

**B-D** BECTON-DICKINSON

Route 7 and Grace Way, North Canaan, Connecticut 06018 / (203) 824-5487 / Division of Becton, Dickinson and Company

23 June 1981

Mr. Boyce H. Grier, Director  
Nuclear Regulatory Commission  
Region 1  
631 Park Avenue  
King of Prussia, Pa. 19406

Dear Mr. Grier:

Docket #30-06891  
IAL File No. 81-24  
License No. 37-03552-02

The following describes the recent cobalt incident at the Canaan facility.

Incident

At about 5:07 PM Thursday, May 14 the cobalt source rack was stuck in the up position. The appropriate personnel were summoned. Several attempts were made to free the source rack by B-D personnel manually lifting on the hoist cable. Eventually the panel lights indicated the source was down, but the cell monitor indicated that there was still a high level of radiation in the cell area. At this point AECL was notified. We were advised to check the monitor by connecting separate lines and a spare probe. After this was done the monitor still indicated the presence of high radiation levels. We were also requested to send pocket dosimeters into the cell area on the mono-rail trolley. When they were recovered high levels of radiation were confirmed. AECL then advised us to secure the area until their arrival.

AECL arrived the next day at approximately 2:45 PM and immediately started to perform their investigation which consisted of the deionizer survey, ventilation check, source up survey, water samples, check of the control panel, inspection of the source hoist and inspection and weighing of the source rack, and a thorough interview of all involved personnel. The source hoist was found free of defects and there were no apparent internal malfunctions. However, the source rack was approximately 40 pounds less than expected, indicating at least one-third of the source material was not in the rack. At that point video monitoring equipment was used and indicated that the top center module was missing and the lower center module was in position but most of the pencils were missing. The rack itself was undamaged and the four other modules were intact. A decision was made to drill a 2" hole through the roof in an attempt to locate the missing module and loose pencils. All necessary precautions were taken by AECL personnel to insure there was no hazard to any personnel. Through

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the use of mirrors and locally manufactured tools the module was returned to the pool. At this point the radiation at the hole dropped by a factor of approximately 40 indicating there were still one or two pencils exposed. Two subsequent 4" holes were drilled and again through the use of TV cameras and specially manufactured tools AECL personnel were able to pick up both pencils and drop them in the pool. Radiation levels immediately fell back to normal.

Upon clearance from AECL the cell area was entered and a thorough inspection of the source rack and product conveyor system was conducted and the cause of the incident was reconstructed.

#### Cause of Incident

A tote on the inner pass of the lower conveyor, lacking the structural support of its cover, apparently bent into the path of the source rack. The edge of this tote interfered with the bottom center of the source module. As the source rack descended the two center modules were prevented from going down. The top bar of the source rack made contact with the damaged tote, preventing the rack from lowering completely. At this point there was no support for the upper module and it is assumed the module leaned to one side until the top was touching the tote box. While raising the source rack in an attempt to free it, the upper module was also raised and eventually slipped off the rack and jammed on the upper conveyor support. It is also assumed that this action was sufficient to disrupt the pencils causing them to dislodge from the module.

#### Corrective Action

To eliminate the possibility of a reoccurrence of this problem, the following steps were taken.

- (1) All damage was repaired and certified by AECL.
- (2) The six pencils bent as a result of this incident were removed from operation and stored at the bottom of the pool. These bent pencils will be returned to AECL at the next source replenishment.
- (3) All of the pencils were installed in the racks and a new loading diagram was made.
- (4) New aluminum totes were instituted using thicker material. All four sides are closed and the top is open. Reinforcing bands were welded at the top, bottom, and middle sections of all totes.
- (5) Aluminum sheets of approximately 1/8" thickness were installed to form a shroud separating the source from the product conveyors. This will prevent product totes from interfering with the source rack as well as prevent any pencils from jamming between the product and the conveyors.

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- (6) We will investigate moving the automatic sprinkler heads to provide better coverage of the source rack and product totes. If feasible an additional manual sprinkler system will be installed over the source rack. The nozzles will be positioned so they all spray the source and product totes on either side of the source rack. These actions will be implemented after compliance with national fire protection and safety codes has been determined. In conjunction with this system two radiation monitor probes will be mounted on the resin beds of the water deionizer system.

In conclusion we believe the above corrective action procedures combined with thorough reinstruction to all operating personnel will eliminate the possibility of a reoccurrence.

Sincerely,

BECTON, DICKINSON AND COMPANY

*A. P. Rowjohn*

A. P. Rowjohn  
Plant Manager

*R. G. Crook*

R. G. Crook  
Manager, Bacteriological and  
Sterilization Services

/ed