

UNITED STATES JCLEAR REGULATORY COMMISSION REGION ! 631 PARK AVENUE KING OF PRUSSIA, PENNSYLVANIA 19406

FEB 1 2 1962

MEMORANDUM FOR: Vandy L. Miller, Chief, Materials Licensing Branch, NMSS

FROM: James H. Joyner, Chief Technical Inspection Branch, RI

SUBJECT: SAFETY DESIGN CRITERIA FOR IRRADIATOR FACILITIES

Two recent incidents at larges, in-air irradiator facilities in Region I have raised generic issues which should be reviewed by NMSS. At the Armed Forces Radiobiology Institute, a source plaque became jammed on an experiment and could not be lowered into the storage pool, while at the Becton Dickenson facility at New Caanan, Connecticut, the source rack became jammed on product tote boxes moving on the conveyer system while being irradiated and individual cobalt-60 pencils were dislodged from the source rack. The issues are:

1. Protective Barrier

In both incidents, a protective barrier, such as a metal screen, would have prevented the source rack from coming into contact with the items being irradiated. Consideration should be given to requiring licensees operating "in-air" irradiators in a continuous mode to install a protective barrier between the source rack and the objects being irradiated. This has been done at the Becton Dickinson facility. Reports from the manufacturer (AECL) indicate Becton Dickinson has experienced a reduction in down time due to minor jams as a result of this barrier.

2. Inspection Program

A program inspection of the product carrier system (e.g., aluminum or fiberboard tote boxes) for those irradiators that operate in a mode where product moves while the source is exposed may have prevented the incident at Becton Dickinson. Normal wear on these boxes causes bent flaps and torn seams which cause the tote boxes to exceed required clearances for transport through the product pass mechanism. We recommend that licensees which use product carrier systems be required to perform periodic inspections to detect defective boxes or other parts which could jam the conveyor system.

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3. Fire Suppression Systems

The incident at Becton Dickinson resulted in a fire inside the facility. The facility had a water sprinkler system which could be activated only by the fire in the irradiator room. The placement of the sprinkler heads was inadequate in that the spray failed to cover the entire area where the fire occurred. A manually activated system may have prevented the fire since it could have been activated once it was determined that the source rack was jammed in the elevated position. Some irradiator facilities have no internal fire suppression system. We recommend that large in-air irradiators be required to have water sprinklers or other fire suppression systems inside the irradiation cell.

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James H. Joyner, Chief Technical Inspection Branch

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