

From: Catherine Haney, NMSS
To: NCD2.CH2.MFW1 mweber, RIII
Date: 2/22/96 2:38pm
Subject: Ltr to Meschter

Sorry about the delay in providing concurrence however, I needed to confer with Don Cool about issue* surrounding this letter. You have IMNS concurrence with the inclusion of the changes noted in the attached file.

Please note that concurrence on this document does not constitute the establishment of a policy for sampling (methodology or establishing MDA limits.) Policy issues on sampling will be addressed during the review of the TAR recently submitted by RIII.

H8/21

Robert Meschter
Radiation Safety Officer
Advanced Medical Systems, Inc.
1020 London Road
Cleveland, OH 44110

Dear Mr. Meschter:

I am writing in response to your recent request to Mr. Michael F. Weber of my staff for information concerning RIII's sampling and analysis of AMS tank 880.

On February 13, 1995, an NRC inspector went to AMS and took seven water samples from tank 880. Four samples were obtained from the top of the tank while the water was being recirculated. (The water in the tank had been recirculating for approximately 24 hours.) Three samples were obtained from the bottom outlet valve of the tank. These bottom samples were taken one hour after the recirculation pump had been turned off. Prior to taking the samples, approximately two liters of water was drained from the bottom outlet valve and returned to the tank.

The analysis of the samples from tank 880 is still in progress. To date, two samples from the top and two samples from the bottom of the tank have been filtered. No Co-60 was detected on the filters from the top samples, but Co 60 was detected on the filters from the bottom samples. (The analysis results are summarized in Attachment 1.) Based on these results, we are reviewing the adequacy of your sampling and analysis procedures.

On February 16, 1996, because of the cobalt-60 detected on the filters, we informed AMS that insoluble cobalt-60 was detected in the water from tank 880, and therefore, a discharge of tank 880 would be a potential apparent violation of 10 CFR 20.2003.

Once our analysis of samples from tank 880 is complete, you will be provided the complete results. In the meantime, please do not hesitate to contact me should you have any further questions.

Sincerely,

Geoffrey C. Wright, Acting Deputy Director
Division of Nuclear Materials Safety

Attached: As stated

cc: standard AMS distribution

RIII	RIII	NMSS	OGC	RIII
Weber	Madera	Cool	Zobler	Wright

ATTACHMENT 1

Results of NRC's Analysis of Filters from Tank 880

AMS Tank Number	Filter Number	Activity (pCi)	MDA (pCi)	Count Time (hours)
880 top	2	< MDA	1.7	15.7
880 top	3	< MDA	2.3	11.0
880 bottom	1	17.2 \pm 1.2	1.5	24.4
880 bottom	2	19.6 \pm 2.0	2.4	7.2

NOTES:

- (1) MDA stands for minimum detectable activity.

2/28/96

1. Are releases to parking lot/ground area, of which some of the release will go to a storm drain that is connected to the waste water treatment facility, releases to the sanitary sewer covered under 10 CFR 20.2003?

Assuming that the release goes through a sanitary sewerage system on its way to a waste water treatment facility or that the waste water treatment facility was part of the sanitary sewerage system, such release is covered under section 20.2003.

2. If the cobalt-60 adheres to biological material (specifically bacteria growing in the tank in this case), does the "readily soluble dispersible material" clause of 10 CFR 20.2003 apply?

No, the presence of bacteria growing in the tank does not implicate the biological material clause of section 20.2003. Section 20.2003 permits the discharge into a sanitary sewerage system of readily dispersible biological material. This clause of section 20.2003 refers to biological materials in which radioisotopes are found resulting from medical, research, or experimental activities. In those instances the radioisotopes would be found incorporated into the biological material and be as dispersible as the biological material, and not merely adherent to an organism simply because both were found in the same environment.

3. Is there a firm legal basis to issue an Order AMS to stop releasing to the parking lot/ground, if the cobalt-60 is determined to be insoluble, even if the concentration is well below 10% of the levels expressed in Appendix B, Table 3?

To be addressed under separate cover.

4. Could AMS release to a water body (creek, etc.) on their own property if the cobalt-60 was found insoluble?

Yes. Assuming that the release would not go off its property and into the sanitary sewerage system, the prohibitions of section 20.2003 would not be applicable.

5. Could the water be processed to eliminate the soluble cobalt-60 before discharging to the parking lot/ground that could enter the storm drain system connected to the water treatment facility?

If AMS were to process the water to eliminate the soluble cobalt-60, so that the water contained no insoluble cobalt, such a release would not violate section 20.2003, assuming all other applicable sections of section 20.2003 were met.

12/22

AMS Tank 880 - Chronology

2/12/96 RIII receives fax from NEORSD which indicates that AMS Tank 880 contains insoluble Co-60.

2/13/96 At AMS, RIII inspector obtains seven water samples from AMS Tank 880. Four samples are obtained from the top of the tank while the water is being recirculated. (The water in the tank had been recirculating for approximately 24 hours.) Three samples are obtained from the bottom outlet valve of the tank. These bottom samples are taken one hour after the recirculation pump had been turned off. Prior to taking the samples, approximately two liters of water was drained from the bottom outlet valve and returned to the tank.

Subsequent NRC analysis reveals presence of Co-60 on the filters from the bottom samples.

2/13/96 RIII receives fax from AMS which indicates that a water sample from Tank 880 has a Co-60 concentration of 3.1 ± 1.9 pCi/l, with an MDA of 3.6 pCi/l.

2/16/96 RIII informs AMS that insoluble cobalt-60 was detected in the water from Tank 880, and therefore, a discharge of Tank 880 would be an apparent violation of 10 CFR 20.2003. RIII also transmits the following results of NRC's analysis to AMS:

AMS Tank Number	Filter Number	Activity (pCi)	MDA (pCi)	Count Time (hours)
880 top	2	< MDA	1.7	15.7
880 top	3	< MDA	2.3	11.0
880 bottom	1	17.2 ± 1.2	1.5	24.4
880 bottom	2	19.6 ± 2.0	2.4	7.2

2/22/96 RIII transmits TAR re: solubility testing, etc., to NMSS

2/26/96 Telephone conference call with RIII, NMSS, and AMS. AMS indicates that it will filter the water from Tank 880 with a 1 um filter, decontaminate the tank, add another pump to the tank in a way to ensure both horizontal and vertical mixing, and then test the water for solubility.

2/29/96 RIII discusses environmental LLDs, solubility testing, etc., with NRR. The information obtained from NRR is transmitted to NMSS during subsequent phone conversations and morning meetings, and via e-mail.

14/23

3/4/96 RIII receives fax (FAX #1) from AMS transmitting the following results:

Count	Location	Water/Filter	Activity (pCi/l)	MDA (pCi/l)
1st	Top	Water	3.5 ± 7.6	18
1st	Top	Filter	2.3 ± 1.7	1.6
1st	Bottom	Water	4.3 ± 2.8	4.5
1st	Bottom	Filter	-0.8 ± 2.8	8.0

3/4/96 RIII transmits above results via telephone to NMSS.

3/6/96 RIII faxes FAX #1 to NMSS.

3/6/96 RIII receives fax (FAX #2) from AMS transmitting the following results:

Count	Location	Water/Filter	Activity (pCi/l)	MDA (pCi/l)
2nd	Top	Filter	-0.36 ± 0.34	3.7
1st (recalc)	Bottom	Filter	-0.3 ± 1.2	3.3

3/6/96 RIII transmits above results via telephone to NMSS.

3/6/96 RIII faxes FAX #2 to NMSS.

3/6/96 NMSS notifies RIII by telephone that AMS may discharge Tank 880.

3/7/96 RIII notifies AMS by telephone that AMS may discharge Tank 880.

3/12/96 RIII requests memo from NMSS giving a technical basis for NMSS' decision re: the discharge of Tank 880.

3/18/96 RIII receives NMSS' memo re: the discharge of AMS Tank 880.

3/19/96 In a phone conversation with NMSS, RIII expresses concerns about NMSS' memo.

3/19/96 RIII sends e-mail to NMSS with results from AMS' FAX #1 and FAX #2.

3/19/96 RIII requests a revision of NMSS' memo re: the discharge of AMS Tank 880.

MEMORANDUM TO: John Madera, Chief
Materials Licensing Branch
Division of Nuclear Material Safety, RIII

FROM: Catherine Haney, Acting Chief
Operations Branch
Division of Industrial and Medical
Nuclear Safety, NMSS

SUBJECT: DISCHARGE OF AMS STORAGE TANK #880

We reviewed the results of the water analysis for Tank #880 at the AMS facility, provided by Lockheed Analytical Services and dated 29 February, 1996. Based on the results of these analyses, and the fact that the analyses were made with sufficiently high measurement sensitivities for this purpose, we have concluded that the results do not show any indications of the presence of Co-60 in the water, either in soluble or insoluble form. We therefore recommend that AMS be permitted to discharge the contents of the tank.

CONVERSATION RECORD

Time
~10:00 amDate
2/28/96

Visit
X

Conference

X Telephone

Incoming
X Outgoing

Contact
Steve ClementowiczOrganization
NRRPhone No.
301-415-1084

Subject
AMS

Summary

Q: A power reactor has some liquid waste containing Co-60 (only), and the utility wants to release the waste as a FREE RELEASE. What NRC requirements must the utility meet?

A: There are no release limits for a free release. The utility would have to count to the environmental LLDs. If Co-60 is not detected, then a free release could be made. If Co-60 is detected, then the waste is considered radioactive, and a free release would be prohibited.

Q: A materials licensee - or a power reactor - has some liquid waste containing Co-60 (only), and the licensee wants to release the waste to a sanitary sewer. Therefore, the requirements of 10 CFR 20.2003 apply. If the licensee counts to the environmental LLDs, and Co-60 is not detected, would NRC require the licensee to test for solubility?

A: No. Since the liquid isn't considered radioactive, there is no need to test for solubility.

Q: A materials licensee - or a power reactor - has some liquid waste containing Co-60 (only), and the licensee wants to release the waste to a sanitary sewer. Co-60 is detected in the liquid, so the licensee must test for solubility by passing a liquid sample through a 0.45 um filter and then counting the filter. What are the MDAs, LLDs, or whatever, which must be reached by the licensee when counting the 0.45 um filter?

A: NRC does not have a MDA or LLD for this. There is no number. A licensee submits a proposal, and NRC either approves it or denies it. Part 20 requires a licensee to perform an appropriate survey, using appropriate instruments. NRC would not expect the same degree of sophistication in a small materials licensee as compared with a large utility.

Steve also mentioned a case (Univ. of IL) where the licensee has proposed passing liquid wastes through a 0.45 um filter prior to disposal. NRC considers this proof that the liquid being discharged is soluble; thus, no solubility tests are required.

Steve indicated that Dave Fauver is the NMSS expert on these matters.

Steve also said that Reg. Guide 4.8 (Dec. 1975), which contains the current environmental LLDs, is the most current reference on this subject. Other useful references include: IN 88-22, IN 81-07, IN 87-92, HPPOS 43, 45, 48, 71, 72, 73, 106, 138, 171, 221, 250, and 300.

Action

Discuss w/ NMSS

Name
Michael F. Weber

Signature

Date
2/29/96

CONVERSATION RECORD

Time
~9:00 am

Date
9/14/95

Visit

Conference

X Telephone

X Incoming
Outgoing

Contact
Rateb Abu-Eid (Boby Eid)

Organization
NMSS

Phone No.
301-415-5811

Subject
AMS

Summary

This concerns the processed water at AMS and the proposal to discharge the water at the Geneva WTP.

I discussed the method used by AMS to prove solubility (pass through 0.45 um filter if Co-60 was detected above 20 pCi/l MDA, soluble if no Co-60 detected on filter; no test if concentration < MDA). He said the 0.45 um criteria is found in IN 94-07, and that the method used by AMS was "great."

I asked if the regs differentiate between processed and non-processed water. He was not aware of any reg which differentiated between the two.

Action
N/A

Name
Michael F. Weber

Signature

Date
9/14/95

CONVERSATION RECORD

Time
~4:00 pmDate
9/13/95

Visit
X

Conference

X Telephone

Incoming
X Outgoing

Contact

Organization

Phone No.

John House, RIII; Steve Klementowicz, NRR; Mike Murphy, EPA

Subject
AMS

Summary

This concerns the processed water at AMS and the proposal to discharge the water at the Geneva WTP.

A. John and Steve

I asked if the regs differentiate between processed and non-processed water - they said no.

I discussed the method used by AMS to prove solubility (pass through 0.45 um filter if Co-60 was detected above 20 pCi/l MDA, soluble if no Co-60 detected on filter; no test if concentration < MDA). John said the 0.45 um criteria is found in IN 94-07. Both said the method was acceptable. Steve said that power plants use 15 pCi/l as the LLD (this is the environmental limit, as found in NUREG 1301), and that if the levels are below 15 pCi/l, the water is considered nonradioactive and thus a test for solubility is not required.

B. Mike

I asked if the EPA regs differentiate between processed and non-processed water - he said, at these levels (approx. 100 pCi/l), no.

I asked him to explain the paragraph in the 8/12/95 CPD article beginning with "Nonetheless, the Ohio EPA....". He stated that the statements were incorrect. He indicated that he was not aware of any EPA rule which would prohibit AMS from discharging the water at the Geneva WTP.

Action

Call NMSS solubility expert Boby Eid (301-415-5811) for another opinion.

Name

Signature

Date

Michael F. Weber

9/13/95

CONVERSATION RECORD			Time	Date
10:00 am			2/28/96	
Visit			Conference	
X Telephone	Incoming			
	X			
				X Outgoing
Contact	Organization	Phone No.		
Steve Klementowicz		NRR		301-415-1084
Subject				
AMS				
Summary				

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Discuss w/ NMSS			Action
Name	Signature	Date	
Michael F. Weber			2/29/96