GEORGIA INSTITUTE OF TECHNOLOGY

ATLANTA. GEORGIA 30332

January 14, 1977

U.S. Nuclear Regulatory Commission, Region II, 230 Peachtree Street, N.W. Suite 818 Atlanta, GA 30303

Reference: Docket 50-160

Gentlemen:

This letter is a report of an unusual event that occurred at the Georgia Tech Research Reactor. On Friday, November 12, 1976, the reactor was operated at 1 MW from 0857 hours to 1123 hours when it was shutdown for the week. Subsequent to the shutdown, the reactor operator began following GTRP. Procedure 2006, "Weekly Reactor Shutdown Checklist" (copy enclosed). Near the end of the procedure, the operator attempted to open the reflector drain valves. When the OPEN switch was operated, neither drain valve 5A or 5B (installed in parallel) opened. The operator pushed the CLOSE switch and then the OPEN switch which caused the reflector to be drained. Field inspection revealed that valve 5A was open and 5B was still closed.

Values 5A and 5B are air operated butterfly values in the top reflector drain line to storage tank TD-1. The control system is such that air must be supplied through an electro-pneumatic solenoid value to maintain the values in the closed position. The loss of either the electric signal or plant air will cause the values to open and drain the top D_2O reflector of the reactor. The values are installed in parallel so that either one will drain the reflector.

When the solenoid on the still closed valve 5B was lightly tapped, valve 5B immediately opened. Subsequently, both valves were opened and closed for 6 complete cycles without the reflector and an additional 3 complete cycles with the top reflector pumped up. In all 9 cases, both valves operated normally. On Monday, November 15, 1976, the solenoids from both drain valves were removed. Each was disassembled and thoroughly cleaned. The internals of both solenoids showed evidence of some dirt or trash presumably from the air supply to the valves. We believe it was this foreign material that caused failure of both solenoids to operate which in turn caused both drain valves to remain closed when the OPEN switch was operated. After reassembling the solenoid valves and installing them on the drain valves the drain system was operated for 8 complete cycles. The valves performed normally. Following the testing, the reactor was started up.

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To prevent this from occurring again we are making two changes. On an annual basis, both solenoid valves will be inspected and cleaned. Additionally, Procedure 2006 will be modified so that the field operator is present when the drain valves are opened. This will alert us to the occurrence of a single failure.

Should you require any additional information on this matter, please contact me.

Sincerely yours,

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Robert S. Kirkland, Reactor Supervisor

RSK:kmb Enclosure: GTRR Procedure 2006 cc: Members, Nuclear Safeguards Committee L. D. McDowell H. Kirbo

Shapter GEORGIA TECH RESEARCH REACTOR		Procedure 2006		
Normal Operation Weekly Reactor	Shutdown Check List	Approved 5/2/74 Revised 5/8/75 Page 1 of 1		
Test run ECCS pump	Close valve 8			
Weekly power calibration completed date and time	Re-establish over	Re-establish overflow		
Shutdown by stopping MD-3 or MD-4 and wait for No D_0 overflow scram	Remove Jumper from TEA-69 and from T Reset ECCS	Remove Jumper from TBA-82 to TBA-69 and from TBA-89 to TEA-98 Reset ECCS		
-2	Open spray block y	Open spray block valve		
Observe the following:	Reset Mag. Act. Amp			
Rod 2 low limit lights 1-4 Magnet current 0.18A	Energine slutshes	Energize clutches 1-4		
	Class second la			
	Close spray block	Manually allock valve		
Tastall jumpers from TPA - SO	Manually close rea valves	actor isolation		
to TEA-98 (Isolation valves not open scram) and TEA-82 to TEA-69 (D ₂ O level Reset Switch) Lower Scram Set point on FRA-H1 to zero and then stop MH-2A (MH-1) Switch pottermeter recorder off and install scram jumpers from TEA-29 to TEA-30 (D O flow	Observe the follow <u>Reactor isolation</u> <u>open</u> plate Rod magnet indi MD-3 (4) stoppe Mag. Act. curre	Observe the following: <u>Reactor isolation valves not</u> <u>open plate</u> Rod magnet indicators 1-4 off MD-3 (4) stopped Mag. Act. current 0.18A		
	Open Reactor isola (ECCS override)	Open Reactor isolation valves (ECCS override)		
scram 1 & 2)	Open ECCS spray bl	Open ECCS spray block valve		
Stop MD-2A	Re-establish over	Re-establish overflow		
	Reset ECCS	Reset ECCS		
close Spray Block Valve	Reset Mag. Act. An	Reset Mag. Act. Amp.		
Lower Reactor tank level	Reset clutches 1-4			
slowly by draining through value 8	Cooldown requireme	Cooldown requirements met		
NOTE: Whichever level channel tring	Secure MHe-1	Secure MHe-1		
first, the reactor isolation valves	Open reflector dra	Open reflector drain valves		
close. Stop draining, Override to reopen the valves and recommence drain.	Observe the follow Drain valves op Mag. Act. Amp.	Observe the following indications: Drain valves open plate Mag. Act. Amp. current 0.18		
Reactor tank low level plate Rod magnet indicators 1 & 2 off Rod magnet indicators 3 & 4 off	Drain time Switch pottermeter on and remove jun TBA-29 to TBA-30	sec. recorder per from	-	
Magnet current 0.18A	Security System Te	st		
Indicators 1 & 2 on MD-3 (4) stopped Reactor isolation valves		Date	Time	
Spray valves open	Operator		Dute	

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