

From: John A. Grobe (JAG) *RIT*
To: JEH *John House, RIT*
Date: Monday, December 5, 1994 11:08 am
Subject: AMS/NEORSO Cobalt Solubility

Folks,

This is a follow up to my previous e-mail on the same subject.

Two substantive matters have come to light that ameliorate this issue.

1. I spoke with the sewer district regarding their technique for analyzing the liquid effluents from AMS. They indicated that they were counting the samples and then filtering the samples with 0.45 micron filter media. They then counted the filter paper as well as recounted the filtrate. When cobalt was found in the sample, it was found on the filter paper and in the filtrate after filtering. This confirms that there was some non-dissolved cobalt-60 in the effluent sample.

2. Cyndi Jones informed me that for the purposes of 10 CFR 20.2003, cobalt-60 oxide is not soluble.

Consequently, this issue is resolved and we will be issuing the report today (hopefully!!).

Thanks.

Jack

CC: FCC, JXD1, CGJ, BAB1, MFK, WLA, CJP1, WJS2

AMS Co-60 Effluent Considerations

Justin
11/29/94

- Water Sample Collected 8/17/94 \Rightarrow 35 pCi/l

Specific Activity of Co-60 \Rightarrow $1.13 \text{E}3 \text{ Ci/g}$

$$\left(\frac{35 \text{ pCi}}{\text{L}} \right) \left(\frac{\text{L}}{1000 \text{ mL}} \right) \left(\frac{\text{mL}}{1 \text{ g H}_2\text{O}} \right) \left(\frac{\text{Ci}}{1 \text{E}12 \text{ pCi}} \right) \left(\frac{\text{g Co-60}}{1.13 \text{E}3 \text{ Ci}} \right) = 3.1 \text{E}-17 \frac{\text{g Co-60}}{\text{g H}_2\text{O}}$$
$$\underline{\underline{= 3.1 \text{E}-8 \text{ ppb Co-60}}}$$

This is an incredibly small amount of Cobalt.
(3 hundred millionths of a part per billion)

- For some regulatory perspective

10 CFR 20, Appendix B, Table 3, "Release to Humans"

- for soluble cobalt or cobalt in readily dispersible biological material -

Monthly Average Concentration Limit
 $3 \text{E}-5 \text{ } \mu\text{Ci/mL}$

AMS's discharges, if they are soluble would be

$$\left(\frac{35 \text{ pCi}}{\text{L}} \right) \left(\frac{\text{L}}{1000 \text{ mL}} \right) \left(\frac{\mu\text{Ci}}{1 \text{E}6 \text{ pCi}} \right) \left(\frac{\text{mL}}{3.0 \text{E}-5} \right) \times 100\% = \underline{\underline{0.1\% \text{ OF LIMIT}}}$$

- Exempt Concentration 10 CFR 30.71, Schedule B

Cobalt - 60 \Rightarrow $1 \mu\text{Ci}$

At $\frac{35 \text{ pCi}}{\text{L}}$

$$\left(\frac{\text{L}}{35 \text{ pCi}} \right) \left(\frac{1 \text{E}6 \text{ pCi}}{\mu\text{Ci}} \right) (1 \mu\text{Ci}) = 2.9 \text{E}4 \text{ L or } 29,000 \text{ L}$$

to have an exempt quantity



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

MEMORANDUM TO: Carl J. Paperiello, Director
Division of Industrial and Medical Nuclear Safety, NMSS
Malcom R. Knapp, Director
Division of Waste Management, NMSS
James Lieberman, Director, Office of Enforcement
Lawrence J. Chandler, Assistant General Counsel for Hearings
and Enforcement

FROM: W. L. Axelson, Director *W. L. Axelson*
Division of Radiation Safety and Safeguards, RIII

SUBJECT: REVISED REPORT ON RESULTS OF NRC RADIOLOGICAL SURVEY AND
SAMPLE ANALYSIS OF SEWER INTERCEPTOR UNDER LONDON ROAD,
CLEVELAND, OHIO, OUTSIDE THE AMS FACILITY AND THE AMS
MANHOLE

Enclosed for your concurrence is a revised inspection report documenting the results of our surveys conducted at the London Road sewer interceptor and the AMS manhole. This inspection report includes your comments/changes requested after review of the initial draft report, which was provided to you in a memorandum dated October 24, 1994.

As stated in this revised report, we have identified one apparent violation of effluent release requirements pursuant to the current Part 20 requirements.

We would appreciate your concurrence within 5 working days of receipt of this document.

Enclosure: Draft Inspection Report
No. 030-16055/94001(DRSS)

CONTACTS: Bill Axelson, RIII/DRSS
(708) 829-9800

Jack Grobe, RIII/DRSS
(708) 829-9837



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

Advanced Medical Systems, Inc.
ATTN: Mr. David Cesar, Treasurer
1020 London Road
Cleveland, OH 44110

SUBJECT: RESULTS OF NRC RADIOLOGICAL SURVEY AND SAMPLE ANALYSIS OF THE
ADVANCED MEDICAL SYSTEMS, INC. (AMS) WASTEWATER PIPING AND ITS
OUTFALL INTO THE CITY OF CLEVELAND SEWER (REPORT NO. 030-16055/
94001(DRSS))

Dear Mr. Cesar:

This refers to the special inspection conducted by Messrs. Michael Kurth and Edward Kulzer of this office from August 17 through October 14, 1994. The special inspection was conducted to examine the radiological conditions of wastewater exiting your facility through your wastewater piping and in the City of Cleveland sewers in the vicinity of the sewage outfall from your facility. The inspection was prompted by the identification of exposure rates above background in the City of Cleveland sewer at the Advanced Medical Systems, Inc. (AMS) outfall. The results of this inspection were discussed with you at the conclusion of the inspection.

As described in the enclosed report, extensive radiation surveys and sampling of solid and liquid materials were conducted identifying cobalt-60 in the solid sediment from the city sewers and your wastewater piping. Also, cobalt-60 was being carried in the wastewater at the AMS outfall into the city sewers. This appears to represent a violation of 10 CFR 20.2003 which permits only the discharge of soluble material or readily dispersible biological material in water.

We plan to meet with you in the near future to discuss these inspection findings. We will contact you at a later date to schedule this meeting. Following our meeting, a decision will be made on the appropriate enforcement action regarding the apparent violation. As such, no Notice of Violation is being issued at this time. While no Notice is being issued and no written response is required, we expect that prompt action has been or will be taken to correct this apparent violation.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC Public Document Room.

Mr. David Cesar

-2-

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

W. L. Axelson, Director
Division of Radiation Safety and Safeguards

License No. 34-19089-01
Docket No. 030-16055

Enclosures: 1. Inspection Report
No. 030-16055/94001(DRSS)

cc w/encl: NEORSD
City of Cleveland