

OAK RIDGE
NATIONAL
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MARTIN MARIETTA

Oak Ridge Research Reactor Shutdown
Maintenance and Surveillance
Quarterly Report
January, February, and March 1988

G. H. Coleman
D. L. Laughlin

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Research Reactors Division
Reactor Operations Section

**OAK RIDGE RESEARCH REACTOR SHUTDOWN MAINTENANCE AND
SURVEILLANCE QUARTERLY REPORT
JANUARY, FEBRUARY, AND MARCH 1988**

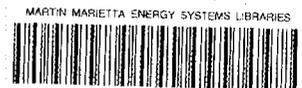
G. H. Coleman
D. L. Laughlin

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Research Reactors Division

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OAK RIDGE RESEARCH REACTOR SHUTDOWN MAINTENANCE
AND SURVEILLANCE QUARTERLY REPORT
JANUARY, FEBRUARY, AND MARCH 1988

SUMMARY

The ORR was not operated during January, February, and March of 1988.

Maintenance activities, both mechanical and instrument, were essentially routine in nature. Details of fuel usage and inventory may be found in Table 1.

SHUTDOWNS

Reactor downtime (power level $<N_L$) totaled 2184 hours. A summary of the shutdown is given in Table 2, and details of the scheduled shutdown are contained in Table 3. Shutdown activities are shown in Table 4.

INSTRUMENTATION AND REACTOR CONTROLS

The performance of the instrumentation for the facility was satisfactory, and maintenance required is indicated in Table 5.

PROCESS SYSTEM

The performance of the process system was satisfactory, and maintenance required is indicated in Table 6.

EXPERIMENT FACILITIES, AND GASEOUS-WASTE FILTERS

Experiment facility usage is given in Table 7. Table 8 summarizes the results of efficiency tests of the various gaseous-waste filters.

Table 1. Fuel status

	This quarter	Last quarter
<u>HEU</u>		
Depleted fuel elements transferred for chemical recovery	0	0
Average percent burnup of fuel elements transferred	--	--
New elements, start of quarter	139	139
New elements received	0	0
New elements placed in service	0	0
New elements, end of quarter	139	139
Special or test elements	21	21
Depleted shim-safety rod elements trans- ferred for chemical recovery	0	0
Average percent burnup of shim-safety rods transferred	--	--
New shim-safety rod elements, start of quarter	8	8
New shim-safety rod elements received	0	0
New shim-safety rod elements placed in service	0	0
New shim-safety rod elements, end of quarter	8	8

Table 1. (continued)

	This quarter	Last quarter
<u>LEU</u>		
Depleted fuel elements transferred for chemical recovery	0	0
Average percent burnup of fuel elements transferred	--	--
New elements start of quarter	30	30
New elements received	0	0
New elements placed in service	0	0
New elements end of quarter	30	30
Special or test elements	0	0
Depleted shim-safety rod elements trans- ferred for chemical recovery	0	0
Average percent burnup of shim-safety rods transferred	--	--
New shim-safety rod elements start of quarter	4	4
New shim-safety rod elements received	0	0
New shim-safety rod elements placed in service	0	0
New shim-safety rod elements end of quarter	4	4

Table 2. Analysis of shutdowns

Description of shutdown	Number	Downtime (h)
<u>Scheduled</u>		
Special, DOE shutdown*	1	2184.0
Subtotal:	1	2184.0
<u>Unscheduled</u>		
Subtotal:	0	0000.0
TOTAL:	<u>1</u>	<u>2184.0</u>

*The Department of Energy ordered the Oak Ridge Research Reactor to be placed in permanent shutdown on July 14, 1987.

Table 3. Scheduled shutdowns, details

Date	Duration (h)	End cycle	Remarks
1-1-88 thru 3-31-88	2184.0	--	The ORR was shut down on March 26, 1987, by the Department of Energy orders for shutdown of class A and B reactors. On July 14, 1987, the Department of Energy issued orders for the ORR to be placed in permanent shutdown status.

Table 4. Shutdown activities

Date	Remarks
1-6-88	Removed five 30 ft long aluminum dry tubes from west pool, wiped down, covered with plastic and stored in long tool storage rack
1-19-88	Shipped five drums of used charcoal and one drum of scrap metal to burial ground
1-20-88	Cleaned hand tools in third level c-zone and returned to shop
1-22-88	Replaced nitrogen cylinder for evacuation horn in basement
1-27-88	Removed pool demineralizer from service and lowered water level in pool 3 in., and level of makeup tank to 70% so Insituform could install liner in pool makeup tank overflow line to process waste system
1-28-88	Rack containing 14 TRIGA-LEU dummy and water rods was moved from pool floor to isotope platform. Checked each rod to ensure no fuel was in rods. Stored dummy and water rods in isotope platform, and removed rack to third level c-zone
1-29-88	Experimenter in process of sorting through miscellaneous equipment in basement experiment room to determine what to salvage or discard
2-2-88	Sent 25 cubic ft of valves, gauges and tubing from basement experiment room to landfill
2-5-88	Tied down reactor secondary fan blades and drained oil from fan gear boxes
2-5-88	Two truck loads of obsolete electronic equipment from Room 308 were sent to salvage
2-10-88	Valved out NOG west bank filters and assisted in removal of filters
2-18-88	Removed north facility pump from service and placed south facility pump in service
2-19-88	Transferred fission chambers RSP-235, 4787, and 61608124 from vault to Building 3500

Table 4. (continued)

Date	Remarks
3-7-88	Removed HFED tools from west pool, wiped with wet rags and stored in tool storage rack
3-9-88	NOG was removed from service for inspection of catch tank and water trap. Returned to service after inspection completed
3-17-88	Placed beryllium breaker in pool and broke 6 beryllium pieces in half preparing for shipment to burial ground
3-22-88	Sent 54 batteries from Building 3085 to landfill
3-25-88	Worked isotope stringer, removed 2 xenon sleeves and stored in isotope platform
3-31-88	Continued scanning of LEU and HEU elements to determine fission product content
3-31-88	Continued wetting wood of secondary towers once a week as a means of fire prevention
3-31-88	Water quality during quarter: pool water resistivity ohm-cm 1,750,000; reactor water resistivity ohm-cm/360,000; pool and reactor radioactivity cpm/ml BG

Table 5. Maintenance and changes, instrumentation and controls

Date	Component	Trouble or change	Reason or maintenance
1-6-88	Control room PA	--	Repaired microphone and cable
1-13-88	Reactor secondary	--	Module for radiation alarm replaced
2-23-88	Cell vent	Broken plug	I&C personnel removed PX-108 pressure switch from panel "C" in basement for repair
2-24-88	Cell vent	--	I&C personnel reinstalled repaired PX-108 pressure switch on panel "C" in basement and calibrated switch
2-26-88	FRCAS	--	Quarterly checks
3-15-88	Cell vent	--	I&C personnel replaced "O" rings in PX-108 switch
3-30-88	Cell vent	--	I&C personnel made quarterly surveillance functional tests on PT-65, PT-66 and radiation alarms
3-30-88	NOG	--	I&C personnel made quarterly surveillance functional tests on PT-63, PT-64, and radiation alarms
3-30-88	Low flow	--	I&C personnel made functional test on FT-1B
3-31-88	Seismic channels	--	I&C personnel tested "B" and "C" channels

Table 6. Process systems, maintenance and changes

Date	Component	Remarks
1-6-88	Room 308	P&E and I&C personnel started removal of equipment from future training room
1-7-88	Building CAMs	Programmed maintenance
1-20-88	Heat exchanger pit	Steam trap replaced and steam leaks repaired
1-21-88	Overhead crane	Programmed maintenance
1-22-88	Evacuation horn	P&E personnel repaired nitrogen leak
1-25-88	Reactor secondary	Fence between the two gates removed
1-29-88	Cell vent	Changed prefilters and south charcoal filters
2-3-88	Building elevator	First level outside door repaired
2-5-88	Analytical Chemistry laboratory	Repaired two steam leaks over laboratory
2-5-88	East truck doors	Repaired
2-10-88	Heat exchanger pit	Steam leaks repaired
2-10-88	A.C. tower	Steam leaks repaired
2-10-88	Cell vent	QA&I personnel performed elemental iodine test on filters
2-12-88	Reactor secondary	Steam leaks repaired
2-16-88	Room 213	P&E personnel are remodeling for training room
2-17-88	NOG	West bank filters removed
2-17-88	South facility pump	New seals and bearings installed

Table 6. (continued)

Date	Component	Remarks
2-18-88	South facility pump	P&E personnel made connections on pump and removed lock from breaker
2-22-88	Experiment room 308	Riggers transferred equipment and records to Building 9720-39 for Engineering Technology Division
2-24-88	Reactor primary pumps	Nos. 1, 2, and 3 starter breakers opened
2-24-88	DC batteries	Electrician disconnected all batteries
2-24-88	Pool secondary	Acid line removed between pump and basin
2-24-88	Reactor secondary	Removed line between acid tank and pumps
2-25-88	Salvage equipment, first level	Oil removed from leak detector, high pressure pump, and a centrifuge
2-25-88	3103 acid pumps	Wires from breakers to starters disconnected
2-25-88	3103 east acid pump	Pump disconnected and transferred to shop for cleaning before storing at 3095 warehouse
2-25-88	DC battery chargers	Chargers for Nos. 1, 2, and 3 DCs disconnected in preparation for sending to salvage
2-29-88	Eye wash	Leak repaired on station at pipe tunnel entrance
3-2-88	NOG east filter bank	QA&I personnel performed elemental iodine test. Results 99.884% efficient
3-2-88	Control room AC	Low pressure switch replaced

Table 6. (continued)

Date	Component	Remarks
3-8-88	Room 113	Equipment being removed to prepare storage room for HFIR records
3-9-88	NOG catch tank and trap	Access covers removed for inspection
3-9-88	Centravac	AC personnel returned to service
3-10-88	Heating unit	Steam valve replaced on third level changehouse unit
3-25-88	Beryllium breaker	Seals replaced
3-28-88	Room 113	Removed obsolete piping
3-29-88	NOG filter pit	Water trap in pit and bypass line removed for inspection and reinstalled after inspection
3-29-88	NOG filters	Installed new filters in east and west banks
3-29-88	NOG filters	QA&I personnel performed DOP test on east and west banks
3-29-88	Cell ventilation system	QA&I personnel performed DOP test on filters bank
3-30-88	Room 308	Insulators removing asbestos insulation from lines

Table 7. Experiment facility usage

Facility	Access flange	Date installed	Date removed	Description of experiment	Division or sponsor
HB-1	None	9-78		Neutron spectrometer	Solid State Physics
HB-2	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
South facility	None	12-16-63		Cold-finger plug ^a	Research Reactors

^aThe facility is on standby.

Table 8. Status of filters, gaseous waste systems

Type filter	Bank designation	Date last changed	Date last tested	Type test	Retention efficiency (%)
<u>Cell-ventilation system</u>					
CWS	Overall ^a	North, 4-16-80 South, 8-14-85	3-29-88	DOP	99.992
Charcoal	Both banks	North, 6-30-87 South, 1-29-88	2-10-88	Elemental iodine	99.961
<u>Basement hood exhaust</u>					
CWS	South	3-11-80	3-29-88	DOP	99.992
CWS	North	3-11-80	3-29-88	DOP	99.997
<u>Normal off-gas</u>					
CWS	West	3-29-88	3-29-88	DOP	99.992
Charcoal	West	3-29-88	12-21-87	Elemental iodine	b
CWS	East	3-29-88	3-29-88	DOP	99.998
Charcoal	East	3-29-88	3-29-88	Elemental iodine	b

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

^bChanged filters March 29, 1988 (elemental test to be performed week of April 1, 1988).

SUMMARY OF SURVEILLANCE TESTS

Table 9 is a tabulation of the completion dates of the shutdown surveillance tests required by the Technical Specifications. This table reflects only the shutdown surveillance requirements for the ORR facility. The technical specifications document is currently under revision to address only shutdown surveillance requirements. This document will be submitted to RORC and DOE for review and approval. Other surveillance requirements which are not reported are satisfied by routine completion of daily and weekly check sheets, start-up checklists, hourly data sheets, the operating logbook, and miscellaneous quality assurance tests.

Table 9. Summary of surveillance tests

Test	Most recent	Previous
<u>Biennially</u>		
Normal off-gas vacuum monitor calibration	10-1-87	9-5-86
Building ventilation flow monitor calibration	5-5-87	11-19-86
<u>Semiannually</u>		
Pressure-drop measurements across NOG filters	3-27-88	12-27-87
NOG filter system efficiency		
Elemental iodine test - east bank	3-2-88	8-11-87
Elemental iodine test - west bank	12-21-87	8-27-87
Diethyl phthalate test - east bank	3-29-88	9-3-87
Diethyl phthalate test - west bank	3-29-88	9-3-87
Containment closure system function test	2-23-88	9-22-87
Cell-ventilation filter system efficiency		
Elemental iodine measurements	2-10-88	12-15-87
Diethyl phthalate measurements	3-29-88	9-3-87
Radiation monitoring equipment calibration	1-8-88	10-7-87
Stack radiation monitor calibration	2-26-88	11-24-87

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