



MEMPHIS STATE UNIVERSITY
MEMPHIS, TENNESSEE 38152

June 11, 1981

Center for Nuclear Studies
Office of the Director
(901) 454-2687



Director
Region II, USNRC
Office of Inspection and Enforcement
101 Marietta Street, Suite 3100
Atlanta, GA 30303

Dear Sir,

Enclosed is the follow-up report to a reportable event that occurred at the Memphis State University AGN-201 Nuclear Reactor Facility on June 8, 1981. The report is submitted in accordance with section 6.9.2 of Appendix A to Facility Operating License R-127, Docket No. 50-538.

An unscheduled power outage occurred during reactor operation which directly caused reactor shutdown. Restoration of electric power service was completed and conditions returned to normal after approximately fifty minutes. Initial notification was made to your office by telephone and confirmed by mailgram on June 9, 1981.

Sincerely,

D. W. Jones
Director

RLD/sf

Enclosures: Follow-up Report to
Reportable Occurrence #81-1

cc: Mr. C. Julian, USNRC Region II
Dr. J. A. Rhodes, MSU
Dr. D. W. Cooke, MSU/RSC
Mr. R. E. Horn, MSU/RCSC
Mr. R. L. Dietz, MSU/CNS
Mr. M. M. Martin, MSU/CNS
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MEMPHIS STATE UNIVERSITY
AGN-201 NUCLEAR REACTOR FACILITY
LICENSE R-127, DOCKET NO. 50-538

FOLLOW-UP REPORT TO REPORTABLE OCCURRENCE NO. 81-1

Date of Report: June 11, 1981
Date of Occurrence: June 8, 1981
Date of NRC Notification: June 9, 1981

1. Reactor.

AGN-201, Serial 108. Located at the Center for Nuclear Studies, Memphis State University, Memphis, Tennessee. Facility Operating License R-127, Docket No. 50-538.

2. Reportable Occurrence.

Electric power service to the Memphis State University Center for Nuclear Studies Facilities was unexpectedly interrupted. The unscheduled power outage occurred during AGN-201 reactor operation and, as a direct result of the event, caused reactor shutdown. Item 6.9.2.a.(7) of the Facility Technical Specifications applies.

3. Conditions at Time of Occurrence.

- a. An operator training program was in progress for the purpose of providing reactor startup experience for students in Memphis State University's Nuclear Skills Related Training Program (NSRT).
- b. The reactor was subcritical and at a steady state neutron level. A startup was in progress with the Safety Rods fully inserted (24 cm), Coarse Control Rod at 17.86 cm, Fine Control Rod at 15 cm, and with an estimated margin of 0.14% reactivity from criticality. The reactor temperature was 21°C.

4. Narrative.

A partial loss of electrical power to the Center for Nuclear Studies Facilities occurred at 3:12 p.m. (CST) on June 8, 1981. The AGN-201 Reactor was being operated by a student under the direct supervision of licensed Senior Operators. At the time of the unscheduled event, the operator was evaluating data to be used for an estimate of the critical rod positions as part of a reactor training startup procedure using a 1/M approach to criticality. The reactor was at a sub-critical, steady state neutron level.

The reactor scrammed, as designed and as required by the Facility Technical Specifications, due to loss of Reactor Control Power which interrupted electrical current to the Control Rod Holding Magnets. Electrical circuits to the neutron flux monitoring instruments, which are connected to a different phase of the power source, remained energized and the reactor power level decay was monitored until normal shutdown readings were obtained. The Fine Control Rod (no scram function) remained inserted to 15 cm and the Safety and Coarse Rod Magnet Assemblies remained at the pre-scram positions. The normal shutdown checkoff was completed at 3:27 p.m. (CST) in accordance with OP-5 with the exception that the Fine Rod remained at the 15. cm position. At 3:40 p.m. (CST), a complete interruption of electric power occurred which deenergized all console instrumentation, alarms, and safety circuits.

The fault was apparently corrected and the electric distribution feeder system was restored to normal at 4:58 p.m. (CST). Three minutes later the Reactor Supervisor reenergized Reactor Control Power to allow the Fine Control Rod and the Holding Magnet Assemblies to be returned to their fully withdrawn positions. The reactor was secured at 4:02 p.m. (CST). Subsequent control and instrumentation checks revealed no abnormalities as a result of the power failure.

The Reactor Supervisor was in the control room at the time that the unplanned event occurred. The Facility Director was notified. The event was reported to the USNRC Region II Office of Inspection and Enforcement (Mr. C. Julian) via telephone and confirmed by mailgram to the Director on June 9, 1981, in compliance with section 6.9.2 of the MSU Facility Technical Specifications.

5. Safety Significance of the Occurrence.

None. A loss of electrical power de-energizes the Safety and Coarse Control Rod Holding Magnets causing a reactor scram and thus assures safe and immediate shutdown in case of a power outage. Reactor systems performed as designed and as required by technical specification 3.3.

6. Cause of Failure.

The interruption of electrical power was apparently caused by a power overload or imbalance of unknown origin on the main distribution feeder to the Center for Nuclear Studies located on the MSU South Campus.

7. Corrective Action.

None. Corrective action to restore and maintain the South Campus electric service feeder is under the cognizance and control of organizations outside the Center for Nuclear Studies and the AGN-201 Reactor Facility.

8. Measures to Prevent Recurrence.

None. Measures to prevent recurrence of an electric power outage of the nature described in this report are not within the capabilities of the Center for Nuclear Studies or AGN-201 Reactor Facility staff.