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Oak Ridge Research Reactor Shutdown Maintenance and Surveillance Quarterly Report July, August, and September 1989

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Research Reactors Division
"B" Reactors Section

OAK RIDGE RESEARCH REACTOR SHUTDOWN MAINTENANCE AND SURVEILLANCE QUARTERLY REPORT JULY, AUGUST, AND SEPTEMBER 1989

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ACRONYMS

CAM	constant air monitor
DOE	Department of Energy
DOP	dioctylphthalate
FR&CAS	Facility Radiation and Contamination Alarm System
HB	horizontal beam
HFIR	High Flux Isotope Reactor
I&C	Instrumentation and Controls Division
LEU	low-enriched uranium
NOG	normal off-gas
ORR	Oak Ridge Research Reactor
P&E	Plant and Equipment Division
QA&I	Quality Assurance and Inspection

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OAK RIDGE RESEARCH REACTOR SHUTDOWN MAINTENANCE AND SURVEILLANCE QUARTERLY REPORT JULY, AUGUST, SEPTEMBER 1989

SUMMARY

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

Maintenance activities, both mechanical and instrument, were essentially routine in nature.

Shutdown activities are shown in Table 1.

INSTRUMENTATION AND REACTOR CONTROLS

The performance of the instrumentation for the facility was satisfactory, and maintenance required is indicated in Table 2.

PROCESS SYSTEM

The performance of the process system was satisfactory, and maintenance required is indicated in Table 3.

GASEOUS-WASTE FILTERS

Table 4 summarizes the results of efficiency tests of the various gaseous-waste filters.

TRANSFER OF FACILITY

Preparation for transfer of the facility to the remedial action program is shown in Table 5.

Table 1. Shutdown activities

DATE	REMARKS
7/13/89	Safeguards and Security Department conducted annual audit of Material Balance Area 020.
7/18/89	Hazardous waste picked up from Buildings 3095 and 3101.
7/19/89	Transferred empty shipping container DOT 6M Type B to Building 3038 for return to Argonne National Laboratory.
7/25/89	DOE personnel conducted annual audit of Material Balance Area 020.
7/25/89	Operated crane for removal of graphite manochromator crystal from HB-6 for transfer to HFIR by Wignall.
7/27/89	Evacuated Building 3042 at 11:00 a.m., in accordance with check of plant emergency public address system.
8/2/89	Cleaned up and cleared c-zone in 3095 warehouse.
8/2/89	Experimenter removed graphite monochrometering crystal from HB-1 and transferred to HFIR.
8/3/89	Industrial Hygiene pulled 50-min air sample at Building 3095 in preparation for removal of asbestos.
8/4/89	Placed empty fuel storage rack No. 1 in plywood box for storage at 3095 warehouse.
8/7/89	Transferred item CAK-10 (32,730 grams of depleted uranium) from MBA 020 to MBA-026 (7900 stg) at HFIR for Zarestky.
8/10/89	Regenerated pool deamineralizer cation and anion columns. Transferred 2756 gal to WC-19 and 1620 gal to process.
8/10/89	Hazardous Waste personnel picked up container of mercury and three mercury contaminated manometers at Building 3095.
9/7/89	Hazardous Waste personnel picked up lightning arrestor capacitor.
9/15/89	Replaced tarp covering NOG filter pit with a new tarp.

Table 1. Continued

DATE	REMARKS
9/19/89	Performed cell vent system functional checks.
9/30/89	Continued wetting of secondary towers as a means of fire prevention.
9/30/89	Water quality during quarter: pool water resistivity ohm-cm was 1,123,553; reactor water resistivity ohm-cm was 962,865; and pool and reactor water radioactivity cpm/mL was background.

Table 2. Maintenance and changes, instrumentation and controls

Date	Component	Reason or Maintenance
7/12/89	Hot cell	I&C performed programmed maintenance on hot cell instrumentation.
7/13/89	Hot cell	I&C removed, repaired, and reinstalled south hot cell off-gas vacuum recorder controller PDRC-65.
8/3/89	3042 CAMs	I&C repaired and returned to service basement south, and Northeast CAMs, balcony south and first level east monitrons.
8/9/89	FR&CAS	I&C performed bimonthly check.
8/25/89	Seismic	I&C replaced batteries for "B" channel. Channel tested satisfactory.
9/6/89	NOG	I&C performed third-quarter surveillance functional tests on PT-63, PT-64, and radiation alarms.
9/6/89	Cell vent	I&C performed third quarter surveillance functional tests on PT-65, PT-66, and radiation alarms.
9/6/89	Seismic channels	I&C personnel tested "B" and "C" channels.
9/6/89	Recorder TR-2	I&C personnel functionally tested and calibrated.
9/6/89	Recorder TR-902	I&C personnel functionally tested and calibrated.
9/15/89	Recorder TR-2	I&C replaced defective chart drive switch.
9/22/89	NOG radiation recorder	I&C retubed and calibrated recorder amplifier.

Table 3. Process systems, maintenance and changes

Date	Component	Remarks
7/6/89	Emergency diesel generator	P&E replaced burned-out relay coil for Building 3003.
7/10/89	Process sump	P&E installed new pump and replaced check valve.
7/12/89	Hot cell	Fire Department checked the three fire extinguishers at hot cell.
7/14/89	Loop II cell	Electrician reset breaker and installed light switch coverplate on switch at entrance to cell.
7/17/89	3095 warehouse	Riggers transferred four steel boxes and three wood boxes containing unneeded and used equipment to burial grounds from 3095 warehouse.
7/18/89	Sump pumps	Pipefitter performed programmed maintenance on decay tank pit, process high level, and expansion pit pumps.
7/19/89	3095 warehouse	Riggers transferred sixteen 55-gal drums of Endcor 4630 from Building 3095 to hydrofracture for ES&H personnel.
7/20/89	3095 warehouse	Riggers transferred trailer load of green tagged items to salvage.
7/20/89	Fuel shipping equipment	Riggers transferred base plate and tie-down cables from Building 3042 to 3095 warehouse for storage.
7/21/89	Elevator	P&E repaired elevator outer doors.
7/22/89	3095 warehouse	Riggers transferred three steel boxes and 16 filter containers from Building 3095 to burial ground.
7/24/89	3095 warehouse	Electrician installed two electrical outlets for use in cutting up metal tools and racks for placing in steel boxes.

Tale 3. Continued

Date	Component	Remarks
7/27/89	3095 warehouse	P&E cut up metal tools and racks and placed them in steel boxes.
7/28/89	3095 warehouse	Riggers transferred two steel boxes to burial ground.
8/1/89	Building 3042 crane	P&E performed programmed maintenance on overhead crane.
8/2/89	3095 warehouse	Riggers transferred two steel boxes to burial ground.
8/2/89	Building 3042	P&E relamped high bay lights.
8/2/89	HB-1	Riggers removed top shield for experimenter.
8/3/89	Fuel storage rack	Carpenters made and delivered a plywood box for storing empty fuel rack.
8/4/89	3095 warehouse	P&E and Industrial Hygiene removed and bagged asbestos items at Building 3095.
8/8/89	3095 warehouse	P&E drained mercury from three manometers for shipping to burial ground.
8/8/89	3095 warehouse	P&E cleaned shelves and swept floor.
8/10/89	Pool demineralizer	P&E removed spool pieces for regeneration.
8/10/89	3095 warehouse	Riggers transferred one steel box and five bags of asbestos to burial ground.
8/14/89	Building 3042 elevator	P&E repaired chain for basement outer door and cleaned first-floor door drum controller contacts.

Table 3. Continued

Date	Component	Remarks
8/14/89	Pool demineralizer	P&E installed spool pieces after regeneration completed.
8/18/89	NOG filter pit	P&E replaced section of drain line and drain valve.
8/21/89	Pool demineralizer	P&E removed tops from strainers for cleaning and reinstalled after cleaning completed.
8/22/89	HB-6	Riggers transferred miscellaneous items from HB-6 area to HFIR and 7000 area for Wignall.
8/23/89	South standpipe	P&E replaced broken instrument air line.
8/23/89	Process sump pump	P&E installed float switch, made electrical connection on low-level pump, adjusted high-level ball float, and placed new low-level sump pump in service.
8/23/89	Room 203 and 210	P&E covered two pipe insulations in 203 and one pipe insulation open end in 210. These places had tested positive for asbestos.
8/23/89	Diesel fuel tank	Advanced Tank Certification group leak tested. No leaks found.
8/31/89	West truck doors	P&E adjusted south door locking pins so door would close and lock.
8/31/89	3095 warehouse	P&E transferred three lightning arrestors to salvage.
9/7/89	PM	P&E performed programmed maintenance on emergency diesel generators, building AC units, AC tower, and roll up doors at Building 3095.
9/8/89	Building 3042 roof	P&E completed reroofing lower north side.
9/12/89	Backflow preventers	P&E performed programmed maintenance on one in emergency diesel generator room and cell vent seal tank pit.

Table 3. Continued

Date	Component	Remarks
9/13/89	HEPA filters	QA&I performed DOP test on NOG east and west banks and laboratory hood exhaust filters.
9/20/89	3042 CAMs	P&E performed programmed maintenance on building CAMs.
9/21/89	Vent fans	P&E performed programmed maintenance on basement vent and north and south basement lab hood vent fans.
9/21/89	Hot cell filters	QA&I ran DOP test on filters.
9/22/89	Truck doors	P&E performed programmed maintenance on east and west truck doors.
9/25/89	3042 elevator	P&E performed programmed maintenance.

Table 4. Status of filters, gaseous waste systems

Type filter	Bank designation	Date last changed	Date last tested	Type test	Retention efficiency (%)
			Cell-ventilation system		
HEPA	Overall[a]	North, 4/16/80 South, 8/14/85	9/13/89	DOP	99.994
Charcoal	Both banks	North, 6/30/87 South, 1/29/88	6/22/88	Elemental iodine	99.882[b,c]
			Basement hood exhaust		
HEPA	South	3/9/89	9/13/89	DOP	99.994
HEPA	North	3/9/89	9/13/89	DOP	99.996
			Normal off-gas		
HEPA	West	1/27/89	9/13/89	DOP	99.998
Charcoal	West	1/27/89	1/31/89	Elemental iodine	99.900
HEPA	East	1/27/89	9/13/89	DOP	99.998
Charcoal	East	1/27/89	2/1/89	Elemental iodine	99.883[b]

[a]The HEPA filters in the cell-ventilation system were checked in series.
[b]Filter retention efficiency 99.882% unsatisfactory, filters to be changed.
[c]Fissionable material removed from facility.
DOE granted technical specification suspension.

Table 5. Preparation for transfer of facility to remedial action program

Date	Remarks
	None

SUMMARY OF SURVEILLANCE TESTS

Table 6 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 will be revised to address only shutdown surveillance requirements. This document will be submitted to RORC and DOE for review and approval. Other surveillance requirements that are not reported are satisfied by routine completion of daily and weekly check sheets, the operating logbook, and miscellaneous quality assurance tests.

Table 6. Summary of surveillance tests

Test	Most recent	Previous
Biennially		
Normal off-gas vacuum monitor calibration	6/7/89	10/1/87
Building ventilation flow monitor calibration	6/7/89	5/5/87
Semiannually		
Pressure-drop measurements across NOG filters	9/25/89	6/26/89
NOG filter system efficiency		
Elemental iodine test - east bank	2/1/89[a]	6/23/89
Elemental iodine test - west bank	1/31/89[a]	12/29/88
Dioctylphthalate test - east bank	9/13/89	3/16/89
Dioctylphthalate test - west bank	9/13/89	3/16/89
Containment closure system function test	9/19/89	3/14/89
Cell-ventilation filter system efficiency[a]		
Elemental iodine measurements	6/22/88[a]	2/10/88
Dioctylphthalate measurements	9/13/89	3/16/89
Radiation monitoring equipment calibration	8/23/89	6/6/89
Stack radiation monitor calibration	7/10/89	5/18/89

[a]Fissionable material removed from facility.
DOE granted technical specification suspension.

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