

ANNUAL OPERATIONS REPORT
of the
TEXAS A&M UNIVERSITY AGN-201M TRAINING REACTOR

NRC LICENSE R-23
June 1, 1984 - May 31, 1985

DEPARTMENT OF NUCLEAR ENGINEERING
Texas A&M University
College Station, Texas 77843

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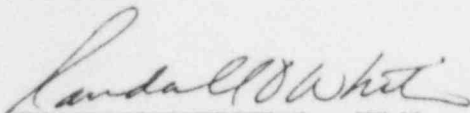
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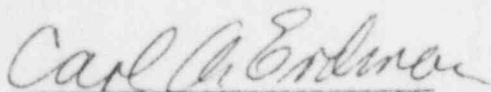
June 1, 1984 - May 31, 1985

Prepared by:



Randall D. White
Reactor Supervisor

Approved by:



Carl A. Erdman, Head
Nuclear Engineering Dept.

DEPARTMENT OF NUCLEAR ENGINEERING

Texas A&M University

College Station, Texas 77843

1. SUMMARY

This report details the pertinent activities related to the Texas A&M University AGN-201M training reactor facility operated by the Department of Nuclear Engineering during the period June 1, 1984 to May 31, 1985. Furthermore, it is intended that the contents of this report comply with the requirements of 10 CFR 50 section 50.59 (b), and Appendix A, Technical Specifications, of license R-23.

The utilization of this facility continues to be similar to that of previous years. The general categories of utilization for this past year were support of Nuclear Engineering courses, operator training, preventive maintenance, and research for a Master's degree thesis. Nuclear Engineering and other courses supported during the past year were:

ENGR 102	Engineering Analysis II
NE 405	Nuclear Engineering Reactor Experiments
NE 606	Nuclear Engineering Reactor Experiments
IE 691	Industrial Engineering Research

Components replaced as part of preventive and corrective maintenance are detailed in Section 4. Components replaced during this period do not involve unreviewed safety questions and are not expected to adversely affect the safe operation of this facility.

A major facility modification was performed this year. It included moving the reactor control console, construction of an additional security wall, and added shielding for personnel protection. The facility changes

did require modifications to the Emergency and Security Plans. The Emergency plan changes have been approved by the NRC, while the Security Plan changes are still under review. None of these changes are expected to adversely affect the safe operation of this facility. These changes were reviewed and approved by the Reactor Safety Board. Following completion of the console move Reactor Safety Board representatives reviewed the work to insure compliance with applicable procedures and specifications.

The results of all major parameter surveillance tests are shown in Table 1.

TABLE 1. REACTOR PARAMETER SURVEILLANCE MEASUREMENTS

<u>Date</u>	<u>Reactivity Worth</u>	<u>Value</u>
18 Apr 85	Safety Rod #1	1.156 % Δ k/k
18 Apr 85	Safety Rod #2	1.150 % Δ k/k
18 Apr 85	Course Control Rod	1.163 % Δ k/k
18 Apr 85	Fine Control Rod	0.3725 % Δ k/k

Rod Drop Times

21 Jan 85	Safety Rod #1	125 msec
21 Jan 85	Safety Rod #2	150 msec
21 Jan 85	Course Control Rod	140 msec

Reactivity Insertion Rates

25 Jan 85	Safety Rod #1	0.0515 Δ k/k/sec
25 Jan 85	Safety Rod #2	0.0517 Δ k/k/sec
25 Jan 85	Course Control Rod	0.0452 Δ k/k/sec
25 Jan 85	Fine Control Rod	0.0109 Δ k/k/sec

Total Excess Reactivity

18 Apr 85	Total Excess Reactivity Corrected to 20 °C	0.304 % Δ k/k
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2. OPERATIONAL SUMMARY

<u>Utilization by Category:</u>	<u>Hours</u>
(a) Support of Nuclear Engineering Courses	16.37
(b) Operator Training	4.47
(c) Preventive/Corrective Maintenance	8.32
(d) Support of Research	1.02
<u>Total Operating Hours</u>	30.16
<u>Total Watt-hours of Operation</u>	52.53
<u>Average Power Level of Operation</u>	1.74
<u>Number of Reactor Startups</u>	93

3. UNSCHEDULED SHUTDOWNS

<u>DATE</u>	<u>TYPE</u>	<u>CAUSE</u>	<u>CORRECTIVE ACTION</u>
8 Feb 85	Hi Level Ch. 3	Student Operator error in switching ranges	Reinstruct Student Operator
20 Feb 85	Hi Level Ch. 3	Student Operator error in switching ranges	Reinstruct Student Operator
21 Feb 85	Lo Level Ch. 3	Student Operator error in switching ranges	Reinstruct Student Operator

4. MAJOR SAFETY RELATED CORRECTIVE MAINTENANCE

Major corrective maintenance and component replacement on the AGN-201M reactor during the reporting period are summarized as follows:

- (a) 16 Aug 84 - Failure of Console Power On indication. Replaced 1250 ohm current limiting resistor on indicator lamp.
- (b) 30 Aug 84 - Relocated C-2 personnel warning device required as part of console relocation.

(c) 19 Sept 84 - New doors and locks installed as part of console relocation.

(d) 20 Sept 84 - Disconnected Console and moved it to new location in reactor room.

(e) 25 Oct 84 - Replaced Ch. 1, 2, 3, detector cables with new detector cables to minimize cable lengths.

(f) 5 Dec 84 - All major modifications associated with console move completed, including cable connections to the console, console wall construction, reactor room concrete wall partition, partial rewiring within the console, and panel re-arrangement on the console. The changes improve utilization of available space in the reactor room, provide radiation shielding for operating personnel, increase reliability of console wiring, and provide more accessible arrangement of instruments on the console.

(g) 7 Dec 84 - Initial console energization after relocation. All rods on test stand. Initial rod testing failed due to wiring errors, errors in some schematics, and bad solder joints on the control rods and in the console. Performed extensive continuity checks and visual wire verifications, corrected schematics to reflect procedural compliance, and resoldered suspect solder joints.

(h) 20 Dec 84 - Replaced rod top micro-switch for Safety Rod #2. The switch may have failed as a result of initial reenergization problems.

(i) 11 Jan 85 - Removed two external resistors on CRTM panel which limit magnet current. Removal of the resistors allows better current control using existing potentiometers. Potentiometers were adjusted to standard 90 mA with no degradation in rod drop times. Also resoldered several wires inside CRTM panel.

(j) 21 Jan 85 - Reinstalled Rods in reactor. All rods operational.

(k) 1 Feb 85 - Resoldered connectors for startup source drive cable. Cable was replaced at this time.

(l) 25 Feb 85 - Radiation survey performed at various power levels. Indications show that operator exposure at console during full power (5 w) operations is within safe levels (approximately 2.5 mrem/hr).

(m) 22 Mar 85 - Failure to receive Ch. 2 high trip during prestartup check. Replaced vacuum tubes V4, V5 and V16 in the instrument and the relay in trip assembly 4103.

(n) 29 Mar 85 - Failure of SR2 rod control switch. Re-wired switch to utilize an unused bank of contacts on the same switch.

(o) 4 Apr 85 - Failure of SR2 relay K-12. This relay was replaced with an electrically equivalent relay from another manufacturer. The replacement relay failed. The failed relay was replaced with an original type relay.

(p) 15 May 85 - Re-wired connectors for Rod Position Indicator lamps to better facilitate lamp changes.

The corrective maintenance and component replacement performed during this reporting period do not involve unreviewed safety questions.

5. (a) FACILITY CHANGES

Facility changes this year included moving the reactor control console from room 60C to the reactor room (room 61). A solid concrete half-wall was constructed between the reactor and the console for operator radiation protection. A removable wall of solid concrete blocks was constructed around the skirt of the reactor to reduce neutron and gamma levels in the room. A solid concrete wall was built to divide room 61 into a reactor area (including the control console) and a laboratory area. Access from the laboratory area to the reactor area is provided via locked doors.

(b) CHANGES TO PLANS AND PROCEDURES

The Emergency and Security Plans and Procedures were changed to reflect the facility modification in 5(a). In particular, facility drawings and access routes were affected. It is our interpretation that none of these changes decreased the effectiveness of the Plans or Procedures. The NRC has reviewed and approved of changes to the Emergency Plan and is currently reviewing the Security Plan.

(c) NEW EXPERIMENTS OR TESTS

No new experiments or tests were performed during this reporting period.

6. SUMMARY OF SAFETY EVALUATIONS

No changes, tests, or experiments were performed during this reporting period which meet the criteria of 10 CFR 50 paragraph 50.59 requiring a safety evaluation.

7. SUMMARY OF RADIOACTIVE EFFLUENT RELEASES

No liquid or solid radioactive waste was released during this reporting period.

8. ENVIRONMENTAL RADIOLOGICAL SURVEYS

No environmental radiological surveys were performed outside the facility during this reporting period.

9. RADIATION EXPOSURE

One individual received a total radiation exposure of between 100 mrem and 250 mrem for the calendar year 1984.

10. MISCELLANEOUS

The following personnel participated satisfactorily in the AGN requalification program.

Carl Erdman	SOP-4136
Gerald Schlapper	SOP-4210
Randy White	SOP-43026
Art Flores	SOP-43027
Barry Willits	SOP-4472

Mr. Barry Willits obtained re-certification effective 13 Sept 84. Mr. David Carpenter (SOP-4471) resigned as Reactor Supervisor effective 31 Dec 84. Mr. Randy White was named the Reactor Supervisor for the AGN-201M facility effective 1 Jan 85.

TEXAS A&M UNIVERSITY

COLLEGE OF ENGINEERING

COLLEGE STATION TEXAS 77843-3133

DEPARTMENT OF NUCLEAR ENGINEERING
(409) 845-4161

11 July 85

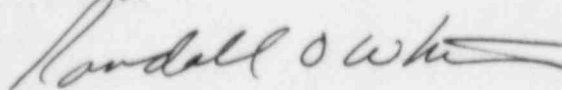
Cecil O. Thomas, Chief
Standardization and Special Proj. Branch
Division of Licensing
U.S. NRC
Washington, DC 20555

Dear Mr. Thomas:

Please find enclosed five copies of the most recently completed annual operating report dated 1 June 84 to 31 May 85, for the AGN-201M, docket no. 50-59.

If you have any questions concerning the report please call me at (409) 845-4988 or (409) 845-4161.

Sincerely,



Randall D. White
Reactor Supervisor, AGN 201-M
Nuclear Engineering Department

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