

# INTERNATIONAL PAPER

ANDROSCOGGIN MILL

JAY, MAINE 04239

July 25, 1989

Mr. Thomas Thompson  
Nuclear Regulatory Commission  
Region 1  
475 Allendale Road  
King of Prussia, PA 19406

Dear Mr. Thompson:

On Monday morning, July 24, 1989, Brent Mitchell, Amanda Barton, and I (one of the mill's Radiation Safety Officers, RSO) went to the wood chip silo area to inspect the installation of new chip silo brackets to be used for the Berthold nuclear sources. The Berthold sources were to be relocated from the cone of the silos to the tile wall in an effort to reduce the vibration to the gauges. Vibration was suspected to have caused the failure of the shutter closing mechanisms. The manufacturer was scheduled to remove the sources from the old housings to the new housings located on the new brackets Tuesday, July 25.

Upon arriving at the area we discovered a potential exposure when we noticed two gamma Cobalt 60 sources laying on the ground in the chip silos. One source was located in #1 silo and was about 1-2 feet away from a cement wall pointing in that direction. The other source was in #2 silo facing downward about 2 feet from the cement wall.

The area was immediately cleared of personnel which at that time consisted of one millwright, Brent, Amanda, and me; and the area was barricaded off. Peter Crosson, who is another RSO, and I returned with a Ludlum model 3 survey meter with an open probe and began measurements. Approximately 2-3 feet from the gauges the meter read 2 mr/hr. (A reading was not taken around the front half of the gauge where the beam was directed.) Readings behind the cement wall were non-detectable. The gauge in #1 silo was then moved to face the ground. Additional readings indicated that 5 mr/hr were detected directly at the housing of the source for both the gauges when facing toward the ground.

A rope was tied to the gauges by RSO Peter Crosson and he dragged the gauges into a room (approximately 30 feet away) that had cement walls on three sides with a wood door on one of the sides. The gauges were face down and the room was secured. The readings done around the room were non-detectable.

The Androscoggin Mill knew the shutters of the gauges were broken in the open position and had contacted the manufacturer to help solve the problem. The solution agreed upon was to mount the gauges on the tile wall instead of on the cone of the silo where they are currently located, to reduce the amount of vibration the gauges were subjected to.

(2)

Through employee interviews I determined that two maintenance millwrights, John Paul Grignon and Perry Nye, installed a bracket on one silo on Friday, July 21, 1989, at approximately 1:30 p.m. and unbolted and removed one Cobalt gauge. The gauge removal was not part of the job. The gauge was unbolted in approximately 10 minutes and lowered 3 feet with a come-a-long to a platform on the silo and then lowered another 25-30 feet with another come-a-long. The whole process of unbolting and lowering the gauge took approximately 30 minutes. The gauge was placed on the ground with the beam facing the cement wall.

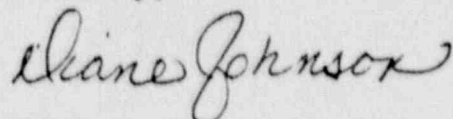
The same procedure was used for the second Cobalt gauge on the other silo on Monday, July 24, 1989, at approximately 7:00 a.m. However, the gauge was placed on the ground with the beam directed toward the ground.

Additional employees that may have been exposed to the source placed on the ground on July 21, 1989, were cleaners from the chip room production area. The normal clean-up time is 10 minutes once per shift. They work a 12-hour shift on weekends, so two people could have been exposed for 10 minutes for July 21, 22, and 23.

The worst case exposure was to the maintenance millwrights who removed the gauges. The gauges were manufactured in October 1986, therefore the activity of each gauge was reduced from 50 microcuries to 34.2 microcuries. The dose rate constant for Cobalt 60 is 2. For a worst case condition (if the source was 6 inches from the whole body of a maintenance employee for a total of 2 hours), the exposure to a maintenance employee is estimated to be 3.8 rems. The exposure calculations are attached.

At 5:30 p.m. Monday night, a representative, Bill Cousek, arrived from Bethold. I explained what happened and showed him the site involved. On Tuesday the sources were removed from the old housings by Bill and placed into the new housings. This was completed at approximately 3:00 p.m.

Sincerely,



Diane Johnson  
Industrial Hygienist

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T = HALF LIFE

N = # OF HALF LIVES THE MATERIAL HAS GONE THROUGH

T = LENGTH OF TIME PASSED

A = CURRENT ACTIVITY

$$N = \frac{T}{\tau}$$

$$\frac{1}{2^N} \text{ (Original) = A} \\ \text{(Activity)}$$

$$D = \frac{K \times A}{(d)^2}$$

$$N = \frac{T}{\tau} = \frac{33 \text{ mo}}{60 \text{ mo}} = 0.55$$

$$A = \frac{1}{2^{0.55}} (50) = \frac{1}{1.46} (50) = 34.2$$

$$D = \frac{2 \times 34.2}{(6)^2} = 1.9 \text{ rem/hr}$$

EXPOSURE = (#HRS. EXPOSED) (D) = rem

= (2 hrs.) 1.9 = 3.8 rem 2 hr. exposure

= (1 hr.) 1.9 = 1.9 rem 1 hr. exposure