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OAK RIDGE NATIONAL LABORATORY

MARTIN MARIETTA

Oak Ridge Research Reactor Shutdown Maintenance and Surveillance Quarterly Report July, August, and September 1987

G. H. Coleman
D. L. Laughlin

OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
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Research Reactors Division
Reactor Operations Section

OAK RIDGE RESEARCH REACTOR SHUTDOWN MAINTENANCE AND SURVEILLANCE QUARTERLY REPORT JULY, AUGUST, AND SEPTEMBER 1987

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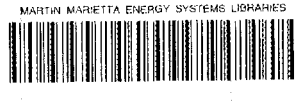

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SUMMARY

The ORR was not operated during July, August, and September of 1987.

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 2208 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
HEU		
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 transferred 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
LEU		
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 transferred 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)
Scheduled		
Special, DOE shutdown*	1	2208.0
Subtotal:	1	2208.0
Unscheduled		
Subtotal:	0	0000.0
TOTAL:	1	2208.0

*The Department of Energy ordered the Oak Ridge Research Reactor to be shut down on March 26, 1987.

Table 3. Scheduled shutdowns, details

Date	Duration (h)	End cycle	Remarks
7-1-87 thru 9-30-87	2208.0	--	The ORR was shut down on 3-26-87 due to Department of Energy orders for shutdown of class A and B reactors. The shutdown continued for the third quarter of 1987.

Table 4. Shutdown activities

Date	Remarks
7-21-87	Drained reactor and pool secondary tower basins
7-21-87	Shipped 36 $Eu2O_3$ target rods to HFIR
8-3-87	Removed all fuel elements from core
8-4-87	Entrance to pipe chase opened
8-4-87 from 8-7-87	Removed fuel sections from shim-safety rods UB-001, UB-002, UB-003, UB-004, U-046, and U-047
8-6-87	Removed the six shim-safety rods from core
8-11-87	Transferred insert containing low temperature specimens from MFE-6J core piece to south hot cell
8-14-87	Started wetting the wood of secondary towers once a week. They will be wet as a means of fire prevention twice per week during month of September and once per week when ambient temperature is above 32oF
9-9-87	Shipped remaining HFED mini fuel plate modules 27, 30, 31, 33 , and 34 to Argonne National Laboartory
9-22-87	Participated in plant evacuation drill of all personnel east of Third Street
9-30-87	Sent a sample of wood form reactor and pool secondaries to be analyzed for chromate content
9-30-87	Continued scanning of LEU elements to determine fission product content
9-30-87	Water quality during quarter: pool water resistivity ohm-cm 928,000; reactor water resistivity ohm-cm 1,342,000; pool water radioactivity cpm/ml BG; and reactor water radiaoactivity cpm/ml BG

Table 5. Maintenance and changes, instrumentation and controls

Date	Component	Trouble or change	Reason or maintenance
7-1-87	FRCAS	--	Bimonthly check
7-10-87	Monitron	Spurious alarms	Southeast basement monitron repaired and returned to service
7-27-87	Flow channel	--	Calibrated FT-1A and FT-1B
8-11-87	Count rate recorders	--	Turned off Nos. 1 and 2 (no fuel in core)

Table 6. Process systems, maintenance and changes

Date	Component	Remarks
8-24-87	Emergency diesel generator	Replaced battery
8-24-87	West badge reader door	Repaired locking mechanism
9-8-87	No. 3 dc unit	Replaced fuses for volts meter
9-22-87	Cell vent	Changed out eight filters on building air intake

Table 7. Experiment facility usage

Facility	Access flange	Date installed	Date removed	Description of experiment	Division or sponsor
C-3	V-10	6-28-85	6-29-87	Material test, fusion program (MFE-7J)	Engineering Technology
C-7	V-2	6-28-85	6-29-87	Material test, fusion program (MFE-6J)	Engineering Technology
E-3	None	6-28-85	2-17-87	Aluminum-base, dispersion-type fuel plates (HFED)	Engineering Technology
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

[a]The 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 (%)
		Cell-ventilation system			
CWS	Overall[a]	North, 4-16-80 South, 8-14-85	9-3-87	DOP	99.990
Charcoal	Both banks	North, 6-30-87 South, 8-14-85	7-8-87	Elemental iodine	99.916
		Basement hood exhaust			
CWS	South	3-11-80	9-3-87	DOP	99.996
CWS	North	3-11-80	9-3-87	DOP	99.995
		Normal off-gas			
CWS	West	8-25-87	9-3-87	DOP	99.998
Charcoal	West	8-25-87	8-27-87	Elemental iodine	99.925
CWS	East	6-30-87	8-7-87	DOP	99.958
Charcoal	East	6-30-87	8-11-87	Elemental iodine	99.984

[a]The CWS filters in the cell-ventilation system were checked in series.

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
Biennially		
Normal off-gas vacuum monitor calibration	10-1-87	9-5-86
Building ventilation flow monitor calibration	5-5-87	11-19-86
Semiannually		
Pressure-drop measurements across NOG filters	6-28-87	3-29-87
NOG filter system efficiency		
Elemental iodine test - east bank	8-11-87	10-3-86
Elemental iodine test - west bank	8-27-87	10-28-86
Dioctyl phthalate test - east bank	8-7-87	3-25-87
Dioctyl phthalate test - west bank	9-3-87	3-25-87
Containment closure system function test	9-22-87	2-18-87
Cell-ventilation filter system efficiency		
Elemental iodine measurements	7-8-87	6-5-87
Dioctyl phthalate measurements	3-25-87	9-23-86
Radiation monitoring equipment calibration	4-8-87	1-7-87
Stack radiation monitor calibration	3-16-87	9-5-86
Quarterly		
Normal off-gas vacuum monitor tested	10-1-87	5-21-87
Building ventilation flow monitor tested	5-21-87	4-15-87
Seismic channels	6-4-87	3-3-87

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