August 30, 2012

Docket No. 50-193

Mr. Xiaosong Yin, Project Manager
Non-Power Reactors, Decommissioning and
Environmental Project Directorate
Division of Reactor Projects - III/IV/V
U. S. Nuclear Regulatory Commission (NRC)
Washington, DC 20555

Dear Mr. Yin:

This letter and enclosures constitute the annual report required by the RINSC Technical Specifications (Section 6.8.4). Enclosure 1 provides reactor operating statistics. Enclosure 2 provides information pertaining to inadvertent reactor shutdowns or scrams. Enclosure 3 discusses maintenance operations performed during the reporting period. Enclosure 4 describes changes to the facility carried out under the conditions of Section 50.59 of Chapter 10 of the Code of Federal Regulations. Lastly, Enclosure 5 summarizes the radiological controls information. If there are any questions regarding this information, please call me at 401-789-9391.

Sincerely,

Stephen Guarino
Health Physicist

Enclosures (5)

Copy to:

Mr. Craig Bassett, USNRC
Dr. John J. Breen, Chairman NRSC
Dr. Stephen Mecca, Chairman RIAEC
Dr. Anthony Nunes, RIAEC
Dr. Peter Gromet, RIAEC
Dr. Andrew Kadak, RIAEC
Dr. Bahram Nassersharif, RIAEC

A020
NRR

ENCLOSURE 1
Technical Specifications
Section 6.8.4.a

Month	Year	Operating Hours	Energy (MWH)	Energy (MWD)
July	2011	25.65	37.98	1.58
August	2011	20.2	24.88	1.04
September	2011	25.82	29.62	1.23
October	2011	15.32	23.1	0.96
November	2011	30.85	41.17	1.72
December	2011	20.73	25.33	1.06
January	2012	6.75	7.2	0.30
February	2012	15.77	17.2	0.72
March	2012	25.58	31.23	1.30
April	2012	19.37	19.65	0.82
May	2012	20.72	26.87	1.12
June	2012	22.87	34.33	1.43
TOTAL	FY12	249.63	318.56	13.27

Total Energy Output since Initial Criticality: 64,199.1 MWhrs or 26,841.63 MWdays.

ENCLOSURE 2

EMERGENCY SHUTDOWNS AND SCRAMS

The following is a list of the emergency shutdowns and inadvertent scrams that occurred during the 2011-2012 reporting period. This information is required by Technical Specification 6.8.4.b.

Date	Run No.	Logbook	Page	Cause	Description
7/14/11	8625	58	114	Environmental	Period Scram due to excess humidity in control room*
7/25/11	8628	58	118	Operator	Natural Convection High Neutron Flux
8/11/11	8632	58	123	Environmental	Period Scram due to excess humidity in control room
8/16/11	8634	58	125	Environmental	Period Scram due to excess humidity in control room
9/8/11	8638	58	129	Environmental	Period Scram due to excess humidity in control room
2/2/12	8673	59	11	Operator	Period Scram while spiking cold core
3/1/12	8681	59	19	Operator	Natural Convection High Neutron Flux, Select switch in wrong position
3/7/12	8682	59	20	Instrumentation	Natural Convection High Neutron Flux, miswired following upgrade**
3/15/12	8685	59	23	Operator	Forced Convection High Neutron Flux, reactor period too low to engage automatic controls

*Increased airflow into the control room from the confinement building due to construction work lead to high humidity levels during the 2011 summer season. Construction has been completed and the issue is resolved.

**During reactor control upgrades a crossed wire crossed Wide Range #2 Power Channel to register Natural Convection (NC) mode during Forced Convection (FC) Mode. This caused the monitor to trip and initiate a scram at the NC LSSS of 115kW, despite all FC conditions being met. The wire was repaired and the issue corrected.

ENCLOSURE 3

Technical Specification 6.8.4.c requires a listing of the major maintenance operations performed in the 2011-2012 reporting period including their impact upon the safe operation of the reactor and the reasons for the corrective maintenance.

The gear reducer in cooling tower #2 seized during use. Operations were switched to system #1 and the gear reducer was replaced. The original was rebuilt and is available as a spare.

Following recommendations made during a routine NRC inspection, a survey was performed of the concrete of the RINSC confinement building and adjoining structures. The independent inspection found that the cracks in the structures are not structural and do not pose a threat to the confinement building. Improvements have been made to roofing materials to prevent water from entering the foundation and expanding the cracks.

ENCLOSURE 4

FACILITY CHANGES - 10CFR50.59 REVIEW

Technical Specification 6.8.4.d requires that we provide a listing and description of any 10 CFR 50.59 evaluations conducted during the 2011-2012 reporting period. There were two facility changes made during this period requiring a 10 CFR 50.59 evaluation.

Ongoing issues with the Neutron Flux Monitor have lead to fabrication of a new Test Generator Card, as described in the RINSC 50.59 Report dated February 28th, 2011 and mentioned in the FY11 Annual Report. Installation of the newly fabricated component revealed a discrepancy in the wiring outside of the Neutron Flux Monitor. The instrument's loss of high voltage alarm and scram were wired to work opposite their original design (normally open vs. normally closed and vice versa). Changes were evaluated in accordance with 10 CFR 50.59 and approved by the Nuclear and Radiation Safety Committee to allow the installation and use of the new test generator card in accordance with the manufacturer's design.

The RINSC has continued efforts to upgrade and modernize the reactor control room. Additional changes were evaluated and approved by the safety committee. These changes include new displays for reactor power level, core and experiment status, and area radiation levels. Other changes include adding annunciatiors, alarms, and additional test points. A new master power switch was fabricated and installed.

ENCLOSURE 5

RADIOLOGICAL CONTROLS

1. Environmental Surveys outside the Facility - Technical Specification 6.8.4.e

   Quarterly OSL[1] badges are deployed outside the reactor building in three separate locations. The general public does not frequent these locations and therefore occupancy factors may be used to approximate annual dose. The allowable external dose rates must be below 50 mrem per year. The quarterly doses in units of mrem are shown in the table below.

LOCATION	3RD QTR 2011	4TH QTR 2011	1ST QTR 2012	2ND QTR 2012[2]
Northeast Wall	0	0	33	0
Demineralizer Door	1	0	44	127
Heat Exchanger Door	4	4	51	21

   These areas are in locations where access is limited. Consequently, the general public will not frequent these areas, and appropriate occupancy factors can be used to approximate annual dose. Assuming that the maximum time that a member of the general public would be present in one of these locations is 15 minutes per day, an occupancy factor of 0.01 can be used to obtain the annual dose that would be received by a member of the general public, in any of these areas.

   The annual dose rate at the Northeast Wall, Demineralizer and Heat Exchanger Doors is dependent on the operations schedule of the reactor. Ignoring the fact that the dose rate is not present 24 hours per day, and applying the occupancy factor of 0.01, the annual dose that would be received by an individual at the Demineralizer Door would be 1.72 mrem. The dose received at the Heat Exchanger Door would be 0.8 mrem. The annual dose at the Northeast Wall would be 0.33 mrem. The variations from quarter to quarter and from previous reports were due in part to movements of items within the reactor building during the fiscal year and varying use of the different irradiation facilities.

2. Annual Exposures Exceeding 500 mrem - Technical Specification 6.8.4.f

   There were no personnel exposures greater than 500 mrem.

3. Radioactive Effluents - Technical Specification 6.8.4.g

   A. Individual gaseous effluent concentrations for each reactor operation are recorded on the Monthly Information Sheets (Form NSC-78). The concentration of radioactive materials in the effluent released from the facility exhaust stacks shall not exceed 1E+05 times concentrations specified in 10CFR20, Appendix B, Table II, when averaged over time periods permitted by 10CFR20.[3]

      Gamma spectroscopy of stack gas samples has shown that the principal gaseous effluent is Argon-41. The maximum concentration for this principal contaminant permitted under that Technical Specification is 1E-8 μCi/cc x 1E5 = 1E-3 μCi/cc. Concentrations released during the year were less than 0.02 of that limit.

      The total Argon-41 release during the reporting period was 120.22 curies. The calculated effective dose equivalent for this release is 2.6 mrem/year (COMPLY Code).

[1] Optically Stimulated Luminescence
[2] Landauer reads the OSL dosimeters to 1 mrem.
[3] Technical Specifications, Section 3.7.2.

ENCLOSURE 5

RADIOLOGICAL CONTROLS

B. Liquid effluent concentrations released to the sewer are documented on the Sewer Disposal Record (Form NSC-52) and/or the Liquid Release Record (Form NSC-17). During the reporting period no discharges were made.