



NUCLEAR SCIENCE & ENGINEERING

Cornell University
Ward Laboratory
Ithaca, NY 14853-7701

(607)255-3480

Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region 1, 631 Park Avenue
King of Prussia, PA 19406

Gentlemen:

Reference: License No. R-80, Docket No. 50-157
License No. R-89, Docket No. 50-97

The purpose of this report is to satisfy the requirements of Section 50.59 of 10CFR, Part 50, in respect to activities carried out on the Cornell TRIGA reactor (facility license No. R-80) and the Cornell Zero Power Reactor (facility license No. R-89) during the period beginning July 1, 1989 and ending June 30, 1990.

TRIGA - LICENSE NO. R-80

1. Operating Experience

During the period reported herein the TRIGA reactor was used primarily for the purpose of teaching and research and, to a small extent, instrument test and calibration.

Teaching programs included, 1) neutron radiography demonstrations, 2) use of a low intensity neutron beam for a nuclear measurement laboratory course, 3) introduction to neutron activation analysis, and 4) demonstration of reactor operation during steady-state and pulsed modes.

Research programs included, 1) trace analysis by neutron activation analysis, 2) use of a neutron beam for the radiography of concrete samples and, 3) research and development of a neutron guide/cold source system.

Instrument test and calibration included performance measurements of neutron sensitive detectors, utilizing the central thimble, flat reflector face, and the annular space in the reflector.

2. Changes in Facility Design

None

3. Changes in Procedures

On February 27, 1990 the Ward Reactor Laboratory Safety Committee approved the following revisions of the Ward Laboratory Emergency Plan.

1. Deletions:

- a) Remove Dynamitron as a Ward Lab facility in Section 1.0 "INTRODUCTION".
Reason: no longer exists
- b) Remove last sentence from Section 8.5 "A self-contained Oxygen Mask is available near the lobby"

Reason: Life Safety removed it from Ward Lab because O₂ is no longer recommended. The Life Safety response teams always carry self-contained breathing apparatus.

2. Changes:
 - a) 7.5.1 item 1
 - From: A 25 rem whole body, once in a lifetime accidental or emergency dose for radiation workers (except for actions involving Life Safety), 12/
 - To: A 10 rem whole body, once in a lifetime accidental or emergency dose for radiation workers.
 - Reason: To reflect changes in guidelines from NCRP No. 91
 - b) 10.4 first paragraph
 - From: The Ward Laboratory staff calibrates annually the portable and fixed radiation instruments.
 - To: The Ward Laboratory staff and the Office of Environmental Health calibrates annually the portable and fixed radiation instruments.
 - Reason: O.E.H. recently got involved in radiation instrument calibration at Ward Lab.
3. Additions:
 - a) Add to the appendix an Emergency Agency list with phone numbers.
4. Surveillance Tests and Inspections

All parameters and systems undergoing surveillance tests and inspections were determining to be within the specified limits.
5. Power Generation

99 megawatt hours
6. Emergency Shutdowns

None
7. Unintentional Scrams
 - a) linear power scram - electronic transient - 9/12/89
 - b) log power scram - electronic transient - 12/18/89 - 7/11/90 - 7/27/90
 - c) loss of magnet current to safety control rod - 6/29/90
 - d) loss of console power; blown fuse - 8/7/90
8. Major Maintenance

None
9. Radioactive Waste Release
 - 1) Liquid waste -- 0.08 μ Ci (gross activity)
 - 2) Solid waste -- None
 - 3) Gaseous waste -- 155 mCi (argon-41)
10. Personnel Exposure

No significant radiation exposure to personnel was experienced.

ZERO POWER REACTOR

1. Operating Experience

During the period reported herein the ZPR was used primarily for the purpose of teaching and instruction in connection with two Nuclear Science & Engineering courses; 1) 121 Fission, Fusion, and Radiation, and 2) A&EP 612 class project. The following ZPR operations were demonstrated:

- 1) Sub critical operation where Keff. is less than 1.

- 2) Demonstration of criticality where Keff. is = 1.
- 3) Supercritical operation where Keff. is greater than 1.
- 4) Measurement of stable reactor period.

Other utilization involved the Operating Requalification Program for two faculty members and one staff member.

2. Changes in Facility Design

None

3. Changes in Procedures

None

4. Surveillance Tests and Inspections

All parameters and systems undergoing surveillance tests and inspections were determined to be within the specified limits.

5. Power Generation

Power generation was approximately 10 watt hours which included 22 start-ups.

6. Emergency Shutdowns

None

7. Unintentional Scrams

None

8. Major Maintenance

None

9. Radioactive Waste Release

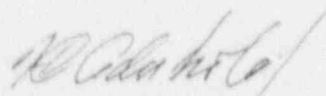
No measurable amount

10. Personnel Exposure

No significant radiation exposure to personnel was experienced

If any additional information is required concerning this report, please don't hesitate to contact this office.

Sincerely yours,



Howard C. Aderhold
Reactor Supervisor

HCA/dmc

cc: Director, Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555