Temp. Comparator (dual) TC-1-432C would not trip.	Electronic Failure	Channel 3 OTΔT reactor trip and OTΔT Rod Stop/Turbine Runback were rendered inoperable.	Replaced power supply capacitors, bench checked for proper operation, installed in system, calibrated and checked for proper operation.	Placed Channel in test. Used approved procedures. Redundant Channels in service and operating properly. Reactor at refueling shutdown.	2 hrs.
11-11-76	Pressurizer Level Transmitter L-460 reading .575% low.	Electronic Drift	High level Rx trip channel 2 would have occurred .075% higher than the redundant channels.	Calibrated transmitter for proper output, checked for proper operation, returned to service.	Placed channel in test. Used approved procedures. Redundant channels in service and normal. Reactor at refueling shutdown.	2 hrs.

MONTHLY OPERATING SUPPLEMENT SHEET
INSTRUMENT MAINTENANCE

DECEMBER, 1976

1. MAINTENANCE ORDERS COMPLETED MAJOR OR SAFETY RELATED ITEMS 6

MONTHLY TOTAL 101

2. DESIGN CHANGES BEING WORKED DC-73-23 (Accumulator Level) DC-76-31 (S/G Blowdown)

3. PERIODIC TEST PERFORMED 62

INSTRUMENT SUPERVISOR

UNIT NO. 1

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-20-76	Reactor Coolant Temp. Low Level Amplifier TM-1-412H.	Electronic spiking	Erroneous ΔT indication	Replaced module with spare & returned to service following calibration.	Reactor at refueling shutdown. Placed channel in test. Used approved procedures	1 hr.
12-29-76	Radiation Monitoring Particulate Detector RMS-159	Power failure to filter advance mechanism due to broken wire.	Filter paper would not advance.	Replaced lead between TB-1 and K-3 advance timer. Checked for proper operation. Returned to service.	Used approved procedures Reactor at refueling shutdown.	1 hr.

INSTRUMENT MAINTENANCE

SURRY POWER STATION

UNIT NO. 2

JANUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
1-14-76	Power Range Neutron Detector N-43	High Voltage Power Supply failed low.	Power supply failure caused nuclear signal to drop to zero, exceeding the rate of change bistable which initiated a turbine runback.	Replaced high voltage power supply with a new unit.	Placed channel in test. Used approved procedures. Redundant channels in service and normal	1 hour

INSTRUMENT MAINTENANCE

SURRY POWER STATION
UNIT NO. 2
FEBRUARY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect On Safe Operation	Corrective Action Taken To Prevent Repetition	Precautions Taken To Provide for Reactor Safety During Repair	Time Req'd For Maint.
2-4-76	Steam Flow Multiplier Divider FM-2-494	Electronic Drift .180 MV Low	Low Steam Flow Indication on Channel 3 Protection in the Amount of 198,000 PPH	Replaced module with spare unit. Calibrated and returned to service.	Placed Channel in test. Used approved procedures. Redundant Instruments Performing Normally	1 hr.
2-18-76	O.T.S.P. Drifted High. TM-2-432F Overtemperature Setpoint Summator	Electronic Drift	9.07% Drift in unconservative direction would have initiated an Overtemp. Trip Signal late.	Replaced Summator with a Spare Module. Calibrated & returned to Service.	Placed Channel in Test. Used approved procedures. Redundant Instruments Performing Normally	1 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

MARCH 1976

UNIT NO. 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-6-76	R.C. Temp Test Switch CT-2-432H. T_h Test Switch	Excessive contact. Resistance, causing O.T. S.P. to read ≈ 1% high.	Would have generated Rx O.T. Trip Signal 1% late.	Replaced switch with a spare. Checked for proper operation.	Reactor at shutdown condition. Used approved procedures. Redundant channels normal.	2 hrs.
3-25-76	Protection Channel IV First Stage Pressure Summator PM-2-447-B	Electronic drift 26 MV in unconservative direction.	Would have caused Hi Steam Flow Comparators to trip .15% late.	Calibrated summator, checked for proper operation and returned to service.	Used approved procedures. Channel in test.	1 hr.
3-30-76	N-42 Overpower Rod Stop Setpoint.	Electronic drift setpoint was tripping and resetting .5% high.	Would have generated overpower rod stop signal .5% late..	Calibrated bistable to proper setpoint checked for proper operation and returned to service.	Channel in test. Used approved procedures. Redundant channels normal.	1/2 hr.
3-30-76	P-2-484 Steam Line Pressure Transmitter.	Electronic Drift.36 MV Low.	Would have caused reactor trip signal at 90 PSI rather than 100 PSI	Calibrated transmitter.	Channel in test. Used approved procedures.	1/2 hr.
3-30-76	P-2-485 Steam Line Pressure Transmitter	Electronic drift. Zero was 25 MV low, span 15 MV low.	Would have caused reactor trip signal at 96 PSI rather than 100 PSI.	Calibrated transmitter.	Channel in test. Used approved procedures.	1/2 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

MARCH, 1976

UNIT NO. 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-30-76	P-2-496 Steam Line Pressure Transmitter	Electronic Drift . Zero 87 MV low, span 18MV low.	Would have caused Rx trip signal at 78.3 rather than 100 PSI.	Calibrated transmitter.	Channel in test. Used approved procedures.	1/2 hr.
3-30-76	P-2-476 Steam Line Pressure Transmitter	Electronic drift 36 MV low zero.	Would have caused Rx trip signal at 90 rather than 100 PSI.	Calibrated transmitter.	Channel in test. Used approved procedures.	1/2 hr.
3-30-76	P-2-486 Steam Line Pressure Transmitter	Electronic drift 43 MV low zero.	Would have caused Rx trip signal at 89 rather than 100 PSI.	Calibrated transmitter.	Channel in test. Used approved procedures.	1/2 hr.
3-30-76	P-2-447 First Stage Pressure Transmitter	Electronic drift 27 MV low zero	P > would have tripped at 10.6% rather than 10% and turbine run-back would trip at 70.5% rather than 70%.	Calibrated transmitter	Channel in test. Used approved procedures.	1/2 hr.

INSTRUMENT MAINTENANCE

(Safety Related Systemd during Outage or Reduced Power Periods.)

MARCH, 1976

UNIT NO. 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
3-10-76	Reactor Coolant Flow Transmitters F-434, & 436.	Plugging of tubes in "C" Steam Generator resulted in loss of D.P. at 100% RC flow conditions.	Low flow indication resulted in reactor trip.	Restored unit operation, lowered Rx trip SP to 90% from conservative setpoint of 92%. Returned to 100% flow conditions, measured actual D.P., calculated new 120% D.P. compared with original flow data to insure minimum PPH coolant flow calculations had not been exceeded. Calibrated transmitters, returned to service. Returned Rx flow trip S.P. to conservative 92%.	Channel in test. Used approved procedures.	6 hrs.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 2

MAY 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maint.
5-1-76	"A" Steam Gen. Level Xmtr. LT 474	Electronic Drift	Indicated level 1.75% low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"A" Steam Gen. Level Xmtr. LT 475	Electronic Drift	Indicated Level 2.5% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"A" Steam Gen. Level Xmtr. LT-476	Electronic Drift	Indicated Level 3.8% high	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"B" Steam Gen. Level Xmtr. LT-484	Electronic Drift	Indicated Level 5.4% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"B" Steam Gen. Level Xmtr. LT-485	Electronic Drift	Indicated Level 9.9% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"B" Steam Gen. Level Xmtr. LT-486	Electronic Drift	Indicated Level 7.1% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"C" Steam Gen. Level Xmtr. LT-494	Electronic Drift	Indicated Level 2.3% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"C" Steam Gen. Level Xmtr. LT-495	Electronic Drift	Indicated Level 5.45% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-1-76	"C" Steam Gen. Level Xmtr. LT-496	Electronic Drift	Indicated Level 2.5% Low	Calibrated Transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT 2

MAY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maintenance
5-1-76	"B" Steam Flow Xmtr. FT-484	Electronic Drift	Indicated steam flow 1% high	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1hr.
5-4-76	Pressurizer Level Xmtr. LT-2-459	Electronic Drift	Indicated level 3.4% Low	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-4-76	Pressurizer Level Xmtr. LT-2-460	Electronic Drift	Indicated level 2% Low	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-4-76	Pressurizer Level Xmtr. LT-2-461	Electronic Drift	Indicated Level 2.7% Low	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-8-76	Protection Channel I Pressurizer Press. PT-455	Electronic Drift	Indicated Level 1.2% High	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-10-76	Safety Injection Press. Xmtr. PT-923	Electronic Drift	Indicated Press. was 7.8 lb High.	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.
5-10-76	Safety Injection Press. Xmtr. PT-925	Electronic Drift	Indicated Press. was 9.6 lb Low	Calibrated transmitter & returned to service.	Used approved procedures. Reactor at Cold Shutdown.	1 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

JUNE, 1976

UNIT NO. 2

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maintenance
6-29-76	Reactor Coolant Temperature high Delta T Alarm Comparator TC-2-432A	Electronic Drift	Alarm was being actuated 1.4% low at 100.6 rather than normal 102% (conservative)	Calibrated comparator to proper trip point. Checked for proper operation and returned to service. Submitted MR-S2-012840, requesting an increase in ventilation to the process protection relay room.	Used approved procedures. Placed channel in test.	1 hr.

INSTRUMENT MAINTENANCE

(Other Safety Related Systems and Major Items)

UNIT NO. 2

JULY, 1976

Date	System or Component Involved	Cause of the Malfunction	Results and Effect on Safe Operation	Corrective Action Taken	Precautions Taken for Reactor Safety	Time Required for Maintenance
7-2-76	Pressure switch for #2 Emergency Diesel Pneumatic start air System	Mechanical failure of switch	Caused motor on air compressor to relay out on thermal overload because of contact chatter at start setpoint	Replaced defective switch with a spare unit. Adjusted to proper operation. Returned to service.	Used approved procedures. Redundant diesel operating normally.	1 hr.
7-20-76	NIS N43A Overpower Rod Stop Bistable Card NC 302	Electronic Noise.	None, card was still functional.	Replaced card No. 686 with spare unit No. 0541. Checked for proper operation and returned to service.	Used approved procedures. Placed channel in test.	2 hrs.
7-27-76	Pressure switch for #3 Emergency Diesel Pneumatic Start Air System.	Mechanical failure of switch.	Caused motor on Air Compressor to relay out on thermal overload because of contact chatter at start setpoint.	Replaced defective switch with a spare unit. Adjusted to proper setpoints checked for proper operation. Returned to service.	Used approved procedures. Redundant diesel operating normally.	1 hr.
7-30-76	N-32 Source Range Nuclear Detector High Voltage Power Supply failed.	Electronic failure.	Only one operable source range detector.	Replaced defective power supply with new unit. Calibrated detector and returned to service.	Used approved procedures. Placed channel in test. Redundant instruments operating normally.	2 hrs.

AUGUST, 1976

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

UNIT NO. 2

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
7-31-76	NIS	Setpoint too close to Tech. Spec. limit.	Moved setpoint away from T.S. limit in conservative direction.	Completed SP-76-7. Changed Low Level Trip from 25% to 23%.	Reactor shutdown. Used approved procedures.	2 hrs.

UNIT NO. 2

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

SEPTEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
9-3-76	OP OT ΔT Protection Delta T Flux Summator. Output erratic.	Electronic drift.	Caused channel 2 OP ΔT Setpoint to be penalized.	Replaced summator with spare unit. Calibrated, checked for proper operation and returned to service.	Placed channel in test. Used approved procedures.	1 hr.
9-23-76	NI-32 Source and Intermediate Range Detector	Source range detector fatigue resulted in low reading.	Unit at cold shutdown, safety not compromised.	Replaced source and intermediate detector assembly. Calibrated and returned to service.	Placed channel in test. Used approved procedures. Redundant channel operating properly.	8 hrs.

UNIT No. 2

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

OCTOBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
10-11-76	Feedwater flow Prot. Channel III Multiplier/ Divider. FM-2-477	Electronic failure resulted in rendering FW < SF comparator FC-2-467B inoperative.	No FW < SF Trip would have been generated from Channel III.	Repaired multiplier/divider module. Checked for proper operation. Returned to service.	Used approved procedures. Redundant channel normal.	2 hrs.
10-17-76	Reactor Coolant Temp. Function Generator NM-2-432-C and Summator TM-2-432F	Electronic component failure in TM-2-432F & NM-2-432C	Combined error of the two modules resulted in OTSP being .02% high. Out of spec. unconservative.	Replaced both modules with system spares. Calibrated, checked for proper operation & returned to service.	Used approved procedures. Redundant channels normal.	2 hrs.

UNIT NO. 2

INSTRUMENT MAINTENANCE

(OTHER SAFETY RELATED SYSTEMS AND MAJOR ITEMS)

DECEMBER, 1976

DATE	SYSTEM OR COMPONENT INVOLVED	CAUSE OF THE MALFUNCTION	RESULTS AND EFFECT ON SAFE OPERATION	CORRECTIVE ACTION TAKEN	PRECAUTIONS TAKEN FOR REACTOR SAFETY	TIME REQ'D FOR MAINT.
12-2-76	Rod Control System fuses	No malfunction	None	As per Westinghouse Engineering Change No. 0268027 all Chase Shomot A25X10 10 amp fuses were changed to Bussman fuse No. 2432B59.	Reactor at cold shutdown.	2 hrs.
12-6-76	RMS 261 Containment H/R Gamma	Mechanical failure of check source.	None	Replaced detector #768 with Det. No. 397 calibrated and placed in service.	Reactor at cold shutdown.	2 hrs.
12-17-76	N-42 Power Range Detector .25 V power supply.	Electronic failure	False indication ≈ 8% on N-42.	Replaced Ser. No. 011002-44 with spare power supply Ser. No. 210028-44. Adjusted for proper output and returned to service.	Placed channel in test. Used approved procedures Unit in shutdown condition.	1 hr.
12-11-76	Reactor Coolant Flow Transmitters	Incorrect 100% flow DP due to S.G. Tube Plugging Operations.	Low Flow Indication	Rescaled transmitters to new 120% DP based on 100% Flow D.P. readings.	Used approved procedures Reactor at Hot Shutdown condition.	3 hrs.

OTHER EVENTS OF INTEREST

1. Chemical Releases To The Cooling Water
2. Instances Where Thermal Discharge Limits Were Exceeded
3. Results of Analysis of Non-Radiological Environment Monitoring Program
4. Fuel Handling
5. Fuel Characteristics
6. Effluent Releases
7. Single Releases of Radioactivity or Radiation Exposure Associated With Outages

CHEMICAL RELEASES

TO THE COOLING WATER

SURRY POWER STATION

CHEMISTRY REPORT

JANUARY ,19 76

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	4.21E-1	2.90E-1	3.52E-1	2.48E-1	1.92E-3	1.56E-1
Suspended Solids, ppm	0.0	0.0	0.0	0.1	0.0	0.1
Gross Tritium, µCi/ml	1.05E-1	2.73E-2	7.57E-2	9.56E-2	2.91E-2	5.15E-2
Iodine-131, µCi/ml	9.17E-2	8.10E-3	1.68E-2	2.02E-2	1.19E-2	1.68E-2
I-131/I-133	0.86	0.35	0.62	0.67	0.31	0.49
Hydrogen, cc/kg	23.1	15.3	19.6	33.6	0.0*	14.4
Lithium, ppm	0.95	0.68	0.85	0.71	0.32	0.50
Boron-10, ppm +	177.4	152.9	165.6	255.4	85.8	160.9
Oxygen-16, ppm	0	0	0	0	0	0
Chloride, ppm	0.07	0.05	0.05	0.09	0.05	0.06
pH @ 25°C	6.82	6.50	6.63	6.89	5.99	6.52

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 0.0 Boron 697.4

Sulfate 1390 Chromate 0.14

Remarks: * Unit Shutdown

SURRY POWER STATION

CHEMISTRY REPORT

February ,19 76

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	4.01E-1	2.70E-1	3.35E-1	2.74E-1	1.63E-2	1.70E-1
Suspended Solids, ppm	0.01	0.00	0.01	0.00	0.00	0.00
Gross Tritium, µCi/ml	1.57E-1	1.37E-1	1.43E-1	8.14E-2	3.70E-2	6.08E-2
Iodine-131, µCi/ml	1.70E-2	4.87E-3	1.13E-2	3.23E-2	6.23E-3	1.50E-2
I-131/I-133	0.8280	0.1664	0.5391	0.5104	0.1639	0.3532
Hydrogen, cc/kg	36.4	15.3	22.4	30.0	8.0	21.7
Lithium, ppm	0.50	1.03	0.93	0.20 *	0.88	0.46
Boron-10, ppm +	155	139	148	296 *	75	154
Oxygen-16, ppm	0.000	0.000	0.000	5.700*	0.000	0.660
Chloride, ppm	0.08	0.05	0.05	0.09	0.05	0. 05
pH @ 25°C	6.82	6.50	6.59	6.87	6.05	6.43

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 0 Boron 1483.4

Sulfate 556 Chromate .03

Remarks: * Unit 2 at cold shutdown

SURRY POWER STATION

PRIMARY CHEMISTRY AND CHEMICAL RELEASES
TO CIRCULATING WATER

MARCH , 19 76

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	3.93E-1	4.70E-2	2.58E-1	2.43E-1	4.05E-2	1.85E-1
Suspended Solids, ppm	0.3	0.0	0.1	0.2	0.0	0.1
Gross Tritium, µCi/ml	1.87E-1	8.67E-3	8.73E-2	1.52E-1	4.08E-2	8.61E-2
Iodine-131, µCi/ml	3.77E-2	1.12E-2	2.72E-2	2.08E-2	8.30E-3	1.58E-2
I-131/I-133	0.7344	0.4381	0.5630	0.6304	0.2030	0.4650
Hydrogen, cc/kg	24.8	2.8*	12.6	26.1	3.0*	17.9
Lithium, ppm	1.00	0.34	0.65	0.75	0.25	0.41
Boron-10, ppm +	271*	105	185	264*	61	130
Oxygen-16, ppm	5.000*	0.000	0.339*	3.300*	0.000	0.233
Chloride, ppm	0.10	0.05	0.05	0.07	0.05	0.050
pH @ 25°C	6.72	6.02	6.40	6.80	6.15	6.58

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 10 Boron 1411.8

Sulfate 1397 Chromate 0.07

Remarks: * Unit Shutdown

SURRY POWER STATION

CHEMISTRY REPORT

APRIL ,19 76

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	4.00E-1	9.63E-2	2.77E-1	2.37E-1	4.09E-3	1.53E-1
Suspended Solids, ppm	0.01	0.00	0.01	0.02	0.00	0.01
Gross Tritium, µCi/ml	1.28E-1	5.97E-2	9.02E-2	1.13E-1	2.40E-2	7.51E-2
Iodine-131, µCi/ml	2.64E-2	1.29E-2	1.67E-2	2.16E-2	1.34E-2	1.68E-2
I-131/I-133	0.9789	0.4074	0.5718	0.8518	0.3057	0.5871
Hydrogen, cc/kg	33.0	2.2 (1)	16.5	25.2	0.0 (2)	14.3
Lithium, ppm	0.60	0.33	0.49	0.41	0.00 (2)	0.29
Boron-10, ppm +	315.0 (1)	109.2	166.2	422.2 (2)	49.4	230.9
Oxygen-16, ppm	0.200 (1)	0.000	0.074 (1)	4.100 (2)	0.000	0.842 (2)
Chloride, ppm	0.09	0.05	0.05	0.07	0.05	0.05
pH @ 25°C	6.70	6.13	6.45	6.80	5.10 (2)	6.40

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate	10	Boron	497
Sulfate	(4) 1126	Chromate	0.06

Remarks: (1) Unit at Cold Shutdown

(2) Unit at Refueling Shutdown

SURRY POWER STATION

CHEMISTRY REPORT

May ,1976

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	2.89E-1	1.78E-2	2.10E-1	3.12E-2	1.24E-3	1.06E-2
Suspended Solids, ppm	0.1	0.0	0.1	0.33	0.0	0.1
Gross Tritium, µCi/ml	1.19E-1	5.06E-2	8.89E-2	2.24E-2	1.22E-2	1.73E-2
Iodine-131, µCi/ml	5.96E-2	2.41E-3	1.75E-2	*	*	*
I-131/I-133	0.7414	0.1424	0.5494	*	*	*
Hydrogen, cc/kg	28.3	2.2 (1)	19.2	7.2	0.0 (1)	0.2 (1)
Lithium, ppm	1.85	0.73	1.45	1.12	0.10 (1)	0.41
Boron-10, ppm +	255.4 (1)	91.5	150.3	500.6 (1)	230.3 (1)	449.6 (1)
Oxygen-16, ppm	5.600 (1)	0.000	0.283 (1)	5.000 (1)	0.000 (1)	1.50 (1)
Chloride, ppm	0.36 (1)	0.05	0.08	0.30 (1)	0.05	0.09
pH @ 25°C	6.95	5.40	6.64	5.95	4.70	5.41

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 0 Boron 1256.9

Sulfate 834 Chromate 0.11

50% NaOH 1050

Remarks:

* Test not performed, unit down for Refueling

(1) Unit Shutdown

William A. Thornton
Chemistry Supervisor

SURRY POWER STATION

CHEMISTRY REPORT

June ,19 76

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	2.67E-1	1.40E-1	2.27E-1	1.27E-1	2.52E-4	6.66E-2
Suspended Solids, ppm	0.01	0.00	0.01	0.02	0.00	0.01
Gross Tritium, µCi/ml	2.59E-1	1.38E-1	1.78E-1	2.67E-1	9.73E-3	9.35E-2
Iodine-131, µCi/ml	6.36E-2	7.60E-3	2.19E-2	1.02E-2	1.46E-3	4.27E-3
I-131/I-133	0.9860	0.3639	0.6570	0.7611	0.1766	0.4450
Hydrogen, cc/kg	20.2	11.0	13.3	30.0	7.3	20.9
Lithium, ppm	1.65	1.10	1.40	2.70	0.68	1.53
Boron-10, ppm +	92.9	77.0	84.7	237.7	159.7	199.1
Oxygen-16, ppm	0.000	0.000	0.000	0.080	0.000	0.003
Chloride, ppm	0.07	0.05	0.05	0.10	0.05	0.06
pH @ 25°C	7.07	6.80	6.94	6.81	5.92	6.62

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 0 Boron 1510.6

Sulfate 1946 Chromate 1.63

50% NaOH 2450

Remarks: (1) Ion Exchanger put in service to lower Lithium back to specifications.

W. A. Thomson

Chemistry Supervisor

SURRY POWER STATION

CHEMISTRY REPORT

JULY ,1976

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	3.83E-1	3.39E-2	2.10E-1	1.20E-1	3.00E-2	9.15E-2
Suspended Solids, ppm	0.05	0.00	0.01	0.01	0.00	0.01
Gross Tritium, µCi/ml	1.48E-1	9.50E-2	1.23E-1	2.64E-1	1.70E-1	2.07E-1
Iodine-131, µCi/ml	5.53E-2	4.88E-3	2.27E-2	2.02E-2	1.57E-3	5.59E-3
I-131/I-133	0.8418	0.3272	0.5186	1.0340	0.1060	0.5425
Hydrogen, cc/kg	16.1	0.0*	10.3	31.8	10.0	21.4
Lithium, ppm	1.40	0.26	0.85	2.25(1)	1.76	2.09
Boron-10, ppm +	313.0	63.1	157.8	262.8	137.6	175.2
Oxygen-16, ppm	6.000*	0.000	0.650*	0.000	0.000	0.000
Chloride, ppm	0.10	0.05	0.06	0.07	0.05	0.05
pH @ 25°C	7.00	5.70	6.46	6.80	6.32	6.71

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate	0.0	Boron	1617.7
Sulfate	1390	Chromate	0.17
50% NaOH	1750		

Remarks: *Unit Shutdown

(1) Lithium found to be high, ion exchanger used to lower the concentration.

W. O. Hamilton
Chemistry Supervisor

SURRY POWER STATION

CHEMISTRY REPORT

AUGUST ,19 76

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	2.95E-1	5.54E-2	2.18E-1	1.49E-1	3.58E-2	1.07E-1
Suspended Solids, ppm	0.2	0.0	0.1	0.1	0.0	0.1
Gross Tritium, µCi/ml	1.11E-1	9.28E-2	1.01E-1	1.75E-1	9.69E-2	1.29E-1
Iodine-131, µCi/ml	2.62E-2	3.99E-3	1.56E-2	9.67E-3	1.25E-3	4.00E-3
I-131/I-133	0.7339	0.3793	0.5369	0.7798	0.1780	0.4083
Hydrogen, cc/kg	0.0*	22.9	11.3	26.7	12.4	19.9
Lithium, ppm	2.10	0.30	0.66	1.95	1.00	1.62
Boron-10, ppm +	300.7*	51.2	110	257.9*	114.5	153.7
Oxygen-16, ppm	7.800*	0.000	0.319	0.000	0.000	0.000
Chloride, ppm	0.09	0.05	0.06	0.06	0.05	0.05
pH @ 25°C	6.80	6.20	6.64	6.86	6.20	6.64

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 0 Boron 1141.9

Sulfate 1946 Chromate 0.08

50% NaOH 2450

Remarks: * Unit shutdown

Chemistry Supervisor

SURRY POWER STATION

CHEMISTRY REPORT

September , 1976

T.S.6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	3.68E-1	4.70E-2	2.35E-1	1.40E-1	5.06E-3	6.85E-2
Suspended Solids, ppm	0.3	0.0	0.1	8.2 (1)	0.0	0.8
Gross Tritium, µCi/ml	1.78E-1	7.80E-2	1.24E-1	5.09E-1	2.95E-2	2.08E-1
Iodine-131, µCi/ml	1.24E-1	2.43E-2	7.84E-2	4.61E-2	1.75E-4	6.98E-3
I-131/I-133	1.1600	0.3573	0.8879	0.5956	0.0743	0.3349
Hydrogen, cc/kg	18.3	0.0 (1)	9.5	20.0	0.0 (1)	8.1
Lithium, ppm	0.40	0.31	0.34	2.20	1.48	1.88
Boron-10, ppm +	234 (1)	32	102	272 (1)	110	211
Oxygen-16, ppm	6.60 (1)	0.000	0.279	0.100 (1)	0.000	0.008
Chloride, ppm	0.13 (1)	0.05	0.06	0.17 (1)	0.05	0.08
pH @ 25°C	6.86	6.18	6.63	6.96	6.28	6.56

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate	16	Boron	2685
Sulfate	1122	Chromate	1.03
50% NaOH	1400		

Remarks: (1) Unit at Cold Shutdown

W. A. Thornton
CHEMISTRY SUPERVISOR

SURRY POWER STATION

CHEMISTRY REPORT

OCTOBER ,1976

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2 *		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	3.74E-1	1.45E-3	1.84E-1	3.17E-2	4.64E-3	1.60E-2
Suspended Solids, ppm	7.8 (1)	0.0	0.6	1.1	0.0	0.2
Gross Tritium, µCi/ml	1.06E-1	1.17E-2	4.34E-2	2.84E-2	1.21E-2	1.96E-2
Iodine-131, µCi/ml	2.63E-2	4.99E-3	1.75E-2	*	*	*
I-131/I-133	0.5610	0.2534	0.3968	*	*	*
Hydrogen, cc/kg	17.8	0.0 (1)	5.4	*	*	*
Lithium, ppm	0.71	0.40	0.53	*	*	*
Boron-10, ppm +	481.0 (1)	24.5	336.2	352.6	248.7	278.7
Oxygen-16, ppm	4.000 (1)	0.000	1.593	>0.100	>0.100	>0.100
Chloride, ppm	0.15 (2)	0.05	0.07	0.14	0.05	0.07
pH @ 25°C	7.30	4.72	5.78	6.02	5.68	5.92

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate 35 Boron 2770

Sulfate 1415 Chromate 0.72

50% NaOH 1755

Remarks: * Unit 2 shutdown for entire month of October.

(1) Unit 1 at refueling shutdown.

(2) At cold shutdown conditions; new mix bed ion exchanger placed in service, two hours after initial sample of 0.15 ppm, another sample showed 0.12 ppm.

Chemistry Supervisor

SURRY POWER STATION

CHEMISTRY REPORT

NOVEMBER ,1976

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	9.32×10^{-3}	4.92×10^{-4}	2.59×10^{-3}	8.95×10^{-3}	5.45×10^{-4}	3.10×10^{-3}
Suspended Solids, ppm	0.7	0.0	0.2	0.8	0.0	0.2
Gross Tritium, µCi/ml	9.98×10^{-3}	8.26×10^{-3}	9.17×10^{-3}	9.04×10^{-3}	5.60×10^{-3}	7.57×10^{-3}
Iodine-131, µCi/ml	(1)	(1)	(1)	(2)	(2)	(2)
I-131/I-133	(1)	(1)	(1)	(2)	(2)	(2)
Hydrogen, cc/kg	(1) 0.0	(1) 0.0	(1) 0.0	(2) 0.0	(2) 0.0	(2) 0.0
Lithium, ppm	(1)	(1)	(1)	2.45	(2) 0.0	1.42
Boron-10, ppm +	(1) 537	(1) 472	(1) 488	(2) 385	(2) 309	(2) 359
Oxygen-16, ppm	(1) 2.0	(1) 0.7	(1) 1.0	(2) 6.50	(2) 0.00	(2) 2.76
Chloride, ppm	0.09	0.05	0.05	0.15	0.05	0.08
pH @ 25°C	5.47	4.62	5.31	6.22	4.73	5.56

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate	45	Boron	781
Sulfate	54	Chromate	0.34
50% NaOH	4	Chlorine	0.0

Remarks: (1) Unit 1 at Refueling shutdown

(2) Unit 2 at Cold shutdown

CHEMISTRY SUPERVISOR

SURRY POWER STATION

CHEMISTRY REPORT

DECEMBER ,19 76

T.S. 6.6.A.11

PRIMARY COOLANT ANALYSIS	UNIT NO. 1			UNIT NO. 2		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Gross Radioact., µCi/ml	1.05×10^{-2}	4.88×10^{-4}	3.25×10^{-3}	1.93×10^{-1}	3.67×10^{-4}	4.32×10^{-2}
Suspended Solids, ppm	0.1	0.0	0.08	0.3	0.0	0.1
Gross Tritium, µCi/ml	6.95×10^{-3}	5.74×10^{-3}	6.34×10^{-3}	1.18×10^{-2}	4.13×10^{-3}	7.03×10^{-3}
Iodine-131, µCi/ml	(1)	(1)	(1)	(2)	(2)	(2)
I-131/I-133	(1)	(1)	(1)	(2)	(2)	(2)
Hydrogen, cc/kg	(1)	(1)	(1)	16.3	0.56	6.87
Lithium, ppm	(1)	(1)	(1)	1.09	0.70	0.83
Boron-10, ppm +	583	485	546	380	109	210
Oxygen-16, ppm	2.400 (1)	0.050 (1)	0.410 (1)	7.000 (2)	0.000	0.280
Chloride, ppm	0.27 (1)	0.05	0.09	0.12	<.05	0.06
pH @ 25°C	5.49	4.20	4.95	6.70	5.30	6.05

+ Boron-10 = Total Boron x 0.196

NON-RADIOACTIVE CHEMICAL
RELEASES, POUNDS
T.S. 4.13.A.8

Phosphate	24	Boron	642
Sulfate	1414	Chromate	0.20
50% NaOH	877	Chlorine	0.0

Remarks:

(1) Unit at Cold Shutdown

(2) Unit at Cold Shutdown or unstable power entire month.

W. A. Thomas
Chemistry Supervisor

INSTANCES WHERE

THERMAL DISCHARGE LIMITS WERE EXCEEDED

INSTANCES WHERE THERMAL DISCHARGE LIMITS WERE EXCEEDED

The temperature limitations on condenser cooling water discharge found in Technical Specification 4.14 apply to heat added to the water passing through the turbine steam condensers and the heat added to the river by the heated water discharged from the condensers. In the following instances the thermal discharge limits delineated in the Technical Specifications were exceeded. Notification letters to the Nuclear Regulatory Commission were sent for each occasion.

DATE	EVENT	TECHNICAL SPECIFICATION
2-15-76	Exceeded 15°F ΔT	4.14.A.2
2-28-76	Exceeded 15°F ΔT	4.14.A.2
3-22-76	Exceeded 15°F ΔT	4.14.A.2
3-23-76	Exceeded 15°F ΔT	4.14.A.2
3-26-76	Exceeded 15°F ΔT	4.14.A.2
4-12-76	Exceeded 15°F ΔT	4.14.A.2
6-25-76	Exceeded 15°F ΔT	4.14.A.2
12-20-76	Exceeded 3°F/Hr Temperature Increase	4.14.A.3
12-26-76	Exceeded 3°F/Hr Temperature Increase	4.14.A.3

RADIOLOGICAL ENVIRONMENTAL MONITORING

ENVIRONMENTAL MONITORING REPORT

JANUARY 1 - DECEMBER 31, 1976

SURRY POWER STATION
VIRGINIA ELECTRIC AND POWER COMPANY

SOUTHEASTERN FACILITY
EBERLINE INSTRUMENT CORPORATION
WEST COLUMBIA, SOUTH CAROLINA

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INTRODUCTION

The Surry Station of the Virginia Electric and Power Company is located on a peninsula in the James River approximately 25 miles upstream of the junction of the river with Chesapeake Bay. The site is on the west bank of the river in Surry County, Virginia. Two pressurized water reactors, are located at the site with a design output of 788 Mwe (net) per unit. Cooling water for the condensers is taken in downstream of the site and discharged 5.7 miles upstream of the intake. The flow of the river at the site is complex, influenced by the amount of fresh-water run-off, and the back-and-forth flow of the tide, upstream flow of more saline water near the bottom, and downstream flow of less saline water near the top.

During plant operation, low levels of radioactivity are released with the cooling water to the James River and with ventilation air to the atmosphere. These releases are limited to "as low as reasonably achievable" and are measured to assure compliance with the NRC Regulations and the Surry Power Station Technical Specifications. The environmental monitoring program provides confirmatory surveillance.

The low levels of radionuclides released to the air and water from Surry Station contribute to the radiation background through both external and internal exposure. The primary modes of external exposure include immersion in a cloud of radioactive gaseous effluent, submersion in water containing radioactive effluent, and exposure from contaminated land surface. The primary modes of potential internal deposition include inhalation of air and ingestion of milk, fish, and shellfish. Dose via the ingestion pathway is somewhat limited because the locale

constitutes a very limited milk shed, and the saline river water is not used for drinking water.

Table I shows the manner in which the elements of the Surry surveillance program fit together to monitor any radiological impact as a result of operations.

TABLE I
Relationship of Sampling and Measurements
to Elements of the Radiation Dose Paths

Radiation Dose Path	Sample and Measurements (Supportive Data)
Air Immersion	Thermoluminescent Dosimetry (Air Sampling)
Inhalation	Air Sampling (Precipitation, Crop Soil and Milk Sampling)
Land Surface	Thermoluminescent Dosimetry, Crop and Soil Sampling (Air and Milk Sampling)
Ingestion	
Fish and Shellfish	Fish, Oysters, Clam, and Crab Sampling (Water and Silt Sampling)
Water	Well, Surface Water, and Precipitation Sampling (River Water and Silt Sampling)
Milk	Milk Sampling (Air, Water, Soil, and Crop Sampling)
Water Submersion	Water Sampling (Silt Sampling)

TABLE II

Monitoring or Sampling Locations and Frequencies

	Air Particulate	Ambient Radiation	Precipitation	Milk	Well Water	Surface Water	Soil
Surry Station	BW	Q	M		SA		A
Hog Island Res.	BW	Q			SA		
Bacon's Castle	BW	Q		M(2 ea)	SA		A
Chippokes Creek						SA	
Alliance	BW	Q					A
Colonial Parkway	BW	Q		M			A
Williamsburg						SA	
Jamestown		Q			SA		
Dow	BW	Q					A
Fort Eustis	BW	Q					A
Newport News	BW	Q	M			SA	
Scotland		Q					
Leehall		Q		M			
Routes 10-676		Q					
Smithfield		Q				SA	

	Crops	Fowl	James River Water	Silt	Oyster	Clams	Fish	Crab
Bacon's Castle	A(3)							
Hog Island Res.		SA						
Jamestown						BM		
Newport News			BM	SA	BM			
Chickahominy			BM	SA		BM		
Station Discharge			BM	SA		BM		
Hog Island Pt.			BM	SA		BM		
Station Intake			BM	SA			SA	SM
Lawnes Creek						BM		
Deep Water Shoals					BM			
Point of Shoals				SA	BM			

BW-Bi-weekly M-Monthly

BM-Bi-monthly Q-Quarterly

SA-Semi-annually A-Annually

A(3)-Annually corn, peanuts, and soybeans

SM-Summer Months (two samplings: July - September)

TABLE III
Environmental Measurement
and
Sample Analysis Program

Type Sample	Frequency	Analysis
Air Particulate	Bi-weekly Quarterly	Gross Beta (1) Gamma Isotopic (2)
James River Water (Salt Water)	Bi-monthly Semi-annual	Gamma Isotopic Tritium
Well Water	Semi-annual	Gross Alpha, Gross Beta, and Tritium
Surface Water (Fresh Water)	Semi-annual	Gross Alpha, Gross Beta, and Tritium
Precipitation	Quarterly	Gross Beta (3) and Enriched Tritium
TLD	Quarterly	mRem
Crops	Annually	Gamma Isotopic and Sr-90
Fowl	Semi-annual	Gamma Isotopic (4)
Fish	Semi-annual	Gamma Isotopic
Oyster & Clam	Bi-monthly	Gamma Isotopic (4)
Crab	Summer months	Gamma Isotopic
Silt	Semi-annual	Gamma Isotopic
Soil	Annually	Gamma Isotopic
Milk	Monthly	Sr-89, 90, Calcium, Gamma Isotopic, and I-131

NOTES TO TABLE III

(1) Gamma isotopic analysis if gross beta exceeds 10 pCi/M^3.

(2) Quarterly composites of bi-weekly air particulate samples will be analyzed for gamma emitters in three groups as follows:

Stations 1 & 2 analyzed as one sample.
Stations 3,5,6,9, & 10 analyzed as one sample.
Station 11 analyzed as one sample.

Strontium-90 determined radiochemically if significant amounts of fission products attributable to the Station are detected by the gamma isotopic analysis.

(3) Perform gamma isotopic analysis if gross beta exceeds 15 nCi/M^3.

(4) Entire sample analyzed for gamma emitters. Sr-90 to be determined if a significant amount of fission products attributable to the Station are noted in the gamma analysis.

SUMMARY

Air Particulate Samples

Air particulate samples showed the arrival of widely reported fallout associated with a nuclear test conducted by the Peoples Republic of China. The chronology of gross beta concentrations shows the extent and duration of the elevated activity. The average of all air sampling locations, for the period of interest showed:

Date Collected	Gross Beta (pCi/M^3)
10-06-76	4.2 E-02
10-21-76	2.3 E-01
11-02-76	2.2 E-01
11-17-76	7.3 E-02
11-21-76	1.3 E-01
11-30-76	8.4 E-02
12-14-76	7.2 E-02
12-27-76	4.4 E-02

The chronological averages of gross beta concentrations ranged from 1.9 to 4.6 E-02 pCi/M^3 during the first half of 1976. A similar comparison for the second half of the year, but exclusive of those noted above, ranged from 2.2 to 3.4 E-02 pCi/M^3. The 1975 average concentrations generally ranged from 1.6 to 5.7 E-02 pCi/M^3 with the exception of a period during late winter and early spring. This latter period, with concentrations ranging up to 1.6 E-01 pCi/M^3, indicated the arrival of older fallout which had been expected due to previous experience. The upper atmosphere inventory of fallout has sufficiently decreased so that no elevated concentrations were observed during the winter/spring of 1976.

Gross alpha concentrations on air particulate samples collected, during 1976, were quantitated by VEPCo. No trend was noted and expected low level concentrations, on the order of 10^{-3} to 10^{-4}

pCi/M^3, were documented. The single highest concentration was noted at Newport News on 9-7-76 with 1.52 ± 0.25 E-02 pCi/M^3. This location is most remote from Surry Station and no plant contribution is indicated.

Gamma spectrometry of quarterly composites showed fission and activation products. Those measured throughout the year, and which are exclusive of the new fallout, included cobalts 58 and 60, and cesium-137. Those data are summarized below:

	Surry Station & Hog Island Reserve	Bacon's Castle, Alliance, Colonial Pkwy., Dow, & Fort Eustis	Newport News
Cobalt-58			
1st Qtr.	5.8 ± 2.8 fCi/M^3	4.1 ± 2.1 fCi/M^3	<6.6 fCi/M^3
2nd Qtr.	23 ± 4	2.6 ± 1.4	3.6 ± 2.0
3rd Qtr.	1.8 ± 1.1	2.1 ± 0.7	<5.3
4th Qtr.	30 ± 5	3.4 ± 1.2	<9.6
Cobalt-60			
1st Qtr.	3.0 ± 1.9 fCi/M^3	1.8 ± 1.5 fCi/M^3	<4.7 fCi/M^3
2nd Qtr.	6.9 ± 2.4	<1.7	<4.8
3rd Qtr.	3.2 ± 1.4	2.4 ± 0.8	<2.9
4th Qtr.	16 ± 4	4.1 ± 1.4	<11
Cesium-137			
1st Qtr.	4.9 ± 1.9 fCi/M^3	3.5 ± 1.7 fCi/M^3	4.5 ± 3.4 fCi/M
2nd Qtr.	5.8 ± 2.2	<1.8	<4.2
3rd Qtr.	5.5 ± 1.4	2.1 ± 0.7	3.2 ± 1.8
4th Qtr.	10 ± 3	3.3 ± 1.2	3.8 ± 2.9

In addition to those above, other fission and activation products, due to the Chinese fallout, were quantitated.

	Surry Station & Hog Island Reserve	Bacon's Castle, Alliance, Colonial Pkwy., Dow, & Fort Eustis	Newport News
Cobalt-57			
4th Qtr.	19 ± 14 fCi/M^3	<6.7 fCi/M^3	<36 fCi/M^3
Zirconium-95			
4th Qtr.	15 ± 4	14 ± 2	31 ± 7
Niobium-95			
4th Qtr.	17 ± 4	17 ± 2	32 ± 7

	Surry Station & Hog Island Reserve	Bacon's Castle, Alliance, Colonial Pkwy., Dow, & Fort Eustis	Newport News
Ruthenium-103			
4th Qtr.	14 ± 3 fCi/M³	10 ± 2 fCi/M³	8.3 ± 4.4 fCi/M³
Cesium-134			
4th Qtr.	3.4 ± 2.7	<1.3	<6.9
Cerium-141			
4th Qtr.	19 ± 5	28 ± 5	31 ± 8
Cerium-144			
4th Qtr.	21 ± 15	18 ± 12	38 ± 22

This same period yielded indications of barium-lanthanum-140 however the precise concentration in time cannot be given due to the relatively short half life of the parent and compared to the composite period.

Other radionuclides, likely to be attributed to Surry Plant effluent, were observed in single instances. All were noted in the first quarter composite and were:

Chromium-51	3.3 ± 3.2 fCi/M³	Newport News
Manganese-54	2.3 ± 1.6	SS & HIR
Cesium-134	2.9 ± 1.8	SS & HIR

One can presume the cobalts-58 and 60 are due to Surry Plant effluent. One can presume much of the cesium-137 is present due to old fallout since its concentration is relatively uniform during the period and comparable to historical data. Further, one would expect cesium-134 concentrations to be apparent with significant plant contribution of cesium-137. This apparently was the case with the Surry Station and Hog Island Reserve fourth quarter composite.

An estimate of the dose committment, through inhalation close in the Surry Plant, can be given by presuming the following concentrations and periods.

Manganese-54	2.3 fCi/M^3	1st Qtr.	(single composite)
Cobalt-58	15	year	(average of 4 qtrs.)
Cobalt-60	7.3	year	(average of 4 qtrs.)
Cesium-137	6.6	4th Qtr.	(difference between 4th qtr. composite and average of all composites at other locations)
Cesium-134	3.1	2 Qtrs.	(average of 2 qtrs.)

Using the model and assumptions given in Regulatory Guide 1.109, and presuming an adult is in residence in the area of the composite sample analysis, the dose committment becomes:

Bone	9.9 E-04 mrem	Kidney	5.3 E-04 mrem
Liver	1.6 E-03	Lung	2.4 E-02
Total Body	1.3 E-03	GI-LLI	3.4 E-03

Ambient Thermoluminescent Dosimetry

Environmental dosimetry data are summarized below, based upon the average for all four quarters less the control dosimeter dose. Where the control dosimeter was missing or where the control dosimeter dose was higher than the field dosimeters, the lowest field measurement was subtracted as an alternate to subtracting the control dosimeter indication.

Bacon's Castle	0.4 mR/wk	Smithfield	0.8 mR/wk
Surry Station	6.8	Scot. Wharf	0.3
Hog Island Reserve	0.4	Jamestown	0.1*
Alliance	0.4	Lee Hall	0.6
Colonian Parkway	0.3	Rts. 10 & 676	0.2**
Fort Eustis	0.4	Dow	0.6
Newport News	0.6		

* Single value - two missing, one net = 0.
** Two values - one missing, one net = 0.

The elevated measurement at Surry Station had been observed in the past and is indicative of on-site dose only. The other single highest location was at Smithfield. Due to its distance from the plant, relative to other locations, plant contribution is not expected. In the past, Alliance had indicated highest ambient

background while Bacon's Castle was also consistently relatively elevated. Other than the Surry Station on-site measurement, no other data showed significant noble gas effluent contribution. The Chinese fallout was not sufficient to result in measurable gamma dose in excess of background.

Precipitation Samples

The fourth quarter precipitation composite showed a relatively elevated tritium concentration at Newport News with 340 ± 180 nCi/M^2. This is the highest concentration observed in any precipitation sample. Other concentrations averaged 87 nCi/M^2 and ranged from 39 ± 14 to 150 ± 30 nCi/M^2.

Gross beta concentrations can be summarized by:

	Average	Maximum	Minimum
Surry Station	4.3 nCi/M^2	6.0 ± 1.3 nCi/M^2	3.2 ± 1.0 nCi/M^2
Newport News	3.3	6.0 ± 1.2	1.3 ± 0.7

The Chinese fallout was not discernible through gross beta concentrations in precipitation.

Milk Samples

The previously mentioned Chinese fallout did show measurable concentrations in milk samples. There was no measurable iodine-131 until October 5th and the distribution is summarized below:

Date Collected	Epp's (pCi/1)	Judkins (pCi/1)	Lee Hall (pCi/1)	Colonial Pkwy. (pCi/1)
10-05-76	2.0 ± 0.1	2.6 ± 0.2		
10-19-76	0.38 ± 0.23		<0.2	
10-21-76			0.57 ± 0.20	0.60 ± 0.16
11-02-76		3.4 ± 0.9		
11-18-76			<0.1	<0.1
11-30-76	0.42 ± 0.14			

Samples collected on 12-14-76, and later, showed no measurable iodine-131. No contribution from Surry Station effluent is presumed.

Gamma spectrometry of milk samples showed cesium-137 in eleven of the fifty-six samples analyzed. There was no trend in time or distribution of the concentrations. These cesium-137 levels averaged 16 pCi/l and ranged from 11 $\pm$ 11 to 31 $\pm$ 16 pCi/l. There was no observable increase during the Chinese fallout.

Other isotopes were observed as a result of the fallout. Iodine-131 was visualized, but the radiochemical procedure is much more precise than the gamma spectrometry. For example, the Epp's sample collected on 10-05-76 showed 20 $\pm$ 20 pCi/l as opposed to the radiochemical 2.0 $\pm$ 0.1 pCi/l. This same Epp's sample did show cerium-144 with 200 $\pm$ 140 pCi/l and lanthanum-140 indicated 26 $\pm$ 24 pCi/l; barium-140 was less than 65 pCi/l.

Other isotopes were potentially present through gamma spectrometry:

Zr-95	Lee Hall	1-15-76	17 $\pm$ 13
Co-60	Judkins	3-24-76	18 $\pm$ 11
	Gwaltney	4-21-76	17 $\pm$ 11
	Colonial Parkway	7-30-76	13 $\pm$ 13
Co-57	Gwaltney	4-21-76	20 $\pm$ 18
	Lee Hall	6-03-76	18 $\pm$ 18
Cr-51	Colonial Parkway	4-06-76	140 $\pm$ 140

The error terms associated with the above concentrations show that the analytical sensitivity is challenged. Some may be statistical artifacts however the large error term indicates that, at worst, actual concentrations were much lower than those indicated.

Radiostrontium analyses of the milk samples yielded measurable strontium-90 concentrations in forty-one of the fifty-six samples. Concentrations averaged 5.0 pCi/l with a range of from 1.4 to 14 pCi/l. While no contribution from Surry Station was indicated,

the appearance of strontium-89 in several samples showed potential relationship to the Chinese fallout. Those samples were:

Location	Date	Sr-89 (pCi/l)	Sr-90 (pCi/l)
Lee Hall	10-19-76	9.4 ± 2.4	0.0 ± 2.3
	10-21-76	3.5 ± 2.2	3.9 ± 1.7
Judkins	11-02-76	12 ± 3	4.3 ± 1.8
Colonial Pkwy.	11-18-76	3.6 ± 1.8	3.0 ± 1.8

Well Water Samples

Well water samples were collected from the four locations on April 21, and November 2, 1976 and analyzed for gross alpha and beta concentrations as well as tritium. Gross alpha was below analytical sensitivity in all samples. The two closest in samples, at Surry Station and Hog Island, showed no measurable beta activity, but both Jamestown and Bacon's Castle indicated activity.

Date	Bacon's Castle	Jamestown
4-21-76	12 ± 5 pCi/l	7.8 ± 5.3 pCi/l
11-02-76	2.4 ± 1.4	2.7 ± 1.6

The results mimic closely the 1975 determinations in location and concentration. No plant contribution is expected and the activity is presumed to be from naturally occuring radionuclides.

Tritium determinations in these same samples showed three of the eight measurements above detection limits:

4-21-76	Surry Station	270 ± 120 pCi/l
	Bacon's Castle	350 ± 110
11-02-76	Bacon's Castle	150 ± 100

This also is expected based upon sampling history. Bacon's Castle has been consistently elevated with 1975 concentrations as high as 410 ± 100 pCi/l. No contribution from Surry operations is expected and contribution from more recent precipitation (or surface water intrusion) is expected.

Surface Water Samples

Surface water sampling, during April and November, showed no measurable gross alpha concentrations. The April sampling showed measurable beta activity in only the Newport News sample with 7.0 ± 5.0 pCi/1. Samples collected on 11-02-76 all showed beta activity and may be indicative of the previously discussed Chinese fallout although concentrations were relatively low. The average of the four was 3.6 pCi/1 with a range of from 2.2 ± 1.5 pCi/1 (Chippokes Creek) to 6.7 ± 1.8 pCi/1 (Smithfield).

Tritium concentrations in the November samples were less than 300 pCi/1 with the exception of Smithfield which indicated 310 ± 260 pCi/1. During April, tritium concentrations averaged 520 pCi/1 and ranged from 290 ± 80 (Williamsburg) to 960 ± 100 (Newport News).

No plant related activity was apparent in the surface water samples.

James River Water Samples

Gamma spectrometry of the bi-monthly samples showed expected concentrations of naturally occuring radionuclides with low levels of Cs-137 detected in four of the 33 samples. These were:

Location	Date	Cesium-137
Station Intake	1-30-76	4.6 ± 4.1 pCi/1
	3-15-76	4.6 ± 4.1
Newport News	5-21-76	4.6 ± 4.1
Chickahominy	9-23-76	5.4 ± 4.3

Both cobalt-58 and chromium-51 were individually detected.

Location	Date	Cobalt-58
Hog Island Point	3-11-76	5.0 ± 5.0 pCi/1
Station Discharge	3-11-76	4.8 ± 4.4

Location	Date	Chromium-51
Station Discharge	5-21-76	81 ± 43 pCi/l
Newport News	10-29-76	52 ± 41

While the cesium-137 observations are typical and are most likely due to old fallout, the low levels of cobalt-58 and chromium-51 could be due to Surry effluent in both the Discharge samples and the Hog Island Point sample. Given the associated error terms, the concentrations were extremely low and, in single instances, constitute essentially no dose to man. This would be true even if the James River were used for drinking water, which it is not. Subsequent portions of this report discuss accumulation in the river and accumulation in shellfish.

Tritium levels, through semi-annual composites, showed:

	Chickahominy	Newport News
First Half '76	200 ± 100	570 ± 200
Second Half '76	210 ± 100	330 ± 110

The higher numbers, more remote to Surry, help one to conclude that no appreciable plant effluent levels are detected. Concentrations are typical for surface water and comparable to the 1975 data.

Two special samples were collected directly at the Discharge Canal to permit more direct measurement before dilution in the James River. Isotopes of interest were:

	7-06-76	10-19-76
Mn-54	8.5 ± 5.1	--------
Co-58	27 ± 9	--------
Co-60	36 ± 11	19 ± 8
Cs-134	10 ± 9	15 ± 6
Cs-137	36 ± 11	29 ± 8
Tritium	<370	500 ± 150
Gross Beta	(not requested)	59 ± 12

Silt Samples

Semi-annual silt collections occurred on March 15th and on September 23rd or October 29th. As in the past, the accumulation gave a number of fission and activation products due to Surry Station liquid effluent. These radionuclides can be summarized.

	Mn-54 (pCi/kg)	
9-23-76	Station Discharge	410 ± 160
10-29-76	Station Intake	110 ± 100
	Co-58 (pCi/kg)	
3-5-76	Point of Shoals	120 ± 100
9-23-76	Station Discharge	940 ± 200
	Co-60 (pCi/kg)	
3-15-76	Point of Shoals	180 ± 100
9-23-76	Station Discharge	2500 ± 300
	Cs-134 (pCi/kg)	
3-15-76	Station Intake	650 ± 100
	Point of Shoals	230 ± 90
	Station Discharge	180 ± 110
	Chickahominy	140 ± 100
9-23-76	Station Discharge	1000 ± 200
10-29-76	Station Intake	140 ± 90
	Cs-137 (pCi/kg)	
3-15-76	Point of Shoals	1000 ± 200
	Newport News	340 ± 100
	Station Discharge	200 ± 130
	Chickahominy	450 ± 170
9-23-76	Station Discharge	3300 ± 300
	Chickahominy	1100 ± 200
10-29-76	Station Intake	650 ± 160
	Newport News	560 ± 160
	Ce-141 (pCi/kg)	
10-29-76	Station Intake	560 ± 320

A significant increase is noted at the Station Discharge for the expected fission and activation products. The March, 1976 concentrations were lower than those of March, 1975. Some activity was "washed" down river with accumulation occurring again during 1976.

Oyster Samples

Gamma spectrometry showed five expected fission and activation products in the quarterly oyster samples. Cobalt-58 was observed most frequently and a representation of the distribution and concentration of the total effluent can be given through this specific isotope.

	Cobalt-58 (pCi/kg wet)	
1-26-76	Newport News	38 ± 21
	Point of Shoals	40 ± 22
	Deep Water Shoals	<35
3-11-76	Naseway Shoals	67 ± 20
3-15-76	Deep Water Shoals	46 ± 36
	Point of Shoals	30 ± 23
5-11-76	Newport News	<39
	Point of Shoals	22 ± 18
	Deep Water Shoals	54 ± 37

Samples collected in July, September, and November did not suggest the presence of cobalt-58. This indicates that radiological decay and/or washout removed the isotope more rapidly than the oysters accummulated the activity. Neither the Chinese fallout nor the increase in sediment activity were reflected in analysis of the oyster samples. Any delay in the path from sediment to oysters would result in increasing concentrations during 1977.

The gamma spectrometry data can be used to fabricate a conservatively "typical oyster" by averaging the concentrations of the specific isotopes that could be attributed to Surry effluent. Such an exercise yields:

Mn-54	32 pCi/kg	Ru-103	22 pCi/kg
Co-58	44	Ag-110m	47
Co-60	24	Cs-137	40

An estimate of dose committment through one years consumption of these oysters can be made utilizing the model and assumptions of Regulatory Guide 1.109.

Dose Committment (mrem)			
Bone	3.2 E-03	Kidney	1.6 E-03
Liver	4.6 E-03	Lung	4.9 E-04
Total Body	3.1 E-03	GI-LLI	5.4 E-03

The dose committments are low even though an appreciable fraction of the dose is attributable to cesium-137. Much, if not all, the cesium-137 is due to old fallout and not as an impact of Surry operations.

Clam Samples

Gamma spectrometry yielded various concentrations of ten different fission and activation products. The three isotopes observed most frequently were cobalts-58 and 60 and cesium-137.

Cobalt-58 (pCi/kg)		
1-13-76	Lawnes Creek	24 ± 14
3-15-76	Station Discharge	130 ± 30
	Jamestown	62 ± 24
	Station Discharge	190 ± 40
	Lawnes Creek	42 ± 41
	Hog Island Point	320 ± 80
	Chickahominy	220 ± 40
5-21-76	Chickahominy	30 ± 12
	Hog Island Point	97 ± 36
7-22-76	Station Discharge	74 ± 46
	Lawnes Creek	71 ± 43
9-09-76	Jamestown	32 ± 25
11-19-76	Lawnes Creek	42 ± 27
	Hog Island Point	34 ± 33
	Station Discharge	81 ± 28

Cobalt-60 (pCi/kg)		
1-13-76	Station Discharge	68 ± 22
3-15-76	Station Discharge	45 ± 36
7-22-76	Hog Island Point	100 ± 50
	Station Discharge	74 ± 46
	Lawnes Creek	52 ± 36
	Jamestown	40 ± 29
9-09-76	Station Discharge	81 ± 48
	Hog Island Point	42 ± 38
11-19-76	Station Discharge	88 ± 30

Cesium-137 (pCi/kg)

1-13-76	Chickahominy	19 ± 18
	Jamestown	17 ± 16
	Station Discharge	26 ± 24
3-15-76	Jamestown	19 ± 18
	Station Discharge	29 ± 25
	Hog Island Point	71 ± 45
	Chickahominy	86 ± 30
5-21-76	Chickahominy	25 ± 14
	Jamestown	26 ± 21
	Hog Island Point	30 ± 28
	Lawnes Creek	31 ± 26
9-09-76	Lawnes Creek	40 ± 31

Cobalt-58 and cesium-137 levels appeared to be somewhat higher in the March samples. Three samples, from that same month, showed iodine-131 levels.

Station Discharge	28 ± 26
Lawnes Creek	27 ± 35
Hog Island Point	79 ± 68

The only potential indication of the Chinese fallout was the presence of zirconium-niobium-95 at 49 ± 32 and 39 ± 33 pCi/kg respectively.

To permit an ingestion dose estimate, one can proceed to construct a hypothetical clam using the same basis for the oyster dose estimate. Such a construction yields:

Mn-54	22 pCi/kg	I-131	48 pCi/kg
Co-58	97	Cs-134	33
Co-60	66	Cs-137	35
Ag-110m	37	Ce-144	100

The dose committment, based upon a one year adult consumption of such clams is given below. To temper the iodine-131 estimate, due to its short half life, that concentration was presumed constant for a two month period.

Dose Committment (mrem)

Bone	4.9 E-03	Kidney	3.0 E-03
Liver	9.1 E-03	Lung	9.5 E-04

Total Body	7.0 E-03	GI-LLI	2.3 E-02
Thyroid	1.6 E-02		

Crab Samples

Crab samples were collected near Surry Station intake during the season (July, August, and September). Cobalts-58 and 60 were measurable in the July and August samples.

Date	Co-58 (pCi/kg)	Date	Co-60 (pCi/kg)
7-29-76	45 ± 24	7-29-76	32 ± 21
8-09-76	100 ± 40	8-09-76	39 ± 33

Annual consumption of a kilogram of crabs having an average of the two concentrations given above, would yield a dose committment of:

Liver	1.3 E-04 mrem
Total Body	2.8 E-04
GI-LLI	2.5 E-03

Fish Samples

The annual fish sampling occured on March 1st. The bottom feeder had manganese-54 with 200 ± 110 pCi/kg. The free swimmer had cesium-137 with 78 ± 57 pCi/kg. Extrapolation to an annual dose committment is tenuous however these single concentrations yield:

Bone	4.3 E-02 mrem	Kidney	2.2 E-02 mrem
Liver	6.5 E-02	Lung	6.6 E-03
Total Body	3.9 E-02	GI-LLI	2.0 E-02

Soil Samples

The annual soil sampling occured at the air sampling locations on August 24th. Naturally occuring radionuclides were observed and while several fission and activation products were suggested,

only cesium-137 was present in measurable concentrations.

Cesium-137 (pCi/kg)

Surry Station	95 ± 93	Colonial Parkway	1500 ± 200
Hog Island Reserve	180 ± 100	Dow	190 ± 130
Bacon's Castle	2400 ± 300	Fort Eustis	1800 ± 200
Alliance	280 ± 90	Newport News	200 ± 120

Some non-specific fraction may have been deposited through gaseous effluent from Surry however the two closest in locations were comparably low. Bacon's Castle, Colonial Parkway, and Fort Eustis are clearly higher than the two other locations. This variation in cesium-137 concentrations from old fallout could be a result of a number of factors. In addition to the potential for non-uniform distribution on a local basis, construction may have removed initially deposited old fallout. Also, heavily vegetated locations tend to retain cesium-137 through uptake within the plant including new growth nourished by dead and decayed vegetation.

Radiostrontium levels in the soil showed a single measurable strontium-89 level which was in the Surry Station sample with 73 ± 48 pCi/kg. Due to the relatively short half life and the relative abundance of strontium-89 expected in the effluent, one presumes the deposition was from the plant. Strontium-90 concentrations averaged 235 pCi/kg and ranged from 93 ± 69 to 720 ± 60 pCi/kg. The latter sample was from Newport News which is most remote to the plant relative to the other sampling locations.

Food Crop Samples

Crops collected for analysis included corn(2 samples), peanuts, and soybeans. The only fission product observed through gamma spectrometry was cesium-137 in soybeans with 69 ± 59 pCi/kg. Since other samples, indicative of the gaseous effluent path, showed no

significant contribution from Surry, one can presume that the above concentration is due to old fallout. Strontium-90 was detected in the soybeans with 14 ± 12 pCi/kg. Again, this can be presumed to be from old fallout.

One corn sample, collected on 10-11-76, showed strontium-89 at 48 ± 26 pCi/kg. A corn sample collected on the following day, at the same farm, did not show strontium-89 and the sensitivity of that particular analysis was 27 pCi/kg. The strontium-89 may have been a component of the current Chinese fallout since air samples collected from 10-06-76 to 11-12-76 showed clearly elevated gross beta activity due to this fallout.

Fowl Samples

The semi-annual fowl samples from the Hog Island Reserve included a goose collected on 6-03-76 and a Blue Heron on 12-01-76. Analysis of the goose showed only naturally occuring potassium-40. The heron showed cesium-137 with 64 ± 45 pCi/kg and barely detectable zirconium and nicobium-95 with respective concentrations of 75 ± 74 and less than 110 pCi/kg. No plant contribution is indicated.

Conclusion

The radiological environmental surveillance program for Surry Power Station continued to permit documentation which included naturally occuring radionuclides, old and new fallout, and also plant contributed activation and fission products in various environmental components.

Environmental dosimetry could not distinguish expected noble gas immersion dose from the plant from ambient natural level. Net

exposure, compared to control dosimeter measurements, showed a total of 20.8 mR/yr at Hog Island Reserve(close in to the plant). The highest apparent exposure was at Smithfield with 41.6 mR/yr on the same basis relative to controls.

A number of analyses yielded sufficient information to permit conservative estimates of dose committment to man through Surry effluent. The sum of those reported in each of the previous sections of this report yields:

	Dose Committment (mrem)		
Bone	5.2 E-02	Kidney	2.7 E-02
Liver	8.0 E-02	Lung	3.2 E-02
Total Body	5.1 E-02	GI-LLI	5.4 E-02
Thyroid	1.6 E-02		

ANALYTICAL PROCEDURES

Air Particulate

Gross alpha and gross beta radioactivity measurements are made utilizing a Beckman Widebeta II low background (anti-coincidence proportional) counter. The minimum detectable levels (99.7% confidence) are approximately 0.24 pCi per sample for alpha emitters and 0.80 pCi per sample for beta emitters.

Air particulate samples are mounted in two inch planchets and counted directly.

Gamma spectrum analysis utilizes a lithium-drifted germanium detector with a sensitive volume of 55 cm^3 and a thin aluminium window. The detector is housed in a graded lead shield with an internal volume of eight ft^3; six inches of lead are at the bottom with four inches of lead on all sides and on top. The analyzer system is a Nuclear Data 4420 and ND812 computer housing a 20K memory for acquisition, storage, and manipulation of spectra and computer programs. The overall system has a resolution of 2.2 kev for the 1170 kev peak of cobalt-60 with a peak to compton ratio of 32:1.

Air particulate composites are fitted into a Petri dish and analyzed directly.

Ambient Radiation

Thermoluminescent dosimeters of lithium flouride (TLD-100) are used to indicate ambient background radiation as well as noble gases such as xenon. The chips are preselected by laboratory irradiation and measurement with criterion of $\pm$ 4%. At low dose levels subsequent response can vary with $\pm$ 6% typical and with a range of less than $\pm$ 10%. A standard annealing cycle is used with one hour at 400° C. Calibration of the overall system includes use

of ionization chambers as directly received from calibration by the National Bureau of Standards. Each annealing batch includes a packet for quality control comparison. The dose reported is that received between annealing and reading unless otherwise directed.

Well Water and Surface Water

These water samples are treated identically as the precipitation samples. The major factor influencing the data is the fraction of the total sample analyzed.

Fowl

The single coot sample analyzed semi-annually is analyzed by high resolution gamma spectrometry on the Ge-Li system. Following separation of the flesh from feathers, bone and other organs, the sample is ground and dried. The minimum detectable activities are essentially equal to those of other dried organic materials.

Silt and Soil Samples

Soil and silt samples are analyzed in an identical manner. Samples are dried and seived through a number 11 U.S.A. Standard Testing Seive to remove pebbles and other foreign matter. The samples are tumbled to provide uniform mixing and aliquots of approximately 100g are analyzed by high resolution gamma spectrometry. Representative sensitivities for various isotopes are:

Zr-95	0.1 pCi/g
Nb-95	0.1 pCi/g
Cs-137	0.1 pCi/g
Pb-214	1.0 pCi/g
Bi-214	1.0 pCi/g
Ra-226	9.0 pCi/g

James River Water

Water samples are analyzed by high resolution gamma spectrometry and also by an enrichment procedure for tritium. The gamma spectrometry is performed by slowly drying a one liter aliquot and counting the residue. The tritium aliquot is electrolytically enriched before liquid scintillation counting and has a sensitivity of 120 pCi/l. This sensitivity is more than adequate to document equilibrium concentration due to world-wide environmental inventories.

Aquatic and Marine Organisms

Oysters and clams are analyzed by high resolution gamma spectrometry following grinding and drying. Only the edible portion of the mollusks are analyzed. Fish entrails are removed and the remainder submitted to pressurized steam to allow segregation of bone and flesh. The resultant sample weights are on the order of 10-20 grams. Typical resultant sensitivities are:

Zr-95	0.8 pCi/g
Nb-95	0.8 pCi/g
Sb-125	1.1 pCi/g
Cs-137	0.4 pCi/g
Ce-144	5.0 pCi/g
Ra-226	10.0 pCi/g

Precipitation

An aliquot of the composite is counted directly for tritium activity via liquid scintillation. The minimum detectable activity is 1.0 pCi/ml. Gross beta analysis is performed by drying an aliquot, in a planchet. The dried planchet is counted directly in the Widebeta II with a minimum detectable activity of 0.58 pCi per planchet.

The fractions of the samples analyzed are then related to the total precipitation collected and the area of the sample collector with units reported as nCi/M^2.

Milk Samples

Milk samples are analyzed for gamma emitters by high resolution gamma spectrometry. Minimum detectable activities are identical to those for water samples. Samples are also analyzed for Sr-89, 90 and calcium.

The strontium procedure includes separation by ion exchange with subsequent dried eluant counted on the Widebeta II system. An initial count with an additional count several days later, identifies the Y-90 in-growth. The sensitivity for Sr-89 and 90 is approximately 2 pCi/1. Stable calcium is measured by a standard titration with a sensitivity of 1 mg/1 for dosimetric techniques.

Milk samples are analyzed for low concentrations of I-131 through radiochemical analysis; sensitivity is approximately 0.25 pCi/1. Iodide carrier is added to the raw milk and ion exchange is used for the first step of purification. Sodium hypochlorite leached solution is treated with nitric acid and hydroxylamine. An organic extraction is effected and AgI is precipitated. The precipitate is washed, dried, and the tared filter is counted on a low background proportional beta particle counter. Recovery is based upon iodide carrier recovery.

EQUIPMENT

Gross alpha, gross beta, Sr-89 and Sr-90 measurements are made using a low background Beckman Widebeta II equipped with shielding and anti-coincidence electronic to obtain very low background counting rates. Automatic absorber measurements are also available.

Tritium enrichment analysis has a minimum detectable concentration of tritium in water on the order of 0.10 pCi/ml. Tritium is determined using a Beckman Model LS-200 liquid scintillation counter with 5 ml of water in Insta-Gel scintillator. The MDA for this system without enrichment is 0.6 pCi/ml based on a 100-minutes counting time, but the practical reporting level is 1 pCi/ml. When values below 1 pCi/ml are required, the sample is electrolytically enriched (HASL procedure) prior to liquid scintillation counting.

The gamma spectrometry system utilizes a high resolution detection with efficiency and resolution suitable for counting environmental samples. The analyzer system is a Nuclear Data 4420 with ND-812 Computer with 20K memory for acquisition, storage, manipulation of spectra and programs. The Ge-Li detector is a right circular cylinder with a 40 mm diameter, drifted coaxially with an open end. The "P" core diameter is 6 mm and "N" layer thickness of 0.5 mm. An active area of 12.3 cm^2 faces the thin aluminum window which permits analysis of photon energies a low a 35 kev. The resolution is 2.2 kev for the 1170 kev peak of Co-60 and the peak-to-compton ratio is 32:1 for Co-60 gamma. The minimum detectable activities (MDA), based upon typcial samples for the type indicated are listed in Table IV. The reporting level is a function of spectrum complexity, detector resolution, and peak-to-compton ratio. One reason this particular system was selected for environmental samples was the excellent resolution and peak-to-

compton ratio. The detector resides in a graded shield with eight ft^3 interior and with four inches of lead on top and sides and six inches on the bottom.

TABLE IV

Typical Minimum Detectable Concentrations
Ge-Li Gamma Spectrometry

Air Samples	
Cs-134	1.6×10^{-2} pCi/M^3
Cs-137	1.6×10^{-2} pCi/M^3
Ba-140	5.2×10^{-2} pCi/M^3
La-140	3.2×10^{-2} pCi/M^3
Other Expected Gamma Emitters	1.2×10^{-2} to 1.2×10^{-1} pCi/M^3
Water Samples	
Cr-51	80 pCi/1
Co-58	8 pCi/1
Co-60	8 pCi/1
Mn-54	8 pCi/1
Cs-134	9 pCi/1
Cs-137	9 pCi/1
Ba-140	30 pCi/1
La-140	20 pCi/1
Other Expected Gamma Emitters	8 to 80 pCi/1
Soil and Bottom Sediments	
Cs-134	35 pCi/kg (dry)
Cs-137	35 pCi/kg (dry)
Cr-51	280 pCi/kg (dry)
Co-58	30 pCi/kg (dry)
Co-60	30 pCi/kg (dry)
Mn-54	30 pCi/kg (dry)
Other Expected Gamma Emitters	30 to 300 pCi/kg (dry)
Fish, Benthus, and Aquatic Vegetation	
I-131	13 pCi/kg (wet)
Cs-134	14 pCi/kg (wet)
Cs-137	13 pCi/kg (wet)
Cr-51	110 pCi/kg (wet)
Co-58	12 pCi/kg (wet)
Co-60	13 pCi/kg (wet)
Mn-54	12 pCi/kg (wet)
Other Expected Gamma Emitters	1 to 120 pCi/kg (wet)

SUMMARY OF SAMPLE DATA

KEY INFORMATION FOR TABLES

1. Where data can range over several orders of magnitude, concentrations are expressed as powers of ten using E notation. For example E-03 is 10^{-3}.
2. Error terms are expressed as two standard deviations (95% confidence) for EIC data; zero values have three standard deviation error terms (99.7% confidence).
3. Where shown, averages are based upon measurable data, that is where two standard deviations are smaller than the calculated value. These averages should be used only as presented; averages among different sampling locations only present a basis for relative variability. The sequence in time is also an important factor.
4. The exact minimum detectable concentrations are variable dependent upon many factors such as complexity of a spectrum, quantity of the sample, etc. In order to maximize the value of the analysis, certain concentrations are reported as less than a given value. These data are reported through two methods.
    a. Frequently the analyses present information, such as a gamma spectrum peak, where the calculation error term at 95% confidence is larger than the calculated value. One can discern a very finite probability for the presence of that isotope. In these cases, the error term is increased to permit 99.7% confidence and the result is divided by sample size to yield concentration.
    b. One can expect certain isotopes to be present in a sample due to the nature of that sample. This is especially true when a member of a class of samples has definite data, but other members of the class do not exhibit the same information. Likewise, one can observe a small

concentration of one member of a parent-daughter pair without observing the other member which is obviously present. In these cases (always represented by the lowest "less than" concentrations) the value reported is based upon three standard deviations (99.7% confidence) of the instrument background with a blank sample in the counting geometry.

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Surry Station

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	238	0.0 ± 4.7 E-03
1-27-76	322	5.7 ± 0.6 E-02
2-10-76	302	1.6 ± 0.4 E-02
2-24-76	302	8.0 ± 3.9 E-03
3-10-76	302	5.6 ± 0.6 E-02
3-23-76	262	6.0 ± 0.6 E-02
4-5-76	251	8.8 ± 0.9 E-02
4-20-76	313	1.2 ± 0.1 E-01
5-4-76	302.4	5.3 ± 0.7 E-02
5-18-76	282	1.0 ± 0.1 E-01
6-3-76	345	4.3 ± 0.5 E-02
6-15-76	259	1.2 ± 0.1 E-01
6-30-76	324	4.4 ± 0.5 E-02
Average		6.4 E-02
Maximum		1.2 ± 0.1 E-01
Minimum		8.0 ± 3.9 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Surry Station

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	4.7 ± 0.5 E-02
7-27-76	302.4	5.9 ± 0.5 E-02
8-10-76	302.4	4.0 ± 0.4 E-02
8-24-76	302.4	4.7 ± 0.5 E-02
9-07-76	302.4	6.7 ± 0.5 E-02
9-22-76	324	6.4 ± 0.5 E-02
10-06-76	324	7.6 ± 0.6 E-02
10-21-76	324	5.0 ± 0.1 E-01
11-02-76	259.2	3.5 ± 0.1 E-01
11-17-76	*	5.3 ± 0.1 E+01
11-21-76	86.4	3.0 ± 1.1 E-02
11-30-76	194.4	1.5 ± 0.1 E-01
12-14-76	302.4	1.3 ± 0.1 E-01
12-27-76	**	1.3 ± 0.1 E+01
	Average	1.3 E-01
	Maximum	5.0 ± 0.1 E-01
	Minimum	3.0 ± 1.1 E-02

* No volume given; results in picocuries per sample

** Sampler malfunction; results in picocuries per sample

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Hog Island

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	246	1.4 ± 0.5 E-02
1-27-76	282	3.2 ± 0.5 E-02
2-10-76	282	2.2 ± 0.5 E-02
2-24-76	302	8.3 ± 3.9 E-03
3-10-76	202	0.0 ± 5.5 E-03
3-23-76	262	9.1 ± 4.4 E-03
4-5-76	Sampler Malfunction	
4-20-76	127	5.8 ± 1.3 E-02
5-4-76	221.8	0.0 ± 4.8 E-03
5-18-76	222	5.4 ± 4.6 E-03
6-3-76	345	7.9 ± 3.4 E-03
6-15-76	207	2.0 ± 0.6 E-02
6-30-76	324	1.6 ± 0.4 E-02
	Average	1.9 E-02
	Maximum	5.8 ± 1.3 E-02
	Minimum	5.4 ± 4.6 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Hog Island

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	1.8 ± 0.4 E-02
7-27-76	302.4	2.8 ± 0.4 E-02
8-10-76	302.4	1.9 ± 0.4 E-02
8-24-76	241.9	2.0 ± 0.4 E-02
9-07-76	221.7	3.3 ± 0.5 E-02
9-22-76	216	3.7 ± 0.6 E-02
10-06-76	324	5.7 ± 0.5 E-02
10-21-76	216	1.2 ± 0.1 E-01
11-02-76	172.8	1.2 ± 0.1 E-01
11-17-76	216	1.0 ± 0.1 E-01
11-21-76	57.6	2.5 ± 0.3 E-01
11-30-76	155.52	5.9 ± 0.8 E-02
12-14-76	241.92	4.6 ± 0.6 E-02
12-27-76	187.2	3.4 ± 0.6 E-02
	Average	6.7 E-02
	Maximum	2.5 ± 0.3 E-01
	Minimum	1.8 ± 0.4 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Alliance

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	222	1.6 ± 0.6 E-02
1-27-76	242	1.3 ± 0.5 E-02
2-10-76	282	4.3 ± 0.6 E-02
2-24-76	282	4.5 ± 0.6 E-02
3-10-76	302	3.8 ± 3.6 E-03
3-23-76	262	2.9 ± 0.5 E-02
4-5-76	262	3.4 ± 0.7 E-02
4-20-76	281	7.9 ± 0.8 E-02
5-4-76	222	4.9 ± 0.8 E-02
5-18-76	222	5.6 ± 0.7 E-02
6-3-76	323	4.5 ± 0.6 E-02
6-15-76	242	6.5 ± 0.7 E-02
6-30-76	324	3.5 ± 0.5 E-02
	Average	3.9 E-02
	Maximum	7.9 ± 0.8 E-02
	Minimum	3.8 ± 3.6 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Alliance

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	4.4 ± 2.9 E-03
7-27-76	302.4	4.4 ± 0.5 E-02
8-10-76	302.4	4.8 ± 0.5 E-02
8-24-76	302.4	3.3 ± 0.4 E-02
9-07-76	302.4	3.7 ± 0.4 E-02
9-22-76	324	1.9 ± 0.3 E-02
10-06-76	302	2.7 ± 0.4 E-02
10-21-76	345.6	1.4 ± 0.1 E-01
11-02-76	259.2	2.7 ± 0.1 E-01
11-17-76	324	1.1 ± 0.1 E-01
11-21-76	86.4	1.3 ± 0.2 E-01
11-30-76	194.4	6.4 ± 0.7 E-02
12-14-76	302.4	1.3 ± 0.3 E-02
12-27-76	271.44	5.6 ± 0.5 E-02

Average		7.1 E-02
Maximum		2.7 ± 0.1 E-01
Minimum		4.4 ± 2.9 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Bacon's Castle

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	262	0.0 ± 4.2 E-03
1-27-76	262	0.0 ± 4.2 E-03
2-10-76	282	0.0 ± 3.9 E-03
2-24-76	242	0.0 ± 4.6 E-03
3-10-76	302	1.0 ± 0.4 E-02
3-23-76	281	4.2 ± 0.6 E-02
4-5-76	281	2.1 ± 0.6 E-02
4-20-76	324	4.6 ± 0.6 E-02
5-4-76	302.4	0.0 ± 4.3 E-03
5-18-76	302	0.0 ± 3.3 E-03
6-3-76	323	0.0 ± 3.1 E-03
6-15-76	259	0.0 ± 3.8 E-03
6-30-76	378	1.5 ± 0.3 E-02
	Average	2.7 E-02
	Maximum	4.6 ± 0.6 E-02
	Minimum	1.0 ± 0.4 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Bacon's Castle

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	3.0 ± 0.4 E-02
7-27-76	302.4	3.3 ± 0.4 E-02
8-10-76	302.4	2.1 ± 0.4 E-02
8-24-76	302.4	2.3 ± 0.4 E-02
9-07-76	322.5	2.8 ± 0.4 E-02
9-22-76	324	2.8 ± 0.4 E-02
10-06-76	302	2.8 ± 0.4 E-02
10-21-76	345.6	1.8 ± 0.1 E-01
11-02-76	259.2	2.0 ± 0.1 E-01
11-17-76	324	3.3 ± 0.4 E-02
11-21-76	86.4	1.4 ± 0.2 E-01
11-30-76	181.44	8.2 ± 0.8 E-02
12-14-76	282.24	6.6 ± 0.6 E-02
12-27-76	299.52	4.1 ± 0.5 E-02

Average	6.7 E-02
Maximum	2.0 ± 0.1 E-01
Minimum	2.1 ± 0.4 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Colonial Parkway

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	190	2.7 ± 0.7 E-02
1-27-76	262	0.0 ± 4.2 E-03
2-10-76	282	0.0 ± 3.9 E-03
2-24-76	282	0.0 ± 3.9 E-03
3-10-76	282	1.7 ± 0.5 E-02
3-23-76	262	1.9 ± 0.5 E-02
4-5-76	262	9.2 ± 5.9 E-03
4-20-76	281	7.6 ± 4.8 E-03
5-4-76	242	0.0 ± 5.3 E-03
5-18-76	222	0.0 ± 4.5 E-03
6-3-76	323	0.0 ± 4.0 E-03
6-15-76	173	0.0 ± 5.8 E-03
6-30-76	378	2.0 ± 0.4 E-02
	Average	1.7 E-02
	Maximum	2.7 ± 0.7 E-02
	Minimum	7.6 ± 4.8 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Colonial Parkway

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	327.6	2.2 ± 0.4 E-02
7-27-76	302.4	3.2 ± 0.4 E-02
8-10-76	302.4	2.2 ± 0.4 E-02
8-24-76	302.4	2.6 ± 0.4 E-02
9-07-76	282.2	3.0 ± 0.4 E-02
9-22-76	324	4.0 ± 0.4 E-02
10-06-76	302	3.3 ± 0.4 E-02
10-21-76	345.6	1.6 ± 0.1 E-01
11-02-76	345.6	2.4 ± 0.1 E-01
11-17-76	432	9.0 ± 0.5 E-02
11-21-76	115.2	1.6 ± 0.1 E-01
11-30-76	259.2	9.9 ± 0.7 E-02
12-14-76	403.2	1.1 ± 0.6 E-01
12-27-76	308.88	1.1 ± 0.3 E-02
Average		7.7 E-02
Maximum		2.4 ± 0.1 E-01
Minimum		1.1 ± 0.3 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Dow

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	222	1.7 ± 0.6 E-02
1-27-76	242	2.2 ± 0.5 E-02
2-10-76	282	1.7 ± 0.4 E-02
2-24-76	302	1.1 ± 0.4 E-02
3-10-76	282	9.8 ± 4.2 E-03
3-23-76	299	7.4 ± 3.9 E-03
4-5-76	Sampler Malfunction.	
4-20-76	259	8.4 ± 5.2 E-03
5-4-76	221.7	0.0 ± 5.8 E-03
5-18-76	202	0.0 ± 4.9 E-03
6-3-76	345	6.0 ± 3.9 E-03
6-15-76	259	6.8 ± 4.0 E-03
6-30-76	324	1.2 ± 0.4 E-02
Average		1.2 E-02
Maximum		2.2 ± 0.5 E-02
Minimum		6.0 ± 3.9 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Dow

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	1.4 ± 0.4 E-02
7-27-76	302.4	1.9 ± 0.4 E-02
8-10-76	302.4	1.8 ± 0.4 E-02
8-24-76	302.4	2.6 ± 0.4 E-02
9-07-76	302.4	3.1 ± 0.4 E-02
9-22-76	324	3.0 ± 0.4 E-02
10-06-76	282	3.8 ± 0.5 E-02
10-21-76	345.6	1.4 ± 0.1 E-01
11-02-76	259.2	2.2 ± 0.1 E-01
11-17-76	324	1.0 ± 0.1 E-01
11-21-76	86.4	1.5 ± 0.2 E-01
11-30-76	194.4	8.3 ± 0.8 E-02
12-14-76	302.4	8.0 ± 0.6 E-02
12-27-76	271.44	4.7 ± 0.5 E-02
Average		7.1 E-02
Maximum		2.2 ± 0.1 E-01
Minimum		1.4 ± 0.4 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Fort Eustis

Date Collected	Volume/ Cu. M.	Gross Beta
1-13-76	158	2.1 ± 0.8 E-02
1-27-76	222	0.0 ± 5.0 E-03
2-10-76	202	0.0 ± 5.5 E-03
2-24-76	342	5.9 ± 3.3 E-03
3-10-76	403	3.1 ± 0.4 E-02
3-23-76	355	2.8 ± 0.4 E-02
4-5-76	262	2.7 ± 0.7 E-02
4-20-76	281	4.1 ± 0.6 E-02
5-4-76	262	2.2 ± 0.6 E-02
5-18-76	202	5.3 ± 5.0 E-03
6-3-76	345	0.0 ± 3.8 E-03
6-15-76	242	1.4 ± 0.5 E-02
6-30-76	324	2.7 ± 0.4 E-02
Average		2.2 E-02
Maximum		4.1 ± 0.6 E-02
Minimum		5.3 ± 5.0 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Fort Eustis

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	1.5 ± 0.4 E-02
7-27-76	302.4	2.1 ± 0.4 E-02
8-10-76	302.4	2.2 ± 0.4 E-02
8-24-76	*	1.1 ± 0.8 E+00
9-07-76	322.5	2.1 ± 0.4 E-02
9-22-76	324	3.1 ± 0.4 E-02
10-06-76	302	3.4 ± 0.4 E-02
10-21-76	403.2	1.3 ± 0.1 E-01
11-02-76	259.2	9.6 ± 0.7 E-02
11-17-76	324	2.1 ± 0.4 E-02
11-21-76	86.4	3.5 ± 1.1 E-02
11-30-76	194.4	6.6 ± 0.7 E-02
12-14-76	302.4	6.6 ± 0.6 E-02
12-27-76	336.96	5.0 ± 0.4 E-02
Average		**4.7 E-02**
Maximum		**1.3 ± 0.1 E-01**
Minimum		**1.5 ± 0.4 E-02**

*Per Sample - sampler out.

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Newport News

Date Collected	Volume/ Cu. M	Gross Beta
1-13-76	206	2.5 ± 0.6 E-02
1-27-76	262	0.0 ± 4.2 E-03
2-10-76	282	0.0 ± 3.9 E-03
2-24-76	300	3.6 ± 0.5 E-02
3-10-76	282	3.8 ± 0.5 E-02
3-23-76	279	3.8 ± 0.5 E-02
4-5-76	255	0.0 ± 5.9 E-03
4-20-76	324	9.3 ± 4.3 E-03
5-4-76	302.4	5.4 ± 3.7 E-03
5-18-76	363	1.0 ± 0.3 E-02
6-3-76	345	1.6 ± 0.4 E-02
6-15-76	130	2.0 ± 0.8 E-02
6-30-76	130	0.0 ± 7.7 E-03
	Average	2.2 E-02
	Maximum	3.8 ± 0.5 E-02
	Minimum	5.4 ± 3.7 E-03

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Newport News

Date Collected	Volume/ Cu. M.	Gross Beta
7-13-76	280.8	2.6 ± 0.4 E-02
7-27-76	302.4	3.1 ± 0.4 E-02
8-10-76	302.4	2.8 ± 0.4 E-02
8-24-76	282.2	2.0 ± 0.4 E-02
9-07-76	302.4	1.7 ± 0.4 E-02
9-22-76	324	2.5 ± 0.4 E-02
10-06-76	262	4.3 ± 0.5 E-02
10-21-76	345.6	5.1 ± 0.1 E-01
11-02-76	259.2	2.3 ± 0.1 E-01
11-17-76	324	5.3 ± 0.5 E-02
11-21-76	86.4	1.2 ± 0.2 E-01
11-30-76	194.4	6.6 ± 0.7 E-02
12-14-76	302.4	6.8 ± 0.6 E-02
12-27-76	262.08	6.6 ± 0.6 E-02
Average		9.3 E-02
Maximum		5.1 ± 0.1 E-01
Minimum		1.7 ± 0.4 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Average of All Stations

Date Collected	
1-13-76	2.0 E-02 (6/8 Stations Detectable)
1-27-76	3.1 E-02 (4/8)
2-10-76	2.4 E-02 (4/8)
2-24-76	1.9 E-02 (6/8)
3-10-76	2.4 E-02 (7/8)
3-23-76	2.9 E-02 (8/8)
4-5-76	3.6 E-02 (5/8)
4-20-76	4.6 E-02 (8/8)
5-4-76	3.2 E-02 (4/8)
5-18-76	3.4 E-02 (5/8)
6-3-76	2.4 E-02 (5/8)
6-15-76	4.1 E-02 (6/8)
6-30-76	2.4 E-02 (7/8)
Average	2.9 E-02
Maximum Average	4.6 E-02
Minimum Average	1.9 E-02

AIR PARTICULATE SAMPLES
GROSS BETA ANALYSIS
(picocuries per cubic meter)

Average of All Stations

Date Collected	
7-13-76	2.2 E-02
7-27-76	3.3 E-02
8-10-76	2.7 E-02
8-24-76	2.8 E-02
9-07-76	3.3 E-02
9-21-76	3.4 E-02
10-06-76	4.2 E-02
10- 1-76	2.3 E-01
11-02-76	2.2 E-01
11-17-76	7.3 E-02
11-21-76	1.3 E-01
11-30-76	8.4 E-02
12-14-76	7.2 E-02
12-27-76	4.4 E-02
Average	7.6 E-02
Maximum	2.3 E-01
Minimum	2.2 E-02

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Surry Station

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	238	1.51 ± 0.94 E-03
1-27-76	322	4.18 ± 1.30 E-03
2-10-76	302.4	6.92 ± 7.13 E-04
2-24-76	302	5.94 ± 7.40 E-04
3-10-76	302.4	2.87 ± 1.06 E-03
3-23-76	262	2.17 ± 1.12 E-03
4-05-76	281	8.51 ± 9.02 E-04
4-20-76	313	1.34 ± 0.97 E-03
5-04-76	302.4	1.28 ± 1.06 E-03
5-18-76	282	2.23 ± 0.97 E-03
6-03-76	345	1.04 ± 0.65 E-03
6-15-76	259	3.12 ± 1.20 E-03
6-30-76	324	2.03 ± 0.87 E-03
7-13-76	280.8	1.06 ± 0.95 E-03
7-27-76	302.4	9.88 ± 6.25 E-04
8-10-76	302.4	1.68 ± 0.81 E-03
8-24-76	302.4	3.76 ± 1.22 E-03
9-07-76	302.4	1.98 ± 2.79 E-04
9-22-76	322	1.94 ± 8.45 E-04
10-06-76	322	3.33 ± 1.22 E-03
10-21-76	322	2.49 ± 1.09 E-03
11-02-76	259.21	1.50 ± 1.06 E-03
11-17-76	324	2.12 ± 0.92 E-03
11-21-76	86.4	3.45 ± 11.98 E-04
11-30-76	194.4	3.38 ± 1.51 E-03
12-14-76	302.4	3.46 ± 1.20 E-03
12-27-76	SAMPLER NOT WORKING	

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Hog Island

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	246	3.10 ± 1.27 E-03
1-27-76	282	2.65 ± 1.14 E-03
2-10-76	282	Less than 5.51 E-04
2-24-76	302	2.97 ± 6.56 E-04
3-10-76	201.6	5.93 ± 5.93 E-04
3-23-76	262	1.14 ± 0.60 E-03
4-05-76	PUMP NOT OPERATING OVER SAMPLING PERIOD	
4-20-76	127	4.71 ± 17.61 E-04
5-04-76	221.8	Less than 1.14 E-03
5-18-76	222	5.38 ± 5.38 E-04
6-03-76	323	3.70 ± 4.53 E-04
6-15-76	207	2.89 ± 4.08 E-04
6-30-76	324	6.46 ± 4.88 E-04
7-13-76	280.8	5.32 ± 8.24 E-04
7-27-76	302.4	1.48 ± 0.77 E-03
8-10-76	302.4	1.28 ± 0.71 E-03
8-24-76	241.9	1.73 ± 0.92 E-03
9-07-76	221.7	4.04 ± 4.67 E-04
9-22-76	216	2.91 ± 1.27 E-03
10-06-76	324	1.20 ± 0.85 E-03
10-21-76	216	1.80 ± 1.27 E-03
11-02-76	172.81	0 ± 9.78 E-04
11-17-76	216	6.92 ± 7.32 E-04
11-21-76	57.6	4.66 ± 3.44 E-03
11-30-76	155.52	1.34 ± 1.15 E-03
12-14-76	241.92	1.85 ± 1.02 E-03
12-27-76	187.2	4.79 ± 10.6 E-04

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Alliance

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	222	2.29 ± 1.10 E-03
1-27-76	242	7.41 ± 7.81 E-04
2-10-76	282	3.76 ± 1.38 E-03
2-24-76	282	3.18 ± 1.31 E-03
3-10-76	302.4	5.93 ± 4.84 E-04
3-23-76	262	5.02 ± 1.61 E-03
4-5-76	262	1.48 ± 1.09 E-03
4-20-76	281	2.66 ± 1.29 E-03
5-04-76	222	2.15 ± 1.52 E-03
5-18-76	222	2.56 ± 1.17 E-03
6-03-76	323	1.67 ± 0.83 E-03
6-15-76	242	3.21 ± 1.25 E-03
6-30-76	324	1.01 ± 6.11 E-03
7-13-76	280.8	Less than 7.14 E-04
7-27-76	302.4	1.48 ± 0.77 E-03
8-10-76	302.4	4.45 ± 1.33 E-03
8-24-76	302.4	5.83 ± 1.52 E-03
9-07-76	302.4	2.27 ± 0.95 E-03
9-22-76	324	4.61 ± 4.12 E-04
10-06-76	302	2.98 ± 6.56 E-04
10-21-76	345.6	1.47 ± 0.86 E-03
11-2-76	259.21	2.54 ± 1.26 E-03
11-17-76	324	1.20 ± 0.71 E-03
11-21-76	86.4	1.73 ± 1.83 E-03
11-30-76	194.4	9.22 ± 8.69 E-04
12-14-76	302.4	2.37 ± 1.01 E-03
12-27-76	271.44	4.40 ± 7.62 E-04

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Bacon's Castle

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	262	2.28 ± 4.56 E-04
1-27-76	262	0 ± 3.23 E-04
2-10-76	282	1.06 ± 5.61 E-04
2-24-76	242	0 ± 6.99 E-04
3-10-76	302.4	3.95 ± 3.95 E-04
3-23-76	281	2.87 ± 1.22 E-03
4-05-76	281	9.57 ± 9.27 E-04
4-20-76	324	1.75 ± 1.03 E-03
5-04-76	302.4	Less than 8.38 E-04
5-18-76	302	9.89 ± 19.79 E-05
6-03-76	323	9.25 ± 32.05 E-05
6-15-76	259	3.46 ± 4.00 E-04
6-30-76	378	4.74 ± 3.87 E-04
7-13-76	280.8	9.58 ± 9.28 E-04
7-27-76	302.4	6.92 ± 5.22 E-04
8 10-76	302.4	1.48 ± 0.77 E-03
8 24-76	302.4	3.36 ± 1.15 E-03
9-07-76	322.5	3.61 ± 1.16 E-03
9-22-76	324	1.84 ± 2.61 E-04
10-06-76	302	4.96 ± 7.13 E-04
10-21-76	345.6	1.73 ± 0.92 E-03
11-02-76	259.21	4.61 ± 7.99 E-04
11-17-76	324	3.68 ± 4.52 E-04
11-21-76	86.4	6.91 ± 13.83 E-04
11-30-76	181.44	9.88 ± 9.32 E-04
12-14-76	282.24	2.65 ± 1.10 E-03
12-27-76	299.52	1.50 ± 0.96 E-03

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Colonial Parkway

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	190	4.71 ± 7.03 E-04
1-27-76	262	Less than 4.84 E-04
2-10-76	282	1.06 ± 5.61 E-04
2-24-76	282	3.18 ± 7.02 E-04
3-10-76	282.2	2.12 ± 2.99 E-04
3-23-76	262	0 ± 5.59 E-04
4-05-76	262	Less than 7.65 E-04
4-20-76	281	Less than 9.58 E-05
5-04-76	242	Less than 1.05 E-03
5-18-76	222	4.04 ± 4.66 E-04
6-03-76	323	Less than 2.78 E-04
6-15-76	173	3.45 ± 4.89 E-04
6-30-76	378	6.32 ± 4.47 E-04
7-13-76	327.6	5.47 ± 7.29 E-04
7-27-76	302.4	1.58 ± 0.79 E-03
8-10-76	302.4	1.19 ± 0.68 E-03
8-24-76	302.4	3.26 ± 1.14 E-03
9-07-76	282.2	2.54 ± 1.04 E-03
9-22-76	SAMPLER FAILED	
10-05-76	302	9.90 ± 8.39 E-04
10-21-76	345.6	1.12 ± 0.79 E-03
11-02-76	345.61	1.73 ± 5.47 E-04
11-17-76	432	1.31 ± 0.63 E-03
11-21-76	115.2	2.33 ± 1.72 E-03
11-30-76	259.2	1.27 ± 0.83 E-03
12-14-76	403.2	9.63 ± 5.74 E-04
12-27-76	308.88	Less than 1.74 E-03

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Dow

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	222	2.15 ± 1.14 E-03
1-27-76	242	1.98 ± 1.10 E-03
2-10-76	282	2.12 ± 1.08 E-03
2-24-76	302	8.91 ± 8.16 E-04
3-10-76	282.2	7.41 ± 5.60 E-04
3-23-76	299	0 ± 4.90 E-04
4-05-76	SAMPLER FAILED	
4-20-76	259	Less than 9.58 E-05
5-04-76	221.8	Less than 1.14 E-03
5-18-76	202	4.44 ± 5.12 E-04
6-03-76	345	3.46 ± 4.24 E-04
6-15-76	259	6.92 ± 5.65 E-04
6-30-76	324	3.69 ± 3.69 E-04
7-13-76	280.8	5.32 ± 69 E-05
7-27-76	302.4	7.91 ± 5.59 E-04
8-10-76	302.4	1.58 ± 0.79 E-03
8-24-76	302.4	4.05 ± 1.27 E-03
9-07-76	302.4	2.96 ± 1.08 E-03
9-22-76	DATA DROPPED	
10-05-76	282	2.13 ± 6.70 E-04
10-21-76	345.6	9.51 ± 7.54 E-04
11-02-76	259.21	2.07 ± 1.18 E-03
11-17-76	324	2.03 ± 0.90 E-03
11-21-76	86.4	1.38 ± 1.69 E-03
11-30-76	194.4	1.23 ± 0.97 E-03
12-14-76	302.4	1.38 ± 0.79 E-03
12-27-76	271.44	5.50 ± 7.94 E-04

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Fort Eustis

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	158	1.89 ± 1.31 E-03
1-27-76	221.7	1.35 ± 6.03 E-04
2-10-76	201.6	1.48 ± 7.84 E-04
2-24-76	342	5.24 ± 6.54 E-04
3-10-76	403.2	2.97 ± 2.96 E-04
3-23-76	355	5.05 ± 5.83 E-04
4-05-76	262	Less than 7.65 E-04
4-20-76	281	1.17 ± 1.02 E-03
5-04-76	262	Less than 9.68 E-04
5-18-76	202	2.96 ± 4.18 E-04
6-03-76	345	2.60 ± 3.87 E-04
6-15-76	242	6.64 ± 6.53 E-04
6-30-76	324	9.22 ± 5.83 E-04
7-13-76	280.8	Less than 7.14 E-04
7-27-76	302.4	1.48 ± 0.77 E-03
8-10-76	302.4	1.58 ± 0.79 E-03
8-24-76	SAMPLER FAILED	
9-07-76	322.5	3.89 ± 1.2 E-03
9-22-76	324	1.75 ± 0.80 E-03
10-05-76	302	2.98 ± 6.56 E-04
10-21-76	403.2	9.63 ± 6.79 E-04
11-02-76	259.21	1.38 ± 1.03 E-03
11-17-76	324	9.22 ± 31.95 E-05
11-21-76	86.4	2.07 ± 1.96 E-03
11-30-76	194.4	6.15 ± 7.53 E-04
12-14-76	302.4	9.88 ± 34.2 E-05
12-27-76	336.96	5.32 ± 6.64 E-04

AIR PARTICULATE SAMPLES
GROSS ALPHA ANALYSIS
(picocuries per cubic meter)

Newport News

Date Collected	Volume/ Cu. M.	Gross Alpha
1-13-76	206	1.16 ± 0.92 E-03
1-27-76	262	4.56 ± 6.45 E-04
2-10-76	282	0 ± 5.19 E-04
2-24-76	300	3.49 ± 1.31 E-03
3-10-76	282.2	1.80 ± 0.87 E-03
3-23-76	279	1.50 ± 0.96 E-03
4-05-76	255	9.37 ± 9.94 E-04
4-20-76	324	Less than 9.58 E-05
5-04-76	302.4	Less than 8.38 E-04
5-18-76	363	4.94 ± 4.03 E-04
6-03-76	345	2.60 ± 3.87 E-04
6-15-76	130	3.68 ± 1.84 E-03
6-30-76	130	9.19 ± 9.19 E-04
7-13-76	280.8	5.32 ± 8.24 E-04
7-27-76	302.4	7.91 ± 5.59 E-04
8-10-76	302.4	7.91 ± 5.59 E-04
8-24-76	282.2	2.54 ± 1.04 E-03
9-07-76	302.4	1.52 ± 0.25 E-02
9-22-76	324	1.66 ± 0.78 E-03
10-05-76	262	1.14 ± 0.97 E-03
10-21-76	345.6	1.64 ± 0.90 E-03
11-02-76	259.21	1.96 ± 1.15 E-03
11-17-76	324	1.01 ± 0.67 E-03
11-21-76	86.4	1.04 ± 1.55 E-03
11-30-76	194.4	2.61 ± 1.34 E-03
12-14-76	302.4	1.78 ± 0.88 E-03
12-27-76	262.08	6.84 ± 8.53 E-04

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

FIRST QUARTER, 1976 COMPOSITES

	Hog Island Reserve Surry Station	Bacon's Castle, Alliance Colonial Parkway, Dow Fort Eustis
Volume	3555 Cu. M.	9161 Cu. M.
Gamma Spectrometry		
Be-7	3.7 ± 1.8 E-02	3.7 ± 1.5 E-02
K-40	Less than 3.1 E-02	Less than 1.2 E-02
Cr-51	Less than 2.5 E-02	Less than 9.7 E-03
Mn-54	2.3 ± 1.6 E-03	Less than 6.2 E-04
Co-58	5.8 ± 2.8 E-03	4.1 ± 2.1 E-03
Co-60	3.0 ± 1.9 E-03	1.8 ± 1.5 E-03
Sb-125	Less than 9.1 E-03	Less than 3.5 E-03
Cs-134	2.9 ± 1.8 E-03	Less than 2.7 E-03
Cs-137	4.9 ± 1.9 E-03	3.5 ± 1.7 E-03
Ce-144	Less than 3.1 E-02	Less than 1.2 E-02
Tl-208	Less than 1.0 E-02	Less than 2.7 E-03
Pb-212	Less than 6.9 E-03	Less than 6.6 E-03
Pb-214	Less than 8.1 E-03	Less than 3.1 E-03
Bi-214	Less than 8.0 E-03	Less than 3.1 E-03
Ra-226	Less than 7.5 E-02	Less than 7.2 E-02

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

FIRST QUARTER, 1976 COMPOSITES

Newport News

Volume	1866 Cu. M.

Gamma Spectrometry

Be-7	Less than 1.1 E-01
K-40	Less than 5.9 E-02
Cr-51	3.3 $\pm$ 3.2 E-02
Mn-54	Less than 3.0 E-03
Co-58	Less than 6.6 E-03
Co-60	Less than 4.7 E-03
Sb-125	Less than 1.7 E-02
Cs-134	Less than 1.3 E-02
Cs-137	4.5 $\pm$ 3.4 E-03
Ce-144	Less than 5.9 E-02
Tl-208	Less than 6.5 E-03
Pb-212	Less than 1.6 E-02
Pb-214	Less than 1.5 E-02
Bi-214	Less than 1.5 E-02
Ra-226	Less than 1.5 E-01

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

SECOND QUARTER, 1976 COMPOSITES

	Hog Island Reserve Surry Station	Bacon's Castle, Alliance Colonial Parkway, Dow, Fort Eustis
Volume	3250 Cu. M.	8388 Cu. M.
Gamma Spectrometry		
Be-7	1.2 ± 0.2 E-01	5.4 ± 1.6 E-02
K-40	2.5 ± 2.3 E-02	1.6 ± 1.4 E-02
Mn-54	Less than 3.3 E-03	Less than 1.3 E-03
Co-58	2.3 ± 0.4 E-02	2.6 ± 1.4 E-03
Co-60	6.9 ± 2.4 E-03	Less than 1.7 E-03
Cs-137	5.8 ± 2.2 E-03	Less than 1.8 E-03
Pb-212	Less than 7.5 E-03	Less than 2.9 E-03
Bi-214	Less than 9.3 E-03	Less than 3.6 E-03
Pb-214	Less than 9.3 E-03	Less than 6.9 E-03
Ra-226	Less than 8.2 E-02	Less than 3.2 E-02

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

SECOND QUARTER, 1976 COMPOSITES

Newport News

Volume	1594 Cu. M.

Gamma Spectrometry

Be-7	3.8 ± 2.8 E-02
K-40	Less than 6.5 E-02
Mn-54	Less than 6.7 E-03
Co-58	3.6 ± 2.0 E-03
Co-60	Less than 4.8 E-03
Cs-137	Less than 4.2 E-03
Pb-212	Less than 1.5 E-02
Bi-214	Less than 1.9 E-02
Pb-214	Less than 1.9 E-02
Ra-226	Less than 1.5 E-01

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

THIRD QUARTER, 1976 COMPOSITES

	Hog Island Reserve, Surry Station	Bacon's Castle, Alliance, Colonial Parkway, Dow, Fort Eustis
Volume	4027.6 Cu. M.	10326.4 Cu. M.
Gamma Spectrometry		
Be-7	7.2 ± 1.3 E-02	4.8 ± 0.9 E-02
K-40	1.2 ± 1.2 E-02	Less than 1.2 E-02
Co-58	1.8 ± 1.1 E-03	2.1 ± 0.7 E-03
Co-60	3.2 ± 1.4 E-03	2.4 ± 0.8 E-03
Nb-95	Less than 1.8 E-03	Less than 1.1 E-03
Zr-95	Less than 2.2 E-03	8.0 ± 6.7 E-04
Ru-103	Less than 1.9 E-03	7.5 ± 4.9 E-04
I-131	Less than 2.0 E-03	Less than 7.8 E-04
Cs-137	5.5 ± 1.4 E-03	2.1 ± 0.7 E-03
Ce-141	Less than 3.6 E-03	Less than 1.4 E-03
Tl-208	Less than 2.6 E-03	Less than 1.0 E-03
Pb-212	Less than 4.1 E-03	Less than 3.5 E-03
Pb-214	Less than 5.1 E-03	Less than 2.0 E-03
Ra-226	Less than 4.4 E-02	Less than 1.7 E-02

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

THIRD QUARTER, 1976 COMPOSITES

Newport News

Volume	2056.2 Cu. M.

Gamma Spectrometry

Be-7	4.9 ± 1.8 E-02
K-40	Less than 6.0 E-02
Co-58	Less than 5.3 E-03
Co-60	Less than 2.9 E-03
Nb-95	Less than 5.5 E-03
Zr-95	Less than 4.3 E-03
Ru-103	Less than 3.7 E-03
I-131	Less than 3.9 E-03
Cs-137	3.2 ± 1.8 E-03
Ce-141	Less than 7.0 E-03
Tl-208	Less than 5.0 E-03
Pb-212	Less than 7.7 E-03
Pb-214	Less than 1.0 E-02
Ra-226	Less than 8.4 E-02

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

FOURTH QUARTER, 1976 COMPOSITES

	Hog Island Reserve, Surry Station	Bacon's Castle, Alliance, Colonial Parkway, Dow, Fort Eustis
Volume	3018.24	9461.52
Gamma Spectrometry		
Be-7	8.7 ± 2.6 E-02	8.2 ± 1.7 E-02
K-40	Less than 4.1 E-02	Less than 1.3 E-02
Co-57	1.9 ± 1.4 E-02	Less than 6.7 E-03
Co-58	3.0 ± 0.5 E-02	3.4 ± 1.2 E-03
Co-60	1.6 ± 0.4 E-02	4.1 ± 1.4 E-03
Nb-95	1.7 ± 0.4 E-02	1.7 ± 0.2 E-02
Zr-95	1.5 ± 0.4 E-02	1.4 ± 0.2 E-02
Ru-103	1.4 ± 0.3 E-02	1.0 ± 0.2 E-02
Cs-134	3.4 ± 2.7 E-03	Less than 1.3 E-03
Cs-137	1.0 ± 0.3 E-02	3.3 ± 1.2 E-03
Ba-140	Less than 1.4 E-02	Less than 4.5 E-03
La-140	8.8 ± 4.6 E-03	Less than 2.2 E-03
Ce-141	1.9 ± 0.5 E-02	2.8 ± 0.5 E-02
Ce-144	2.1 ± 1.5 E-02	1.8 ± 1.2 E-02
Tl-208	Less than 3.7 E-03	Less than 1.2 E-03
Pb-212	Less than 8.4 E-03	Less than 5.6 E-03
Pb-214	Less than 1.1 E-02	Less than 3.4 E-03
Ra-226	Less than 8.6 E-02	Less than 6.4 E-02

AIR PARTICULATE SAMPLES
(picocuries per cubic meter)

FOURTH QUARTER, 1976 COMPOSITES

Newport News

Volume	1774.08
Gamma Spectrometry	
Be-7	8.5 ± 3.8 E-02
K-40	Less than 7.0 E-02
Co-57	Less than 3.6 E-02
Co-58	Less than 9.6 E-03
Co-60	Less than 1.1 E-02
Nb-95	3.2 ± 0.7 E-02
Zr-95	3.1 ± 0.7 E-02
Ru-103	8.3 ± 4.4 E-03
Cs-134	Less than 6.9 E-03
Cs-137	3.8 ± 2.9 E-03
Ba-140	Less than 2.4 E-02
La-140	Less than 1.2 E-02
Ce-141	3.1 ± 0.8 E-02
Ce-144	3.8 ± 2.2 E-02
Tl-208	Less than 6.3 E-03
Pb-212	Less than 1.4 E-02
Pb-214	Less than 1.8 E-02
Ra-226	Less than 3.4 E-01

VEPCo

AMBIENT THERMOLUMINESCENT DOSIMETRY

FIRST QUARTER, 1976

Date Annealed: 12-18-76
Date Issued: 12-18-76
Date Returned: 4-8-76
Date Read: 4-8-76

	Net mrem							
	1st	2nd	3rd	4th	5th	Average* ± 2 Sigma		mrem/wk
Control	13	12	13	14	13	17.0	1.8	1.1
Bacon's Castle	21	19	19	20	19	25.6	2.3	1.6
Surry Station	149	140	141	153	138	188.5	16.9	11.7
Hog Island Reserve	23	22	26	20	21	24.3	5.0	1.5
Alliance	18	18	19	19	21	24.8	2.3	1.6
Colonial Parkway	21	19	21	29	29	26.4	2.2	1.6
Ft. Eustis	Missing							
Newport News	29	25	27	25	26	34.5	4.3	2.1
Smithfield	27	30	30	26	28	36.8	4.7	2.3
Scotland Wharf	Missing							
Jamestown	Missing							
Lee Hall	Missing							
Rt. 10 & 676	Missing							
Dow	24	24	23	23	25	31.1	2.2	1.9

*Calibration Factor Applied

AMBIENT THERMOLUMINESCENT DOSIMETRY

SECOND QUARTER, 1976

Date Annealed: 3-29-76
Date Issued: 3-29-76
Date Returned: 7-16-76
Date Read: 7-16-76

	Net mrem							
	1st	2nd	3rd	4th	5th	Average* ± 2 Sigma		mrem/wk
Control	7	8	4	D	D	6.1	3.9	0.4
Bacon's Castle	16	16	15	15	15	14.8	1.0	0.9
Surry Station	122	124	128	129	126	121.0	5.5	7.7
Hog Island Reserve	22	17	D	18	14	17.0	6.3	1.1
Alliance	14	D	10	9	11	10.5	4.1	0.7
Colonial Parkway	Missing							
Ft. Eustis	18	16	D	19	17	16.8	2.5	1.1
Newport News	21	21	D	19	19	19.2	2.2	1.2
Smithfield	23	22	21	23	22	21.3	1.5	1.4
Scotland Wharf	17	D	17	17	17	16.3	0.0	1.0
Jamestown	Missing							
Lee Hall	18	21	22	19	20	19.2	2.9	1.2
Rt. 10 & 676	12	13	14	12	12	13.1	1.9	0.8
Dow	17	17	12	D	16	16.1	4.9	1.0

*Calibration Factor Applied

AMBIENT THERMOLUMINESCENT DOSIMETRY

THIRD QUARTER, 1976

Date Annealed: 7-8-76 Date Returned: 10-8-76
Date Issued: 7-8-76 Date Read: 10-8-76

	Net mrem							
	1st	2nd	3rd	4th	5th	Average* ± 2 Sigma		mrem/wk
Control	Missing							
Bacon's Castle	21	19	18	19	19	14.6	1.6	1.1
Surry Station	109	75	87	90	92	69.7	18.7	5.3
Hog Island Reserve	26	23	23	29	23	18.7	3.3	1.4
Alliance	19	18	18	18	18	14.0	0.7	1.1
Colonial Parkway	19	20	21	19	21	15.4	1.5	1.2
Fort Eustis	24	19	25	25	23	17.8	3.7	1.3
Newport News	23	23	22	24	23	17.7	1.1	1.3
Smithfield	26	22	25	25	24	19.9	2.4	1.5
Scotland Wharf	20	19	20	21	21	16.5	1.3	1.2
Jamestown	21	21	20	17	19	16.0	2.7	1.2
Lee Hall	24	23	23	26	24	19.6	1.9	1.5
Route 10 & 676	19	19	18	17	17	14.7	1.6	1.1
Kingsmill	20	19	19	18	18	15.4	1.3	1.2
Budweiser	23	23	22	21	21	17.9	1.6	1.3
Dow	22	23	22	25	24	18.7	2.1	1.4

*Calibration Factor Applied

AMBIENT THERMOLUMINESCENT DOSIMETRY

FOURTH QUARTER, 1976

Date Annealed: 9-28-76
Date Issued: 9-28-76

Date Returned: 1-4-77
Date Read: 1-4-77

	Net mrem							
	1st	2nd	3rd	4th	5th	Average* ± 2 Sigma		mrem/wk
Control	20	14	16	14	18	14.8	4.7	1.1
Bacon's Castle	13	18	D	15	15	13.8	3.7	0.9
Surry Station	87	101	91	97	82	83.1	13.8	6.0
Hog Island Reserve	18	17	19	18	23	17.2	4.2	1.2
Alliance	19	18	25	15	27	18.8	9.1	1.3
Colonial Parkway	13	13	15	14	14	12.5	1.4	0.9
Fort Eustis (Annealed 11-24-76)	5	6	6	7	8	6.2	2.2	1.1
Newport News	18	18	16	18	17	15.8	1.6	1.1
Smithfield	19	23	21	24	21	19.6	3.2	1.4
Scotland Wharf	15	15	16	16	14	13.7	1.4	0.9
Jamestown	11	11	14	12	12	10.8	2.2	0.7
Lee Hall	21	17	16	17	22	16.8	4.9	1.2
Route 10 & 676	13	10	14	15	12	11.6	3.4	0.8
Dow	12	11	11	14	10	10.5	2.7	0.7

Calibration Facotr Applied

PRECIPITATION SAMPLES
(nanocuries per square meter)

FIRST QUARTER 1976

	Newport News	Surry Station
Gross Beta	6.0 ± 1.2 E+00	6.0 ± 1.3 E+00
Tritium (En.)	4.7 ± 1.3 E+01	3.9 ± 1.4 E+01

SECOND QUARTER 1976

	Newport News	Surry Station
Gross Beta	3.4 ± 1.6 E+00	4.0 ± 1.2 E+00
Tritium (En.)	1.5 ± 0.3 E+02	1.0 ± 0.2 E+02

PRECIPITATION SAMPLES
(nanocuries per square meter)

THIRD QUARTER 1976

	Surry Station	Newport News
Gross Beta	3.2 ± 1.0 E+00	1.3 ± 0.7 E+00
Enr. Tritium	1.3 ± 0.3 E+02	7.4 ± 2.6 E+01

FOURTH QUARTER, 1976

	Surry Station	Newport News
Gross Beta	4.2 ± 1.1 E+00	2.5 ± 0.9 E+00
Enr. Tritium	7.1 ± 2.1 E+01	3.4 ± 1.8 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall
Date Collected	1-15-76
Radiochemistry	
I-131	0.0 ± 8.2 E-01
Sr-89	0.0 ± 3.0 E+00
Sr-90	2.6 ± 2.2 E+00
Gamma Spectrometry	
K-40	1.2 ± 0.4 E+03
Zr-95	1.7 ± 1.3 E+01
Cs-137	Less than 1.8 E+01
Pb-214	Less than 9.2 E+01
Bi-214	Less than 6.8 E+01
Ra-226	Less than 9.4 E+02

Note: Sample was received from U.S. Postal Service in damage condition. Sr-89,90 and Gamma Spectrometry aliquots were normal; Iodine-131 aliquot was smaller than normal.

MILK SAMPLES
(picocuries per liter)

	Colonial Pkwy. Dairy
Date Collected	1-15-76
Radiochemistry	
I-131	0.0 ± 6.2E-02
Calcium	0.8 g/l
Sr-89	0.0 ± 4.6 E+00
Sr-90	7.1 ± 3.4 E+00
Gamma Spectrometry	
K-40	1.6 ± 0.4 E+03
Zr-95	Less than 1.0 E+01
Sb-125	Less than 7.6 E+01
Cs-137	Less than 1.8 E+01
Bi-212	3.1 + 1. E+02
Bi-214	Less than 6.8 E+01
Pb-214	Less than 9.2 E+01
Ra-226	Less than 9.4 E+02

MILK SAMPLES
(picocuries per liter)

	Judkins Dairy
Date Collected	1-27-76
Radiochemistry	
I-131	0.0 ± 7.7 E-02
Calcium	1.4 g/l
Sr-89	0.0 ± 5.2 E+00
Sr-90	6.0 ± 2.6 E+00
Gamma Spectrometry	
K-40	1.3 ± 0.4 E+03
Cs-137	Less than 1.5 E+01
Bi-214	Less than 7.5 E+01
Pb-214	Less than 8.9 E+01

MILK SAMPLES
(picocuries per liter)

	Gwaltney Dairy
Date Collected	1-28-76
Radiochemistry	
I-131	0.0 ± 7.6 E-02
Calcium	0.9 g/l
Sr-89	0.0 ± 2.6 E+00
Sr-90	4.6 ± 1.6 E+00
Gamma Spectrometry	
K-40	1.2 ± 0.4 E+03
Cs-137	Less than 2.1 E+01
Pb-212	Less than 8.0 E+01
Pb-214	Less than 7.9 E+01

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy Dairy
Date Collected	2-10-76	2-10-76
Radiochemistry		
I-131	0.0 ± 1.2 E-01	0.0 ± 8.1 E-02
Calcium	1.1 g/l	1.4 g/l
Sr-89	0.0 ± 2.7 E+00	0.0 ± 3.9 E+00
Sr-90	2.5 ± 1.6 E+00	1.1 ± 0.2 E+01
Gamma Spectrometry		
K-40	1.5 ± 0.4 E+03	1.4 ± 0.4 E+03
Sb-125	Less than 7.8 E+01	Less than 7.8 E+01
Cs-137	Less than 1.8 E+01	Less than 1.8 E+01
Pb-212	Less than 7.9 E+01	Less than 8.5 E+01
Bi-214	Less than 1.8 E+02	Less than 7.0 E+01
Pb-214	Less than 9.0 E+01	8.7 ± 6.0 E+01

MILK SAMPLES
(picocuries per liter)

	A. Gwaltney Dairy	Floyd B. Scott Dairy
Date Collected	2-25-76	2-25-76
Radiochemistry		
I-131	0.0 ± 9.9 E-02	0.0 ± 9.3 E-02
Calcium	1.6 g/l	1.6 g/l
Sr-89	0.0 ± 3.1 E+00	0.0 ± 4.0 E+00
Sr-90	4.4 ± 1.9 E+00	7.6 ± 2.4 E+00
Gamma Spectrometry		
K-40	1.2 ± 0.4 E+03	1.5 ± 0.4 E+03
Cs-137	Less than 1.9 E+01	Less than 2.0 E+01
Tl-208	Less than 2.6 E+01	Less than 2.6 E+01
Pb-212	Less than 7.9 E+01	Less than 8.0 E+01
Bi-214	Less than 6.5 E+01	Less than 6.5 E+01
Pb-214	Less than 8.7 E+01	Less than 9.0 E+01

MILK SAMPLES
(picocuries per liter)

	Colonial Dairy
Date Collected	3-10-76
Radiochemistry	
Sr-89	0.0 ± 3.4 E+00
Sr-90	1.4 ± 0.2 E+01
I-131	0.0 ± 1.5 E-01
Cal. (g/l)	1.5
Gamma Spectrometry	
K-40	1.4 ± 0.4 E+03
Cs-137	1.1 ± 1.1 E+01
Pb-212	Less than 8.3 E+01
Ra-226	Less than 9.0 E+02
Ac-228	Less than 1.9 E+02

MILK SAMPLES
(picocuries per liter)

	Gwaltney Dairy	Judkins Dairy
Date Collected	3-24-76	3-24-76
Radiochemistry		
I-131	0.0 ± 1.4 E-01	0.0 ± 1.5 E-01
Calcium	1.5 g/l	1.6 g/l
Sr-89	0.0 ± 3.0 E+00	0.0 ± 2.8 E+00
Sr-90	4.9 ± 1.6 E+00	1.1 ± 0.2 E+01
Gamma Spectrometry		
K-40	1.2 ± 0.4 E+03	1.4 ± 0.4 E+03
Co-60	Less than 1.6 E+01	1.8 ± 1.1 E+01
Cs-137	1.3 ± 1.1 E+01	Less than 2.1 E+01
Pb-212	Less than 8.2 E+01	Less than 8.2 E+01
Pb-214	Less than 8.6 E+01	Less than 8.6 E+01

MILK SAMPLES
(picocuries per liter)

	Lee Hall
Date Collected	3-25-76
Radiochemistry	
Sr-89	0.0 ± 2.1 E+00
Sr-90	3.7 ± 1.4 E+00
Calcium	1.6 g/l
I-131	0.0 ± 2.7 E-01
Gamma Spectrometry	
K-40	1.1 ± 0.4 E+03
Cs-137	Less than 2.1 E+01
Pb-212	Less than 8.5 E+01
Bi-214	Less than 8.1 E+01
Pb-214	7.5 ± 6.3 E+01

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy Dairy
Date Collected	4-6-76	4-6-76
Radiochemistry		
I-131	0.0 ± 1.3 E-01	0.0 ± 1.4 E-01
Calcium		
Sr-89	0.0 ± 2.5 E+00	0.0 ± 2.6 E+00
Sr-90	4.2 ± 1.7 E+00	3.4 ± 1.7 E+00
Gamma Spectrometry		
K-40	1.0 ± 0.4 E+03	1.6 ± 0.4 E+03
Cr-51	Less than 2.1 E+02	1.4 ± 1.4 E+02
Cs-137	Less than 1.8 E+01	Less than 2.3 E+01
Tl-208	Less than 2.4 E+01	Less than 2.4 E+01
Pb-212	Less than 8.3 E+01	Less than 8.3 E+01
Bi-214	4.5 ± 4.2 E+01	Less than 6.8 E+01
Ra-226	Less than 9.1 E+02	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Gwaltney Dairy	Judkins Dairy
Date Collected	4-21-76	4-21-76
Radiochemistry		
I-131	0.0 ± 6.6 E-02	0.0 ± 1.2 E-01
Calcium	1.6 g/l	1.7 g/l
Sr-89	0.0 ± 3.8 E+00	0.0 ± 4.2 E+00
Sr-90	5.3 ± 2.0 E+00	5.2 ± 2.2 E+00
Gamma Spectrometry		
K-40	1.2 ± 0.3 E+03	1.5 ± 0.4 E+03
Co-57	2.0 ± 1.8 E+01	Less than 2.7 E+01
Co-60	1.7 ± 1.1 E+01	Less than 1.6 E+01
Sb-125	Less than 8.2 E+01	Less than 8.2 E+01
Cs-137	1.6 ± 1.3 E+01	Less than 2.4 E+01
Tl-208	Less than 2.4 E+01	Less than 2.4 E+01
Bi-212	Less than 2.4 E+02	1.8 ± 1.6 E+02
Pb-212	Less than 8.1 E+01	Less than 8.1 E+01
Bi-214	Less than 6.5 E+01	Less than 6.5 E+01
Pb-214	Less than 8.9 E+01	Less than 8.5 E+01
Ra-226	Less than 9.1 E+02	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy. Dairy
Date Collected	5-4-76	5-4-76
Radiochemistry		
I-131	0.0 ± 1.0 E-01	0.0 ± 2.0 E-01
Calcium	1.5 g/l	1.5 g/l
Sr-89	0.0 ± 2.6 E+00	0.0 ± 5.0 E+00
Sr-90	4.1 ± 2.6 E+00	5.5 ± 3.3 E+00
Gamma Spectrometry		
K-40	1.5 ± 0.4 E+03	2.2 ± 0.5 E+03
Cr-51	Less than 3.1 E+02	Less than 3.1 E+02
Co-58	Less than 2.7 E+01	Less than 2.7 E+01
Cs-137	Less than 2.8 E+01	Less than 2.8 E+01
Tl-208	3.2 ± 2.4 E+01	Less than 3.6 E+01
Bi-212	Less than 4.7 E+02	Less than 4.7 E+02
Pb-212	Less than 1.0 E+02	Less than 1.0 E+02
Pb-214	Less than 9.5 E+01	Less than 9.8 E+01
Ra-226	Less than 1.0 E+03	Less than 1.0 E+03

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Epps D. & Barron's Castle Dairy
Date Collected	5-20-76	5-20-76
Radiochemistry		
I-131	0.0 ± 3.2 E-01	0.0 ± 1.9 E-01
Calcium	2.1 g/l	1.8 g/l
Sr-89	0.0 ± 1.3 E+01	0.0 ± 1.0 E+01
Sr-90	0.0 ± 1.3 E+01	0.0 ± 9.6 E+00
Gamma Spectrometry		
K-40	1.6 ± 0.4 E+03	1.7 ± 0.4 E+03
Sb-125	Less than 8.6 E+01	Less than 8.6 E+01
I-131	Less than 3.1 E+01	Less than 3.1 E+01
Cs-134	Less than 1.6 E+01	Less than 1.6 E+01
Cs-137	Less than 1.7 E+01	1.9 ± 1.1 E+01
Hg-203	Less than 2.8 E+01	Less than 2.8 E+01
Pb-212	Less than 7.7 E+01	Less than 8.0 E+01
Ra-226	Less than 9.0 E+02	Less than 9.0 E+02
Ac-228	Less than 1.9 E+02	Less than 1.9 E+02

NOTE: Both samples received in poor condition - almost solid.
Poor Radiochemical Recoveries

MILK SAMPLES
(picocuries per liter)

	Judkins Dairy	Gwaltney Dairy
Date Collected	5-19-76	5-19-76
Radiochemistry		
I-131	0.0 ± 1.8 E-01	0.0 ± 8.9 E-02
Calcium	1.5 g/l	1.4 g/l
Sr-89	0.0 ± 9.3 E+00	0.0 ± 7.3 E+00
Sr-90	0.0 ± 8.9 E+00	0.0 ± 7.7 E+00
Gamma Spectrometry		
K-40	1.9 ± 0.5 E+03	2.2 ± 0.6 E+03
Mn-54	Less than 3.2 E+01	Less than 3.2 E+01
Cs-137	3.1 ± 1.6 E+01	2.2 ± 2.0 E+01
Hg-203	Less than 4.0 E+01	Less than 4.0 E+01
Tl-208	Less than 3.2 E+01	Less than 3.6 E+01
Pb-212	Less than 1.0 E+02	Less than 1.0 E+02
Pb-214	Less than 9.7 E+01	Less than 9.7 E+01
Ra-226	Less than 1.0 E+03	Less than 1.0 E+03

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy
Date Collected	6-3-76
Radiochemistry	
I-131	0.0 ± 8.6 E-02
Calcium	1.5 g/l
Sr-89	0.0 ± 4.2 E+00
Sr-90	0.0 ± 4.6 E+00
Gamma Spectrometry	
K-40	1.7 ± 0.4 E+03
Co-57	1.8 ± 1.8 E+01
Cs-137	1.3 ± 1.2 E+01
Pb-214	Less than 8.7 E+01

MILK SAMPLES
(picocuries per liter)

	Colonial	Wy. Dairy
Date Collected	6-7-76	
Radiochemistry		
I-131	0.0 ± 6.2 E-01	
Calcium	1.5 g/l	
Sr-89	0.0 ± 3.4 E+00	
Sr-90	2.4 ± 1.8 E+00	
Gamma Spectrometry		
K-40	1.3 ± 0.4 E+03	
Tl-208	Less than 2.8 E+01	
Pb-212	Less than 8.3 E+01	
Pb-214	Less than 7.7 E+01	

MILK SAMPLES
(picocuries per liter)

	Judkins Dairy
Date Collected	6-15-76
Radiochemistry	
I-131	0.0 ± 9.6 E-02
Calcium	1.4 g/l
Sr-89	0.0 ± 2.0 E+00
Sr-90	2.4 ± 1.5 E+00
Gamma Spectrometry	
K-40	1.2 ± 0.4 E+03
Sb-125	Less than 8.0 E+01
Cs-137	Less than 2.1 E+01

MILK SAMPLES
(picocuries per liter)

	Epp's Dairy
Date Collected	6-24-76
Radiochemistry	
I-131	0.0 ± 1.1 E-01
Calcium	1.5 g/l
Sr-89	0.0 ± 5.6 E+00
Sr-90	8.6 ± 3.5 E+00
Gamma Spectrometry	
K-40	1.6 ± 0.4 E+03
Cs-137	Less than 2.1 E+01
Pb-212	Less than 8.3 E+01
Bi-214	Less than 6.5 E+01
Ra-226	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Colonial Pkwy. Dairy
Date Collected	6-29-76
Radiochemistry	
I-131	0.0 ± 9.7 E-02
Calcium	1.4 g/l
Sr-89	*0.0 ± 1.3 E+01
Sr-90	0.0 ± 1.3 E+01
Gamma Spectrometry	
K-40	1.5 ± 0.4 E+03
Cs-137	Less than 1.9 E+01
Tl-208	Less than 3.1 E+01
Pb-212	Less than 8.0 E+01
Bi-214	Less than 7.3 E+01
Pb-214	6.0 ± 6.0 E+01
Ra-226	Less than 9.4 E+02

*Low chemical recovery

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy
Date Collected	7-2-76
Radiochemistry	
I-131	0.0 ± 1.5 E-01
Calcium	1.4 g/l
Sr-89	*1.5 ± 1.0 E+01
Sr-90	0.0 ± 1.2 E+01
Gamma Spectrometry	
K-40	1.4 ± 0.4 E+03
Cs-137	Less than 2.2 E+01
Pb-212	Less than 8.4 E+01
Bi-214	7.8 ± 5.9 E+01
Pb-214	Less than 9.6 E+01

MILK SAMPLES
(picocuries per liter)

	Judkins Dairy
Date Collected	7-13-76
Radiochemistry	
I-131	0.0 ± 1.3 E-01
Calcium	1.4 g/l
Sr-89	0.0 ± 4.1 E+00
Sr-90	5.0 ± 3.0 E+00
Gamma Spectrometry	
K-40	1.2 ± 0.3 E+03
Cs-137	Less than 2.6 E+01
Pb-212	Less than 8.6 E+01
Bi-214	7.2 ± 5.7 E+01
Pb-214	1.2 ± 0.7 E+02
Ra-226	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Epp's Dairy
Date Collected	7-16-76
Radiochemistry	
I-131	0.0 ± 2.1 E-01
Calcium	1.3 g/l
Sr-89	0.0 ± 3.0 E+00
Sr-90	2.9 ± 2.3 E+00
Gamma Spectrometry	
K-40	1.6 ± 0.4 E+03
Co-57	Less than 2.8 E+01
Cs-137	Less than 2.0 E+01
Ce-141	Less than 7.8 E+01
Pb-212	Less than 8.0 E+01
Bi-214	Less than 7.1 E+01
Pb-214	Less than 9.0 E+01
Ac-228	Less than 1.9 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy. Dairy
Date Collected	7-30-76	7-30-76
Radiochemistry		
I-131	0.0 ± 1.1 E-01	0.0 ± 7.3 E-02
Calcium	1.4 g/l	1.4 g/l
Sr-89	0.0 ± 5.2 E+00	5.6 ± 2.6 E+00
Sr-90	0.0 ± 4.4 E+00	0.0 ± 3.6 E+00
Gamma Spectrometry		
K-40	1.2 ± 0.4 E+03	1.6 ± 0.4 E+03
Co-60	Less than 2.0 E+01	1.3 ± 1.3 E+01
Cs-137	Less than 2.3 E+01	Less than 1.8 E+01
Pb-212	Less than 8.3 E+01	Less than 8.3 E+01
Bi-214	1.3 ± 0.6 E+02	Less than 7.1 E+01
Pb-214	2.2 ± 0.7 E+02	7.6 ± 5.8 E+01
Ra-226	Less than 9.4 E+02	Less than 9.3 E+02

MILK SAMPLES
(picocuries per liter)

	Epp's Dairy	Judkins Dairy
Date Collected	8-10-76	8-10-76
Radiochemistry		
I-131	0.0 ± 9.4 E-02	0.0 ± 1.1 E-01
Calcium	1.5 g/1	1.5 g/1
Sr-89	0.0 ± 2.1 E+00	0.0 ± 3.0 E+00
Sr-90	4.0 ± 1.6 E+00	7.1 ± 2.2 E+00
Gamma Spectrometry		
Be-7	Less than 1.6 E+02	1.1 ± 1.1 E+02
K-40	1.5 ± 0.4 E+03	1.6 ± 0.4 E+03
Cs-137	Less than 2.1 E+01	Less than 2.2 E+01
Ce-141	Less than 7.7 E+01	Less than 7.7 E+01
Bi-214	Less than 6.5 E+01	Less than 6.5 E+01
Pb-214	Less than 9.0 E+01	Less than 9.0 E+01

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Epp's Dairy
Date Collected	8-12-76	8-12-76
Radiochemistry		
I-131	0.0 ± 1.8 E-01	0.0 ± 1.1 E-01
Calcium	1.5 g/l	1.3 g/l
Sr-89	0.0 ± 4.7 E+00	0.0 ± 3.2 E+00
Sr-90	3.5 ± 3.0 E+00	3.2 ± 1.7 E+00
Gamma Spectrometry		
K-40	1.6 ± 0.4 E+03	1.5 ± 0.4 E+03
Sb-125	Less than 8.5 E+01	Less than 8.5 E+01
Cs-137	Less than 2.2 E+01	Less than 1.9 E+01
Tl-208	Less than 3.2 E+01	Less than 3.2 E+01
Bi-214	8.8 ± 5.8 E+01	Less than 8.7 E+01
Pb-214	Less than 9.5 E+01	Less than 9.5 E+01

MILK SAMPLES
(picocuries per liter)
(split sample)

	Lee Hall Dairy
Date Collected	8-12-76
Radiochemistry	
I-131	0.0 ± 1.5 E-01
Calcium	1.5 g/l
Sr-89	0.0 ± 5.2 E+00
Sr-90	0.0 ± 4.7 E+00
Gamma Spectrometry	
K-40	8.2 ± 3.7 E+02
Cs-137	Less than 2.6 E+01
Bi-214	Less than 6.9 E+01
Pb-214	1.2 ± 0.8 E+02

MILK SAMPLES
(picocuries per liter)

	Colonial Pkwy. Dairy	Lee Hall Dairy
Date Collected	8-24-76	8-24-76
Radiochemistry		
I-131	0.0 ± 1.0 E-01	0.0 ± 8.8 E-02
Calcium	1.3 g/l	1.4 g/l
Sr-89	0.0 ± 3.8 E+00	0.0 ± 2.4 E+00
Sr-90	4.0 ± 2.1 E+00	1.4 ± 1.3 E+00
Gamma Spectrometry		
K-40	1.2 ± 0.4 E+03	1.0 ± 0.4 E+03
Cs-137	1.1 ± 1.0 E+01	Less than 1.6 E+01
Pb-212	4.0 ± 0.5 E+02	Less than 8.0 E+01
Bi-214	Less than 6.7 E+01	Less than 6.7 E+01
Pb-214	Less than 8.8 E+01	Less than 8.8 E+01
Ra-226	Less than 8.8 E+02	Less than 8.8 E+02

MILK SAMPLES
(picocuries per liter)

	Epp's Dairy	Judkins Dairy
Date Collected	9-7-76	9-7-76
Radiochemistry		
I-131	0.0 ± 6.3 E-02	0.0 ± 1.2 E-01
Calcium	1.1 g/l	1.0 g/l
Sr-89	0.0 ± 6.4 E+00	0.0 ± 5.1 E+00
Sr-90	0.0 ± 5.0 E+00	0.0 ± 6.4 E+00
Gamma Spectrometry		
K-40	1.4 ± 0.4 E+03	1.3 ± 0.4 E+03
Cr-51	Less than 2.2 E+02	Less than 2.2 E+02
Cs-137	Less than 2.2 E+01	Less than 1.7 E+01
Tl-208	Less than 3.0 E+01	Less than 3.0 E+01
Pb-212	Less than 7.8 E+01	Less than 7.5 E+01
Bi-214	4.2 ± 4.2 E+01	Less than 6.3 E+01
Pb-214	Less than 1.6 E+02	Less than 1.6 E+02
Ra-226	Less than 8.4 E+02	Less than 8.4 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy. Dairy
Date Collected	9-22-76	9-22-76
Radiochemistry		
I-131	0.0 ± 8.2 E-02	0.0 ± 1.2 E-01
Calcium	1.5 g/l	1.4 g/l
Sr-89	0.0 ± 3.5 E+00	0.0 ± 3.7 E+00
Sr-90	6.1 ± 1.9 E+00	0.0 ± 3.0 E+00
Gamma Spectrometry		
K-40	1.5 ± 0.4 E+03	1.7 ± 0.5 E+03
Cs-137	Less than 2.3 E+01	Less than 2.0 E+01
Pb-212	Less than 7.9 E+01	Less than 7.9 E+01
Bi-214	Less than 6.9 E+01	Less than 4.6 E+01
Pb-214	Less than 9.1 E+01	Less than 9.1 E+01
Ra-226	Less than 9.2 E+02	Less than 9.2 E+02

MILK SAMPLES
(picocuries per liter)

	Epp's Dairy	Judkins Dairy
Date Collected	10-5-76	10-5-76
Radiochemistry		
I-131	2.0 ± 0.1 E+00	2.6 ± 0.2 E+00
Calcium	1.5 g/l	1.5 g/l
Sr-89	0.0 ± 6.4 E+00	0.0 ± 2.9 E+00
Sr-90	0.0 ± 1.2 E+01	1.4 ± 0.6 E+01
Gamma Spectrometry		
K-40	1.5 ± 0.4 E+03	1.7 ± 0.4 E+03
Co-60	Less than 1.1 E+01	Less than 1.1 E+01
I-131	2.2 ± 2.2 E+01	2.9 ± 2.1 E+01
Cs-137	Less than 2.2 E+01	Less than 1.8 E+01
Ba-140	Less than 6.5 E+01	Less than 6.5 E+01
La-140	2.6 ± 2.4 E+01	Less than 3.6 E+01
Ce-141	Less than 7.6 E+01	Less than 7.5 E+01
Ce-144	2.0 ± 1.4 E+02	Less than 2.1 E+02
Pb-212	Less than 8.2 E+01	Less than 8.2 E+01
Pb-214	Less than 8.0 E+01	Less than 8.0 E+01
Ra-226	Less than 9.1 E+02	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Epp's Dairy
Date Collected	10-21-76	10-19-76
Radiochemistry		
I-131	5.7 ± 0.2 E-01	3.8 ± 2.3 E-01
Calcium	1.4 g/l	1.4 g/l
Sr-89	*3.5 ± 2.2 E+00	0.0 ± 3.3 E+00
Sr-90	3.9 ± 1.7 E+00	4.0 ± 1.9 E+00
Gamma Spectrometry		
K-40	1.6 ± 0.4 E+03	1.4 ± 0.4 E+03
Cs-137	Less than 1.6 E+01	Less than 1.2 E+01
Pb-212	Less than 8.2 E+01	Less than 8.1 E+01
Pb-214	Less than 8.9 E+01	Less than 8.9 E+01
Ra-226	Less than 9.4 E+02	Less than 9.4 E+02

*At time of collection.

MILK SAMPLES
(picocuries per liter)

	Colonial Pkwy. Dairy	Lee Hall Dairy
Date Collected	10-21-76	10-19-76
Radiochemistry		
I-131	6.0 ± 1.6 E-01	0.0 ± 2.0 E-01
Calcium	1.4 g/l	1.5 g/l
Sr-89	0.0 ± 2.2 E+00	*9.1 ± 2.4 E+00
Sr-90	3.5 ± 1.4 E+00	0.0 ± 2.3 E+00
Gamma Spectrometry		
K-40	9.5 ± 4.0 E+02	1.4 ± 0.4 E+03
Cs-137	Less than 1.9 E+01	1.9 ± 1.1 E+01
Pb-212	Less than 8.1 E+01	Less than 8.3 E+01
Pb-214	Less than 8.9 E+01	Less than 8.9 E+01
Ra-226	Less than 9.4 E+02	Less than 9.4 E+02

*At time of collection.

MILK SAMPLES
(picocuries per liter)

	Judkins Dairy
Date Collected	11-2-76
Radiochemistry	
I-131	3.4 ± 0.9 E+00
Calcium	1.5 g/l
Sr-89	*1.2 ± 0.3 E+01
Sr-90	4.3 ± 1.8 E+00

Extra Sample Collected for Gamma Spectrometry

Date Collected	11-30-76
Gamma Spectrometry	
K-40	1.6 ± 0.4 E+03
Cs-137	1.2 ± 0.9 E+01
Bi-212	2.2 ± 1.6 E+02
Pb-212	Less than 8.0 E+01

*At Time of Collection

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy. Dairy
Date Collected	11-18-76	11-18-76
Radiochemistry		
I-131	0.0 ± 1.1 E-01	0.0 ± 8.7 E-02
Calcium	1.5 g/1	1.3 g/1
Sr-89	0.0 ± 1.7 E+00	3.6 ± 1.8 E+00
Sr-90	3.4 ± 1.6 E+00	3.0 ± 1.8 E+00
Gamma Spectrometry		
K-40	1.5 ± 0.4 E+03	1.7 ± 0.4 E+03
Sb-125	Less than 8.2 E+01	Less than 8.2 E+01
Cs-137	Less than 2.0 E+01	Less than 1.7 E+01
Pb-212	Less than 8.2 E+01	Less than 7.9 E+01

MILK SAMPLES
(picocuries per liter)

	Epp's Dairy
Date Collected	11-30-76
Radiochemistry	
I-131	4.2 ± 1.4 E-01
Calcium	1.5 g/l
Sr-89	0.0 ± 1.8 E+00
Sr-90	2.5 ± 1.4 E+00
Gamma Spectrometry	
K-40	1.4 ± 0.4 E+03
Cs-137	Less than 2.1 E+01
Pb-212	Less than 7.9 E+01
Ra-226	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Smith Brothers Dairy
Date Collected	12-14-76	12-14-76
Radiochemistry		
I-131	0.0 ± 7.8 E-02	0.0 ± 9.0 E-02
Calcium	1.4 g/l	1.4 g/l
Sr-89	0.0 ± 2.2 E+00	0.0 ± 2.3 E+00
Sr-90	0.0 ± 2.1 E+00	3.0 ± 1.4 E+00
Gamma Spectrometry		
K-40	1.0 ± 0.3 E+03	1.5 ± 0.4 E+03
Ru-106	Less than 1.6 E+02	Less than 1.6 E+02
Sb-125	Less than 7.9 E+01	Less than 7.9 E+01
I-131	Less than 3.2 E+01	Less than 3.2 E+01
Cs-137	Less than 1.9 E+01	Less than 2.1 E+01
Pb-212	Less than 8.0 E+01	Less than 8.0 E+01
Ra-226	Less than 9.1 E+02	Less than 9.1 E+02

MILK SAMPLES
(picocuries per liter)

	Lee Hall Dairy	Colonial Pkwy. Dairy
Date Collected	12-27-76	12-27-76
Radiochemistry		
I-131	0.0 ± 1.2 E-01	0.0 ± 7.4 E-02
Calcium	1.4 g/1	1.4 g/1
Sr-89	0.0 ± 2.0 E+00	0.0 ± 2.6 E+00
Sr-90	2.2 ± 1.2 E+00	0.0 ± 2.6 E+00
Gamma Spectrometry		
K-40	1.4 ± 0.4 E+03	1.7 ± 0.4 E+03
Cs-137	Less than 1.8 E+01	1.2 ± 1.2 E+01
Pb-212	Less than 8.4 E+01	Less than 8.0 E+01
Pb-214	Less than 7.6 E+01	Less than 7.6 E+01

WELL WATER SAMPLES
(picocuries per liter)

	Surry Station	Jamestown
Date Collected	4-21-76	4-21-76
Radiochemistry		
Gross Alpha	0.0 ± 2.4 E+00	0.0 ± 2.8 E+00
Gross Beta	0.0 ± 4.8 E+00	7.8 ± 5.3 E+00
Tritium (En.)	2.7 ± 1.2 E+02	Less than 1.2 E+02

	Bacon's Castle	Hog Island Reserve
Date Collected	4-21-76	4-21-76
Radiochemsitry		
Gross Alpha	0.0 ± 2.0 E+00	0.0 ± 2.3 E+00
Gross Beta	1.2 ± 0.5 E+01	0.0 ± 4.8 E+00
Tritium (En.)	3.5 ± 1.1 E+02	Less than 1.1 E+02

WELL WATER SAMPLES
(picocuries per liter)

	Hog Island	Surry Station
Date Collected	11-2-76	11-2-76
Radiochemistry		
Gross Alpha	0.0 ± 1.2 E+00	0.0 ± 1.2 E+00
Gross Beta	0.0 ± 1.5 E+00	0.0 ± 1.5 E+00
Enr. Tritium	Less than 1.5 E+02	Less than 1.5 E+02

	Jamestown	Bacon's Castle
Date Collected	11-2-76	11-2-76
Radiochemistry		
Gross Alpha	0.0 ± 1.2 E+00	0.0 ± 7.4 E-01
Gross Beta	2.7 ± 1.6 E+00	2.4 ± 1.4 E+00
Enr. Tritium	Less than 1.5 E+02	1.5 ± 1.0 E+02

SURFACE WATER SAMPLES
(picocuries per liter)

4-21-76	Gross Alpha	Gross Beta	Tritium (En.)
Chippokes Creek	0.0 ± 2.0 E+00	0.0 ± 4.7 E+00	4.5 ± 0.9 E+02
Newport News Reservoir	0.0 ± 1.7 E+00	7.0 ± 5.0 E+00	9.6 ± 1.0 E+02
Smithfield Reservoir	0.0 ± 5.3 E+00	0.0 ± 9.2 E+00	3.7 ± 1.0 E+02
Williamsburg Reservoir	0.0 ± 1.9 E+00	0.0 ± 4.7 E+00	2.9 ± 0.8 E+02

SURFACE WATER SAMPLES
(picocuries per liter)

	Chipokes Creek	Newport News
Date Collected	11-2-76	11-2-76
Radiochemistry		
Gross Alpha	0.0 ± 9.3 E-01	0.0 ± 7.0 E-01
Gross Beta	2.2 ± 1.5 E+00	3.2 ± 1.5 E+00
L.S. Tritium	3.1 ± 2.6 E+02	Less than 3.0 E+02

	Smithfield	Williamsburg
Date Collected	11-2-76	11-2-76
Radiochemistry		
Gross Alpha	0.0 ± 7.9 E-01	0.0 ± 8.8 E-01
Gross Beta	6.7 ± 1.8 E+00	2.5 ± 1.5 E+00
L.S. Tritium	Less than 3.0 E+02	Less than 3.0 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Hog Island Point	Newport News
Date Collected	1-13-76	1-26-76
Gamma Spectrometry		
K-40	Less than 1.3 E+02	1.8 ± 0.9 E+02
Nb-95	Less than 8.5 E+00	Less than 8.5 E+00
Sb-125	Less than 2.7 E+01	Less than 2.7 E+01
Cs-137	Less than 9.9 E+00	Less than 7.9 E+00
Tl-208	Less than 8.3 E+00	Less than 8.3 E+00
Pb-212	Less than 2.4 E+01	Less than 2.3 E+01
Bi-214	Less than 2.1 E+01	Less than 2.8 E+01
Pb-214	Less than 2.7 E+01	Less than 2.7 E+01
Ra-226	Less than 2.4 E+02	Less than 2.5 E+02
Ac-228	Less than 5.9 E+01	Less than 5.9 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Chickahominey	Station Discharge
Date Collected	1-13-76	1-13-76
Gamma Spectrometry		
K-40	Less than 8.8 E+01	Less than 8.8 E+01
Nb-95	Less than 8.5 E+00	Less than 8.5 E+00
Sb-125	Less than 2.8 E+01	Less than 2.7 E+01
Cs-137	Less than 7.0 E+00	Less than 6.1 E+00
Tl-208	Less than 9.8 E+00	Less than 8.3 E+00
Pb-212	Less than 2.3 E+01	Less than 2.3 E+01
Bi-214	Less than 2.1 E+01	Less than 2.5 E+01
Pb-214	Less than 2.7 E+01	Less than 2.8 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02
Ac-228	Less than 5.9 E+01	Less than 5.9 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Station Intake
Date Collected	1-30-76
Gamma Spectrometry	
K-40	8.3 ± 7.4 E+01
Nb-95	Less than 8.5 E+00
Sb-125	Less than 2.7 E+01
Cs-137	4.6 ± 4.1 E+00
Tl-208	Less than 8.9 E+00
Pb-212	Less than 2.3 E+01
Bi-214	Less than 2.1 E+01
Pb-214	Less than 2.7 E+01
Ra-226	Less than 2.4 E+02
Ac-228	Less than 5.9 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Hog Island Point	Station Intake
Date Collected	3-11-76	3-15-76
Gamma Spectrometry		
K-40	Less than 1.1 E+02	Less than 1.0 E+02
Co-58	5.0 ± 5.0 E+00	Less than 6.6 E+00
Sb-125	Less than 3.0 E+01	Less than 3.0 E+01
Cs-137	Less than 9.1 E+00	4.6 ± 4.1 E+00
Tl-208	Less than 1.0 E+01	Less than 1.0 E+01
Pb-212	Less than 2.3 E+01	Less than 2.3 E+01
Bi-214	Less than 2.7 E+01	2.4 ± 2.0 E+01
Pb-214	Less than 3.0 E+01	3.8 ± 2.0 E+01
Ra-226	Less than 2.4 E+02	Less than 2.5 E+02
Ac-228	Less than 5.8 E+01	Less than 5.8 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Chickahominy	Newport News
Date Collected	3-15-76	3-15-76
Gamma Spectrometry		
K-40	Less than 8.9 E+01	1.4 ± 0.8 E+02
Co-58	Less than 6.6 E+00	Less than 6.6 E+00
Sb-125	Less than 3.0 E+01	Less than 3.0 E+01
Cs-137	Less than 6.4 E+00	Less than 6.8 E+00
Tl-208	Less than 1.0 E+01	Less than 1.0 E+01
Pb-212	Less than 2.3 E+01	Less than 2.3 E+01
Bi-214	Less than 2.9 E+01	Less than 2.7 E+01
Pb-214	Less than 3.0 E+01	2.6 ± 1.9 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02
Ac-228	Less than 5.8 E+01	Less than 5.8 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

Station Discharge

Date Collected	3-11-76

Gamma Spectrometry

K-40	Less than 9.2 E+01
Co-58	4.8 ± 4.4 E+00
Sb-125	Less than 3.0 E+01
Cs-137	Less than 4.7 E+00
Tl-208	Less than 1.0 E+01
Pb-212	Less than 2.3 E+01
Bi-214	Less than 2.7 E+01
Pb-214	Less than 3.0 E+01
Ra-226	Less than 2.4 E+02
Ac-228	Less than 5.8 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Newport News	Point of Shoals
Date Collected	5-21-76	5-21-76
Radiochemistry		
Tritium (En.)	Less than 3.7 E+02	Less than 3.7 E+02
Gamma Spectrometry		
K-40	1.8 ± 0.9 E+02	1.2 ± 0.9 E+02
Cr-51	Less than 6.4 E+01	Less than 6.4 E+01
Sb-125	Less than 2.9 E+01	Less than 2.9 E+01
Cs-137	4.6 ± 4.1 E+00	Less than 7.4 E+00
Ce-144	Less than 5.0 E+01	Less than 5.0 E+01
Tl-208	Less than 8.9 E+00	Less than 8.8 E+00
Pb-212	Less than 2.2 E+01	Less than 2.4 E+01
Bi-214	Less than 2.4 E+01	Less than 2.4 E+01
Pb-214	Less than 2.7 E+01	Less than 2.7 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02
Ac-228	Less than 5.7 E+01	Less than 5.7 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Station Discharge	Chickahominey
Date Collected	5-21-76	5-21-76
Radiochemistry		
Tritium (En.)	Less than 3.7 E+02	Less than 3.7 E+02
Gamma Spectrometry		
K-40	Less than 1.2 E+02	Less than 1.2 E+02
Cr-51	8.1 ± 4.3 E+01	Less than 6.4 E+01
Sb-125	Less than 2.9 E+01	Less than 2.9 E+01
Cs-137	Less than 6.4 E+00	Less than 8.4 E+00
Ce-144	Less than 5.0 E+01	Less than 5.0 E+01
Tl-208	Less than 8.8 E+00	Less than 8.8 E+00
Pb-212	Less than 2.2 E+01	Less than 2.2 E+01
Bi-214	Less than 2.4 E+01	Less than 2.4 E+01
Pb-214	Less than 2.7 E+01	Less than 2.7 E+01
Ra-226	Less than 2.5 E+02	Less than 2.4 E+02
Ac-228	Less than 5.7 E+01	Less than 5.7 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Hog Island Point
Date Collected	5-21-76
Radiochemistry	
Tritium (En.)	Less than 3.7 E+02
Gamma Spectrometry	
K-40	1.1 ± 0.8 E+02
Cr-51	Less than 6.4 E+01
Sb-125	Less than 2.9 E+01
Cs-137	Less than 4.0 E+00
Ce-144	Less than 5.0 E+01
Tl-208	Less than 8.8 E+00
Pb-212	Less than 2.2 E+01
Bi-214	Less than 2.4 E+01
Pb-214	Less than 2.7 E+01
Ra-226	Less than 2.4 E+02
Ac-228	Less than 5.7 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Chickahominy	Hog Island Point
Date Collected	7-22-76	7-21-76
Gamma Spectrometry		
K-40	Less than 1.3 E+02	9.1 ± 7.6 E+01
Cs-137	Less than 4.4 E+00	Less than 6.3 E+00
Pb-212	Less than 2.2 E+01	Less than 2.3 E+01
Bi-214	Less than 2.5 E+01	Less than 2.4 E+02
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Station Intake	Station Discharge
Date Collected	7-21-76	7-21-76
Gamma Spectrometry		
K-40	1.1 ± 0.9 E+02	Less than 1.3 E+02
Cs-137	Less than 5.9 E+00	Less than 7.8 E+00
Pb-212	Less than 2.4 E+01	Less than 2.2 E+01
Bi-214	Less than 2.4 E+02	Less than 2.4 E+02
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Newport News
Date Collected	7-21-76
Gamma Spectrometry	
K-40	1.9 ± 0.9 E+02
Cs-137	Less than 6.6 E+00
Pb-212	Less than 2.2 E+01
Bi-214	Less than 2.6 E+01
Ra-226	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Hog Island Point	Station Intake
Date Collected	9-23-76	9-23-76
Radiochemistry		
Enr. Tritium	3.8 ± 0.9 E+02	2.0 ± 0.8 E+02
Gamma Spectrometry		
Be-7	5.3 ± 3.0 E+01	Less than 4.5 E+01
K-40	1.2 ± 0.9 E+02	1.6 ± 0.9 E+02
Ru-106	Less than 6.6 E+01	Less than 6.6 E+01
I-131	Less than 1.0 E+01	Less than 1.0 E+01
Cs-137	Less than 7.2 E+00	Less than 8.0 E+00
Tl-208	Less than 9.6 E+00	Less than 9.6 E+00
Pb-212	Less than 2.3 E+01	Less than 2.2 E+01
Bi-214	Less than 4.5 E+01	Less than 4.5 E+01
Pb-214	Less than 5.0 E+01	Less than 5.0 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Chickahominy	Station Discharge
Date Collected	9-23-76	9-23-76
Radiochemistry		
Enr. Tritium	2.6 ± 0.9 E+02	4.0 ± 0.9 E+02
Gamma Spectrometry		
Be-7	Less than 4.5 E+01	Less than 4.5 E+01
K-40	Less than 8.5 E+01	7.5 ± 7.2 E+01
Ru-106	Less than 6.6 E+01	Less than 6.6 E+01
I-131	Less than 1.0 E+01	Less than 1.0 E+01
Cs-137	5.4 ± 4.3 E+00	Less than 6.7 E+00
Tl-208	Less than 9.6 E+00	Less than 9.6 E+00
Pb-212	Less than 2.3 E+01	Less than 2.3 E+01
Bi-214	Less than 4.5 E+01	3.5 ± 3.0 E+01
Pb-214	Less than 5.0 E+01	Less than 5.0 E+01
Ra-226	Less than 2.5 E+02	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Newport News	Lawnes Creek
Date Collected	10-29-76	10-29-76
Radiochemistry		
Enr. Tritium	7.5 ± 3.7 E+02	7.6 ± 4.6 E+02
Gross Alpha	0.0 ± 5.2 E+00	0.0 ± 2.1 E+00
Gamma Spectrometry		
Be-7	4.4 ± 3.7 E+01	Less than 5.5 E+01
K-40	1.3 ± 1.0 E+02	Less than 1.5 E+02
Cr-51	5.2 ± 4.1 E+01	Less than 6.1 E+01
Sb-125	Less than 2.9 E+01	Less than 2.9 E+01
Cs-137	Less than 7.9 E+00	Less than 6.8 E+00
Ce-141	Less than 1.8 E+01	Less than 1.8 E+01
Tl-208	Less than 8.3 E+00	Less than 8.3 E+00
Pb-212	Less than 2.4 E+01	Less than 2.3 E+01
Bi-214	Less than 2.1 E+01	1.5 ± 1.4 E+01
Pb-214	Less than 2.6 E+01	Less than 2.6 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Point O' Shoals	Deep Water Shoals
Date Collected	10-29-76	10-29-76
Radiochemistry		
Enr. Tritium	3.7 ± 3.7 E+02	2.6 ± 2.6 E+02
Gross Beta	0.0 ± 4.2 E+00	7.0 ± 5.2 E+00
Gamma Spectrometry		
Be-7	Less than 5.5 E+01	Less than 5.5 E+01
K-40	Less than 1.5 E+02	Less than 1.5 E+02
Cr-51	Less than 6.1 E+01	Less than 6.1 E+01
Sb-125	Less than 2.9 E+01	Less than 2.9 E+01
Cs-137	Less than 6.0 E+00	Less than 5.2 E+00
Ce-141	Less than 1.8 E+01	Less than 1.8 E+01
Tl-208	Less than 8.3 E+00	Less than 8.3 E+00
Pb-212	Less than 2.3 E+01	Less than 2.3 E+01
Bi-214	Less than 2.1 E+01	Less than 2.1 E+01
Pb-214	Less than 2.6 E+01	Less than 2.6 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Newport News	Station Intake
Date Collected	11-17-76	11-17-76
Radiochemistry		
Enr. Tritium	3.0 ± 1.5 E+02	Less than 1.5 E+02
Gamma Spectrometry		
K-40	1.3 ± 1.0 E+02	1.1 ± 1.0 E+02
Sb-125	Less than 2.7 E+01	Less than 2.7 E+01
Cs-137	Less than 7.0 E+00	Less than 5.6 E+00
Ce-141	Less than 1.9 E+01	Less than 1.9 E+01
Bi-212	5.9 ± 5.8 E+01	Less than 8.7 E+01
Pb-212	Less than 2.2 E+01	Less than 2.3 E+01
Bi-214	5.4 ± 3.4 E+01	Less than 2.5 E+01
Pb-214	2.1 ± 2.0 E+01	Less than 4.7 E+01
Ra-226	Less than 2.4 E+02	Less than 2.4 E+02
Ac-228	Less than 5.9 E+01	Less than 5.9 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Station Discharge	Chickahominey
Date Collected	11-17-76	11-17-76
Radiochemistry		
Enr. Tritium	2.4 ± 1.6 E+02	Less than 1.3 E+02
Gamma Spectrometry		
K-40	Less than 1.3 E+02	Less than 1.3 E+02
Sb-125	Less than 2.7 E+01	Less than 2.7 E+01
Cs-137	Less than 7.6 E+00	Less than 6.7 E+00
Ce-141	Less than 1.9 E+01	Less than 1.9 E+01
Bi-212	Less than 8.7 E+01	Less than 8.7 E+01
Pb-212	Less than 2.3 E+01	Less than 2.2 E+01
Bi-214	Less than 2.5 E+01	Less than 2.5 E+01
Pb-214	Less than 4.7 E+01	Less than 4.7 E+01
Ra-226	Less than 2.5 E+02	Less than 2.4 E+02
Ac-228	Less than 5.9 E+01	Less than 5.9 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

	Hog Island Point
Date Collected	11-17-76
Radiochemistry	
Enr. Tritium	2.2 ± 1.3 E+02
Gamma Spectrometry	
K-40	Less than 1.3 E+02
Sb-125	Less than 2.7 E+01
Cs-137	Less than 6.0 E+00
Ce-141	Less than 1.9 E+01
Bi-212	Less than 8.7 E+01
Pb-212	Less than 2.3 E+01
Bi-214	Less than 2.5 E+01
Pb-214	Less than 4.7 E+01
Ra-226	Less than 2.4 E+02
Ac-228	Less than 5.9 E+01

JAMES RIVER WATER SAMPLES
(picocuries per liter)

SEMI-ANNUAL COMPOSITE 1976

	Chickahominey	Newport News
Tritium (En.)	2.0 ± 1.0 E+02	5.7 ± 2.0 E+02

JAMES RIVER WATER SAMPLES
(picocuries per liter)

2nd SEMI-ANNUAL COMPOSITE 1976

	Chickahominey	Newport News
Enr. Tritium	2.1 ± 1.0 E+02	3.3 ± 1.1 E+02

SPECIAL WATER SAMPLES
(picocuries per liter)

	Discharge Canal
Date Collected	7-6-76
Radiochemistry	
Tritium (L.S.)	Less than 3.7 E+02
Gamma Spectrometry	
Mn-54	8.5 ± 5.1 E+00
Co-58	2.7 ± 0.9 E+01
Co-60	3.6 ± 1.1 E+01
Cs-134	1.0 ± 0.9 E+01
Cs-137	3.6 ± 1.1 E+01
Pb-212	Less than 2.3 E+01
Pb-214	Less than 3.1 E+01
Ra-226	Less than 2.6 E+02

SPECIAL WATER SAMPLES
(picocuries per liter)

	Discharge Canal
Date Collected	10-19-76
Radiochemistry	
Gross Alpha	0.0 ± 5.2 E+00
Gross Beta	5.9 ± 1.2 E+01
Enr. Tritium	5.0 ± 1.5 E+02
Gamma Spectrometry	
Co-60	1.9 ± 0.8 E+01
Mn-54	6.5 ± 4.1 E+00
Cs-134	1.5 ± 0.6 E+01
Cs-137	2.9 ± 0.8 E+01
Pb-212	Less than 2.4 E+01

SILT SAMPLES
(picocuries per kilogram dry)

	Station Intake	Point of Shoals
Date Collected	3-15-76	3-15-76
Sample Weight Dry	0.129 kg	0.1285 kg
Gamma Spectrometry		
K-40	1.4 ± 0.3 E+04	1.3 ± 0.3 E+04
Mn-54	Less than 1.5 E+02	Less than 1.5 E+02
Co-58	Less than 1.5 E+02	1.2 ± 1.0 E+02
Co-60	Less than 1.6 E+02	1.8 ± 1.0 E+02
Cs-134	6.5 ± 1.0 E+02	2.3 ± 0.9 E+02
Cs-137	Less than 3.0 E+02	1.0 ± 0.2 E+03
Hg-203	Less than 2.2 E+02	Less than 2.2 E+02
Tl-208	4.0 ± 1.4 E+02	3.0 ± 1.6 E+02
Bi-212	1.5 ± 1.4 E+03	Less than 2.1 E+03
Pb-212	1.3 ± 0.4 E+03	1.6 ± 0.4 E+03
Bi-214	1.5 ± 0.4 E+03	1.0 ± 0.4 E+03
Pb-214	9.0 ± 1.6 E+02	7.2 ± 3.8 E+02
Ra-226	4.2 ± 3.5 E+03	4.3 ± 3.5 E+03
Ac-228	1.4 ± 0.7 E+03	1.4 ± 0.7 E+03

SILT SAMPLES
(picocuries per kilogram dry)

	Newport News	Station Discharge
Date Collected	3-15-76	3-15-76
Sample Weight Dry	0.164 kg	0.1115 kg
Gamma Spectrometry		
K-40	1.5 ± 0.2 E+04	1.4 ± 0.3 E+03
Mn-54	Less than 1.1 E+02	Less than 1.7 E+02
Co-58	Less than 1.1 E+02	Less than 1.7 E+02
Co-60	Less than 1.3 E+02	Less than 1.9 E+02
Cs-134	Less than 1.0 E+02	1.8 ± 1.1 E+02
Cs-137	3.4 ± 1.0 E+02	2.0 ± 1.3 E+02
Hg-203	Less than 1.7 E+02	Less than 2.5 E+02
Tl-208	2.3 ± 1.1 E+02	4.0 ± 1.7 E+02
Bi-212	Less than 1.6 E+03	1.6 ± 1.4 E+03
Pb-212	1.2 ± 0.3 E+03	1.4 ± 0.4 E+03
Bi-214	6.8 ± 3.0 E+02	7.0 ± 3.0 E+02
Pb-214	6.8 ± 2.8 E+02	9.7 ± 3.8 E+02
Ra-226	Less than 3.9 E+03	Less than 5.9 E+03
Ac-228	8.0 ± 4.8 E+02	1.5 ± 0.7 E+03

SILT SAMPLES
(picocuries per kilogram dry)

	Chickahominey	Hog Island Point
Date Collected	3-15-76	3-15-76
Sample Weight Dry	0.093 kg	0.082 kg
Gamma Spectrometry		
K-40	1.2 ± 0.3 E+04	1.2 ± 0.2 E+04
Mn-54	Less than 1.9 E+02	Less than 2.2 E+02
Co-58	Less than 1.9 E+02	Less than 1.5 E+02
Co-60	Less than 2.3 E+02	Less than 2.6 E+02
Cs-134	1.4 ± 1.0 E+02	Less than 2.0 E+02
Cs-137	4.5 ± 1.7 E+02	Less than 2.1 E+02
Hg-203	Less than 2.8 E+02	Less than 3.4 E+02
Tl-208	2.7 ± 2.0 E+02	4.6 ± 1.6 E+02
Bi-214	Less than 2.8 E+03	Less than 3.2 E+03
Pb-212	1.6 ± 0.4 E+03	1.6 ± 0.4 E+03
Bi-214	9.1 ± 3.5 E+02	4.6 ± 0.6 E+03
Pb-214	1.4 ± 0.4 E+03	7.0 ± 0.5 E+03
Ra-226	Less than 6.5 E+03	Less than 5.9 E+03
Ac-228	8.4 ± 8.2 E+02	1.4 ± 0.8 E+03

SILT SAMPLES
(picocuries per kilogram dry)

	Station Discharge	Chickahominy
Date Collected	9-23-76	9-23-76
Sample Weight Dry	0.116 kg	0.093 kg
Gamma Spectrometry		
K-40	1.8 ± 0.3 E+04	1.4 ± 0.3 E+04
Mn-54	4.1 ± 1.6 E+02	Less than 3.0 E+02
Co-58	9.4 ± 2.0 E+02	Less than 3.7 E+02
Co-60	2.5 ± 0.3 E+03	Less than 1.9 E+02
Nb-95	1.7 ± 1.6 E+02	Less than 3.0 E+02
Cs-134	1.0 ± 0.2 E+03	Less than 3.7 E+02
Cs-137	3.3 ± 0.3 E+03	1.1 ± 0.2 E+03
Tl-208	5.5 ± 1.9 E+02	4.5 ± 1.8 E+02
Bi-212	2.6 ± 2.0 E+03	1.8 ± 1.8 E+03
Pb-212	1.6 ± 0.4 E+03	1.6 ± 0.4 E+03
Bi-214	1.1 ± 0.5 E+03	1.1 ± 0.4 E+03
Pb-214	1.4 ± 0.4 E+03	1.4 ± 0.5 E+03
Ra-226	Less than 6.5 E+03	4.9 ± 4.5 E+03
Ac-228	1.6 ± 0.9 E+03	9.2 ± 8.9 E+02

SILT SAMPLES
(picocuries per kilogram dry)

	Hog Island Point
Date Collected	9-23-76
Sample Weight Dry	0.111 kg
Gamma Spectrometry	
K-40	1.5 ± 0.3 E+04
Mn-54	Less than 2.5 E+02
Co-58	Less than 3.1 E+02
Co-60	Less than 1.6 E+02
Nb-95	Less than 2.5 E+02
Cs-134	Less than 3.1 E+02
Cs-137	Less than 2.1 E+02
Tl-208	4.6 ± 1.7 E+02
Bi-212	Less than 2.3 E+03
Pb-212	1.7 ± 0.4 E+03
Bi-214	9.8 ± 3.9 E+02
Pb-214	1.4 ± 0.4 E+03
Ra-226	Less than 5.8 E+03
Ac-228	1.5 ± 0.8 E+03

SILT SAMPLES
(picocuries per kilogram dry)

	Station Intake	Newport News
Date Collected	10-29-76	10-29-76
Sample Weight Dry	0.1085 kg	0.1145 kg
Gamma Spectrometry		
Be-7	1.3 ± 1.1 E+03	Less than 1.6 E+03
K-40	1.0 ± 0.3 E+04	1.4 ± 0.3 E+04
Mn-54	1.1 ± 1.0 E+02	Less than 1.4 E+02
Nb-95	Less than 1.9 E+02	Less than 1.8 E+02
Zr-95	Less than 2.7 E+02	Less than 2.5 E+02
Ru-103	Less than 1.9 E+02	Less than 1.8 E+02
Cs-134	1.4 ± 0.9 E+02	Less than 1.3 E+02
Cs-137	6.5 ± 1.6 E+02	5.6 ± 1.6 E+02
Ce-141	5.6 ± 3.2 E+02	Less than 4.1 E+02
Tl-208	2.8 ± 1.7 E+02	2.4 ± 1.6 E+02
Bi-212	Less than 2.5 E+03	1.6 ± 1.3 E+03
Pb-212	1.0 ± 0.4 E+03	1.4 ± 0.4 E+03
Bi-214	9.2 ± 3.0 E+02	5.0 ± 3.0 E+02
Pb-214	1.1 ± 0.4 E+03	1.2 ± 0.4 E+03
Ra-226	4.5 ± 3.8 E+03	Less than 5.5 E+03
Ac-228	9.8 ± 7.3 E+02	1.3 ± 0.6 E+03

OYSTER SAMPLES
(picocuries per kilogram)

	Newport News	Point of Shoals
Date Collected	1-26-76	1-26-76
Sample Weight Dry/Wet	0.020/0.3285 kg	0.026/0.241 kg
Gamma Spectrometry		
K-40	3.5 ± 3.2 E+02	1.7 ± 0.5 E+03
Co-58	3.8 ± 2.1 E+01	4.0 ± 2.2 E+01
Co-60	2.2 ± 1.9 E+01	2.6 ± 2.6 E+01
Ru-103	1.7 ± 1.2 E+01	Less than 1.4 E+01
Cs-137	2.6 ± 2.1 E+01	1.1 ± 0.4 E+02
Ce-141	Less than 1.1 E+02	Less than 8.2 E+01
Tl-208	Less than 6.0 E+01	Less than 4.6 E+01
Pb-212	Less than 7.0 E+01	Less than 1.1 E+02
Bi-214	Less than 1.4 E+02	8.5 ± 7.3 E+01
Pb-214	Less than 8.9 E+01	Less than 1.3 E+02
Ra-226	Less than 7.6 E+02	Less than 1.1 E+03

OYSTER SAMPLES
(picocuries per kilogram)

	Deep Water Shoals
Date Collected	1-26-76
Sample Weight Dry/Wet	0.018/0.284 kg
Gamma Spectrometry	
K-40	6.8 ± 4.1 E+02
Co-58	Less than 3.5 E+01
Co-60	Less than 2.9 E+01
Ru-103	Less than 2.0 E+01
Cs-137	2.8 ± 2.3 E+01
Ce-141	Less than 1.2 E+02
Tl-208	Less than 6.7 E+01
Pb-212	Less than 8.3 E+01
Bi-214	Less than 1.5 E+02
Pb-214	Less than 1.9 E+02
Ra-226	Less than 8.9 E+02

OYSTER SAMPLES
(picocuries per kilogram wet)

	Deep Water Shoals	Point of Shoals
Date Collected	3-15-76	3-15-76
Sample Weight Dry/Wet	0.0145/0.177	0.016/0.2825
Gamma Spectrometry		
K-40	6.4 ± 5.9 E+02	4.9 ± 3.0 E+02
Co-58	4.6 ± 3.6 E+01	3.0 ± 2.3 E+01
Sb-125	Less than 1.2 E+02	Less than 1.1 E+02
Cs-137	Less than 5.6 E+01	Less than 3.7 E+01
Tl-208	Less than 5.8 E+01	Less than 3.5 E+01
Pb-212	Less than 1.4 E+02	Less than 1.3 E+02
Bi-214	1.9 ± 1.4 E+02	Less than 1.9 E+02
Pb-214	Less than 1.7 E+02	Less than 1.0 E+02
Ra-226	Less than 1.4 E+03	Less than 1.3 E+03

OYSTER SAMPLES
(picocuries per kilogram wet)

	Naseway Shoals
Date Collected	3-11-76
Sample Weight Dry/Wet	0.0235/0.331
Gamma Spectrometry	
K-40	7.7 ± 3.7 E+02
Co-58	6.7 ± 2.0 E+01
Sb-125	Less than 7.5 E+01
Cs-137	Less than 2.0 E+01
Tl-208	Less than 2.4 E+01
Pb-212	Less than 6.9 E+01
Bi-214	Less than 1.3 E+02
Pb-214	Less than 6.8 E+01
Ra-226	Less than 7.6 E+02

OYSTER SAMPLES
(picocuries per kilogram)

	Newport News
Date Collected	5-11-76
Sample Weight Dry/Wet	0.440 kg
Gamma Spectrometry	
K-40	1.6 ± 0.5 E+03
Mn-54	Less than 1.2 E+01
Co-58	Less than 3.9 E+01
Co-60	Less than 1.7 E+01
Sb-125	Less than 6.1 E+01
Cs-137	Less than 4.3 E+01
Ce-141	Less than 4.2 E+01
Tl-208	Less than 4.8 E+01
Bi-212	Less than 6.0 E+02
Pb-212	Less than 1.3 E+02
Pb-214	Less than 6.1 E+01
Ra-226	Less than 5.6 E+02
Ac-228	Less than 1.3 E+02

OYSTER SAMPLES
(picocuries per kilogram wet)

	Point of Shoals	Deep Water Shoals
Date Collected	5-21-76	5-21-76
Sample Weight Dry/Wet	0.193 kg	0.130 kg
Gamma Spectrometry		
K-40	8.0 ± 4.5 E+02	8.8 ± 8.0 E+02
Mn-54	Less than 2.8 E+01	3.2 ± 2.8 E+01
Co-58	2.2 ± 1.8 E+01	5.4 ± 3.7 E+01
Co-60	Less than 3.9 E+01	Less than 5.8 E+01
Sb-125	Less than 1.4 E+02	Less than 2.1 E+02
Cs-137	Less than 4.7 E+01	Less than 7.0 E+01
Ce-141	Less than 9.6 E+01	Less than 1.4 E+02
Tl-208	Less than 1.1 E+02	Less than 7.0 E+01
Bi-212	Less than 5.2 E+02	Less than 7.7 E+02
Pb-212	Less than 1.2 E+02	Less than 1.8 E+02
Pb-214	Less than 1.4 E+02	Less than 2.1 E+02
Ra-226	Less than 1.3 E+03	Less than 1.9 E+03
Ac-228	Less than 3.0 E+02	Less than 4.5 E+02

OYSTER SAMPLES
(picocuries per kilogram wet)

	Deep Water Shoals	Newport News
Date Collected	7-21-76	7-21-76
Sample Weight Dry/Wet	0.0175/0.1873 kg	0.01500/0.1270 kg
Gamma Spectrometry		
K-40	8.6 ± 4.8 E+02	2.1 ± 0.8 E+03
Co-60	Less than 4.6 E+01	Less than 6.8 E+01
Sb-125	Less than 1.5 E+02	Less than 2.3 E+02
Cs-137	Less than 5.6 E+01	Less than 8.3 E+01
Ce-141	Less than 1.0 E+02	Less than 1.5 E+02
Tl-208	Less than 5.4 E+01	Less than 7.6 E+01
Pb-212	Less than 1.3 E+02	Less than 1.9 E+02
Bi-214	Less than 1.4 E+02	Less than 2.0 E+02
Pb-214	Less than 1.5 E+02	Less than 2.3 E+02
Ra-226	Less than 1.3 E+03	Less than 1.9 E+03

OYSTER SAMPLES
(picocuries per kilogram wet)

	Point of Shoals
Date Collected	7-21-76
Sample Weight Dry/Wet	0.0270/0.2882 kg

Gamma Spectrometry

K-40	4.1 ± 4.0 E+02
Co-60	Less than 3.0 E+01
Sb-125	Less than 1.0 E+02
Cs-137	Less than 3.6 E+01
Ce-141	Less than 6.7 E+01
Tl-208	Less than 3.5 E+01
Pb-212	Less than 8.4 E+01
Bi-214	Less than 8.8 E+01
Pb-214	Less than 1.0 E+02
Ra-226	Less than 8.5 E+02

OYSTER SAMPLES
(picocuries per kilogram wet)

	James River Bridge	Deep Water Shoals
Date Collected	9-9-76	9-9-76
Sample Weight Dry/Wet	0.0220/0.2465 kg.	0.0185/0.2079 kg.
Gamma Spectrometry		
K-40	6.4 ± 4.9 E+02	8.1 ± 4.4 E+02
Ag-110m	Less than 2.5 E+01	4.7 ± 3.0 E+01
Cs-137	Less than 2.0 E+01	Less than 3.3 E+01
Tl-208	Less than 3.8 E+01	Less than 4.5 E+01
Pb-212	Less than 9.1 E+01	Less than 1.2 E+02
Bi-214	Less than 1.0 E+02	Less than 1.2 E+02
Pb-214	Less than 1.1 E+02	Less than 1.3 E+02
Ra-226	Less than 9.7 E+02	Less than 1.1 E+03

OYSTER SAMPLES
(picocuries per kilogram wet)

	Naseway Shoals
Date Collected	11-29-76
Sample Weight Dry/Wet	0.041/0.412 kg.
Gamma Spectrometry	
K-40	1.4 ± 0.5 E+03
Co-60	Less than 3.1 E+01
Nb-95	Less than 2.0 E+01
Zr-95	Less than 1.9 E+01
Ru-103	3.8 ± 2.1 E+01
Cs-137	2.0 ± 1.4 E+01
Ce-141	Less than 4.6 E+01
Pb-212	Less than 1.2 E+02
Pb-214	Less than 9.7 E+01
Ra-226	Less than 1.4 E+03
Ac-228	Less than 1.4 E+02

OYSTER SAMPLES
(picocuries per kilogram wet)

	Point of Shoals	Deep Water Shoals
Date Collected	11-30-76	11-30-76
Sample Weight Dry/Wet	0.0250/0.3426 kg.	0.0215/0.3049 kg.
Gamma Spectrometry		
K-40	4.5 ± 3.2 E+02	Less than 6.1 E+02
Co-60	Less than 3.7 E+01	Less than 4.2 E+01
Nb-95	Less than 2.4 E+01	Less than 2.7 E+01
Zr-95	Less than 2.3 E+01	Less than 2.6 E+01
Ru-103	Less than 3.8 E+01	Less than 4.3 E+01
Cs-137	Less than 2.4 E+01	1.8 ± 1.4 E+01
Ce-141	Less than 5.5 E+01	Less than 6.2 E+01
Pb-212	Less than 6.6 E+01	Less than 7.5 E+01
Pb-214	Less than 8.1 E+01	Less than 9.1 E+01
Ra-226	Less than 7.3 E+02	Less than 1.9 E+03
Ac-228	Less than 1.7 E+02	Less than 1.9 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Lawnes Creek	Chickahominy
Date Collected	1-13-76	1-13-76
Sample Weight Dry/Wet	0.0215/0.418	0.0215/0.316
Radiochemistry		
Sr-89	0.0 ± 5.0 E+00	0.0 ± 8.4 E+00
Sr-90	0.0 ± 4.3 E+00	1.7 ± 0.5 E+01
Gamma Spectrometry		
K-40	Less than 3.0 E+02	Less than 4.4 E+02
Co-58	2.4 ± 1.4 E+01	Less than 4.8 E+01
Co-60	Less than 3.5 E+01	Less than 3.5 E+01
Ag-110m	Less than 2.2 E+01	Less than 2.2 E+01
Sb-125	Less than 7.2 E+01	Less than 9.8 E+01
Cs-137	Less than 1.8 E+01	1.9 ± 1.8 E+01
Tl-208	Less than 2.3 E+01	Less than 3.1 E+01
Bi-212	Less than 2.4 E+02	Less than 2.4 E+02
Pb-212	Less than 5.5 E+01	Less than 7.9 E+01
Pb-214	Less than 1.2 E+02	7.0 ± 5.9 E+01
Ra-226	Less than 6.0 E+02	Less than 7.9 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Jamestowne	Station Discharge
Date Collected	1-13-76	1-13-76
Sample Weight Dry/Wet	0.0215/0.434 Kg	0.023/0.416 kg
Radiochemistry		
Sr-89	0.0 ± 6.1 E+00	0.0 ± 6.4 E+00
Sr-90	6.0 ± 3.5 E+00	4.1 ± 3.6 E+00
Gamma Spectrometry		
K-40	Less than 3.4 E+02	Less than 3.7 E+02
Co-58	Less than 4.8 E+01	1.3 ± 0.3 E+02
Co-60	Less than 3.5 E+01	6.8 ± 2.2 E+01
Ag-110m	Less than 2.2 E+01	2.7 ± 1.4 E+01
Sb-125	Less than 1.1 E+02	Less than 1.0 E+02
Cs-137	1.7 ± 1.6 E+01	2.6 ± 2.4 E+01
Tl-208	Less than 2.3 E+01	Less than 2.1 E+01
Bi-212	1.6 ± 1.6 E+02	Less than 2.2 E+02
Pb-212	Less than 5.5 E+01	Less than 6.0 E+01
Pb-214	Less than 1.2 E+02	Less than 7.2 E+01
Ra-226	Less than 5.8 E+02	Less than 6.5 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Hog Island Point
Date Collected	1-13-76
Sample Weight Dry/Wet	0.023/0.273
Radiochemistry	
Sr-89	0.0 ± 8.8 E+00
Sr-90	0.0 ± 7.6 E+00
Gamma Spectrometry	
K-40	6.8 ± 4.2 E+02
Co-58	Less than 4.5 E+01
Co-60	Less than 3.3 E+01
Ag-110m	Less than 2.1 E+01
Sb-125	Less than 1.0 E+02
Cs-137	Less than 4.8 E+01
Tl-208	Less than 4.1 E+01
Bi-212	Less than 2.2 E+02
Pb-212	Less than 9.7 E+01
Pb-214	Less than 1.1 E+02
Ra-226	Less than 9.2 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Jamestowne	Station Discharge
Date Collected	3-15-76	3-15-76
Sample Weight Dry/Wet	0.0215/0.287 kg	0.0205/0.330 kg
Gamma Spectrometry		
Be-7	Less than 3.1 E+02	Less than 3.2 E+02
K-40	Less than 4.6 E+02	2.3 ± 2.2 E+02
Cr-51	Less than 2.2 E+02	Less than 2.3 E+02
Mn-54	Less than 3.1 E+01	Less than 3.2 E+01
Co-58	6.2 ± 2.4 E+01	1.9 ± 0.4 E+02
Co-60	Less than 2.7 E+01	4.5 ± 3.6 E+01
I-131	Less than 3.7 E+01	2.8 ± 2.6 E+01
Cs-134	Less than 4.1 E+01	Less than 4.3 E+01
Cs-137	1.9 ± 1.8 E+01	2.9 ± 2.5 E+01
Tl-208	Less than 5.1 E+01	Less than 5.4 E+01
Pb-212	Less than 8.2 E+01	Less than 7.3 E+01
Bi-214	Less than 1.0 E+02	Less than 1.1 E+02
Pb-214	Less than 9.4 E+01	Less than 9.5 E+01
Ra-226	Less than 8.4 E+02	Less than 7.9 E+02
Ac-228	Less than 2.1 E+02	Less than 2.2 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Lawnes Creek	Hog Island Point
Date Collected	3-15-76	3-15-76
Sample Weight Dry/Wet	0.015/0.2115 kg	0.0075/0.1195 kg
Gamma Spectrometry		
Be-7	2.3 ± 2.0 E+02	4.2 ± 3.3 E+02
K-40	Less than 6.6 E+02	Less than 1.3 E+03
Cr-51	Less than 3.1 E+02	Less than 6.3 E+02
Mn-54	Less than 4.4 E+02	Less than 8.8 E+01
Co-58	4.2 ± 4.1 E+01	3.2 ± 0.8 E+02
Co-60	Less than 4.0 E+01	Less than 7.9 E+01
I-131	3.7 ± 3.5 E+01	7.9 ± 6.8 E+01
Cs-134	Less than 5.9 E+01	Less than 1.2 E+02
Cs-137	Less than 3.8 E+01	7.1 ± 4.5 E+01
Tl-208	Less than 4.6 E+01	Less than 1.5 E+02
Pb-212	Less than 1.1 E+02	Less than 2.0 E+02
Bi-214	Less than 1.5 E+02	Less than 3.0 E+02
Pb-214	Less than 1.3 E+02	Less than 2.6 E+02
Ra-226	Less than 1.2 E+03	Less than 2.4 E+03
Ac-228	Less than 3.0 E+02	Less than 5.2 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

Chickahominy

Date Collected	3-15-76
Sample Weight Dry/Wet	0.0245/0.258

Gamma Spectrometry

Be-7	Less than 2.7 E+02
K-40	6.0 ± 3.4 E+02
Cr-51	Less than 1.9 E+02
Mn-54	2.2 ± 1.8 E+01
Co-58	2.2 ± 0.4 E+02
Co-60	Less than 4.1 E+01
I-131	Less than 3.2 E+01
Cs-134	Less than 3.6 E+01
Cs-137	8.6 ± 3.0 E+01
Tl-208	Less than 4.5 E+01
Pb-212	Less than 1.0 E+02
Bi-214	1.5 ± 0.8 E+02
Pb-214	1.5 ± 0.8 E+02
Ra-226	Less than 9.8 E+02
Ac-228	Less than 2.7 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Chickahominy	Jamestowne
Date Collected	5-21-76	5-21-76
Sample Weight Dry/Wet	0.352 kg.	0.235 kg.
Gamma Spectrometry		
K-40	Less than 3.5 E+02	4.9 ± 3.4 E+02
Co-58	3.0 ± 1.2 E+01	Less than 4.2 E+01
Co-60	Less than 3.0 E+01	Less than 4.5 E+01
Ag-110m	Less than 3.2 E+01	Less than 4.8 E+01
Sb-125	Less than 7.3 E+01	Less than 1.1 E+02
Cs-134	Less than 2.1 E+01	Less than 3.1 E+01
Cs-137	2.5 ± 1.4 E+01	2.6 ± 2.1 E+01
Ce-141	Less than 5.3 E+01	Less than 8.0 E+01
Ce-144	1.0 ± 0.9 E+02	Less than 2.0 E+02
Tl-208	Less than 2.9 E+01	Less than 4.3 E+01
Pb-212	Less than 6.6 E+01	Less than 1.0 E+02
Bi-214	7.1 ± 5.1 E+01	Less than 1.1 E+02
Pb-214	Less than 7.9 E+01	Less than 1.2 E+02
Ra-226	Less than 6.9 E+02	Less than 1.0 E+03
Ac-228	Less than 1.7 E+02	Less than 2.6 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Hog Island Point	Lawnes Creek
Date Collected	5-21-76	5-21-76
Sample Weight Dry/Wet	0.212 kg	0.214 kg
Gamma Spectrometry		
K-40	Less than 7.1 E+02	6.1 ± 5.0 E+02
Co-58	9.7 ± 3.6 E+01	Less than 4.6 E+01
Co-60	Less than 4.6 E+01	Less than 5.0 E+01
Ag-110m	Less than 5.3 E+01	Less than 5.2 E+01
Sb-125	Less than 1.2 E+02	Less than 1.2 E+02
Cs-134	3.3 ± 2.3 E+01	Less than 3.4 E+01
Cs-137	3.0 ± 2.8 E+01	3.1 ± 2.6 E+01
Ce-141	Less than 8.9 E+01	Less than 8.8 E+01
Ce-144	Less than 2.2 E+02	Less than 2.2 E+02
Tl-208	Less than 4.6 E+01	Less than 4.8 E+01
Pb-212	Less than 1.1 E+02	Less than 1.1 E+02
Bi-214	Less than 1.2 E+02	Less than 1.2 E+02
Pb-214	Less than 1.3 E+02	Less than 1.3 E+02
Ra-226	Less than 1.2 E+03	Less than 1.1 E+03
Ac-228	Less than 2.9 E+02	Less than 2.9 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

Station Discharge

Date Collected	5-21-76
Sample Weight Dry/Wet	0.261 kg

Gamma Spectrometry

K-40	Less than 4.6 E+02
Co-58	Less than 3.8 E+01
Co-60	Less than 4.1 E+01
Ag-110M	Less than 4.3 E+01
Sb-125	Less than 9.9 E+01
Cs-134	Less than 2.8 E+01
Cs-137	Less than 3.9 E+01
Ce-141	Less than 7.2 E+01
Ce-144	Less than 1.8 E+02
Tl-208	Less than 3.9 E+01
Pb-212	Less than 9.0 E+01
Bi-214	Less than 1.0 E+02
Pb-214	Less than 1.0 E+02
Ra-226	Less than 9.0 E+02
Ac-228	Less than 2.3 E+02

CLAM SAMPLES
(picocuries per kilogram wet)

	Hog Island Point	Station Discharge
Date Collected	7-22-76	7-22-76
Sample Weight Dry/Wet	0.0215/0.1920 kg	0.0440/0.3002 kg
Gamma Spectrometry		
K-40	Less than 1.1 E+03	9.6 ± 5.5 E+02
Co-58	Less than 5.7 E+01	8.2 ± 3.2 E+01
Co-60	1.0 ± 0.5 E+02	7.4 ± 4.6 E+01
Cs-134	Less than 6.2 E+01	Less than 4.0 E+01
Cs-137	Less than 7.8 E+01	Less than 5.5 E+01
Ce-141	Less than 2.5 E+02	Less than 1.6 E+02
Tl-208	Less than 1.2 E+02	Less than 5.7 E+01
Pb-212	Less than 2.7 E+02	Less than 1.7 E+02
Bi-214	4.8 ± 2.2 E+02	Less than 1.5 E+02
Pb-214	1.1 ± 0.2 E+03	Less than 2.0 E+02
Ra-226	Less than 3.0 E+03	Less than 1.9 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Lawnes Creek	Chickahominy
Date Collected	7-22-76	7-22-76
Sample Weight Dry/Wet	0.0320/0.2014 kg	0.0175/0.1445 kg
Gamma Spectrometry		
K-40	1.2 ± 0.9 E+03	1.1 ± 0.8 E+03
Co-58	7.1 ± 4.3 E+01	Less than 7.6 E+01
Co-60	5.2 ± 3.6 E+01	Less than 9.4 E+01
Cs-134	Less than 6.0 E+01	Less than 8.3 E+01
Cs-137	Less than 6.7 E+01	Less than 5.2 E+01
Ce-141	Less than 2.4 E+02	Less than 3.3 E+02
Tl-208	Less than 1.2 E+02	Less than 1.7 E+02
Pb-212	Less than 2.5 E+02	Less than 3.5 E+02
Bi-214	2.4 ± 1.5 E+02	Less than 3.2 E+02
Pb-214	2.3 ± 2.0 E+02	Less than 3.8 E+02
Ra-226	Less than 2.8 E+03	Less than 3.8 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Jamestown
Date Collected	7-22-76
Sample Weight Dry/Wet	0.0350/0.2185 kg
Gamma Spectrometry	
K-40	1.1 ± 0.6 E+03
Co-58	Less than 5.0 E+01
Co-60	4.0 ± 2.9 E+01
Cs-134	Less than 5.5 E+01
Cs-137	Less than 6.2 E+01
Ce-141	Less than 2.2 E+02
Tl-208	Less than 1.1 E+02
Pb-212	Less than 2.2 E+02
Bi-214	2.6 ± 1.6 E+02
Pb-214	2.7 ± 1.6 E+02
Ra-226	Less than 2.5 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Station Discharge	Chickahominy
Date Collected	9-9-76	9-9-76
Sample Weight Dry/Wet	0.0215/0.1838 kg.	0.0190/0.185 kg.
Gamma Spectrometry		
K-40	9.0 ± 5.5 E+02	Less than 7.2 E+02
Co-58	Less than 3.0 E+01	Less than 3.0 E+01
Co-60	8.1 ± 4.8 E+01	Less than 4.5 E+01
Ag-110m	Less than 4.0 E+01	Less than 4.0 E+01
Cs-137	Less than 4.4 E+01	Less than 4.5 E+01
Ce-141	Less than 1.0 E+02	Less than 1.0 E+02
Hg-203	Less than 4.7 E+01	Less than 4.6 E+01
Tl-208	Less than 5.1 E+01	Less than 5.0 E+01
Bi-212	3.9 ± 3.3 E+02	Less than 4.6 E+02
Pb-212	Less than 1.2 E+02	Less than 1.2 E+02
Bi-214	Less than 1.7 E+02	Less than 3.3 E+02
Pb-214	Less than 3.0 E+02	Less than 1.5 E+02
Ra-226	Less than 1.3 E+03	Less than 1.3 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Lawnes Creek	Jamestown
Date Collected	9-9-76	9-9-76
Sample Weight Dry/Wet	0.0230/0.1606 kg.	0.0205/0.1460 kg.
Gamma Spectrometry		
K-40	Less than 9.0 E+02	8.9 ± 7.3 E+02
Co-58	Less than 3.4 E+01	3.2 ± 2.5 E+01
Co-60	Less than 5.2 E+01	Less than 5.7 E+01
Ag-110m	Less than 4.6 E+01	Less than 5.1 E+01
Cs-137	4.0 ± 3.1 E+01	Less than 6.6 E+01
Ce-141	Less than 1.1 E+02	Less than 1.3 E+02
Hg-203	4.3 ± 3.6 E+01	Less than 5.9 E+01
Tl-208	Less than 5.8 E+01	Less than 6.4 E+01
Bi-212	Less than 5.3 E+02	Less than 5.8 E+02
Pb-212	Less than 1.4 E+02	Less than 1.6 E+02
Bi-214	Less than 2.0 E+02	Less than 3.8 E+02
Pb-214	Less than 1.7 E+02	Less than 1.9 E+02
Ra-226	Less than 1.5 E+03	Less than 1.6 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Hog Island Point
Date Collected	9-9-76
Sample Weight Dry/Wet	0.0205/0.1457 kg.
Gamma Spectrometry	
K-40	1.5 ± 0.7 E+03
Co-58	Less than 3.8 E+01
Co-60	4.2 ± 3.8 E+01
Ag-110m	Less than 5.1 E+01
Cs-137	Less than 4.7 E+01
Ce-141	Less than 1.3 E+02
Hg-203	Less than 5.9 E+01
Tl-208	Less than 6.4 E+01
Bi-212	Less than 5.8 E+02
Pb-212	Less than 1.6 E+02
Bi-214	Less than 2.2 E+02
Pb-214	Less than 3.5 E+02
Ra-226	Less than 1.7 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Lawnes Creek	Hog Island Point
Date Collected	11-19-76	11-19-76
Sample Weight Dry/Wet	0.024/0.1791 kg.	0.0255/0.1879 kg.
Gamma Spectrometry		
K-40	9.7 ± 5.7 E+02	Less than 9.0 E+02
Co-58	4.2 ± 2.7 E+01	3.4 ± 3.3 E+01
Co-60	Less than 6.9 E+01	Less than 6.6 E+01
Nb-95	Less than 6.3 E+01	Less than 6.0 E+01
Zr-95	Less than 7.4 E+01	Less than 7.1 E+01
Ag-110m	Less than 8.3 E+01	Less than 7.9 E+01
Cs-137	Less than 6.1 E+01	Less than 5.9 E+01
Ce-141	Less than 1.0 E+02	Less than 1.0 E+02
Tl-208	Less than 6.1 E+01	Less than 5.8 E+01
Bi-212	Less than 6.8 E+02	Less than 6.5 E+02
Pb-212	Less than 1.3 E+02	Less than 1.3 E+02
Ra-226	Less than 1.4 E+03	Less than 1.3 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Station Discharge	Chickahominey
Date Collected	11-19-76	11-19-76
Sample Weight Dry/Wet	0.0290/0.2767 kg.	0.013/0.194 kg.
Gamma Spectrometry		
K-40	3.8 ± 2.8 E+02	Less than 6.8 E+02
Co-58	8.1 ± 2.8 E+01	Less than 3.7 E+01
Co-60	8.8 ± 3.0 E+01	Less than 6.4 E+01
Nb-95	Less than 4.1 E+01	3.9 ± 3.3 E+01
Zr-95	Less than 4.8 E+01	4.9 ± 3.2 E+01
Ag-110m	4.7 ± 3.6 E+01	Less than 7.7 E+01
Cs-137	Less than 3.1 E+01	Less than 4.5 E+01
Ce-141	Less than 6.8 E+01	Less than 9.7 E+01
Tl-208	Less than 3.9 E+01	Less than 5.6 E+01
Bi-212	Less than 4.4 E+02	Less than 6.3 E+02
Pb-212	Less than 8.8 E+01	Less than 1.3 E+02
Ra-226	Less than 9.1 E+02	Less than 1.3 E+03

CLAM SAMPLES
(picocuries per kilogram wet)

	Jamestown
Date Collected	11-19-76
Sample Weight Dry/Wet	0.0125/0.1655 kg.

Gamma Spectrometry

K-40	Less than 6.1 E+02
Co-58	Less than 4.4 E+01
Co-60	Less than 7.5 E+01
Nb-95	Less than 6.3 E+01
Zr-95	Less than 6.4 E+01
Ag-110m	Less than 9.0 E+01
Cs-137	Less than 4.5 E+01
Ce-141	Less than 1.2 E+02
Tl-208	Less than 6.6 E+01
Bi-212	Less than 7.4 E+02
Pb-212	Less than 1.4 E+02
Ra-226	Less than 1.5 E+03

CRAB SAMPLES
(picocuries per kilogram wet)

	Intake Canal
Date Collected	7-29-76
Sample Weight Dry/Wet	0.0570/0.2918 kg

Gamma Spectrometry

K-40	2.7 ± 0.8 E+03
Co-58	4.5 ± 2.4 E+01
Co-60	3.2 ± 2.1 E+01
Cs-137	Less than 4.3 E+01
Bi-212	3.3 ± 2.6 E+02
Bi-214	Less than 1.5 E+02
Pb-214	Less than 1.9 E+02
Ra-226	Less than 1.8 E+03

CRAB SAMPLES
(picocuries per kilogram wet)

	Station Intake
Date Collected	8-9-76
Sample Weight Dry/Wet	0.0485/0.3360 kg
Gamma Spectrometry	
K-40	1.8 ± 0.7 E+03
Co-58	1.0 ± 0.4 E+02
Co-60	3.9 ± 3.3 E+01
Cs-134	Less than 4.5 E+01
Cs-137	Less than 4.4 E+01
Pb-212	Less than 1.4 E+02
Pb-214	Less than 1.7 E+02

CRAB SAMPLES
(picocuries per kilogram wet)

Intake (Lower Level)

Date Collected	September, 1976
Sample Weight Dry/Wet	0.0540/0.5345 kg.

Gamma Spectrometry

K-40	1.1 ± 0.5 E+03
Cs-137	Less than 2.4 E+01
Pb-214	Less than 9.1 E+01
Ac-228	Less than 2.0 E+02

FISH SAMPLES
(picocuries per kilogram wet)

	Bottom Feeder	Free Swimmer
Date Collected	3-1-76	3-1-76
Sample Weight Dry/Wet	.0075/.0194kg	.014/.054kg
Gamma Spectrometry		
K-40	Less than 3.4 E+03	1.6 ± 1.2 E+03
Cr-51	Less than 2.6 E+03	Less than 1.4 E+03
Mn-54	2.0 ± 1.1 E+02	Less than 8.8 E+01
Cs-137	Less than 2.4 E+02	7.8 ± 5.7 E+01
Pb-212	Less than 8.4 E+02	Less than 5.2 E+02
Pb-214	Less than 1.0 E+03	Less than 5.3 E+02
Ra-226	Less than 8.8 E+03	Less than 4.7 E+03

SOIL SAMPLES
(picocuries per kilogram dry)

	Colonial Pkwy.	Dow
Date Collected	8-24-76	8-24-76
Sample Weight Dry	0.132 kg.	0.116 kg.
Radiochemistry		
Sr-89	0.0 ± 5.8 E+01	0.0 ± 9.4 E+01
Sr-90	1.1 ± 0.4 E+02	2.0 ± 0.7 E+02
Gamma Spectrometry		
K-40	3.0 ± 1.5 E+03	1.4 ± 0.2 E+04
Co-58	Less than 9.2 E+01	1.2 ± 0.7 E+02
Co-60	Less than 1.5 E+02	Less than 1.7 E+02
Cs-137	1.5 ± 0.2 E+03	1.9 ± 1.3 E+02
Ce-141	Less than 3.6 E+02	Less than 4.1 E+02
Hg-203	Less than 2.1 E+02	Less than 2.4 E+02
Tl-208	Less than 1.7 E+02	4.5 ± 1.6 E+02
Bi-212	Less than 1.8 E+03	2.1 ± 1.4 E+03
Pb-212	3.3 ± 2.6 E+02	1.5 ± 0.4 E+03
Bi-214	3.6 ± 2.6 E+02	1.2 ± 0.4 E+03
Pb-214	6.5 ± 2.9 E+02	1.7 ± 0.4 E+03
Ra-226	Less than 4.3 E+03	4.9 ± 3.5 E+03
Ac-228	Less than 8.2 E+02	1.2 ± 0.7 E+03

SOIL SAMPLES
(picocuries per kilogram dry)

	Alliance	Hog Island Point
Date Collected	8-24-76	8-24-76
Sample Weight Dry	0.154 kg.	0.130 kg.
Radiochemistry		
Sr-89	0.0 ± 8.7 E+01	0.0 ± 4.4 E+01
Sr-90	9.3 ∓ 6.9 E+01	1.1 ∓ 0.3 E+02
Gamma Spectrometry		
K-40	1.5 ± 1.1 E+03	1.5 ± 0.3 E+04
Co-58	Less than 7.9 E+01	Less than 9.4 E+01
Co-60	Less than 1.3 E+02	Less than 1.5 E+02
Cs-137	2.8 ± 0.9 E+02	1.8 ± 1.0 E+02
Ce-141	Less than 3.1 E+02	Less than 3.7 E+02
Hg-203	Less than 1.8 E+02	Less than 2.1 E+02
Tl-208	Less than 1.5 E+02	3.2 ± 1.6 E+02
Bi-212	Less than 1.6 E+03	Less than 1.9 E+03
Pb-212	2.6 ± 2.4 E+02	1.5 ± 0.4 E+03
Bi-214	3.9 ± 2.3 E+02	1.2 ± 0.3 E+03
Pb-214	4.7 ± 2.7 E+02	1.3 ± 0.4 E+03
Ra-226	Less than 3.7 E+03	4.5 ± 3.3 E+03
Ac-228	Less than 7.0 E+02	1.2 ± 0.6 E+03

SOIL SAMPLES
(picocuries per kilogram dry)

	Bacon's Castle	Surry Station
Date Collected	8-24-76	8-24-76
Sample Weight Dry	0.094 kg.	0.121 kg.
Radiochemistry		
Sr-89	0.0 ± 5.0 E+01	7.3 ± 4.8 E+01
Sr-90	1.5 ± 0.5 E+02	0.0 ± 7.2 E+01
Gamma Spectrometry		
K-40	9.2 ± 2.5 E+03	1.4 ± 0.3 E+04
Co-58	Less than 1.3 E+02	Less than 1.0 E+02
Co-60	Less than 2.1 E+02	Less than 1.6 E+02
Cs-137	2.4 ± 0.3 E+03	9.5 ± 9.3 E+01
Ce-141	Less than 5.1 E+02	Less than 3.9 E+02
Hg-203	Less than 3.0 E+02	Less than 2.3 E+02
Tl-208	Less than 2.6 E+02	4.4 ± 1.6 E+02
Bi-212	Less than 2.6 E+03	Less than 2.0 E+03
Pb-212	7.4 ± 4.1 E+02	1.5 ± 0.4 E+03
Bi-214	4.9 ± 3.3 E+02	8.8 ± 6.1 E+02
Pb-214	8.3 ± 4.6 E+02	1.2 ± 0.4 E+03
Ra-226	4.7 ± 4.2 E+03	Less than 5.5 E+03
Ac-228	1.4 ± 0.7 E+03	1.4 ± 0.7 E+03

SOIL SAMPLES
(picocuries per kilogram dry)

	Newport News	Fort Eustis
Date Collected	8-24-76	8-24-76
Sample Weight Dry	0.166 kg.	0.107 kg.
Radiochemistry		
Sr-89	0.0 ± 9.4 E+01	0.0 ± 8.3 E+01
Sr-90	7.2 ± 0.6 E+02	2.6 ± 0.5 E+02
Gamma Spectrometry		
K-40	2.7 ± 0.3 E+04	1.0 ± 0.3 E+04
Co-58	Less than 7.3 E+01	Less than 1.1 E+02
Co-60	Less than 1.2 E+02	Less than 1.8 E+02
Cs-137	2.0 ± 1.2 E+02	1.8 ± 0.2 E+03
Ce-141	Less than 2.9 E+02	Less than 4.4 E+02
Hg-203	Less than 1.7 E+02	Less than 2.6 E+02
Tl-208	4.6 ± 1.4 E+02	1.9 ± 1.6 E+02
Bi-212	Less than 1.5 E+03	Less than 2.3 E+03
Pb-212	1.3 ± 0.4 E+02	8.0 ± 3.9 E+02
Bi-214	2.8 ± 0.5 E+03	4.7 ± 3.1 E+02
Pb-214	6.5 ± 0.5 E+03	8.6 ± 4.1 E+02
Ra-226	1.5 ± 0.4 E+04	3.9 ± 3.8 E+03
Ac-228	2.0 ± 0.7 E+03	Less than 1.0 E+03

FOOD CROP SAMPLES
(picocuries per kilogram wet)

	Corn (Brock Farm)
Date Collected	10-11-76
Sample Weight Dry/Wet	0.0980/0.1116 kg

Radiochemistry

Sr-89	4.8 ± 2.6 E+01
Sr-90	0.0 ± 3.2 E+01

Gamma Spectrometry

K-40	3.2 ± 1.2 E+03
Cs-137	Less than 7.7 E+01
Pb-212	Less than 3.1 E+02

FOOD CROP SAMPLES
(picocuries per kilogram wet)

	Corn (Brock Farm)
Date Collected	10-12-76
Sample Weight Dry/Wet	0.092/0.104 kg
Radiochemistry	
Sr-89	0.0 ± 2.7 E+01
Sr-90	0.0 ± 2.2 E+01
Gamma Spectrometry	
K-40	2.5 ± 1.3 E+03
Sb-125	Less than 3.7 E+02
Cs-137	Less than 8.7 E+01
Ba-140	Less than 2.1 E+02
La-140	Less than 1.6 E+02
Tl-208	Less than 9.9 E+01
Pb-212	Less than 3.3 E+02
Bi-214	Less than 6.4 E+02
Ra-226	Less than 3.6 E+03

FOOD CROP SAMPLES
(picocuries per kilogram wet)

	Peanuts (Brock Farm)
Date Collected	10-14-76
Sample Weight Dry/Wet	0.106/0.122 kg
Radiochemistry	
Sr-89	0.0 ± 1.7 E+01
Sr-90	0.0 ± 1.4 E+01
Gamma Spectrometry	
K-40	5.8 ± 1.3 E+03
Cs-137	Less than 7.0 E+01
Pb-212	Less than 2.8 E+02
Bi-214	Less than 2.0 E+02
Ra-226	Less than 3.2 E+03

FOOD CROP SAMPLES
(picocuries per kilogram wet)

	Soybeans
Date Collected	12-1-76
Sample Weight Dry/Wet	0.088/.10075 kg.
Radiochemistry	
Sr-89	0.0 ± 2.1 E+01
Sr-90	1.4 ± 1.2 E+01
Gamma Spectrometry	
K-40	1.4 ± 0.2 E+04
Cs-137	6.9 ± 5.9 E+01
Tl-208	Less than 1.1 E+02
Pb-212	Less than 3.6 E+02
Ra-226	Less than 3.8 E+03

FOWL (GOOSE) SAMPLES
(picocuries per kilogram wet)

	Hog Island Point
Date Collected	6-3-76
Sample Weight Dry/Wet	0.1574 kg
Radiochemistry	
Sr-89	0.0 ± 1.4 E+02
Sr-90	0.0 ± 1.2 E+02
Gamma Spectrometry	
K-40	3.2 ± 1.1 E+03
Co-60	Less than 5.0 E+01
Cs-137	Less than 7.8 E+01
Pb-212	Less than 3.2 E+02
Bi-214	Less than 2.7 E+02
Pb-214	Less than 3.3 E+02
Ac-228	Less than 7.0 E+02

FOWL SAMPLES
(picocuries per kilogram wet)

Hog Island (Blue Heron)

Date Collected	12-1-76
Sample Weight Dry/Wet	0.055/0.1262 kg.

Gamma Spectrometry

K-40	1.9 ± 1.5 E+03
Nb-95	Less than 1.1 E+02
Zr-95	7.5 ± 7.4 E+01
Cs-137	6.4 ± 4.5 E+01
Ra-226	Less than 4.3 E+03