

Crosbie

INTELCOM RAD TECH

January 20, 1975

United States Atomic Energy Commission
Attn: Mr. L. C. Rouse, Chief
Fuel Fabrication and Reprocessing Branch
Directorate of Licensing
Washington, D. C. 20545

Re: Docket 70-1359
SNM-1405

Gentlemen:

In response to requests as per telecon to Mr. K. L. Crosbie from Mr. J. Delaney your office on 31 December 1974, and conversations between Dr. D. Rundquist and J. Delaney on 8 January 1975, the following information concerning the CFX multiplier system is hereby submitted.

Item 1:

Increased reflector worth:

In our letter dated 28 August 1974 it was stated that reactivity effects of additional shielding of polyethylene or paraffin over 50% of the area was measured to be negligible with the system at a k_{eff} of 0.946. This measurement was repeated with a more reactive system ($k_{eff} = 0.989$) and it was determined that there is a small but measurable effect associated with the addition of 4" to 6" thick hydrogenous reflector (polyethylene and paraffin) or 4" to 8" of concrete over about 70% of the permanent reflector surface. This effect as reported in our letter of 15 Nov 1974 was \$0.06 both for the hydrogenous case and for the concrete.

Polyethylene plugs placed in the access ports, i. e. the Thermal Neutron Activation Analysis Port and radiography port, showed no measurable increase in reactivity.

Item 2:

Daily check out and organizational check out forms were supplied to your office on 8 Jan 1975. Kodak has our forms and intends to modify them to efficiently cover their operation.

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Item 3:

Separation of multiple units --

It is not anticipated that a situation would develop that more than one unit will be installed in any single customer facility. The possibility does exist that more than one unit may be in development and/or construction at the IRT corporation facility. The facility as described in our application CFX DESCRIPTION AND SAFETY ANALYSIS, INTEL-RT 5052-001 is adequate to handle more than a single unit. The units are effectively decoupled by virtue of the associated reflectors (a minimum of 4" of high density polyethelene) which completely surround the core and are an integral part of the core support structure. Additional separation of the units is necessary to provide access for loading operations.

However, in the event that more than one unit is present, administrative controls will be in effect to establish an isolated area for each unit. Isolation will be accomplished by distance or intervening shields other than the reflectors. The minimum surface to surface separation distance will be 8 feet of air or 24 inches of concrete. Each area will be established as an MBA for SNM accountability purposes.

Item 4:

The CFX core contains 1582.6 grams of U-235.

Item 5:

Fuel loading on site

All fuel handling operations at the installation site which include initial unpackaging of fuel, initial inventory, and fuel loading will be done by IRT personnel. Once loaded there is no need for any operation requiring the manipulation of fuel plates.

The fuel will be loaded at the site in precisely the same configuration as it was unloaded at IRT, i. e. each fuel plate and polyethylene moderator plate will be in the same location within the core. A map has been prepared designating fuel plate position and moderator position.

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Since the configuration of the system is the same at Kodak as at IRT, the fully loaded core will have the same reactivity as measured at IRT and the loading operation can be performed in a single step.

To determine that the system is as it was at IRT, flux measurements will be made in the thermal neutron activation analysis port with the safety rods at "full in" and at three intermediate positions between "full in" and full out prior to total withdrawal of the rods. These measurements will be compared with measurements made at IRT to assure that a k_{eff} of 0.990 will not be exceeded with the rods fully withdrawn.

These flux measurements will be made with the same fission counter and associated equipment as used at IRT. In addition to the comparison of flux measurements, power level information from the linear and logarithmic channels (these are also the same as used at IRT) will be compared to further establish that the system is identical.

The safety rods will not be fully withdrawn until it has been determined that the neutron flux is the same as that measured at San Diego when the reactivity was 0.990.

In our most recent submission dated 15 November 1974 it was stated in Supplement II, paragraph 1, line 12 that "There is an additional interlock directly associated with this in that the source must also be in the position before the rods can be moved." This is not the case so this sentence should be deleted. Also, in Supplement I, page 3, section 5, line 7 change WEP shielding to lithium carbonate loaded paraffin.

Thank you for your prompt attention to this submittal.

Yours truly,

C. A. Preskitt
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C. A. Preskitt
Vice President

CAP/km