

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-602/88-04 Construction Permit: CPRR-123

Docket: 50-602 Expiration Date: December 31, 1988


Licensee: University of Texas
College of Engineering
Department of Mechanical Engineering
Nuclear Engineering Program
Austin, Texas 78712

Facility Name: Nuclear Engineering Teaching Laboratory (NETL) (TRIGA Mark II)

Inspection At: NETL Balcones Research Center, Austin, Texas


Inspection Conducted: July 22, 1988

Inspector:



W. C. Seidle, Chief, Test Programs Section
Division of Reactor Safety


8/1/88
Date



J. E. Gagliardo, Chief, Operational Programs
Section, Division of Reactor Safety

8/1/88
Date

Approved:



J. L. Milhoan, Director, Division of Reactor
Safety

8/4/88
Date

Inspection Summary

Inspection Conducted July 22, 1988 (Report 50-602/88-04)

Areas Inspected: Routine, announced inspection of the biological shield wall concrete placement for the NETL facility, and review of the preoperational and startup test programs for the TRIGA Mark II reactor.

Results: Within the areas inspected, no violations or deviations were identified.

DETAILS1. Persons ContactedUniversity of Texas (U of T)

D. Klein, Director, Nuclear Engineering Teaching Laboratory (NETL)
*T. Bauer, Assistant Director, NETL
M. Krause, Senior Reactor Operator
J. Green, Construction Inspector

Construction Incorporated of Texas

A. Hilz, President
B. Webb, Project Manager

Raba-Kistner-Brytest Consultants, Inc.

J. Yesenik, Concrete Consultant

Pioneer Concrete of Texas Inc.

D. Groh, Quality Control

*Denotes individual contacted for exit interview.

2. Test Program

The NRC inspectors reviewed the licensee's test program to verify that (a) the preoperational tests will assure that all systems and components described in the licensee's Safety Analysis Report will perform their function as described; (b) the startup (after license is issued) tests will assure that the reactor is safely loaded with fuel, started up, and initially tested at increasing power levels as described in the Reactor Startup Plan (Section 13.4 of the SER); and (c) the surveillance test program includes procedures applicable to all Technical Specifications surveillance requirements.

The licensee's Test Program Manual included the following sections:

- a. An outline of the startup and calibration test procedures to be performed,
- b. the instrumentation and control system plan for evaluation and checkout,
- c. the checkout and evaluation plan for the reactor console issued by GA Technologies, and
- d. the Acceptance Tests Manual.

The tests outlined in the Test Program Manual appeared to comprehensively cover all of the tests needed to verify that the reactor and associated systems have been constructed, installed, and demonstrated to be operable in accordance with the licensee's commitments and industry guidance and practices. The test program had not been reviewed and approved by the Reactor Operation Committee and by licensee management.

The licensee had not prepared and issued the test procedures which will implement the approved test program. The NRC inspectors noted that the test procedures would have to be issued and preoperational tests would have to be conducted before Region IV could make a finding regarding the licensee's readiness to receive an operating license. The licensee committed to have the above procedures completed by November 12, 1988. During the inspection, and in a subsequent telephone conversation on July 28, 1988, the licensee also committed to the following milestones regarding the completion of the TRIGA Mark II facility:

<u>Milestones</u>	<u>Completion Dates-1988</u>
Receive control room console and mechanical components	September 1
Complete HVAC balancing	October 1
Complete physical security elements	October 1
Complete pool water system	October 1
Complete preoperational test procedures	October 1
Install control room console	November 1-11
Install GA mechanical components	October 3-31
Install radiation monitoring equipment (partial installation by GA; remainder by U of T)	November 1
License two Senior Reactor Operators	November 12
Complete all operating procedures	November 12 (90 percent complete by September 15)
Receive operating license	December 15
Load reactor fuel - achieve initial criticality	December 15-30

3. Construction Activities

The NRC inspectors witnessed the placement of 37 cubic yards of concrete for the biological shield wall. The placement was made on top of 13 cubic yards of high density concrete. This 13 cubic yard placement was completed about 10 minutes before the NRC inspectors arrived on site.

The concrete specifications are documented in a specifications manual entitled "Construction Specifications for Nuclear Engineering Teaching Laboratory Balcones Research Center for the University of Texas at Austin - Project No. 102-568," dated September 15, 1986.

The NRC inspectors obtained the following information and made the following observations during the placement:

- o The Assistant Director, NETL, assured the NRC inspectors that the form was thoroughly inspected for cleanliness prior to placing concrete. He also noted that the coating on the aluminum tank had been inspected prior to the placement. A minor break in the coating had been repaired.
- o The 3,000 psi compressive strength concrete used for the 31-cubic-yard placement was supplied by Pioneer Concrete of Texas, Inc., Austin, Texas. According to the onsite Quality Control representative for Pioneer, their State-certified batch plant is located about 8 miles (15-20 minutes) from the Research Center. He indicated that because of the short distance, occasionally the discharge of concrete from the truck was held up until the specified number of mixer drum turns was logged on the counter. He indicated the specification is between 70 and 300 turns.
- o Two representatives from Raba-Kistner-Brytest Consultants, Inc., inspected the placement and performed concrete tests at the site for verification of quality. The NRC inspectors observed the casting of break cylinders near the form for 7- and 28-day strength tests. The NRC inspector observed one slump test that measured about 3.5 inches. The specified slump for the biological shield wall placement is 2 to 4 inches.
- o The concrete was pumped from the truck to the form. The NRC inspector counted 14 individuals involved with the placement. The several workers placing concrete and adjusting reinforcing steel appeared to be adequately supervised.
- o The University of Texas Construction Inspector; the Assistant Director, NETL; and the Senior Reactor Operator performed in a QC capacity during the placement. At least one vibrator was in operation at all times, and sometimes two were used when needed.

- o Particular attention was given to placement lift rate which was not to exceed 3 ft./hr. Adequate checks were made of reinforcing steel location during the placement.

There were no violations or deviations identified.

4. Exit Interview

The inspection scope and findings were discussed with the Assistant Director, NETL, at the conclusion of the inspection on July 22, 1988. The licensee did not identify as proprietary any of the material provided to, or reviewed by the NRC inspectors.