**Oak Ridge Research Reactor
Quarterly Report
January, February and March of 1979**

S. S. Hurt III
E. D. Lance

MASTER

OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION · FOR THE DEPARTMENT OF ENERGY

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
NTIS price codes—Printed Copy: A03; Microfiche A01

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use or the results of such use of any information, apparatus, product or process disclosed in this report, or represents that its use by such third party would not infringe privately owned rights.

ORNL/TM-6973

Contract No. W-7405-eng-26

OPERATIONS DIVISION

OAK RIDGE RESEARCH REACTOR QUARTERLY REPORT
JANUARY, FEBRUARY AND MARCH of 1979

S. S. Hurt, III

E. D. Lance

SPONSOR: J. A. Cox
Director, Operations Division

Date Published - October 1979

NOTICE This document contains information of a preliminary nature.
It is subject to revision or correction and therefore does not represent a
final report.

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
DEPARTMENT OF ENERGY

DISCLAIMER

This book was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED
leg

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

CONTENTS

	<u>Page</u>
SUMMARY	1
OPERATIONS	1
FUEL USAGE AND INVENTORY	3
SHUTDOWNS AND POWER REDUCTIONS	4
INSTRUMENTATION AND REACTOR CONTROLS	10
PROCESS SYSTEM	10
MECHANICAL COMPONENTS	10
EXPERIMENT FACILITIES, GASEOUS WASTE FILTERS, AND CORE CHANGES . .	10
SPECIAL TESTS	20
REACTOR DESIGN CHANGES	21
DISTRIBUTION	23

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

FIGURE LIST

	<u>Page</u>
FIGURE 1. ORR Lattice Configuration - Jan. 1 - Jan. 11, 1979	14
FIGURE 2. ORR Lattice Configuration - Jan. 12 - Jan. 15, 1979	15
FIGURE 3. ORR Lattice Configuration - Jan. 18 - Feb. 26, 1979	16
FIGURE 4. ORR Lattice Configuration - Feb. 27 - Mar. 22, 1979	17
FIGURE 5. ORR Lattice Configuration - Mar. 22 - Mar. 28, 1979	18
FIGURE 6. ORR Lattice Configuration - Mar. 28 - Mar. 30, 1979	19

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

TABLE LIST

	<u>Page</u>
TABLE 1. ORR Basic Operating Data	2
TABLE 2. Cycles of Operation	2
TABLE 3. ORR Fuel Status	3
TABLE 4. Summary of Shutdowns	4
TABLE 5. ORR Scheduled Shutdowns, Details	5
TABLE 6. ORR Unscheduled Shutdowns, Details	9
TABLE 7. Reductions in ORR Power Not Resulting in Shutdowns . . .	9
TABLE 8. Experiment Facility Usage	11
TABLE 9. Status of Filters - Gaseous Waste System	12
TABLE 10. Mechanical Change Memoranda	21

OAK RIDGE RESEARCH REACTOR QUARTERLY REPORT
JANUARY, FEBRUARY AND MARCH OF 1979

S. S. Hurt, III and E. D. Lance

SUMMARY

The ORR operated at an average power level of 28.9 MW for 84.2% of the time during January, February and March of 1979.

The reactor was shut down on seventeen occasions, three of which were unscheduled. Reactor downtime needed for refueling, maintenance and checks was normal, with the reactor remaining available for operation 93.6% of the time.

Maintenance activities, both mechanical and instrument, were essentially routine in nature with the exception of one mechanical design change.

Special tests or measurements completed during the quarter included:

- 1) preliminary measurements for the LWR Pressure Vessel Irradiation Program;
- 2) flux mapping for Core No. 148-A; and 3). calibration of all six shim rods.

OPERATIONS

The basic operating data presented in Table 1 indicates that the ORR operation for the quarter was normal as compared with recent experience.

Details relative to cycles of operation during the quarter are given in Table 2.

Table 1. ORR Basic Operating Data
 Period: January, February and March of 1979

	This Quarter	Last Quarter	Year To Date	January Thru March, 1978
Total energy, MWd	2,180.6	2,160.8	2,180.6	1,893.6
Average power, MW/operating hr	28.9	29.0	28.9	28.7
Time operating, %	84.2	80.9	84.2	73.4
Availability, %	93.6	92.2	92.9	88.9
Reactor water radio- activity $\frac{\text{c/min}}{\text{ml}}$ (av)	26,800	23,900	26,800	24,300
Pool water radio- activity, $\frac{\text{c/min}}{\text{ml}}$ (av)	820	510	820	460
Reactor water resis- tivity, ohm-cm (av)	1,079,000	4,200,000 ^a	1,079,000	1,931,000
Pool water resis- tivity, ohm-cm (av)	796,385	1,744,000	796,385	1,643,000
Fuel elements depleted	21	10	21	10
Average burnup of fuel elements depleted, %	50	52.6	50.0	54.2
Shim rods depleted	2	2	2	0
Average burnup of shim rods depleted, %	56.7	72.1	56.7	-
Radioisotope samples	7	11	7	0
Research samples	0	0	0	0

^aTwo reactor demineralizer units in service.

Table 2. Cycles of Operation

Cycle No.	Date Begun	Date Ended	Accumulated Energy (Mwd)
147	October 19, 1978	January 15, 1979	266.4*
148	January 18, 1979	In Progress	1,914.2

* Mwd this quarter.

FUEL USAGE AND INVENTORY

Twenty-one fuel elements and two shim rods were declared spent during the quarter, with an average burnup of 50.0% for the fuel elements and 56.7% for the shim rods. Twenty-nine new fuel elements and two new shim rods were placed in service. Seventeen depleted fuel elements were shipped to the Savannah River Plant for chemical separation.

Other details of fuel usage and inventory may be found in Tables 1 and 3.

Table 3. ORR Fuel Status

	This Quarter	Last Quarter	Jan-Mar 1979	Jan-Mar 1978
Depleted fuel elements transferred for chemical separation	17	32	17	18
Average percent burnup of fuel elements transferred	48.0	43.9	48.0	57.1
New fuel elements placed in service	29	20	29	8
New fuel elements available for use	76 ^a	48 ^a	76 ^a	8 ^a
Depleted shim rods transferred for chemical separation	0	2	0	2
Average percent burnup of shim rods transferred	-	66.0	-	72.1
New shim rods placed in service	2	2	2	0
New shim rods available for use	12	14	12	2

^aIncludes four partial fuel elements.

Shutdowns and Power Reductions

Reactor downtime (power level $<N_L$) totaled approximately 351 hours. A summary of the shutdowns is given in Table 4, and details of each are contained in Table 5. Table 6 offers information relative to unscheduled shutdowns, while Table 7 offers information relative to power reductions which did not result in a shutdown.

Table 4. Summary of Shutdowns

Description of Shutdown	Number	Downtime (hr)
Scheduled		
Regular, refueling, the reactor was shutdown in December, 1978 and remained down through New Years' holiday	1	33.650 ^a
Regular, end of cycle	1	100.916
Regular, xenon removal	3	1.217
Regular, refueling, and xenon removal	2	26.600
Regular, refueling, and experiment work	1	57.433
Special, refueling, xenon removal, and flux monitor installation in core position E-7	1	29.767
Special, refueling, xenon removal and temperature measurements made at pool window of the reactor	2	17.833
Special, refueling, experiment removal, and installation of a temperature simulator mock-up with a surveillance package at the pool window of the reactor	1	27.567

Table 4. (Cont'd)

Description of Shutdown	Number	Downtime (hr)
Special, removed water from surveillance package in the temperature simulator mock-up, and repaired water leak	1	25.033
Special, end of run for temperature measurements using the simulator mock-up with a surveillance package	1	29.217 ^b
<u>Subtotal:</u>	14	349.233
Unscheduled		
Instrument failure, reactor	2	1.200
Human error	1	0.200
<u>Subtotal:</u>	3	1.400
<u>Total:</u>	<u>17</u>	<u>350.633</u>

^aDowntime continued from December, 1978.

^bDowntime continued into April, 1979.

Table 5. ORR Scheduled Shutdowns, Details

Date	Duration	End Cycle	Remarks
1-1-79	33.650	-	The reactor shutdown was carried over from December, 1978, into January, 1979.
1-5-79	0.467	-	Shutdown to quick change xenon assembly in CP-D2.
1-11-79	29.767	147-F	The shutdown activities included: 1) refueling; 2) the changing of the xenon assembly in CP-D2; and 3) the installation of a flux measuring device in CP-E7.
1-15-79	69.583	147-G	The shutdown marked the end of operating cycle 147. Shutdown activities included: 1) refueling; 2) the removal of the flux measuring device in CP-E7; and 3) special run for flux mapping of the core. Flux monitors were installed in fuel, shim rods, and Be elements in CP Nos. G-1, -2, -5, -8, and F-9.
1-18-79	31.333	147-G	The end of operating cycle 147 shutdown work activities continued after a short low power run for flux measurements. The activities included: 1) removal of flux monitors; 2) calibration of shim rods; 3) installation of a locating post at the poolside facility; 4) completion of core loading for the next operating cycle, and 5) completion of programmed maintenance.
1-25-79	0.450	-	Shutdown to quick change the xenon assembly in CP-D2.
2-8-79	13.400	148-A	The shutdown activities included: 1) refueling; and 2) exchange of the xenon assembly in CP-D2.
2-15-79	0.300	-	Shutdown to quick change xenon assembly in CP-D2.

Table 5. (Cont'd)

Date	Duration	End Cycle	Remarks
2-22-79	7.700	148-B	The shutdown activities included: 1) refueling; 2) exchange of the xenon assembly in CP-D2; and 3) the installation of a Pressure Vessel Simulator at the poolside facility. The simulator contained thermocouples and was used for measuring temperatures at various power levels. ^a
2-26-79	57.433	148-C	The shutdown activities included: 1) refueling; 2) installation of experiment OC-3 in CP-E5; and 3) cleaning of the primary and secondary sides of the pool heat exchanger.
3-8-79	10.133	148-D	The shutdown activities included: 1) refueling; 2) exchange of the xenon assembly in CP-D2; and 3) measurement of temperatures of the aluminum "window" at the poolside facility (without thermal shield mock-up) ^a
3-22-79	3.200	148-E	The shutdown activities included: 1) refueling; and 2) changing of the xenon assembly in CP-D2.
3-28-79	27.567	148-F	The shutdown activities included: 1) refueling; 2) experiment removal; and 3) installation of a mock-up of the Pressure Vessel Simulator Experiment at the poolside facility. A surveillance package to monitor temperatures at various positions of the aluminum "window" was installed in the mock-up. ^a

Table 5. (Cont'd)

Date	Duration	End Cycle	Remarks
3-29-79	25.033	-	The surveillance package in the Pressure Vessel Steel Experiment mock-up contained a water leak. The reactor was shut down to clear the package of water and repair the leak.
3-30-79	53.217	-	The run for the temperature surveillance of the aluminum "window" of the reactor tank was completed. The reactor was shut down and preparations were made for the removal of the PVS mock-up and surveillance package. The reactor remained shut down for the duration of the report period.

^aPreliminary measurements for the "LWR Pressure Vessel Irradiation Program".

Table 6. ORR Unscheduled Shutdowns, Details

Date	Duration	End Cycle	Remarks
1-13-79	0.617	-	A false period scram occurred, apparently initiated in the No. 2 Log-N amplifier.
1-13-79	0.583	-	A false period scram occurred, apparently initiated in the No. 2 Log-N amplifier.
3-5-79	0.200	-	Human error. The instrument power was tripped out (apparently momentarily shorted to ground) during instrument checks.

Table 7. Reductions in ORR Power Not Resulting in Shutdowns

Date	Source of Signal	Type of Signal	Lowest Power (MW)	Comments
2-22-79	Setback	Reactor Primary Flow ΔP	15.0	The reactor ΔP was reduced to the setback level because of minor troubles with the reactor temperature control system.
2-22-79	Setback	Reactor Primary Flow ΔP	27.0	Same reason as above.
3-27-79	Setback	Experiment	7.0	An experimenter checking temperatures on the OC-3 experiment inadvertently initiated a setback.

INSTRUMENTATION AND REACTOR CONTROLS

The performance of the instrumentation for the complex was satisfactory and only routine maintenance was required, except for the No. 2 Log-N amplifier which was replaced January 16, after apparently causing two shutdowns on January 13 (false period scrams).

PROCESS SYSTEM

The performance of the process system was satisfactory and only routine maintenance was required.

MECHANICAL COMPONENTS

The performance of the mechanical components was satisfactory and only routine maintenance was required.

EXPERIMENT FACILITIES, GASEOUS WASTE FILTERS, AND CORE CHANGES

Experiment facility usage is given in Table 8. Table 9 summarizes the results of efficiency tests of the various gaseous waste filters. The core configurations used during the quarter are shown in Fig. Nos. 1, 2, 3, 4, 5, and 6.

Table 8. Experiment Facility Usage

Facility	Access Flange	Date Installed	Date Removed	Description of Experiment	Division or Other Sponsor
D-2	None	2-13-78		Radioisotopes	Operations
D-8	V-3	3-10-67		Hydraulic tube No. 2 used for isotope production	Operations
E-5	V-6	2-26-79	3-28-79	HTGR creep irradiation capsule OC-3	Engineering Technology Division
E-7	V-5	1-12-79	1-15-79	Neutron flux monitoring rig	Metals and Ceramics
Poolside Window	None	1-22-79	1-22-79	Neutron flux monitoring rig	Operations
Poolside Window	None	3-28-79	3-30-79	Gamma heating measuring assembly	Engineering Technology Division
HB-1	None	9-78		Neutron spectrometer	Solid State Physics
HB-2	None	9-78		Neutron spectrometer	Solid State Physics
HB-3	None	11-1-58		Neutron diffraction experiments	Solid State Physics
HB-4	None	9-78		Neutron spectrometer	Solid State Physics
HB-6	None	4-76		Neutron small angle scattering facility	Solid State Physics
HN-3	None	11-59		Activation analysis	Analytical Chemistry
HN-4	None	12-15-63		Neutron diffraction experiment	Instrumentation and Controls

Table 9. Status of Filters - Gaseous Waste System

Type Filter	Bank Designation	Date Installed	Date Last Tested	Type Test	Retention Efficiency (%)
Cell-Ventilation System					
CWS	Overall ^a	North, 6-20-73 South, 1-12-75	3-26-79	DOP	99.984
Charcoal	Both banks	North, 9-16-74 South, 12-12-77	11-28-78	Elemental Iodine	99.96
Charcoal	Both banks	North, 9-16-74 South, 12-12-77	11-30-78	Methyl Iodide	76.54
Basement Hood Exhaust					
CWS	South	10-4-76	3-26-79	DOP	99.996
CWS	North	10-4-76	3-26-79	DOP	99.995

Table 9. (Cont'd)

Type Filter	Bank Designation	Date Installed	Date Last Tested	Type Test	Retention Efficiency (%)
Normal Off-Gas					
CWS	West	10-17-78	3-26-79	DOP	99.994
Charcoal	West	10-17-78	10-26-78	Elemental Iodine	99.99
CWS	East	12-14-78	3-26-79	DOP	99.990
Charcoal	East	12-14-78	1-16-79	Elemental Iodine	99.990
Charcoal	West	10-17-78	11-2-78	Methyl Iodide	99.75
Charcoal	East	12-14-78	1-18-79	Methyl Iodide	99.31

Pressurizable Off-Gas^b

The POG system is on standby; therefore, all filter tests have been discontinued.

^aThe CWS filters in the cell ventilation system were checked in series.

ORR LATTICE LOADING

For Fuel Cycles 147-F

	1	2	3	4	5	6	7	8	9
A	Be	Be	Be	F	F	F	Be	Be	Be
B	Be	Be	F	SR	F	SR	F	Be	Be
C	Be	F	F	F	F	F	F	F	Be
D	Be	Xe ¹³³	F	SR	F	SR	F	HT	Be
E	Be	F	F	F	Al Dummy	F	F	F	Be
F	Be	F	F	SR	F	SR	F	F	Be
G	Be	Be	Be	Be	Be	Be	Be	Be	Be

<u>LATTICE COMPONENT</u>	<u>NUMBER</u>
Fuel (F)	<u>27</u>
Shim Rod (SR)	<u>6</u>
Beryllium (Be)	<u>28</u>
Experiment (E)	<u>0</u>
Xenon Sleeve (Xe ¹³³)	<u>1</u>
Special (Al Dummy)	<u>1</u>
Hydraulic Tube (HT)	<u>1</u>

Fig. 1. ORR Lattice Configuration - January 1, 1979 through January 11, 1979.

ORR LATTICE LOADING

For Fuel Cycles 147-G

	1	2	3	4	5	6	7	8	9
A	Be	Be	Be	F	F	F	Be	Be	Be
B	Be	Be	F	SR	F	SR	F	Be	Be
C	Be	F	F	F	F	F	F	F	Be
D	Be	Xe ¹³³	F	SR	F	SR	F	HT	Be
E	Be	F	F	F	Al Dummy	F	E	F	Be
F	Be	F	F	SR	F	SR	F	F	Be
G	Be	Be	Be	Be	Be	Be	Be	Be	Be

LATTICE COMPONENTNUMBER

Fuel (F)

26

Shim Rod (SR)

6

Beryllium (Be)

28

Experiment (E)

1Xenon Sleeve (Xe¹³³)1

Special (Al Dummy)

1

Hydraulic Tube (HT)

1

Fig. 2. ORR Lattice Configuration - January 12, 1979 through January 15, 1979.

ORR LATTICE LOADING

For Fuel Cycles 148-A, B, C

	1	2	3	4	5	6	7	8	9
A	Be	Be	F	F	F	F	F	Be	Be
B	Be	F	F	SR	F	SR	F	Be	Be
C	Be	F	Solid Al	F	F	F	F	F	Be
D	Be	Xe ¹³³	F	SR	F	SR	F	HT	Be
E	Be	Solid Al	F	F	Solid Al	F	Solid Al	F	Be
F	Be	F	F	SR	F	SR	F	F	Be
G	Be	Be	Be	Be	Be	Be	Be	Be	Be

LATTICE COMPONENTNUMBER

Fuel (F)

27

Shim Rod (SR)

6

Beryllium (Be)

24

Experiment (E)

0Xenon Sleeve (Xe¹³³)1

Special (Solid Al)

4

Hydraulic Tube (HT)

1

Fig. 3. ORR Lattice Configuration - January 18, 1979 through February 26, 1979.

ORR LATTICE LOADING

For Fuel Cycles 148-D, E

	1	2	3	4	5	6	7	8	9
A	Be	Be	F	F	F	F	F	Be	Be
B	Be	F	F	SR	F	SR	F	Be	Be
C	Be	F	Solid Al	F	F	F	F	F	Be
D	Be	Xe ¹³³	F	SR	F	SR	F	HT	Be
E	Be	Solid Al	F	F	OC-3 E	F	Solid Al	F	Be
F	Be	F	F	SR	F	SR	F	F	Be
G	Be	Be	Be	Be	Be	Be	Be	Be	Be

LATTICE COMPONENT

NUMBER

Fuel (F)	<u>27</u>
Shim Rod (SR)	<u>6</u>
Beryllium (Be)	<u>24</u>
Experiment (E)	<u>1</u>
Xenon Sleeve (Xe ¹³³)	<u>1</u>
Special (Solid Al)	<u>3</u>
Hydraulic Tube (HT)	<u>1</u>

Fig. 4. ORR Lattice Configuration - February 27, 1979 through March 22, 1979.

ORR LATTICE LOADING

For Fuel Cycles 148-F

	1	2	3	4	5	6	7	8	9
A	Be	Be	F	F	F	F	F	Be	Be
B	Be	F	F	SR	F	SR	F	Be	Be
C	Be	F	Solid Al	F	F	F	F	F	Be
D	Be	Be	F	SR	F	SR	F	HT	Be
E	Be	Solid Al	F	F	E	F	Solid Al	F	Be
F	Be	F	F	SR	F	SR	F	F	Be
G	Be	Be	Be	Be	Be	Be	Be	Be	Be

LATTICE COMPONENTNUMBER

Fuel (F)

27

Shim Rod (SR)

6

Beryllium (Be)

25

Experiment (E)

1Xenon Sleeve (Xe¹³³)0

Special (Solid Al)

3

Hydraulic Tube (HT)

1

Fig. 5. ORR Lattice Configuration - March 22, 1979 through March 28, 1979.

ORR LATTICE LOADING

For Fuel Cycles 148-G

	1	2	3	4	5	6	7	8	9
A	Be	Be	F	F	F	F	F	Be	Be
B	Be	F	F	SR	F	SR	F	Be	Be
C	Be	F	Solid Al	F	F	F	F	F	Be
D	Be	Be	F	SR	F	SR	F	HT	Be
E	Be	Solid Al	F	F	Solid Al	F	Solid Al	F	Be
F	Be	F	F	SR	F	SR	F	F	Be
G	Be	Be	Be	Be	Be	Be	Be	Be	Be

<u>LATTICE COMPONENT</u>	<u>NUMBER</u>
Fuel (F)	<u>27</u>
Shim Rod (SR)	<u>6</u>
Beryllium (Be)	<u>24</u>
Experiment (E)	<u>0</u>
Xenon Sleeve (Xe ¹³³)	<u>0</u>
Special (Solid Al)	<u>4</u>
Hydraulic Tube (HT)	<u>1</u>

Fig. 6. ORR Lattice Configuration - March 28, 1979 through March 30, 1979.

SPECIAL TESTS

- A. LWR Metallurgical Pressure Vessel Benchmark Field (PSF)
 - 1. In support of the experiment review documentation for the PSF, the following experiments were performed at the ORR poolside:
 - a. Flux gradient measurements were made at two different times during a typical fuel cycle--one at startup and another near the end of a fuel cycle. These measurements will permit the evaluation of flux and spectrum changes associated with fuel burnout and control rod position.
 - b. Temperature measurements were made at the outer surface of the poolside "window" with the thermal shield simulator in place. Comparison of these data with that measured without the shield in place indicate that there is essentially no effect on the reactor of moving the thermal shield within 4 cm of the reactor face.
- B. Flux Mapping of Core
 - 1. Changes to the core configuration necessitated flux measurements in the fuel, shim rod, and certain Be positions in core 148-A (Fig. 3). The results of the measurements will be used for fuel burnup calculations and for flux estimating purposes.
- C. Calibration of ORR Shim Rods
 - 1. The ORR shim rods were calibrated on January 18, 1979. The reactor was refueled with core loading 148-A which contained 5613 g of U^{235} . This calibration was necessary since the configuration was changed to increase the neutron flux in the area of the Poolside Experiment Facility.

REACTOR DESIGN CHANGES

Mechanical design change memoranda which describes work completed this quarter are tabulated in Table 10.

Table 10. Mechanical Change Memoranda

Memo No.	Date	Subject	General Description
ORR-24	3-7-79	Reroute degasifier effluent from hot drain (return to system)	The effluents of the air-water separator tanks which consists of carry-over droplets and steam condensate was routed back to the degasifier tank by use of liquid level control of the contents of the air-water separator tank.

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

INTERNAL DISTRIBUTION

1. F. T. Binford	16. R. V. McCord
2. G. H. Burger	17. H. Postma
3. C. D. Cagle	18. M. E. Ramsey
4. W. R. Casto	19. J. H. Swanks
5. G. H. Coleman	20. J. R. Thomas
6. J. A. Conlin	21. W. E. Thomas
7. J. A. Cox	22. K. R. Thoms
8. W. A. Duggins	23. K. W. West
9. T. P. Hamrick	24-26. Laboratory Records Department
10. R. W. Hobbs	27. Laboratory Records, ORNL R. C.
11. C. C. Hopkins	28-29. Central Research Library
12. K. E. Howard	30. Document Reference Section
13. S. S. Hurt, III	31. ORNL Patent Office
14. J. D. Jenkins	
15. E. D. Lance	

EXTERNAL DISTRIBUTION

- 32. Safety and Environmental Control Division, DOE, Oak Ridge
- 33. C. Moller, Atomic Energy Board, Pelindaba, Private Bag X256, Pretoria, SOUTH AFRICA
- 34. M. Jacquemain, Head, Technical Department ILL, Institute Max von Laue-Paul Langevin, CEDEX 156, 38 Grenoble-Gare, FRANCE
- 35. Office of Assistant Manager, Energy Research and Development, DOE-ORO
- 36. Robert J. Swanenburg de Veye, Head, Research Reactor Department, Reactor Centrum Nederland, Westerduinweg 3-Petten (N.-H), THE NETHERLANDS
- 37-63. Technical Information Center, Oak Ridge
- 64. A. C. Wood, A.A.E.C. Research Establishment, New Illawarra Rd., Lucas Hts., N.S.W., AUSTRALIA
- 65. M. Nakai, NAIG Nuclear Research Laboratory, Nippon Atomic Industry Group Co., Ltd., 4-1, Ukishimacho, Kawaskaki City, JAPAN