DEPARTMENT OF MECHANICAL ENGINEERING
THE UNIVERSITY OF TEXAS AT AUSTIN

Nuclear Engineering Teaching Laboratory · 10100 Burnet Road · Austin, Texas 78758
(512)471-5787 · FAX (512)471-4589

January 25, 1993

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Notification of Reportable Occurrence
Docket 50-602

Dear Sir:

Pursuant to License R-129 Technical Specification 6.6.2.2(b) other events and 6.5.2 the following notification is provided. Discovery of the event during testing the week of January 19-22, 1993, was reported to the licensee's project manager, Al Adams, by telephone on January 25, 1993. Amendment of Technical Specification 3.2.2 is requested pursuant to 10CFR 50.56 to correct the condition.

The University of Texas (UT) has identified a reportable event as part of a routine test and review of the ICS reactor system operation. The event is a change of the number of standard control rods subject to the simultaneous withdrawal interlock requirements when the reactor is in modes other than manual mode.

The event which occurs during automatic or square wave mode operation removes the regulating rod from the interlock requirements. The Technical Specification 3.2.2(c) states that 4 interlocks, one for each rod, are applicable for manual operation. By note to the table (page 14) the same requirement is applied to the automatic and square wave modes, however, the regulating rod in these modes is not part of the interlock sequence, thus reducing the applicable interlocks from 4 to 3. The reportable event is an error in the licensee's representation of the Technical Specifications. Review of the section 6 (page 6-12) of the Safety Analysis Report indicates a potential source of the error by way of a statement in the list of interlocks (item F). Item (F) applies to an interlock against manual operation of the regulating rod while that rod is in auto or square wave mode. This condition, however, does allow simultaneous movement of another rod other than the regulating rod. A review of the control software and startup program demonstrates that the condition (4 interlocks in auto mode or square wave mode) was not true at the initial test nor in subsequent or current control software configurations.

Discovery of the reportable condition occurred during test of an update replacement of the control system software. The software replacement corrected a withdrawal interlock failure found by another licensee that compromised the withdrawal interlock logic. The corrected interlock error was related to a mode switch change while the rod up switch was depressed. The

IE28 1/1

manufacturer, General Atomics, has corrected the software and provided the update version to UT. Review of this software correction was underway when the present condition was recognized. The reportable event in this case (UT) is an erroneous Technical Specification and not an actual event related to the instrument control and safety system.

Corrective action by the licensee is amendment of the Technical Specifications. No safety to reactor operation is presented by the event. The amendment to the Technical Specifications is enclosed.

The licensee considers the loss of the interlock in automatic and square wave modes an acceptable safety condition. Any withdrawal of a rod simultaneous with a mode (automatic or square wave) control condition that is moving the regulating rod up will automatically cause a change in the regulating rod motion with both period and power level constraints. These responses are tested in the startup and checkout procedures and are reevaluated periodically as part of software updates and replacements.

The licensee will refrain from use of the automatic and square wave modes until amendment of the Technical Specifications is approved.

Sincerely,

Thomas L. Bauer

Thomas L. Bauer
Assistant Director/NETL

Approval: Bernard W. Wehring
Bernard W. Wehring, Director/NETL

TLB:jgr

Attachments: SAR page 6 - 12
Technical Specifications page 14
Technical Specifications page 14 amendment 1/93

xc: U.S. NRC Region IV
R. Charbeneau
H. Woodson (D. Klein)
K. Diller

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	ξ	
	ξ	
The University of Texas	ξ	
at Austin	ξ	Docket No. 50-602
	ξ	
Balcones Research Center	ξ	
Nuclear Engineering Teaching	ξ	
Laboratory (NETL)	ξ	

AFFIDAVIT

Gerhard J. Fonken being duly sworn, hereby deposes and says that he is Executive Vice President and Provost, The University of Texas at Austin; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the enclosed requested Technical Specifications amendement of license R-129, for docket 50-602; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge and belief.

Gerhard J. Fonken
Executive Vice President and Provost

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 29th day of January, 1993.

David M O'Mary
NOTARY PUBLIC in and for the State of Texas

The manual and automatic reactor control modes are used for reactor operation from source level to 100% power. These two modes are used for manual reactor startup, change in power level, and steady-state operation. The pulse mode generates high-power levels for very short periods of time. High-power and low-power pulse mode options are available. The square-wave operation allows the power level to be raised quickly to a desired power level.

Manual rod control is accomplished by the lighted push buttons on the rod control panel. The top row of annunciators, when illuminated, indicates magnet contact with the armature and magnet current. Depressing any one of the AIR-MAGNET push buttons will interrupt the current to that magnet and extinguish the magnet current on indication. If the rod is above the down limit, the rod will fall back into the core and the AIR-MAGNET light will remain extinguished until the magnet is driven to the down limit where it again contacts the armature.

The middle row of pushbuttons (UP) and the bottom row (DOWN) are used to position the control rods. Depressing the pushbuttons causes the control rod to move in the direction indicated. Several interlocks prevent the movement of the rods in the up direction under conditions such as the following:

a. Scrams not reset.

b. Magnet not coupled to armature.

c. Source level below minimum count.

d. Two UP switches depressed at the same time.

e. Mode switch in one of the pulse positions.

f. Mode switch in AUTO position (regulating rod only).

There is no interlock inhibiting the down direction of the control rods except in the case of the regulating rod while in the AUTO mode.

Automatic (servo) power control can be obtained by switching from manual operation to automatic operation. All the instrumentation, safety, and interlock circuitry described above applies and is in operation in this mode. However, the regulating rod is now controlled automatically in response to a power level and period signal. The reactor power level is compared with the demand level set by the operator and is used to bring the reactor power to the demand level on a fixed preset period. Logic for the automatic control operation by proportional and integral control is contained within the digital algorithms of the control system. The purpose of this feature is to automatically maintain the preset power level during long-term power runs. The function of automatic control is provided by the regulating rod with a stepping motor drive.