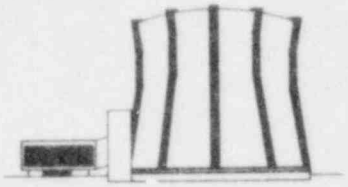
TEXAS ENGINEERING EXPERIMENT STATION

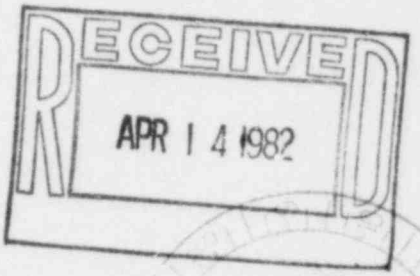
THE TEXAS A&M UNIVERSITY SYSTEM

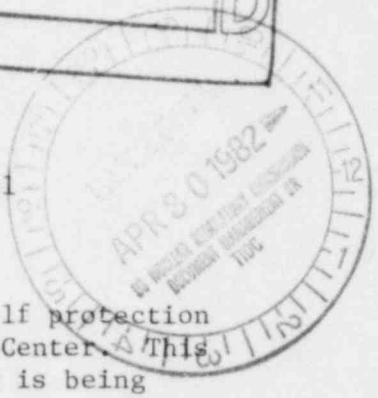
COLLEGE STATION, TEXAS 77843



NUCLEAR SCIENCE CENTER
713/845-7551

12 April 1982





Mr. G. L. Madsen
Office of Inspection
and Enforcement
Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza, Suite 1000
Arlington, Texas 76012

Subject: Required Self Protection of Special Nuclear Material

Dear Mr. Madsen:

Enclosed is a final report concerning the possible loss of self protection of special nuclear material at the Texas A&M Nuclear Science Center. This report is submitted in compliance with 10CFR73.71C and a copy is being sent to the Director of Inspection and Enforcement.

Sincerely,

Dale Rogers

Dale Rogers, Manager of
Reactor Operations

DR/ym

Enclosure

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Final Report of Possible Loss of Self Protection of Special Nuclear Material

The Texas A&M University Nuclear Science Center (NSC) is allowed to possess up to 1510 grams of non-self protected special nuclear material. There are currently twenty TRIGA FLIP fuel rods not located within the reactor core, and since each contains approximately 120 grams there are eight rods (two bundles) which must be maintained self protected. This report is being made in accordance with 10CFR73.71C to notify the Nuclear Regulatory Commission of the possibility of a brief loss of self protection on a fuel bundle at the NSC.

Fuel Bundle #06 was removed from the reactor core on 17 August 1981 and then monitored for self protection by surveying radiation levels at 18 feet in air. Due to the uncertainties associated with each measurement several instruments were used, and it should be noted in Table I that large discrepancies existed in the readings. Therefore, to be conservative the lowest value was always considered. Assuming a linear decay rate based on these lowest readings (Figure I) Bundle #06 was not expected to drop below 100 R/hr at three feet for another three weeks. However, a survey performed on March 30, 1982 indicated a level of approximately 76 R/hr at three feet.

Corrective Action

Due to the scattered data obtained throughout the survey it was not certain that the fuel bundle had actually decayed below the self protection limit. The bundle was placed in the reactor on April 2, 1982 and Region IV was initially notified on Monday, April 5, 1982. To avoid a future reoccurrence of this problem a more stringent survey program has been established. Also because of ALARA considerations an effort is being made to establish a method for performing fuel surveys underwater to reduce personnel exposure.

TABLE I

RADIATION SURVEY RESULTS OF BUNDLE #06

Date	Detector	R/hr @ 18'	R/hr @ 3'
11-3-81	Radector III Model 2064 SN 582	5.5	198
	Radector III Model 2035 SN 664	6.5	234
12-11-81	Radector III Model 2064 SN 582	5.0	180
	Radector III Model 2035 SN 1093	8.0	288
	Keithley Model 36100 SN 10934	5.99	216
1-4-82	Radector III Model 2064 SN 582	4.5	162
	Radector III Model 2035 SN 1093	6.9	248
	Keithley Model 36100 SN 10934	4.89	176
	Radector III Model 2035 SN 925	4.5	162
3-30-82	Radector III Model 2035 SN 1093	2.1	76
	Keithley Model 36100 SN 10934	2.16	78

NO. 340R-M DIETZGEN GRAPH PAPER
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Figure I

Decay of Bundle 06

(Plot of lowest reading from each survey)