

**RADIATION
STERILIZERS
INCORPORATED**

July 31, 1985

FEDERAL EXPRESS

Mr. John W.N. Hickey, Section Leader
Industrial, Medical and Academic Sections
Material Licensing Branch
Division of Fuel Cycle and Material Safety
U.S. N.R.C.
Willste Building
7915 Eastern Avenue
Silver Springs, MD 20910

Dear John:

Per your July 25, 1985 request, the following additional information is provided regarding the temperature monitoring of the WESF capsules in the Westerville, OH plant.

Chromel-alumel thermocouples will be used to monitor the temperature using an Omega digital potentiometer read out. The thermocouple wire will be insulated with a glass-resin cover. Ceramic standoffs will be used wherever the wire might contact the sources.

A dummy source, simulating a WESF capsule, will be used. The dummy will be of the same outside diameter, aluminum, and have 3/4" wall. A hole will be drilled into the mid-height of the dummy, and the chromel-alumel bead peened into the wall. The dummy will be sealed top and bottom.

The dummy will be loaded centrally into the source rack, and be surrounded by WESF capsules. The dummy will be positioned such that the thermocouple will be in closed proximity to the adjacent WESF capsule. The temperature should simulate the surface temperature of the WESF capsules within reasonable limits. It should be better than monitoring the source rack as we originally discussed.

The reference thermocouple will be located on the source cage as close as possible to the dummy thermocouple. The leads from the dummy will be routed vertically along the source rack. They will then be

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routed vertically to a pulley at the ceiling, and thence to the outside cell wall to connect to a terminal strip. Additional wires will attach to the terminal strip and be routed through wall penetrations to the readout potentiometer located outside of the cell.

As you know, I have always questioned the need to show that the surface temperature of the WESF capsule stays below 300°C in my application. Every thermal analysis and actual temperature measurement on the WESF capsules has shown that the surface temperature will not exceed 175°C. Enclosed is RSI's analysis which shows an expected surface temperature of 135°C.

The most recent thermal test run at PNL shows maximum surface temperatures of about 160°C in stagnant air. In our facilities the temperatures should be significantly lower because of our higher ventilation rates.

Of more concern to me are the potential safety hazards involved in having loose, moving wires strung around the inside of the radiation cell. I am very concerned that they could get entangled with the conveyor system, and potentially cause a source jam. If this occurs, I expect the NRC to accept the responsibility.

As stated in my previous letter, I would like to measure the temperature after the first loading, and then remove it once the corresponding cage temperature has been established.

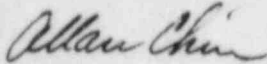
Thermal models and analyses have indicated that only immediately adjacent sources can influence a specific source. Therefore the capsule temperature is not affected by the total number of sources. The initial temperature reading should also be the worst case, since decay will always make it lower.

Based upon the above concerns, I am requesting that you permit us to remove the thermocouples after our first test. My major reason for this request is radiation safety.

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I would appreciate your rapid response to this request since we are planning to start loading WESF capsules into the Westerville plant on August 5, 1985.

Sincerely,

A handwritten signature in cursive script, appearing to read "Allan Chin".

Allan Chin
President

AC/tk

cc: Dr. Barry Fairand
D.G. Wiederman, Chief