



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

June 21, 1995

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

Dear Mr. Meschter:

Enclosed is Amendment No. 36 to your NRC Material License No. 34-19089-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office so that we can provide appropriate corrections and answers.

This amendment authorizes the following items: (1) Subitem iv. of License Condition 21.H.iv. (previously License Condition 20.H.iv.) has been removed; (2) License Condition 20. has been added allowing you to re-connect the foundation under drain system to a new manhole and lateral for the purpose of collecting water from the existing under drain system to be pumped for storage and analysis for cobalt-60 concentration; and (3) Your letter dated June 14, 1995 has been tied down in License Condition No. 21.I. to allow the RSO to make minor changes to the provisions of RWP No. 95-10 and the work plan as described in Attachment 3, Item G of your June 14 letter. However, please note that the issuance of this amendment does not preclude you from the requirement to continue to collect and analyze foundation water to ensure 10 CFR Part 20 criteria has been met, to assure that surrounding soil is free of contamination.

Finally, we have received your June 16, 1995 response to our June 14, 1995 deficiency letter and will make every effort to review your response in an expeditious manner. We will notify you if we have additional questions. Again, please note that we have only approved the installation of a new manhole and lateral and its re-connection to the existing under drain system. We will need to evaluate all of the other issues regarding cobalt-60 contamination within the existing under drain system and soils both under the building and in the vicinity of the under drain system prior to discharge of collected water.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

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1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Notify NRC, in writing, within 30 days:
 - a. When Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or
 - b. When the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.
4. Request and obtain a license amendment before you:
 - a. Change Radiation Safety Officers;
 - b. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
 - c. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or
 - d. Change ownership of your organization.
5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will

June 21, 1995

result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

K. G. N. 11
for John R. Madera
Nuclear Materials Licensing Section

License No.: 34-19089-01
Docket No.: 030-16055/040-08764/
030-171554

Enclosure: Amendment No. 36

MATERIALS LICENSE

uant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of
ral Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made
uy the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear
material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to
persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions
specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the
Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with letter dated June 14, 1995
1. Advanced Medical Systems, Inc.		3. License Number 34-19089-01 is amended in its entirety to read as follows:
2. 1020 London Road Cleveland, OH 44110		4. Expiration Date December 31, 1994
		5. Docket or Reference No. 030-16055/040-08764/030-17154
6. Byproduct, Source, and/or Specifi Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License
A. Cobalt-60	A. Solid Metal	A. 150,000 curies
B. Cobalt-60	B. Sealed sources (teletherapy/ radiography sealed sources which have been evaluated and approved for commercial distribution by the NRC or an Agreement State)	B. 135,000 curies (no single source to exceed 13,700 curies)
C. Cesium-137	C. Sealed sources (teletherapy/ radiography sealed sources which have been evaluated and approved for commercial distribution by the NRC or an Agreement State)	C. 40,000 curies (no single source to exceed 2,200 curies)
D. Depleted Uranium	D. Nickel Plated	D. 4,040 kilograms
E. Cobalt-60	E. Sealed Sources	E. 15,000 curies

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Amendment No. 36

6. Byproduct, source,
and/or special nuclear
material

F. Cobalt-60

7. Chemical and/or physical
form

F. Sealed Sources
(any sealed source
approved by the NRC
or an Agreement
State)

8. Maximum amount that
licensee may possess at
any one time under this
license

F. 15 millicuries

9. Authorized Use:

- A. For storage only incident to waste disposal or transfer to an authorized recipient. This license does not authorize the manufacture of sealed sources.
- B. For installation, maintenance of, dismantling and servicing of Picker Corporation and Advanced Medical Systems, Inc. teletherapy units and Picker Model 6145 radiography units possessed by licensees authorized to possess the radioactive material pursuant to a specific license issued by the Commission or an Agreement State. For installation and removal of sealed sources into Picker Corporation, Advanced Medical Systems, Inc. and Keleket Barnes teletherapy units of licensees authorized to possess the radioactive material pursuant to a specific license issued by the Commission or an Agreement State. For training Hospital or Clinic personnel for in-house service operations on teletherapy equipment, on unit model per course, in accordance with letter dated August 15, 1988 and September 29, 1988.
- C. For installation, maintenance, dismantling and servicing of Picker Corporation and Advanced Medical Systems radiography and teletherapy units of licensees authorized to possess the radioactive material pursuant to a specific license issued by the Commission or an Agreement State.
- D. Shielding material in Picker Corporation and Advanced Medical System, Inc., radiography and teletherapy devices.
- E. For storage only, those non-NRC approved sources in the possession of the licensee prior to the issuance of this amendment.
- F. For use in devices (including Tech OP Model 571 Calibrator described in application dated November 12, 1984) approved by the Nuclear Regulatory Commission or an Agreement State to calibrate radiation survey instruments.

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Amendment No. 36

CONDITIONS

10. Licensed material in Items 6.A., 6.E. and 6.F. shall be used only at the licensee's facility at 1020 London Road, Cleveland, Ohio. Licensed material in Items 6.B. and 6.C. shall be used only at 1020 London Road, Cleveland, Ohio and at facilities of customers who possess a specific license from the NRC authorizing possession of the licensed material. Licensed material in Item 6.D. shall be used only at the licensee's facilities at 1020 London Road, Cleveland, Ohio or 121 North Eagle Street, Geneva, Ohio, and at facilities of customers who possess a specific license from the NRC authorizing possession of the licensed material.

11. A. The Radiation Protection Officer for service operations described in Subitems 9.B. and 9.C. and routine health physics activities is Robert Meschter.

The licensee shall not perform service operations described in Subitems 9.B. and 9.C. until Robert Meschter has completed the required training.

- B. Licensed material shall be used by, or under the supervision of and in the physical presence of users listed in the table below. The users are only authorized to perform the indicated services on the teletherapy or radiography units specified in the table below:

AMS/PICKER TELETHERAPY/RADIOGRAPHY UNITS MODELS

	CS 600	C 1000	C 2000	C 3000	C 5000	C 10,000	C4	C8	C9	C12	Cyclops
USER											
Curtis Perry				3	1.2	1.2	1.2	1.2	1.2		1.2
Haddock	5	5	5	5	5	5	5	5	5	5	5

AMS/PICKER TELETHERAPY/RADIOGRAPHY UNITS MODELS

	V 1000	V 2000	V 3000	V 10,000	C V4	C V9				
USER										
Curtis Perry		1.2	1.2	1.2	1.2	1.2				
Haddock	5	5	5	5	5	5				

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11. (Continued)

1. Authorizes the servicing of AMS/Picker units, excluding source exchange.
 2. Authorizes sealed source exchange.
 3. Authorizes removal of unit and head from customer sites only.
 4. Authorizes the training of AMS personnel in the manufacture of AMS/Picker sealed sources.
 5. Authorizes the handling of sealed sources only.
12. A. (1) Each sealed source acquired from another person and containing licensed material, other than hydrogen-3, with a half-life greater than 30 days and in any form other than gas shall be tested for contamination and/or leakage before use. In the absence of a certificate from a transfer or indicating that a test has been made within 6 months before the transfer, a sealed source received from another person shall not be put into use until tested.
- (2) Notwithstanding the periodic leak test required by this condition, any licensed sealed source is exempt from such leak tests when the source contains 100 microcuries or less of beta and/or gamma emitting materials or 10 microcuries or less of alpha emitting material.
- (3) Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage before any use or transfer to another person unless they have been leak tested within 6 months before the date of use or transfer.
- B. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.
- C. Each sealed source containing licensed material, other than hydrogen-3, with a half-life greater than 30 days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed 6 months except that each source designated for the purpose of emitting alpha particles shall be tested at intervals not to exceed 3 months.
- D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in what the sealed source is permanently or semi-permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission. Records may be disposed of following Commission inspection.

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12. (Continued)

- E. If the test required by Subsection A. or C. of this condition reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region III, 801 Warrenville Road, Lisle, Illinois 60532-4351, ATTN: Chief, Nuclear Materials Safety Branch, describing the equipment involved, the test results, and the corrective action.
13. The licensee may transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
14. Inventory Requirements:
- A. An inventory system will be established that accounts for the receipt, movement, transfer and disposal of all radioactive material possessed under this license. Records of inventories will be maintained for 10 years from the date of each inventory.
- B. A complete examination of records will be completed every six months to confirm the location of all radioactive material and ensure that possession is within the limits specified in this license.
- C. A physical inventory of all radioactive material possessed under this license will be conducted on or before June 1, 1993. Thereafter, a physical inventory of all radioactive material possessed under this license will be completed within 60 months of the previous physical inventory.
15. The licensee's field service audits (as described in the ATC Medical Group Management Plan, revised April 1, 1989, and submitted with letter dated April 17, 1989) shall be performed unannounced by the Radiation Protection Officer (i.e., Radiation Safety Officer).
16. The licensee shall follow the recommend survey frequencies outlined in Regulatory Guide 8.21, Revision 1, October 1979, in work areas where radioactive materials are handled or used.
17. The licensee shall maintain records of information important to safe and effective decommissioning at 1020 London Road, Cleveland, Ohio per the provisions of 10 CFR 30.35(g) until this license is terminated by the Commission.

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18. The licensee shall maintain and execute the response measure of their Emergency Plan dated October 25, 1991 and revised January 1992, May 27, 1992 and April 26, 1993. The licensee shall make no change in the emergency plan submitted pursuant to 10 CFR [30.32(i), 40.31(j), 70.22(i)] that would decrease the effectiveness of the plan without prior Commission approval. The licensee may make changes to its Emergency Plan without prior Commission approval if the changes do not decrease the effectiveness of the plan. The licensee shall maintain records of changes that are made to the plan without prior approval for a period of three years from the date of the changes and shall furnish the Chief, Medical, Academic, and Commercial Use Safety Branch, Division of Industrial and Medical Nuclear Safety, NMSS, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and the appropriate NRC Regional Office specified in Appendix D of 10 CFR 20, a report, within six months after the change is made, containing a description of each change.
19. The licensee is authorized to begin the following activities no sooner than March 17, 1995, and must complete them by the date specified in each item in accordance with letters dated January 27, February 2, 10, and 14, and March 1, 3, 8, and 10, 1995, wherein the licensee proposed and clarified its plans for: (1) dealing with the accumulation of ground water in and around its facility basement; (2) immobilizing and/or remediating contamination that has collected in below ground sewer piping and manholes; and (3) processing future ground water that builds up around the facility. These plans address the following actions the licensee will take.
- A. Process water that is currently stored outside its facility in above-ground tanks.
- Tanked water will be processed in-situ using a submersible water treatment system that includes filtration and ion-exchange demineralization as described in letters dated March 1, 3, 8, and 10, 1995.
 - Water will be treated until it contains no detectable non-soluble cobalt-60 and less than 1000 pCi/l of soluble cobalt-60 as determined by a contract analytical laboratory. The licensee may continue to pump treated water to the collapsible storage containers prior to receiving results of solubility tests from the contract laboratory. The treated water will subsequently be pumped to 25,000 gallon storage containers located in the facility warehouse, as described in letters dated March 3, 8 and 10, 1995.
- B. Simultaneously pump and process water currently residing in the sewer manhole and lateral, building sump pit and basement. This project shall be completed by June 30, 1995.
- Pumping will be sequenced as described in letter dated March 1, 1995, to ensure a positive hydrostatic pressure is maintained from outside to inside the facility's basement.

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Amendment No. 36

19. (Continued)

E. Immobilize the radioactive contamination present in the sewer manhole, lateral and four-inch discharge line. This project shall be completed by July 7, 1995.

i. Completely grout-in the radioactively contaminated four-inch sewer discharge line and the manhole and lateral up to the sewer interceptor as described in "Issue 4" of letter dated January 27 and letter dated March 1, 1995. The grouting will render the existing sewer discharge piping system inoperable and immobilize (fix) the radioactive contamination that resides in the system.

ii. Develop and implement a sub-surface radiological monitoring program to assess contamination migration as described in letter dated February 10, 1995. The program must be submitted in writing and approved by the NRC.

F. Remediate the London Road interceptor in the vicinity of the abandoned lateral, as described in letter dated January 27, 1995. The remediation activities will be coordinated with the Northeast Ohio Regional Sewer District. This project shall begin no later than July 8, 1995.

G. i. The licensee shall notify the NRC Region III office no later than July 14, 1995, regarding the status of the completion of License Condition Numbers 19.B., 19.D. and 19.E.

ii. The licensee shall notify the NRC Region III office no later than July 14, 1995, to confirm initiation of the remediation project described in License Condition Number 19.F., and provide an estimated completion date.

20. The licensee is authorized to install a new manhole and lateral and re-connect this to the existing under drain system. The purpose of the new manhole is strictly to act as a means of collecting water from the under drain system which will be pumped to storage containers and subsequent analysis for cobalt-60 concentration.

21. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Application dated November 12, 1984;

B. Letters dated November 12, 1984 (excluding Item 4), February 12, 1985, June 7, 1985 (excluding letter Item 4), September 6, 1985 (excluding change to Page 29 of ISP-1 manual);

C. Letters dated May 29, 1986 (Response to Enclosure A, Significant Licensing Deficiencies of NRC letter dated March 7, 1986);

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Amendment No. 36

19. (Continued)

- ii. Water in the sewer manhole, lateral, building sump pit, and basement will be pumped to a radiologically controlled area of the facility and processed using a skid mounted, multi-stage filtration and ion-exchange system as described in letters dated March 1, 3, 8 and 10, 1995. Spill procedures and radiological controls will be implemented as described in letter dated February 14, 1995, and Attachment 2 to letter dated March 1, 1995.
 - iii. Water removed from the sewer manhole, lateral, building sump pit, and basement will be treated to contain no detectable non-soluble cobalt-60 and less than 1000 pCi/l soluble cobalt-60 as determined by a contract analytical laboratory. The licensee may continue to pump treated water to the collapsible storage containers prior to receiving results of solubility tests from the contract laboratory. The treated water will subsequently be pumped to 25,000 gallon storage containers located in the facility warehouse, as described in letters dated March 3, 8, and 10, 1995.
- C. Water sampling and analytical protocols will be as described in letter dated February 2, 1995, as clarified in letters dated February 14, and March 3, 1995. Solubility of cobalt-60 in samples containing detectable activity will be demonstrated in accordance with the reference in Supplement 2 to letter dated March 3, 1995. All solid radwaste generated from the water processing activities, including filter and demineralizer resin wastes, will be collected and stored at the London Road facility pending its ultimate disposal as radioactive waste.
- D. Excavate areas around the facility to allow: (i) access to the radioactively contaminated four-inch waste discharge line; and (ii) the radiological evaluation of the facility's underdrain system and surrounding soils. This project shall be completed by July 7, 1995.
- i. Excavate the soil in the vicinity of the building's four-inch waste discharge line and underdrains and disconnect these drains as described in letter dated March 1, 1995. Evaluate the radiological contamination status of the underdrain system and remediate or replace the system. Reconnect the underdrain system to the building sump pit and pump, test and process the underdrain system waters as described in letter dated March 1, 1995. The testing and processing of water pumped from the underdrain system will continue until sampling of the water consistently reveals no detectable non-soluble cobalt-60 and less than 200 pCi/l soluble cobalt-60.
 - ii. Evaluate the radiological status of the soil in the vicinity of the underdrain system and building sump pit as described in the letter dated March 1, 1995.

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Amendment No. 36

21. (Continued)

- D. Letter dated July 23, 1986 (Response to Enclosure B, Additional Licensing Issues for Renewal Applications of NRC letter dated March 7, 1986) excluding approval of the licensee's in-house training program;
- E. Letters dated August 22, 1986, October 28, 1986, November 13, 1986, November 14, 1986 and December 4, 1986 (with Revised ISP-1 Manual, Appendices A and B attached), May 7, 1987, August 3, 1987, December 31, 1987, January 15, 1988 (Item V only), August 15, 1988 (with attached course manual), September 29, 1988 (with attachments) and November 21, 1988; and
- F. Letters dated March 29, 1989 (except Section 3.4 "Hot Cell Entry and Action Levels"), April 7, 1989, August 25, 1989 (except Item B(4)), July 23, 1990 (except Sections 3.0 and 5.0 of ISP-14 procedure), March 1, 1991 (with attachments), March 27, 1991 (with attachments), May 9, 1991, May 14, 1991, February 27, 1992, February 28, 1992, March 2, 1992, and March 5, 1992.
- G. Letters dated April 16, 1992 (with enclosures), June 15, 1992 (with attachments), August 10, 1992, September 18, 1992, December 29, 1992 (with enclosures), January 20, 1993, March 30, 1993, March 31, 1994 (with enclosure), April 11, 1994, and September 21, 1994.
- H. Letters with attachments dated January 27, 1995, February 2, 10, and 14, 1995, and March 1, 3, 8, and 10, 1995.

Notwithstanding any reference to the specific activities in the above listed letters, the following activities are not addressed by this license.

- i. The evaporation of treated water or its discharge to the sanitary sewer system.
- ii. Installation of a composite sampler and flow gage.
- iii. Conventional disposal of excavated soils exhibiting cobalt-60 concentrations greater than 8 pCi/g.
- I. Letters dated May 3, 1995, May 17, 1995, June 6, 1995, June 13, 1995 and June 14, 1995.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date

6/21/95

By

K. G. N. II

Materials Licensing Section, Region III

COPY

June 21, 1995

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

Dear Mr. Meschter:

Enclosed is Amendment No. 36 to your NRC Material License No. 34-19089-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office so that we can provide appropriate corrections and answers.

This amendment authorizes the following items: (1) Subitem iv. of License Condition 21.H.iv. (previously License Condition 20.H.iv.) has been removed; (2) License Condition 20. has been added allowing you to re-connect the foundation under drain system to a new manhole and lateral for the purpose of collecting water from the existing under drain system to be pumped for storage and analysis for cobalt-60 concentration; and (3) Your letter dated June 14, 1995 has been tied down in License Condition No. 21.I. to allow the RSO to make minor changes to the provisions of RWP No. 95-10 and the work plan as described in Attachment 3, Item G of your June 14 letter. However, please note that the issuance of this amendment does not preclude you from the requirement to continue to collect and analyze foundation water to ensure 10 CFR Part 20 criteria has been met, to assure that surrounding soil is free of contamination.

Finally, we have received your June 16, 1995 response to our June 14, 1995 deficiency letter and will make every effort to review your response in an expeditious manner. We will notify you if we have additional questions. Again, please note that we have only approved the installation of a new manhole and lateral and its re-connection to the existing under drain system. We will need to evaluate all of the other issues regarding cobalt-60 contamination within the existing under drain system and soils both under the building and in the vicinity of the under drain system prior to discharge of collected water.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

E/27

June 21, 1995

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Notify NRC, in writing, within 30 days:
 - a. When Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or
 - b. When the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.
4. Request and obtain a license amendment before you:
 - a. Change Radiation Safety Officers;
 - b. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
 - c. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or
 - d. Change ownership of your organization.
5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will

June 21, 1995

result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

Original Signed By
John R. Madera
Nuclear Materials Licensing Section

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Update on AMS Licensing Issues as of 6/22/95

1. Basement and ground water processing project

Amendment 32. was issued on March 17, 1995 to authorize AMS to process contaminated basement and ground water to 200 pCi/L and store it in special storage bladders in the facilities warehouse area. This process included water stored outside the facility in above ground tanks. Amendment 32. also authorized AMS to excavate around the outside underdrain system, remediate or replace it, reconnect the underdrain system to a sump pit, analyze the ground water until it consistently revealed no detectable non-soluble cobalt-60 and less than 200 Pci/L soluble cobalt-60, grout in the contaminated manhole and lateral on AMS property, develop a subsurface monitoring system to assess contamination migration from the facility, and to remediate the London Road interceptor in the vicinity of the abandoned lateral.

This amendment was important because it required AMS to maintain a positive hydrostatic pressure from outside to inside the facility's basement.

2. Renewal application

Deficiency letter mailed 4/17/95. Licensee given 45 days to respond. Response due June 1, 1995. Licensee FAXED a letter on 5/31 requesting an extension on their response to 6/16. Extension granted via letter dated June 7, 1995. Revised due date is June 16, 1995. Response received 6/16 and is currently being reviewed.

3. DFP/Cost Estimate

Deficiency letter mailed March 30, 1995. Licensee was given 30 days to respond. They requested an additional 30 days. Response due May 30, 1995 and received June 2, 1995. Licensee response inadequate; therefore, a TAR was submitted to HQ on 6/15/95 requesting contractor assistance.

↳ 6/18 call L. B. Dept response was 7/18 per L. Pittiglio

4. Financial Instrument and Standby Trust Agreement

Technical Assistance Request submitted to HQ for contractor review on 4/14/95. A telephone call was made to HQ re: status. Was informed the package is in hands of contractor. HQ will do what they can to push through. Following HQ review it must go through OGC for concurrence. This typically takes 10 to 14 days.

Called Lou Bykoski on 6/1 to check on status of contractor's review. Lou stated that their review is complete and he expects to receive their comments on 6/2. He will then forward to OGC for concurrence. As noted above, this typically takes 10 - 14 days.

Contractor comments received 6/19. A deficiency letter is in typing as of 6/22.

Deficiency letter mailed 6/28. STA. very poor. Contractor suggested AMS resubmit New STA per in contract 2.3 Sec, as per bank to original STA. STA. + other problems per contract. STA. + other problems per contract.

6/28

5. Amendment request to: 1) evaporate water in bladders, 2) install sampling device, 3) reconnect underdrain, and 4) discharge water to sewer with Co-60 < 200 pCi/liter.

This action was submitted to HQ for technical assistance on 4/7/95. NMSS response received 6/6/95 and supplemented with information from Bob Shewmaker on 6/7/95. Deficiency letter regarding 3 of the 4 above requests (excluding the evaporator request) sent to AMS on 6/14/95. The licensee's response to the deficiency letter is due 7/14/95. A second TAR was sent to NMSS on 6/14/95, regarding the evaporator request.

Licensee's response to the deficiency letter was received 6/16/95. The response will be reviewed with assistance from Bob Shewmaker. HQ has completed their review of the evaporator issue. Their memo is going through concurrence.

6. Emergency Plan

Deficiency letter issued 6/7/95. Response due 7/7/95. Comments on AMS's emergency plan received in early June from two offsite response organizations. Comments from other response organizations expected within next few weeks. The Region will wait until AMS forwards all the comments it receives from offsite response organizations, before the region will review them for appropriateness.

7. Amendment to change analytical labs

Was issued on May 18, 1995 via Amendment No. 33.

8. Amendment to increase the release criterion for treated water into the storage bladders from 200 to 1,000 pCi/L of water

Was issued on June 9, 1995 via Amendment No. 34

9. Amendment to extend due date of June 17 For Water Processing Project Completion as required by License Condition 19. of license

Amendment # 35 issued 6/16/95, tying-in interim milestone completion dates for various phases of the project. Amendment #35 requires that the activities required by License Condition # 19 be completed by 7/7/95, with the exception of remediation of the London Road interceptor.

10. Amendment Request to Allow the RSO to Make Minor Changes as the Water Processing Project Continues

Amendment # 36 was issued on June 21, 1995, authorizing the RSO to make minor changes to operations that are not considered to be safety significant. AMS's request for this amendment received via letter dated 6/6/95, and supplemented by letter dated 6/14/95. Also issued in this amendment was authorization to re-connect a new manhole and lateral to the underdrain system. This does not allow connection to the sewer system, nor does it preclude them from requirement to continue to take water samples for cobalt-60 concentration.

June 22, 1995

Advanced Medical Systems, Inc.
ATTN: Seymour S. Stein, Ph.D.
President
121 North Eagle Street
Geneva, OH 44041

SUBJECT: DETERMINATION REGARDING APPARENT VIOLATION
(NRC INSPECTION REPORT 030-16055/94003(DRSS))

Dear Dr. Stein:

This refers to the special inspection conducted from August 17, 1994 through October 14, 1994, of activities authorized by NRC Byproduct Material License No. 34-19089-01. Inspection Report No. 030-16055/94003(DRSS), documenting the findings of the inspection, was sent to Mr. David Cesar of your staff by letter dated December 6, 1994. As a result of this inspection, one apparent violation of NRC requirements was identified. On February 6, 1995, the inspection findings were discussed during a transcribed management meeting held in the NRC Region III office between members of our respective organizations. The transcript of that meeting was provided to you in our letter dated March 15, 1995.

As described in the inspection report, the identification of cobalt-60 in wastewater effluent discharged from the Advanced Medical Systems (AMS), Inc., lateral into the city sewer interceptor appeared to represent a violation of 10 CFR 20.2003. A licensee is permitted under 10 CFR 20.2003 to discharge licensed material into the sanitary sewerage system if the material is, among other conditions, readily soluble (or readily dispersible biological material) in water. This apparent violation was based on a water effluent sample collected by the NRC on August 17, 1994, at the outfall of the AMS sewer lateral into the London Road interceptor. The Northeast Ohio Regional Sewer District (NEORS) assisted the NRC in gaining access to the sewer system and in collecting the sample.

NRC analysis of the water sample collected on August 17, 1994 identified positive indications of cobalt-60. Based on our knowledge of London Road facility operations, the cobalt-60 was assumed to be cobalt oxide, which is listed as insoluble in the Handbook of Chemistry and Physics. Similarly, a May 7, 1987 letter from AMS to the NRC indicated that contamination resulting from cobalt-60 source fabrication was due to cobalt oxides, an insoluble material. Therefore, a solubility analysis of the water sample collected on August 17, 1994, was not performed by the NRC at that time.

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On September 20, 1994, possession of the water sample was transferred back to the NEORS, at their request, and in accordance with NRC Region III policy. Unknown to the NRC at that time, the NEORS subsequently performed a solubility analysis on this and other samples they collected at the same location between July and October 1994. Documentation provided to the NRC by the NEORS indicated varying concentrations of both soluble and insoluble cobalt-60 in the samples collected.

In early 1995, preliminary solubility studies conducted by the NRC on stagnant AMS sewer manhole/lateral water showed the cobalt-60 in those samples to be soluble, as defined in NRC Information Notice No. 94-07. These preliminary results coupled with the earlier NEORS results showing both soluble and insoluble cobalt-60 in the water flowing through the AMS manhole/lateral system, prompted NRC to begin preparations for a solubility analysis of the water sample given to the NEORS. However, since solubility (filtration) analyses performed by NEORS altered the solubility characteristics of samples, the samples no longer existed in their original condition and further solubility studies could not be performed. Consequently, NRC was unable to perform an independent solubility analysis necessary to support a violation of NRC requirements.

Therefore, absent NRC solubility test data on the water sample collected on August 17, 1994, and the inability to collect additional representative samples due to the present condition of the AMS lateral, no violation is being cited at this time.

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

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

Sincerely,

Original signed by James L. Caldwell

James L. Caldwell, Deputy Director
Division of Radiation Safety and Safeguards

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

See Attachment Distribution

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OFFICIAL RECORD COPY via Email

from Mike
Stein

via E-mail
from
Fred Combs

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Northeast Ohio Regional Sewer District

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VIA CERTIFIED U.S. MAIL

June 23, 1995

David Cesar, Treasurer
Advanced Medical Systems, Inc.
121 North Eagle Street
Geneva, Ohio 44041

Re: Comments on Proposed Emergency Plan

Dear Mr. Cesar:

Thank you for forwarding a copy of the Advanced Medical Systems, Inc. Emergency Plan for your facility located at 1020 London Road, Cleveland, Ohio. As you are aware, the Northeast Ohio Regional Sewer District did not receive this plan until April 26, 1995; accordingly, the following comments are timely submitted pursuant to 10 CFR 30.32(4), which allow offsite response organizations 60 days in which to comment on a proposed emergency plan.

We have reviewed the document in detail, and have found that in many cases the Plan reflects intentions rather than existing conditions, intended outcomes rather than actual procedures, and apparently oral understandings rather than written commitments.

Further, there is abundant information that is relevant to emergency response, yet the necessary information—where available—is difficult to locate because of poor organization and confusing pagination. In addition, many of the conditions known to exist at Advanced Medical Systems have been omitted from this proposed Emergency Plan. For example, there does not appear to be any room-by-room indication of specific levels of radioactivity or the specific condition of radioactive materials contained therein. Also, several creditable emergency scenarios have not been evaluated; the “worst case” scenario presented does not adequately address a variety of other release issues. Further, no attention whatsoever is paid to offsite releases that could contaminate surrounding properties short of requiring evacuation.

To best assist you in locating and correcting these and other omissions, we have gone through the proposed Emergency Plan page by page and offer our comments in the page-referenced schedule which is attached hereto and incorporated herein by reference.

E/ 30

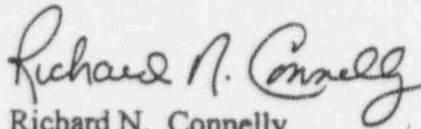
The mission of the Northeast Ohio Regional Sewer District is to enhance public health and welfare through the efficient, cost-effective conveyance and treatment of wastewater. This is accomplished by an organization dedicated to professionalism, fairness and consistency that anticipates and responds to the changing environmental needs of the community.

9507250280 6788

David Cesar, Treasurer
June 23, 1995
Page 2

Should any of the attached require clarification or other discussion, please contact me at (216) 641-6000. I look forward to your prompt attention to the matters raised herein.

Sincerely,



Richard N. Connelly
Manager, Water Quality & Industrial Surveillance

RNC/ydm

Enclosure

cc: Michael S. Kalstrom, Secretary, Cuyahoga County LEPC
James L. Caldwell, Deputy Director, NRC Region III
Commander Robert Cermak, Cleveland Police Dept.
Thomas E. Lenhart, NEORSD
Lawrence K. English, NEORSD
Edmund Mecklenburg, Cuyahoga County Emergency Management
Edwin Price, Cuyahoga County Community Services
Dr. Rao, University Hospitals
Chief Thomas Root, Cleveland Fire Marshal, Cleveland Fire Prevention Bureau
James Williams, Ohio Emergency Management Agency
Jane Harf, Ohio State Emergency Response Commission

Page-Referenced Comments

on

Proposed Emergency Plan for Advanced Medical Systems, Inc.

by

Northeast Ohio Regional Sewer District

Page	Section	Comments
<u>Cover Letter</u>		
1		<p>According to 10 CFR 30.32(i)(4), the District's response need not be sent until June 25, 1995.</p> <p>No document entitled "Emergency Plan" was included in the package forwarded. The initial "Emergency Pre-Plan Operating Procedures" contains a 1-¼ page Section called "Emergency Plan;" however, review encompassed the entire package forwarded.</p>
2		<p>Emergency Medical Services should be included in distribution list for AMS Emergency Plan.</p> <p>Richard N. Connelly should be listed as the contact for the Northeast Ohio Regional Sewer District.</p>
<u>Emergency Pre-Plan Operating Procedures</u>		
Cover page		<p>This initial "Emergency Pre-Plan Operating Procedures" does not contain operating procedures.</p> <p>How do the initial "Emergency Pre-Plan" and the second "Emergency Pre-Plan" attached as Appendix "A" to the "Onsite Radiological Contingency Plan" correlate to one another? How do the two Pre-Plans relate to the Onsite Radiological Contingency Plan?</p>
1	2	<p>The page heading lists "Section 2- Emergency Plan." What is included in Section 1 and where can it be found?</p>

Page	Section	Comments
1	2	<p>Reference is made to a consultant's report describing "an absolute worst-case incident." What is the meaning of the modifier "absolute" to the phrase "worst-case"?</p> <p>For the paragraph numbered 1 to be meaningful, it appears necessary to move up the text of paragraph 3.</p> <p>Each of the numbered paragraphs one through seven speaks of steps that will be taken in the future. The Emergency Plan should only contain those conditions which presently exist; if in fact any one of the seven items is actually installed or becomes operational, the plan should be amended.</p>
1	2	<p>Per the second paragraph from the bottom of the page, each of the enumerated changes should have been completed already, insofar as the date of these comments is more than the "8-12 weeks" from the January, 1995 revision date of this plan. Accordingly, please confirm those enumerated items that are complete, or delete those items.</p> <p>The descriptions in paragraph 1) do not in all cases correspond to the Figure 1-8, included as part of the proposed Onsite Radiological Contingency Plan. In particular, no "Isotope Shop Warehouse" can be found, although both an Isotope Shop and a warehouse area may be found. Similarly, no "Isotope Shop Workshop" could be found on Figure 1-8.</p> <p>No HEPA room could be found on either Figure 1-8 or Figure 1-9. This is of particular concern, inasmuch as the HEPA filters may be found in both the High Level Waste Storage room located next to the Hot Cell on the first floor, as well as in the HEPA equipment room itself located on the second floor, according to the <i>Advanced Medical Systems, Inc. Decommissioning Cost Estimate for the London Road Site in Cleveland, Ohio</i> prepared by Scientific Ecology Group, Inc. ("SEG"). Such ambiguity should be eliminated.</p> <p>No "Clean Equipment Room" could be found on Figures 1-8, 1-9 or 1-10. While SEG described its location, no "High Level Waste Storage" area or room was found on the drawings.</p> <p>More importantly, it appears from Figures 1-8, 1-9 and 1-10, that there are restricted areas in the facility that are not listed among the</p>

Page	Section	Comments
1	2	<p>areas that AMS anticipates monitoring. For example, Figure 1-9 indicates that the "roof area" is a restricted area. In the event of a fire in this area, asphaltic materials could catch fire and presumably expose and/or carry cobalt-60 residues. The roof area should thus be included in those areas which are monitored.</p> <p>In paragraph 5), the "local monitoring company" is not identified, nor is there a contact name, phone number or facility identification number provided for this local monitoring company. In the event of an emergency at the 1020 London Road facility in which none of the AMS personnel were available to contact this local monitoring company, emergency responders should be given enough information and authority to obtain detailed information from that local monitoring company.</p> <p>In paragraph 6) there is reference to the "cell office." Is the cell referred to the Hot Cell? What office is indicated by "cell office"?</p> <p>As indicated above, no "Clean Equipment Room" is included in Figures 1-8, 1-9 or 1-10.</p> <p>Paragraph 6) indicates that AMS personnel only will be notified in the event of a gamma radiation alarm. It is the District's understanding that the Radiation Safety Officer resides far from the 1020 London Road facility. Therefore, there should be agreed levels for direct notification of emergency responders for high-level gamma alarms.</p> <p>In the second last paragraph, reference is made to the "E-Plan." Abbreviations should be avoided to minimize any potential for confusion.</p>
2	2	<p>The joint exercise described addresses only "local firehouse personnel." All emergency responders should be involved in joint exercises, to ensure familiarity with the facility and enable coordination of effort.</p> <p>As to any such joint exercise, it does not appear that any schedule has been agreed to, nor is one suggested. This is an important omission, as only through actual joint exercises can non-obvious weaknesses in the Emergency Plan be identified and ameliorated.</p>

Page	Section	Comments
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Onsite Radiological Contingency Plan

Cover page		<p>Does the "Emergency Pre-Plan Operating Procedures" differ from the "On-Site Radiological Contingency Plan" enough that those few points raised in the former could not be melded into the latter to form a single document?</p> <p>As indicated above, pagination is problematic throughout the document forwarded. For example, the cover sheet itself apparently should be Roman numeral "I." In addition, after page "iii," there are two pages called "Revision Sheet" that are not numbered at all.</p> <p>The revision dates on the cover page of the On-Site Radiological Contingency Plan do not agree with those on the "Revision Sheets." Is there a reason for the discrepancy?</p> <p>No date is given for the approval signature of Robert Meschter, Radiation Safety Officer.</p> <p>Insofar as the plan is for the 1020 London Road site, that address should be listed on the cover page to eliminate a possible source of confusion.</p>
ii	Contents	<p>In many cases, the page numbers listed and the contents themselves diverge. This could create dangerous delays in locating information.</p> <p>The Table of Contents omits some materials that are included in the Onsite Radiological Contingency Plan. For example, no reference is made to figures 1-8, 1-9 and 1-10, although facility diagrams would be of great importance to emergency responders. Less important examples include the omission of the Revision Sheet.</p>
[iii-iv]		<p>Effective dates on the Revision Sheets do not correspond to those on the cover page of the On-Site Radiological Contingency Plan.</p> <p>No date certain is given for the Effective Date of Revision "C."</p>
iv		<p>The Statement of Policy appears to place all responsibility for emergency planning upon the Radiation Safety Officer ("RSO"). There should be a statement of policy by Advanced Medical Systems recognizing their responsibility for implementation of the plan.</p>

Page	Section	Comments
iv		<p>The Statement of Policy indicates that the Radiation Safety Officer is responsible for "the direction and control of emergency situations." In an actual emergency situation, command is given to the Fire Chief, and the RSO would be at most a technical advisor to the emergency responders, rather than a supervisor thereto.</p> <p>Does the RSO have sufficient training to serve as an advisor in regard to fires, first aid emergencies, or spills? That is, what level of fire, first aid, spill control or Hazardous Waste Operations and Emergency Response ("HAZWOPER") training does the RSO possess? Is the RSO health physics trained? To what extent? That is, does the RSO have the training to do the things that the Advanced Medical Systems Statement of Policy makes him responsible for? Emergency responders should not be put in a position of being directed, controlled, advised, or audited by persons whose competence has not been demonstrated.</p> <p>The Statement of Policy speaks of "emergency response staff". Who is this staff? What training do they possess?</p> <p>The Statement of Policy speaks of "authority to marshal the resources to control the emergency." What does this mean?</p> <p>There does not appear in the Statement of Policy any ability on the part of the RSO to pass authority on to any subsequent Radiation Safety Officer or to any other personnel. This omission could impair the ability of personnel at AMS to respond to emergencies at the facility in the event of injury to the current RSO or other unavailability.</p> <p>The signature by Mr. Cesar does not indicate his position at Advanced Medical Systems, nor is it dated.</p> <p>Since this Onsite Radiological Contingency Plan is in regard to the 1020 London Road facility, that address should be referenced below Mr. Cesar's signature.</p>
1-1		<p>The Introduction section refers to authorized possession of "up to 78K ci" of Cobalt-60. This does not agree with the table at the bottom of page 1-1, nor does it agree with the current Amendment No. 33 to the AMS NRC license, which authorizes more than 300,000 Curies of Cobalt-60. What is the reason for these discrepancies?</p>

Page	Section	Comments
		<p>The Introduction also speaks "an additional 15 curies of radwaste stored in certain restricted areas of the facility." This does not agree with other estimates of radwaste presented by AMS elsewhere, nor does it agree with numbers presented by the Nuclear Regulatory Commission at public meetings. What is the source of this discrepancy?</p> <p>What are the "certain restricted areas" in which radwaste is store? What are the relative hazards of the areas in which radwaste is stored?</p> <p>The Introduction also indicates that the proposed plan was prepared "in accordance with Regulatory Guide 3.67". Omissions with respect to Regulatory Guide 3.67 were found in the proposed plan, including Sections 4.3 (Local Offsite Assistance to Facility), 4.4 (Coordination with Participating Government Agencies), 7.2 (Training), 7.3 (Drills and Exercises), and 7.7 (Letters of Agreement) of Regulatory Guide 3.67.</p>
1-1	1.1	<p>The licensed activity description contemplates operations involving only teletherapy and radiography machines manufactured by AMS' Geneva, Ohio facility. This does not correspond to the scope of activities contemplated in the current License Amendment from the NRC. What is the reason for this discrepancy?</p> <p>Is the origin of equipment on which AMS operates relevant to emergency response? If not, references thereto should be deleted.</p> <p>The phrase, "The material is used under the supervision of the radiation safety officer" is overbroad, insofar as the current RSO's activities are restricted with respect to certain isotope operations in the current AMS NRC license amendment. See, e.g., paragraph 11(A) of Amendment No. 33 to the AMS NRC license.</p> <p>As indicated above, the table of types and quantities of licensed materials does not correspond to the present AMS NRC license, nor to inventory information from either the NRC or AMS.</p>
1-2	1.1	<p>The top paragraph indicates that "approximately 29 curies of radioactive material are in a locations other than the Hot Cell and WHUT Room and in a form that would allow the material to be dispersed in an emergency." This number does not agree with the 15 curie figure in the Introduction on page 1-1, nor does it agree</p>

with NRC estimates. What is the source of this discrepancy? What is the basis for this 2.9 curie figure?

What is meant by the phrase "breach the facility"? What evaluations conducted by professional engineers form the basis for the estimated amount that would be dispersed "in an emergency that would breach the facility"?

The "majority" of the "dispersible" radioactive material is said to be stored in 55-gallon drums or steel boxes. What is the definition of the term "dispersible radioactive material"?

What is the specific number of curies contained in 55 gallon drums or steel boxes? Where are these drums or boxes located?

1-2

1.2

What is meant by the phrase "controlled access building"? What are the details of such access control? How does a "controlled access" area differ from a "controlled area" or a "restricted area", terms which arise elsewhere in the proposed plan?

In what way are the access controls provided during (a) an electrical blackout, (b) a telephone service interruption, or (c) a combination of (a) and (b)?

Figure 1-11, described in Section 1.2, is difficult to locate quickly, and does not prominently display the location of Advanced Medical Systems.

The proximity of the AMS facility to populated areas, including special populations such as the elderly, to other facilities containing hazardous materials, and to the railroad tracks adjacent to the building, should be highlighted.

Security is said to be maintained by ADT, yet no telephone number or other contact information is provided.

Reference is also made to "remote security links" between ADT and, presumably, the facility. What backup systems exist in the event of a power outage combined with a telephone service discontinuity?

What is the nature of the site security system that windows on both the first and second floor can remain broken for months at a time

Page	Section	Comments
		and a pick-up truck can breach the parking lot fence and be set on fire in the parking lot without raising alarms or prompting rapid response?
		Where are the Letters of Agreement contemplated under Section 7.7 of the NRC Regulatory Guide 3.67 with the fire and other emergency response authorities?
		Fire response is "estimated to be within five minutes." However, according to page 4, Section 7.4, subparagraph 2a, of the second set of Emergency Pre-Plan Operating Procedures, fire personnel are expected to do nothing until AMS personnel arrive. What is the fire department and other emergency responders expected to do in the estimated hour it takes the Radiation Safety Officer to arrive at the facility?
		Reference is made to Figure 1-8, 1-9 and 1-10. These drawings are difficult to locate quickly. Further, these drawings appear to date back to 1986. Have there been no significant facility changes since 1986?
		The description of the figures indicates "Restricted areas are shaded." The entire basement is restricted; for consistency, therefore, the entire basement should be shaded.
		Shading should vary in intensity or color according to radiation hazard presented.
		The restricted areas delineated on Figures 1-8, 1-9 and 1-10 do not appear coextensive with those areas described in the <i>Decommissioning Cost Estimate for the London Road Site in Cleveland, Ohio</i> prepared by Scientific Ecology Group, Inc., which appears to be the most recent survey of areas in the facility.
		The addition of water treatment equipment may present new obstructions and new restricted areas because of radiation removed from the water that had collected at the facility; accordingly, the building layout drawings should be updated.
1-2	1.2.1	The statement, "As AMS no longer manufactures sealed sources, the facility safeguards afford additional protection given current operations," is of no assistance to emergency responders and should be deleted.

The statement "Health and safety considerations have been based on minimum hazard in restricted areas and zero hazard in controlled areas. The Company actively strives to minimize restricted areas of the facility to confine emergency situations to the Isotope Shop area," appears overly optimistic. While it appears that the quoted sentences refer to radiological hazards, the emergency plan must contemplate hazards other than those radiological in character. For example, were the bladders storing treated contaminated water to suffer a failure, certainly some hazard would be presented to personnel in that area and adjoining areas.

Other examples of hazards which do not appear to have been addressed include fires involving filters, filter bags, and filter media (activated charcoal) used to remove Cobalt from the contaminated water on-site, fires associated with the filtration equipment itself, breaches of any other water retention systems on-site, fires or explosions involving the evaporation apparatus contemplated by AMS, and so on.

1-3

1.2.1

The "Isotope Facility" is not defined.

The phrase, "Because of proximity to these areas, special care has been exercised in planning the safety program," does not assist emergency responders and should be deleted.

The "Isotope Shop Area" is not delineated on any of the Figures. In what way does the "Isotope Shop Area" differ from the "Isotope Shop" designated on the Figures?

The discussion of why windows may not be found in the Isotope Shop Area is unnecessary and should be deleted.

In that discussion of windows, however, is found one of the few mentions of the railroad tracks just south of the AMS facility. The problems presented by the railroad tracks go beyond noise. What steps have been taken to address the potential for emergencies involving those railroad tracks? Foreseeable accident scenarios include, for example, train derailments involving nitric acid, toluene, or chlorine.

What measures have been taken to insure that any emergency at the AMS facility will not present dangers to passing railroad personnel, equipment, or cargo?

Page	Section	Comments
		What measures have been taken to notify railroad operators in order to restrict traffic to the area of the facility in an emergency?
		Reference is made in the first paragraph on page 1-3 to "controlled areas." What is the definition of a "controlled area" and how does it differ from areas having "controlled access" or being "restricted"?
		The last sentence in the first paragraph speaks of "possible radiation hazards of cleaning windows on the outside." What hazards are presented by windows on the outside of the AMS facility?
		In the third paragraph on page 1-3, the phrase "controlled access" areas is again used without definition.
		The so-called "controlled access areas" are said to be enclosed by heavy dashed lines on, presumably, Figures 1-8 and/or 1-9. No such heavy dashed lines could be found. Similarly, no heavy dashed lines could be found on the larger floor plans of the facility, either. This discrepancy should be corrected.
		For each type of area -- controlled area, controlled access area, and restricted area -- how is access controlled?
		Reference is made to "high occupancy areas of the rest of the building." What is meant by "high occupancy"? Is "high occupancy" higher than normal expected capacity? How many people are normally expected to be in the building area?
		Is there a sign-in sheet for the facility? If so, where is it located?
1-3	1.2.3	The sentence, "AMS ceased source manufacturing in 1990," does not assist emergency responders and should be deleted.
1-4	1.2.3	The Hot Cell is described as having "Numerous small access ports ... located on the front and side faces of the cell, and a 20-inch square port opens from each side." What is meant by numerous? What is the size of each such "small" access port? In what manner are these ports sealed, if they are indeed sealed at all? What is the exact location of each of these access ports? Are photographs or diagrams of these numerous small access ports available? What is meant by "20-inch square port"? Does that mean it is 20 inches on each side of a square opening, or does it mean that the total area of the port is 20 square inches? Considering the Hot Cell contains a

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		very large amount of radioactive material, this information could be very important to emergency responders.
		In the second paragraph on page 1-4, reference is made to an intercom system. Does this system have emergency back-up power?
		No mention is made of the fact that the new Hot Cell window was replaced in 1984 because the old one cracked. In what ways does the new design and construction differ from the earlier model?
		Inasmuch as the Hot Cell is in close proximity to the primary entrance to the facility, it is probable that fire fighters would certainly cross its path. What will happen to the present Hot Cell window when it is hit by a stream of cold, high-pressure water from a fire hose?
		The description of Master Slave Manipulators does not assist emergency responders and should be deleted.
		The description of the Hot Cell door operation is unclear. A diagram of the device would be helpful.
		The statement is made that the forty-ton door is removable in case of bearing failure. Is it removable on an emergency basis? If not, that fact should be made explicit.
		Because of the large amount of radioactive material contained in the Hot Cell, the emergency plan would have to be updated substantially in the event the forty-ton door were in fact removed for any period of time.
		The phrase "but due to the low rotational speed and infrequent operation of the door, a long service life is anticipated," does not assist emergency responders and should be deleted.
1-5	1.2.3.	The segment beginning with the phrase "The upper bearing is a sealed unit ..." and ending with the phrase "which runs beneath the floor level to the service trench on the south side of the cell" does not assist emergency responders and should be deleted
		The Hot Cell door is said to operate electrically. Is the Hot Cell door provided with an emergency back-up?

Similarly, is there an emergency back-up to the electrical interlock for the electric door drive?

There is an indication that switches prevent the operation of the cell door without a second person present. Is there an emergency override to enable rescue in an emergency?

The statement regarding shielding for the Hot Cell, "The shielding thickness was chosen as sufficient to handle the largest sources currently available with complete safety, and to provide adequate shielding for the larger sources the future may require," appears inaccurate as it relates to any persons who may enter the Hot Cell, as it relates to occasions during which the Hot Cell door is open, and during all times at which the Hot Cell window may be compromised.

Moreover, inasmuch as it appears that there are a number of other openings into the Hot Cell of unknown shielding, the statement that "the Hot Cell is shielded by 5-1/2 feet of concrete, with 1/4-inch steel plate on the inside faces," is overbroad and should be modified.

The statement that "the Hot Cell does not contain any flammable material" conflicts with statements by the NRC to the effect that one paint-can-full of flammable material may be present in the Hot Cell.

The first two paragraphs of section 1.2.4 do not assist emergency responders and should be deleted.

The first sentence of the third paragraph of section 1.2.4 appears misleading. There are residential areas right next door to the facility. The phrase "within a block of the facility" may mislead emergency responders into believing they have a greater margin of safety than is the case.

The Isotope Shop Area and Hot Cell are described as having an air flow system with "carefully balanced flow gradient". Does this air flow system have an emergency back-up? What is the nature of this back-up?

The sentence beginning with the phrase "The heavy burden of industrial air wastes" does not assist emergency responders and

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		should be deleted.
1-6	1.2.4	<p>Manually-adjustable dampers for the distribution of radioactively contaminated air do not appear well advised. Some emergency back-up for remote control of the ventilation system should be installed. Until such backup is implemented, those dampers should be very clearly labeled as to their operation. The plan cannot assume that the dampers will be accessible to other than non-AMS emergency responders reacting to emergency circumstances.</p> <p>The fact that there does not appear to be an emergency back-up to the ventilation duct dampers suggests that some type of gamma alarm system should be connected to an alarm or flashing light in front of the building in the event phone lines are down. This would enable notification to emergency responders and to the neighborhood at large that there is a potential release of radioactive contamination and that the ventilation systems may not be operating properly.</p> <p>The plan does not appear to make any effort to provide neighborhood notification in the event of an emergency until the Radiation Safety Officer is onsite, which, as has been noted above, may be upwards of one hour.</p> <p>The statement, "The air flow pattern is adjusted initially by balancing the supply and exhaust systems to obtain the desired flow pattern, and periodic checks of manometers are made to assure the desired pattern is maintained," does not assist emergency responders and should be deleted.</p> <p>The description of the ventilation system does not appear to agree with the drawings thereof.</p> <p>The extended description of ducting and exhaust system is difficult to follow. A diagram of ducts, filters, and stacks would be helpful, along with an air flow indication.</p> <p>Time/temperature/fire ratings for filters and equipment would be helpful in assessing the safety of these systems.</p> <p>What is the status of ventilation ducts originally connected to rooms in the basement?</p>

The second paragraph on page 1-6 speaks of a "monitoring and safety system" which shuts down exhaust and supply fans at "any increase of activity above the preset level." What is the preset level? How was it determined? How is it detected?

The control system is said to automatically shutdown "either exhaust fan" in the event of a pressure drop. In the event this automatic system fails, where is a manual back-up located?

The third paragraph on page 1-6 speaks of a "natural gas burning emergency generator with automatic rapid changeover." Where is this emergency generator located? Is this emergency generator equipped with a manual start-up mode in the event the automatic start-up fails? Is there a battery back-up for the facility in the event that natural gas service is terminated (e.g., in the event of a train wreck, tornado or earthquake)?

What is the schedule for testing the emergency generator?

The emergency generator apparently provides power only to "air handling equipment, the monitoring facilities and the liquid waste facilities" and the "emergency lighting system". What liquid waste facilities require emergency power? Are all aspects of air handling provided with emergency power? What monitoring facilities are provided with power?

Does the phrase "monitoring facilities" also include gamma alarm systems? If so, please make that clear. If not, they should be included.

Why are electrical door interlocks not included in list for emergency power back-up? What other systems are left without back-up by the gas burning emergency generator?

What is the inspection schedule for the natural gas emergency generator? In what way are the results of such inspection logged? At the time of inspection, is the Fire Department given the opportunity to observe and/or certify the results of such inspection?

In the final paragraph beginning on page 1-6, what devices are included in "all safety and monitor devices"?

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		transmitted to a "local burglar alarm company". Is this ADT? If so, contact information should be provided sufficient to enable emergency responders to directly obtain information therefrom. If not, an indication of which local burglar alarm company is referred to should be included.
		That alarms are transmitted by the local burglar alarm company to "a responsible person or agency" is unclear. What is the order of contact and/or reporting conducted by the local burglar alarm company? Under what circumstances are alarms transmitted directly to competent emergency responders?
1-7	1.2.5	<p>Is the "Storage Garden" the same as the "Isotope Garden" shown on Figure 1-10? Only one designation should be used to reduce chance of confusion.</p> <p>Description is made of the "Storage Garden" and how its shielding could be improved. Why has shielding not been maximized?</p> <p>What is the nature of waterproofing for the Storage Garden and Irradiation Facility?</p> <p>Why is there an Irradiation Facility contemplated in the plan when no provision therefor may be found in the present AMS NRC license and irradiation is not a use of radioactive materials for which AMS is licensed?</p> <p>Reference is made to a "well drilling point" that extends to the basement floor level beneath each manhole cover so that temporary additional shielding may be obtained by flooding the voids of the sand with water. What is meant by "well drilling point"? Under what circumstances would such additional temporary shielding be necessary?</p> <p>No manhole covers are depicted on any of the facility drawings; please supply. To what do these manholes connect?</p> <p>The statement is made that, "If storage needs ever require it, the rooms can be emptied and filled with concrete, steel shot or other higher density material." What storage needs would create such a requirement?</p>

Inasmuch as AMS contemplates the use of concrete for shielding and storage purposes in this context, AMS should consider covering the loose Cobalt-60 waste on the bottom of the Waste Hold-Up Tank ("WHUT") room with concrete to immobilize that loose Cobalt waste powder and/or sludge.

Absent from the description of the Storage Garden and Irradiation Facility is any mention of how much Cobalt-60 is actually located therein, or the radiation hazard presented thereby. Please supply.

Insofar as a substantial amount of Cobalt-60 sources are located in the Storage Garden and Irradiation Facility, the statement "This area of the facility has an extremely low probability for an emergency situation" appears too optimistic. Due to the very large amount of Cobalt-60 at this facility, even relatively low-probability events should be evaluated.

Figure 1-8

The drawings that are included at this point in the proposed plan use language that does not correspond to that used in the text of the emergency plan, and should be revised.

Color coding of the radiation risks for the various areas of the facility should be included in the drawings, and use consistently throughout each set of the drawings provided.

The date of the drawing is 1986. The assessment of radiation problem areas as delineated by the Scientific Ecology Group in their 1995 reports (or any subsequent comprehensive evaluation) should be incorporated into the plan. Any changes thereto should be addressed by revisions to the plan documents.

The location of water treatment equipment should be delineated on the drawings, along with the location or proposed location of any evaporation equipment.

In the case of the evaporation equipment, the nature of any electrical power cabling or natural gas feed thereto should also be delineated.

In the Warehouse, several thousand pounds of plastic resin and molded parts are stored. Inasmuch as these present both a physical obstruction and a potential flammable material source, their location in the warehouse should be delineated.

Only a single fire pull is shown on Figure 1-8. Is there only one fire pull? What is done if the fire pull is inaccessible at the same time telephone service is out of order?

No evacuation paths are shown on the facility drawings. Both primary and secondary evacuation paths should be marked. The relative locations of streets, the railroad tracks, the loading dock, parking lots, and evacuation collection points -- both primary and secondary -- should be delineated.

The location of the alarm enunciator board (if an enunciator board is in fact installed) should be shown, and instructions in how to shut off audible alarms should be provided.

A lighted windsock or flag should be installed at the facility to aid emergency responders in determining the wind direction; the location of same should be delineated on the Figure(s).

A list of at least nine doors which are ordinarily locked is included on page 2-5. Doors that are ordinarily locked should be clearly marked on the emergency plan.

The location of fire extinguishers should be shown on the diagrams.

The location of the emergency generator and any back-up thereto should be clearly marked.

The plan indicates that protective clothing and air equipment may be found at various points throughout the facility. Those points should be clearly marked on the plan drawings.

It appears that both the CEI substation providing electricity and the gas meter providing natural gas are on the same side of the facility as the railroad tracks. What provisions are made for a failure of both electrical and natural gas power in the event of, for example, a train derailment?

In NRC inspection reports, there have been indications that there are located at the facility several thousand and/or several thousand pounds of lead bricks to stack in front of the Hot Cell in the event of a Hot Cell window breach. Where are these bricks located? This should be included on the Figure.

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Figure 1-9		<p>All of the comments that were made for figure 1-8 regarding present levels of contamination, evacuation paths, etc., apply to Figure 1-9.</p> <p>It appears that there is no fire pull whatsoever on the second floor. If that is the case, that problem should be ameliorated, and the location of such fire pull should be marked.</p> <p>The roof area is shown to be a restricted area, though not listed as such in the text. What measures have been taken to avoid distribution of Cobalt-contaminated material therefrom in the event of roof involvement in a fire?</p>
Figure 1-10		<p>There is no indication of North on this drawing.</p> <p>Two stairwells into the Basement are indicated, but the text indicates that only one is ordinarily used. Which stairwell is usually used?</p> <p>No door is shown on either stairwell. What doors exist, and are they normally locked or unlocked?</p> <p>A door is shown in front of the WHUT Room entry. What material comprises that door?</p> <p>Why is there no indication of the relative radiation levels throughout the basement, inasmuch as it has been stated by AMS that levels vary widely throughout the basement?</p>
Figure 1-11		<p>The AMS facility is very difficult to locate on this map.</p> <p>Populated areas and special populations, as well as hazardous material facilities should be clearly marked on Figure 1-11.</p>
Figure 1-12		<p>The map apparently used for Figure 1-11 is copyrighted 1990. Have any changes taken place since 1990 in this area?</p>
2-1	2.0	<p>The phrase "abnormal conditions" should be defined.</p> <p>The phrase "central measures" should be defined.</p>
	2.1	<p>This Section is identified as "Criteria for Accommodation of Abnormal Conditions." The plan should be prepared to control,</p>

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		contain and terminate abnormal conditions; accommodation should not be the goal.
	2.1.1	<p>Reference is made to Isotope Shop Procedures. No such procedures were found in the plan. Please provide or describe.</p> <p>Reference is made to ISP's. If these are Isotope Shop Procedures, those Isotope Shop Procedures that are relevant to emergency planning should be distributed to all emergency responders for their review and comment as incorporated into this proposed emergency plan. In the event that Isotope Shop Procedures are not to be incorporated into the emergency plan, any reference thereto should be deleted.</p> <p>The statement is made that "Facility personnel strictly follow the operating procedures (ISP's) and are well trained in these procedures as well as overall plant safety." Which "facility personnel" are referred to? What training do the personnel have in plant safety? What is the level of their training in first aid, fire and spill containment?</p> <p>Reference is made to operating procedures which are "designed to maintain conformance with accordance with certain operating federal regulations." Which federal regulations pertaining to safety and/or emergency response are referred to? Why is it that only "certain" operating federal regulations, rather than all applicable operating federal regulations, are sought to be conformed with? Specify which "certain operating federal regulations" are sought to be conformed with.</p>
	2.1.2	<p>Reference is made to "systems designed to prevent and detect releases of hazardous materials." Please identify what hazardous materials are maintained at the facility.</p> <p>Please specify which systems are designed to prevent the release of said hazardous materials.</p> <p>Please specify which systems are designed to detect releases of hazardous materials from the facility.</p> <p>In what way does the ventilation system prevent and/or detect releases of hazardous materials? What is included in the radioactive waste handling system? In what way does the radioactive waste</p>

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		handling system prevent and/or detect releases of hazardous materials?
		What personnel have hazardous waste material training?
		Has an inventory of hazardous materials at the facility been provided to the Local Emergency Planning Committee?
		What health physics procedures or systems are designed to prevent and/or detect releases of hazardous materials?
		What stack monitor systems are designed to prevent and/or detect releases of hazardous materials?
2.1.2.1		The discussion of the safety and monitoring devices in section 2.1.2.1 appears to be largely redundant to page 1-6. The proposed emergency plan should be organized to minimize or eliminate redundancy.
		Given the discussion in the "Emergency Pre-Plan Operating Procedures" of upgrades that are apparently planned, is the discussion on either page 1-6 or page 2-1 current?
		The statement is made that "The alarm can be erased only by correcting the difficulty after depressing the acknowledgment button." It appears from the text directly above this statement that the only "difficulty" that is contemplated is a "controlled item malfunction." What are the "controlled items"? What conditions beyond controlled item malfunctions constitute a "difficulty" for which an alarm will sound? What measures are taken when a hazardous condition, rather than a malfunction, exists?
		What signals are sent off-site and/or what records are made when an alarm goes off? To whom? What record is made or what signal is sent when an alarm is acknowledged?
		The statement is made that "Evaluation tests indicate that no unusual hazardous exist in these [equipment room, cell machinery room, isotope shop area] areas under normal cell procedure, but the precautions should be taken nevertheless." This statement does not appear to agree with the content of the 1995 Scientific Ecology Group study.

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		<p>The statement is made that alarms in only five of the six major systems will be transmitted to the local alarm monitoring company. Is the local alarm monitoring company ADT? If so, so state.</p> <p>Which of the five of the six major systems have their alarms transmitted? Why has the sixth major system not been connected to the local alarm monitoring company?</p> <p>It is stated that the local alarm monitoring company will report it to "a responsible person". Is that responsible person an AMS employee? Who? Does this responsible person have a back-up? Inasmuch as the Radiation Safety Officer lives a considerable distance from the facility, alarms should be transmitted directly to the emergency responders themselves.</p> <p>The statement is made that "The emergency generator will not trip the other five alarms if it restores power before the fans stop." This appears to make the emergency generator the device which triggers other alarms. If the emergency generator is not operating because of a natural gas service interruption, what alarms go off?</p> <p>What notification is given to any personnel at the facility and to off-site responders that the facility is operating on emergency power?</p> <p>What back-up for the emergency generator exists?</p>
2-2		<p>This page presents six apparently serious situations in which an alarm is sounded at the facility. Which of these emergencies is not transmitted to the local alarm company?</p>
2-3		<p>Something is missing in the transition from page 2-2 to 2-3.</p> <p>With respect to Hot Cell Systems subparagraph A, is there an emergency override to the two-person requirement for the electrical interlock on the Hot Cell door? Is there back-up emergency power for the electrical interlock and door operation motors? Is there any mechanical or hydraulic back-up in the event of complete power failure to the facility -- both electrical and natural gas?</p> <p>In Hot Cell Systems subparagraph B is a description of the device used to find loose Cobalt-60 pellets in the Hot Cell. How many loose Cobalt-60 pellets remain in the Hot Cell? Why have they not been cleaned up?</p>

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		Does the Cell Probe described work in a power failure situation? What measures are being taken to provide back-up emergency power to this device?
		Regarding Hot Cell Systems subparagraph C, why is the preset level for the gamma alarm set at "approximately" 2 mR/hr? Is the gamma alarm equipped with a battery back-up in the event both electricity and natural gas services fail?
		What is the inspection/calibration schedule for this gamma alarm?
		The Decontamination Room ventilation discussion appears redundant. The paragraph should be tailored to emphasize the alarm system, and the redundancy should be eliminated.
		Does the gamma alarm in the Isotope Shop Area have a battery back-up in case of a failure of both electricity and natural gas?
		Why is the Hot Cell gamma alarm set at 2 mR/hr, while the Isotope Shop Area alarm is set at 5 mR/hr? In that an alarm can apparently be set at 2 mR/hr, why is a higher level of radiation tolerated in the Isotope Shop Area?
		Is there an emergency back-up for the light above the basement door? Does that emergency back-up have a battery back-up?
2-4		Are there emergency back-ups for the electrical interlocks on the air locks? Are there manual overrides in case of loss of both electrical power and natural gas?
		With respect to the Equipment Room, why is the setting of the gamma alarm "approximately" 2 mR/hr?
		Is there battery back-up for this gamma alarm in the event of loss of both electrical and natural gas service?
		In all capital letters, the following statement is made: "PERSONNEL ARE NOT PERMITTED IN THIS ROOM WHEN THERE IS NO SIGNAL GREEN LIGHT OR WHEN THERE IS A RED LIGHT." What circumstances exist in the room to justify such caution? Under what circumstances does the red light come on? What measures must be taken to enable the red light to be turned off? What conditions exist in the equipment room justifying

an alarm in the event of the door being opened?

Reference is made to a Shielded Work Room. No Shielded Work Room is found on Figure 1-8; where is this Shielded Work Room located?

The gamma alarm in this Shielded Work Room is set at "approximately 5 mR/hr." Why is this an approximate figure? Inasmuch as alarms may be set at 2 mR/hr, why is this set at a higher level?

Does a battery back-up exist for this gamma alarm in the event of loss of both natural gas and electrical service?

2-5

The statement is made that "Only authorized personnel have keys to any isotope area." No "Isotope Area" is delineated on Figure 1-8 or elsewhere. What area is referred to?

Who are the "authorized personnel" that have keys to the locked areas of the facility? How may they be contacted in off-hours?

A back-up set of keys to these areas should be placed in the pump house, perhaps in a separate lockbox therein, or provided to the fire department.

The statement is made that "Doors to restricted areas are kept locked at all times." Is the phrase "isotope area" coextensive with the phrase "restricted areas"?

None of the more than nine doors stated to be locked at the facility are delineated as such on any facility drawings.

It is not clear from the drawings where the air lock from the cell control area to the change area is, inasmuch as there is no "cell control area" or "change area" delineated on the facility drawings.

It is not known where the doors from the warehouse to the "above air lock" are located, insofar as no "above air lock" is delineated on the drawings.

The phrase in the paragraph numbered 6, "equipment room on second floor," is ambiguous, inasmuch as there are both HVAC equipment areas and Hot Cell ventilation equipment areas.

Is the Cell Machinery room on the second floor the same as the Hot Cell Ventilation Equipment room?

The phrase "room adjacent to cell machinery room" is ambiguous, both because the meaning of Cell Machinery Room is not clear, and because each room on the second floor appears to have more than one adjacent room.

The phrase "Basement door opening to clean side of basement" is unclear, insofar as no clean side of the basement is marked.

Item nos. 2, 3, 4, and 5 list plural doors. These should be clearly identified and marked.

As indicated above, these locked doors should be set out in some high-attention color on the facility drawings to alert emergency responders to the fact that apparent access routes are not available. While firefighters may have tools to knock open locked doors, not all other emergency responders are so equipped.

The paragraph numbered 10 on page 2-5 states that "The perimeter of the entire facility is tied-in with a local alarm monitoring company (ADT)." It is known that a number of windows on both the first and second floors have been broken and have remained broken for months, that there were thefts from an NRC vehicle parked in front of the AMS facility, and that a pick-up truck breached the fence to the facility parking lot and was set on fire, each apparently without an alarm being raised. What is the nature of this perimeter control?

2-5

2.1.2.2

Reference is made to "various monitoring devices" connected to the HEPA system. What is the nature of those "various monitoring devices"?

Reference is made to both local and remote alarms. What are the thresholds for these local and remote alarms? Who is actually notified in the event of each?

Any alarm dealing with a failure of the HEPA system should be transmitted directly to emergency responders inasmuch as this ventilation system exhausts to the outside environment.

Does the ventilation system have a battery back-up in the event that

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		both electrical and gas power are lost?
		The statement is made that "A portable HEPA system is available for special isolated area use." What is meant by the term "special isolated area"? Where is this portable HEPA system located? Is it outside of any of the many areas above that are listed as being locked off? How is the portable HEPA system powered? Is the system easy enough to use that emergency responders could put it in place?
2-6	2.1.2.3	<p>What is meant by the phrase "solid radioactive waste"? What is meant by the term "designated container"? How do the "designated containers" differ from the 55-gallon drums that they are apparently placed in?</p> <p>How many barrels of solid radioactive waste are stored at the facility? Why are these storage areas not clearly delineated on the facility drawings?</p> <p>What is meant by the phrase "restricted locations"? Where are these restricted locations located? Do those areas marked in 1986 as restricted areas remain so?</p> <p>The statement that "The packaging and shipment of radioactive wastes are controlled by procedures ISP-25 and ISP-26," does not assist emergency responders and should be deleted.</p>
2-6	2.1.2.4	<p>Reference is made to fire pull boxes plural, although only one box is indicated on the facility drawings. If there is more than one pull box, its location should be indicated on the drawing. If there is not more than one, that fact should be confirmed.</p> <p>Reference is made to "A commercial alarm company that notifies off-site fire organizations." Is this commercial alarm company ADT? If so, contact information and any codes necessary to obtain information about this site should be provided.</p> <p>What is meant by the phrase "off-site fire organizations"? Is this different from the Cleveland Fire Department?</p> <p>Throughout the proposed emergency plan, there is inconsistency about whether and under what circumstances off-site fire departments are directly notified in the event of an emergency. This</p>

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		must be clarified.
		The statement is made that "In the event of a fire, personnel follow established routes of evacuation from the effected areas." No established routes of evacuation are described in the plan or delineated on the facility drawings, nor do there appear to be provisions made for secondary routes in the event the primary route is cut-off by smoke, fire, or other obstruction.
2.1.2.5		This Section contemplates an active role on the part of personnel that were involved in an emergency situation. This may be unrealistic, insofar as any number of catastrophic incidents can disable the personnel from being able to report anything. Similarly, personal problems such as heart attacks, stroke, etc. can disable individuals not involved directly in an emergency situation. What measures are taken to insure that personnel have the capacity to participate in any active alarm procedures? What measures are taken to insure that there is no situation for which personnel reporting does not have some automatic emergency back-up reporting/alarm system?
2-6	2.1.2.6	<p>Reference is made to "periodic" checks of radiation levels in areas in which radioactivity is handled. What is the schedule for such period checks? What records thereof are maintained? Where may they be found?</p> <p>What kind of metering is done for monitoring areas and personnel contamination?</p> <p>What is meant by the phrase "work areas"? Are these areas coextensive with either "restricted areas", "controlled areas", "controlled access areas", or any other type area described above?</p> <p>Are there battery back-ups to the meters in these areas in the event of failure of both electrical and natural gas service?</p>
2-6	2.1.2.7	<p>What is the nature of the "stack monitor"? What is done with the chart recordings made thereby? Are they accessible and/or meaningful to emergency responders?</p> <p>What is the "preset level" for the stack monitor?</p> <p>What is a "sufficient increase in activity above the preset level"?</p>

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		<p>Since there are automatic shut-offs for exhaust and supply fans, why are these supply air ducts referred to on page 1-6 left to manual adjustment?</p> <p>What is meant by "activation point"?</p> <p>Only the manner in which the "activation point" is calculated is set forth in section 2.1.2.7. This calculation should be performed and the activation point itself should be set forth.</p>
2-7	2.1.3.1	<p>The fact that the facility is designed and built to conform to Cuyahoga County building codes is not sufficient to provide necessary structural performance information. Cuyahoga County building codes do not appear sufficient to determine whether or not the Hot Cell, the Isotope Shop, or the WHUT room can withstand, for example, a boiler explosion, a natural gas explosion, a train wreck, a tornado, a severe earthquake, sabotage, or other foreseeable catastrophes.</p> <p>Inasmuch as no disaster modeling is contemplated under Cuyahoga County building codes, a professional engineer's opinion based on actual observation of the facility should be obtained to insure that the facility is of appropriate structural integrity to house the highly-radioactive Cobalt-60 that is present therein in the event of the expanded set of catastrophic events.</p> <p>This area is of particularly grave concern, given the extensive testimony by AMS' health physicist and AMS' attorneys before the NRC and the Federal District Court that the facility was on the brink of collapse.</p> <p>In the discussion of the Hot Cell construction, no mention is made of the several openings into it other than the window. As indicated above, these openings and the nature of any seals thereof should be set forth.</p>
	2.1.3.2	<p>The phrase "confinement barriers" is used as an apparent synonym for containers for radioactive waste. What testing (DOE, DOT, ASTM, NRC or other standard-making body) provides the basis for the assertion that such containers provide barrier function?</p> <p>Reference is made to lead shielded transfer containers. Inasmuch as lead melts at only 327°C, what shielding is providing for common</p>

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		fire situations, which involve temperatures significantly higher than 327°C?
		Reference is made to the HEPA filters that confine radioactive material. What are the temperature and fire ratings of these HEPA filters?
2.1.3.3		<p>The statement is made that "During minor incidents, no evacuation will be required and response team access will be through normal access routes." What is a "minor incident"?</p> <p>What is the "response team"?</p> <p>What are the "normal access routes"? What routes are used when normal access routes are obstructed?</p> <p>The statement is made that "The RSO's staff is responsible for normal facility monitoring and are quite familiar with these routes." Who is the "RSO's staff"? Is the RSO's staff to be distinguished from other AMS employees? How?</p> <p>What constitutes "normal facility monitoring"?</p>
2-8	2.1.3.4	<p>A statement is made that "There is only a remote probability of a facility breach is a restricted area from fire." (It is presumed that the second word "is" was meant to be "in".) It is known that protective clothing (spun-bonded polyolefin (Tyvek) overalls, plastic gloves, etc.) are stored at the site, along with filter media, all in restricted areas. Combined with the number of broken windows in the facility, it does not appear that an additional facility breach is required to present an opportunity for distribution of contaminated materials outside of the facility. What assessment has been made for distribution of Cobalt contaminated particulates in the event of a fire involving the plastic materials in the facility?</p> <p>Reference is made to fire extinguishers being located "throughout the facility". No fire extinguisher locations are found on any of the facility drawings, and should be supplied. Moreover, as water has been deemed inappropriate for fighting fires in restricted areas, foam or Halon or other chemical fire-control materials should be available in sufficient amount to control fires at the facility.</p>
2-8	2.1.3.5	The statement is made that "The cell is 6' by 6' by 11' high. It has a

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		4' floor and 4' ceiling." Is the later sentence meaning that the thickness of the floor and ceiling are 4"? Please clarify.
		The Hot Cell door is described here as having a 402-ton hinged door; elsewhere it was described as being 42-tons. Please clarify.
2-8	2.1.4	<p>The statement is made that AMS "routinely checks and documents the performance of these systems." The systems that are checked are not specified, nor is the nature of the checks and/or documentation of the performance of those systems specified. Please address.</p> <p>Section 2.1.4 refers to monthly checks of the alarm system. How can this be reconciled with the number of broken windows on the first and second floors?</p>
2-8	2.2	This section is introduced as the "Demonstration of Engineered Provisions for Abnormal Conditions." Once again, "abnormal conditions" is not defined. Moreover, demonstration of these provisions does not appear to be included in section 2.2.
	2.2.1	<p>This Section makes reference to "all operating personnel". In what way does this differ from other AMS employees, the RSO staff, and other descriptions of personnel?</p> <p>Of these "operating personnel", who has emergency training, and if what is that training comprised? That is, under what "abnormal conditions" have these "operating personnel" been trained?</p>
2-9	2.2.2	<p>This Section indicates that the ventilation, fire and evacuation alarms, personnel reporting, health physics procedures and stack monitor systems will no longer perform "under the most severe conditions." Please specify the conditions under which each of the ventilation, fire and evacuation alarms, personnel reporting, health physics procedures and stack monitor systems will fail.</p> <p>The ventilation system is described as confining radioactivity "under most conditions." Specify those conditions under which the ventilation system will not confine radioactivity.</p> <p>The statement is made "Failure of the ventilation system will not result in radioactive release due to the damper system." The only "damper system" described in the proposed emergency plan is that</p>

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		on page 1-6, and this is a manual system. Any manual system should have automatic emergency back-up systems, including battery back-up in the event of loss of both natural gas and electricity service, for such a confident statement to be accurate.
		The statement is made that "Under the most severe conditions, the ventilation system cannot be expected to confine radioactivity." The ventilation system should be redesigned to provide confinement of radioactive materials.
		The fire and area alarms are described as being "functional at all times". Are these fire and area alarms connected to off-site monitoring by means of telephone lines? If so, what provision is made for the failure of telephone service?
		Reference is made to "fire and area alarms" being functional at all times. What alarms are not functional at all times?
		The alarms are described as being "regularly checked". In what manner and according to what schedule are the alarms checked?
		The fire and area alarms are set to receive power from "emergency systems". Are these emergency systems the same as the natural gas driven emergency generator? If so, provisions should be made for power in the event of cessation of both electricity and natural gas service.
		The statement is made that "During an abnormal situation, personnel would conduct radiation level surveys, according to emergency procedures." What measures exist for conducting radiation level surveys by emergency responders while they wait for the radiation safety officer to arrive on the scene in the event of an off-hours emergency?
		Where may the "emergency procedures" are employed during an "abnormal situation" be found?
		The statement is made that "The stack monitor is expected to be operational in all but the most severe conditions." Under what circumstances does the stack monitor no longer function?
2-9	2.2.3	The statement is made that the facility building "is expected to maintain its structural integrity under all but the most severe natural

phenomenon." This is contrary to extensive testimony by AMS' health physicist and attorneys.

What is meant by "the most severe natural phenomenon"? Under what circumstances will failure occur?

The structural integrity questions raised by AMS' attorneys and health physicist arose under a circumstance of rain water incursion into the building. Inasmuch as the water that had flooded the building is now stored in bladders in the building, will structural integrity be retained in the event of a failure of the bladders?

What "confinement, shielding and barrier systems" are being referred to?

The "confinement, shielding and barrier systems in use throughout the facility" are also said to be expected to maintain structure integrity "under all but the most severe natural phenomenon." Under what natural phenomenon would the confinement, shielding and barrier systems fail?

The statement is made that "the ventilation systems should also be operational under all conditions except those resulting from extremely severe natural phenomenon." In what way do the "extremely" severe natural phenomenon contemplated under section 2.2.3 differ from the "most" severe conditions described in section 2.2.2? That is, under what conditions will the ventilation system fail?

Reference is made to routine checks of systems designed to prevent the release of radioactivity. What is the nature of the routine? What is the nature of the checks? What systems are included in those designed to prevent the release of radioactivity? Are those systems the ones described above, which do not function in extreme circumstances? At what point do "abnormal conditions" become conditions under which the systems no longer operate fully?

Reference is made to a "safety assurance program." Where is this safety assurance program set forth? What systems are incorporated in the safety assurance program?

The safety assurance program is said to insure that systems meet the "performance goals ... listed in 2.1.4." No performance goals

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		are listed in 2.1.4. Moreover, no provisions in section 2.1.4 refers to loss of function of systems in the event of extreme circumstances, as is expressly contemplated by sections 2.2.2 and 2.2.3.
3-1	3.1	Reference is made to an NRC "standard format document". Please provide a copy of such standard format document.
	3.2	The off-site licensee action described in response to a Class I - Alert is vague. In particular, the paragraph numbered 3, which directs AMS to "Augment resources and bring key personnel to standby status" does not appear to be appropriately detailed to alert fire, EMS, or spill control personnel of what preparations should be made.
3-2	3.2.2	<p>The licensee action described in response to a Class II - Site Area Emergency appears to be in conflict with the proposed emergency plan so far. That is, in many cases, contacts are to be made to AMS personnel only. In contrast, licensee action to a Class II - Site Area Emergency appears to require contacting local authorities with the status and reason for emergency as soon as discovered. That the latter directive should control should be made explicit.</p> <p>As in the case for a Class I - Alert, the directive to "augment resources and bring key personnel to standby status" is vague. Similarly, in paragraph 4, the directive to "assess and respond" is insufficient to provide any meaningful response by either AMS personnel or offsite emergency responders.</p> <p>What health physics training do AMS personnel have to prepare and provide release and dose projections as contemplated by paragraph 7 of the response to a Class II - Site Emergency?</p> <p>What are "foreseeable contingencies"? Do these include for example, a boiler explosion, a natural gas explosion, a train wreck, a tornado, an earthquake, and sabotage?</p> <p>Paragraph number 8 contemplates closing out or reducing the class of emergency based on the results of actions. What provisions are made for the eventuality that instead of reducing or eliminating, the emergency escalates?</p> <p>The Class II description indicates that "off-site releases are not</p>

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		<p>expected to exceed those permitted by 10 CFR Part 20 except near the site boundary." What conditions are expected at the site boundary?</p> <p>What provisions are made for emergencies in which off-site releases are expected to or do in fact exceed those permitted by 10 CFR Part 20?</p> <p>What procedures are in place for the monitoring of exposure levels in the neighborhood of the facility? What area evacuation plans exist for evacuation of the neighborhood in the event of a release exceeding Part 20 limits?</p> <p>Just as no provision appears to be made for releases which exceed those permitted under Part 20, there does not appear to be any provision for control of releases which may contaminate neighborhood property in excess of the 8 picoCuries per gram of soil release criteria of the NRC and the 0.8 picoCuries per gram of soil level contemplated by the EPA.</p>
3-2	3.3	<p>The Postulated Accidents list is not sufficient in light of the equipment at the facility, the neighborhood, and other factors, as is discussed in more detail below.</p>
3-3	3.3	<p>The first paragraph on page 3-3 refers to a "fire prevention program". What does this fire prevention program entail? Where is it set forth for review?</p> <p>The HEPA filters are described as being "fire resistant". What are the HEPA filters' fire ratings?</p> <p>What sections of the facility are protected by a sprinkler system? Please indicate those areas on the facility drawings.</p> <p>For those restricted areas, for which a sprinkler system is said to be inappropriate, what carbon dioxide, Halon, or other dry chemical fire control systems is in place? If no such systems are in place, has AMS made plans for their installation?</p> <p>In the second paragraph on page 3-3, the statement is made that "Major fires have been included in this plan due to the potential for off-site impact." Where in the Emergency Plan are the off-site impacts discussed? What is the nature of these off-site impacts?</p>

What follow-up activities are anticipated in the event of off-site impacts?

What steps have been taken to quantify the effects of toxics that could be released by a fire involving the plastic molding resins and molded parts in the warehouse?

What training have the AMS employees received in terms of handling hazardous materials and/or flames involving hazardous materials?

The statement is made that "The firefighting crews will be monitored with personnel monitoring devices." What personnel monitoring devices are referred to? Where are they located? How many of them are there? What provisions are made for training firefighters in their use?

During a June 21, 1995, visit to the facility, an NEORSD representative was denied access to the facility because not enough dosimeters were available. At the time, fewer than 10 people were at the facility. Is fewer than 10 dosimeters adequate?

The statement is made that "Firefighters and rescue teams entering the building will use appropriate respiratory equipment and will be accompanied by an AMS employee or off-site support personnel trained in the use of and equipped with portable radiation detection equipment." What is meant by the term "appropriate respiratory equipment"? Where is such equipment located? How many units of each type of equipment is available?

As the overall emergency plan to this point contemplates only the Radiation Safety Officer being available in an off-hours emergency (i.e., no provision is made for calling out additional AMS staff upon initial alert of a potential problem at the facility), does AMS anticipate that only a single firefighter will be involved in fighting a major fire justifying off-site support?

What is meant by "off-site support personnel"? Are contracts in place with any non-AMS off-site support personnel? What is the level of their training? How many of such personnel are available?

What is the nature of the portable radiation detection equipment those off-site personnel are equipped with? Where is this equipment

located?

The Proposed Emergency Plan recommends that fires within restricted areas "be fought with dry chemicals - CO₂, Halon or equivalent - to prevent possible runoff of contaminated water." Large-scale dry chemical firefighting equipment and supplies are not available to the Cleveland Fire Department. Accordingly, how does AMS propose that fires within restricted areas be fought? Is it AMS' intention to provide the fire department with such chemicals? In the absence of such supply, is it AMS' intent that all fires within restricted areas be allowed to burn, potentially releasing contaminated materials to the environment? If that is not the intent, what runoff controls does AMS intend to install to provide flow control?

The discussion of response to risks from tornados and earthquakes does not appear adequate. Just as major fires were to be included in the proposed emergency plan due to their potential for off-site impacts, so too should risks from train derailment, tornados and earthquakes.

The discussion of vandalism is unrealistic. Vandalism is, unlike theft, activity unrelated to the economic value of the materials. The numerous broken windows at the facility, the theft of equipment from the NRC mobile unit, the crashing of the AMS security gate, and the burning of the pick-up truck in the AMS parking lot, render vandalism and sabotage concerns quite realistic. These should be directly addressed.

3-3

3.4

As to the referenced Consultant's Report, the facility drawings disclose that there are at least two natural gas boilers that are a permanent part of the facility. One of these is located on the second floor, in a restricted area. The second appears to be located in the warehouse area, potentially proximate to the thermoplastic resins stored on-site. (The reason this is phrased in terms of "potentially" located is that the exact location of the thermoplastic resins on-site is not indicated in the proposed emergency plan.) Notwithstanding, no boiler explosion scenarios are postulated in the proposed emergency plan.

In addition to the permanent boilers, AMS contemplates the addition of a gas-fired evaporation system. This would be in close proximity to contaminated activated charcoal filter media, as well

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		as, ultimately, deflated polymeric water storage bladders. Some consideration of a fire involving the filter media and empty bladders should be considered.
		Similarly no involvement of natural gas fed explosions are discussed, although the natural gas meter appears to be just outside the Isotope Shop. In fact, the gas meter is between the isotope shop and the railroad tracks.
		Similarly no discussion whatsoever is made of the effect of a train wreck of any character on this facility.
		Further, although one pick-up truck has already been set on fire in the parking lot of the AMS facility, no discussion has been made of a potential truck explosion on the facility. Such a scenario should contemplate that, just as the perimeter fence could be breached, that garage doors as are seen on the north side of the facility may also be breached.
		Further, no provision is made in the evaluations for delays in emergency response because of the loss of all utilities -- including electricity, natural gas, and telephone service.

Consultants's Report

Page 1	3-4	<p>The Dose Assessment prepared by Integrated Environmental Management appears to have been prepared by a certified health physicist. Structural integrity questions are better evaluated by a certified professional engineer.</p> <p>The first paragraph of the letter report indicates that it is a "preliminary assessment". When will a final assessment be prepared, including a professional engineer's assessment of the structural integrity of the building as related to catastrophic events such as train derailments, tornados or earthquakes?</p> <p>The dose assessment prepared by AMS' consultant appears to be based on a inventory of dispersible radioactivity communicated to the consultant by the Treasurer of AMS. This inventory of dispersible radioactivity does not agree with figures provided by the Nuclear Regulatory Commission. What is the specific basis of this inventory, and has this inventory been accepted by the NRC?</p>
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		<p>The first footnote indicates that radioactivity contained in the Hot Cell was not included in the analysis. Insofar as the window to the Hot Cell is known to be capable of breaking, and that seismic events could certainly breach either the windows or the walls themselves, releases from the Hot Cell should be modeled.</p> <p>The same footnote goes on to state that a scenario for rupture from within the Hot Cell "cannot be postulated". Were a natural gas leak to coincide with the Hot Cell door being open, would an explosion of such natural gas rupture the Hot Cell window? A catastrophic failure of the Hot Cell window should be considered.</p> <p>There are apparently several other openings into the Hot Cell, none of which is directly addressed by the consultant. Why were evaluations of these openings not conducted?</p> <p>Footnote 2 of page 1 indicates that the inventory upon which the consultant based her estimates was a personal communication. Modeling of releases from the facility should be based on empirical measurement, direct observation and proper engineering analysis of the inventory located in the facility.</p> <p>Each page of the report is marked with the legend "Confidential -- Attorney Work Product". These legends should be removed.</p>
Page 2	3-5	<p>A discussion in the first paragraph of page 2 does not address the possibility that containers could be ruptured as a result of explosion, which could then be followed by a fire. The assumption that any such release from a ruptured container "could be quickly cleaned up before contamination could spread" is thus unrealistically optimistic. Moreover, at a public meeting it was stated that there is a single container at the facility which contains approximately 17,000 curies of Cobalt. Where is that container located? What would be the effect of an explosive release of the contents of this container?</p> <p>What would be the effect of a rupture of the basement walls, causing a release of contaminated water and/or sludge into the environment?</p> <p>Reference is made in the second paragraph to a "fire safety program for routine and emergency operations". Where is this fire safety program located in the proposed emergency plan?</p>

Reference is made to agreements with local fire departments, plural. Which fire departments have entered into agreements with AMS?

As contemplated by section 4.3 of Regulatory Guide 3.67, the licensee is to identify specifically what those organizations will actually do in a crisis. Both AMS and the consultant appear to contemplate that the fire departments responding to an emergency will have dry fire control chemicals. As these chemicals are not available to the Cleveland Fire Department in substantial amounts, the overall fire control program contemplated by AMS appears to require some updating.

The consultant also indicates that the form of radioactive material stored at AMS renders it incapable of combustion on its own. While Cobalt-60 may not itself catch fire, it is known that contaminated Tyvek protective garments, gloves and boots are stored at the site, each of which is combustible. Because these materials are combustible, and ash therefrom can carry radioactive materials with it, the assumption about Cobalt non-combustion may be understating the risk of dispersion of contaminant by combustion.

Similarly, filter media and the HEPA filters may present a significant source of dispersible radioactive material in credible accident scenarios.

AMS' consultant concedes that "Severe natural disasters could conceivably compromise the protective nature of the building and its radioactive materials storage areas." However, the consultant does not assess the effect of a flood on the facility. Historically, this facility has flooded several times during the period it had sewer service, and has even received NRC Notices of Violation for not reporting radioactive discharges during such flood events. Moreover, the facility presently harbors many thousands of gallons of water in flexible bladders in the facility. Accordingly, flood scenarios should be evaluated for potential releases off-site.

Cleveland, Ohio, is also in a designated earthquake zone.

Similarly, "tornadic storms" are not systematically evaluated, although Northeast Ohio is known to be subject to tornados.

The consultant appears to justify the absence of evaluations of

flood, earthquake or tornado events partially on the basis that "the majority of the Cobalt-60 inventory at the site is in primary containment (steel containers or cells) that is resistant to ready release." According to the study by Scientific Ecology Group, and according to presentations made by the NRC, loose Cobalt may be found in full curie amounts through many areas of the building. Accordingly, this justification does not appear well founded.

The consultant also states that the physical form of the Cobalt-60 material is "not conducive to movement". This is contrary to the contents of the 1988 NSS report on the contents of the waste holdup tank room, which described the Cobalt-60 wastes therein to be an easily-disturbed talc-like material.

No discussion is made in the consultant's report or elsewhere in the plan as to what notification will be provided to off-site emergency responders in the event telephone service is lost. Similarly, there is no indication that the loss of telephone service itself would trigger some notification to emergency responders.

As indicated previously, the discussion of vandalism activity, while quite extreme, does not anticipate other reasonable accident scenarios at the site.

For example, since both the CEI substation and the gas meter are on the same side as the building as the railroad tracks, rail accidents involving releases of, e.g., gasoline, toluene, or chlorine, could well be combined with a loss of both emergency power and communication to off-site responders. Accordingly, large-scale emergency situations could evolve and, during off-hours, not be reported for potentially hours. (Note that it was at a minimum many hours before discovery was made that a pick-up truck had been set on fire in the parking lot at AMS; this burnt-out truck apparently was only noticed when the Radiation Safety Officer reported for work on a Monday morning.) This is of particular concern, given the apparent capabilities of the alarm system. Specifically inspectors had found dead birds on the second floor of the facility that had apparently flown through the broken windows at the facility. When these birds flew in, apparently no alarm had been triggered. It is not known how large an object thus may go through the window before an alarm is actually triggered.

Similarly, fires involving the used (and therefore Cobalt

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		contaminated) filter media and the natural gas fed to the evaporator unit to be installed should be considered.
Page 3	3-6	<p>The CAP88-PC computer code is not generally used for emergency planning. Was any modeling conducted using standard release programs?</p> <p>Meteorological data for this facility would be more appropriately obtained from Burke Lake Front Airport.</p> <p>The one meter release height for emissions from this facility appears low, given the layout of the building, including the broken windows on the first and second floor. Moreover, it is reasonable to assume that in the event of a detonation of an entire tanker truck full of gasoline, that significant structural damage would occur to the facility. No discussion of actual physical damage to the facility (such as creating wholesale openings to areas in which loose Cobalt may be found) is found in the discussion of the "vandalism scenario."</p>
3-7		<p>The first sentence of page 3-7 appears to assume that the basement contains only 15 curies of Cobalt-60. This is contrary to the findings of the 1988 NSS report, and contrary to the presentations by the NRC as to their estimate of the loose contamination that maybe found in the basement.</p> <p>The assumption that only the contents of the basement room would be released in the event of the explosion of an entire tank of gasoline does not appear well-founded.</p> <p>Inasmuch as an explosion could physically open up the contaminated areas directly to the environment, the 5×10^{-3} release fraction does not appear warranted in application here. A 1.00 release fraction would be a more appropriate number. The "entire released fraction of 0.08 curies" is too low.</p> <p>The Consultant's Report does not address the potential for soil contamination above unrestricted release levels.</p>
3-8		<p>The consultant's report does not in any way examine contamination pathways involving runoff of contaminated water in fighting fires, nor accumulation of contamination at wastewater treatment plants.</p>

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3-11		Although the estimated curie number involved in an accident scenario is lower than the number of loose curies of Cobalt-60 known to be in the facility, and the stack height and other working assumptions are liberal, the lifetime fatal cancer risk is nonetheless 9.51×10^{-4} , or very close to 1×10^{-3} . This is an order of magnitude greater than acceptable risk under, e.g., EPA standards.
3-13		As indicated above, the stack height assumption in this model is quite liberal. Modeling should be conducted on the basis of releases following the catastrophic failure of the HEPA filter system on the second floor.
4-1	4.2.1	<p>Inasmuch as the Radiation Safety Officer lives quite a distance from the facility, to contemplate that he will be "responsible for all off-site notification and reporting" is unrealistic, particularly in off-hour situations.</p> <p>Reference is made to "emergency personnel on call". Who are these individuals? Where is contact information on these "on call" personnel located?</p> <p>Reference is made to an Emergency Manager. It is said that this is "a role filled by the RSO." Who fills this role when the RSO is sick, injured or on vacation?</p> <p>The statement is made that the Emergency Manager "will have direct control over emergency operations." It should be expressly recognized that this control is relinquished to the emergency responders upon their arrival on the scene.</p> <p>The third paragraph of Section 4.2.1 contemplates that the RSO will assess radioactive material spills and take appropriate action. What spill response training has the RSO had? What tools are available to the RSO to respond to a spill? What measures have been taken to provide the RSO with the appropriate tools and training to respond to a spill?</p> <p>What provisions are made for timely response to an off-hours spill?</p> <p>What is the basis for the statement "in general, the RSO will be capable of handling these situations entirely with no further on-site or off-site support"? What training and tools does the RSO have available to respond to a spill involving splashing of contaminated</p>

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		<p>water on personnel, such as were a hose on the pretreatment equipment to fail? Such a situation would force a choice between decontamination of personnel or spill control. How would such a situation be addressed?</p> <p>Section 4.2.1 also contemplates that contacting off-site emergency responders in the event of a major emergency would be delayed until the RSO chose to alert them. There should be direct contract between the alarm monitoring organization and the emergency responders. The terms and response thresholds should be worked out as soon as possible.</p>
4.2	4.2.2.1	<p>Several items are asterisked in this paragraph. What is the meaning of the asterisks?</p> <p>What training does the RSO have in the separate areas of first aid, medical transport, evacuation planning, fire fighting or rescue operations?</p> <p>The statement is made that "Staff for medical assistance, fire fighting and rescue operations will be off-site personnel." With whom does AMS have agreements for such staffing? If, by staffing, AMS is referring to the emergency responders themselves (e.g., firefighters, EMS, etc.), this outlook should be substantially modified.</p> <p>"Area personnel" are expected to aid in the evacuation. Where is the phrase "area personnel" defined? Where in the proposed emergency plan are evacuation plans located?</p>
4-2	4.2.2.2	<p>What is meant by the phrase "supporting staff"?</p> <p>Reference is made to "personnel and facility decontamination." Does this include decontamination of off-site emergency responders?</p> <p>Reference is made to the Radiological Contingency Plan. Does this mean the Onsite Radiological Contingency Plan? If not, where is this Radiological Contingency Plan located?</p>
4-2	4.2.2.3	<p>What is meant by the phrase "facility employees"? Are these personnel the same as the "supporting staff" of section 4.2.2.2 or the "area personnel" of section 4.2.2.1?</p>

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4-2	4.3	<p>The statement is made that AMS has arrangement with local police and fire departments, with local hospitals, and ambulance services, plural. These agreements are said to be included with the plan as Appendix B. No such appendix was found.</p> <p>Should such agreements be entered, care should be taken to ensure that they include an explicit agreement on the part of each emergency responder to participate in full scale exercises, a schedule of such planned exercises, and such specific requirements as permission for a health physicist (if one is available) to actually ride in an ambulance with a victim.</p>
4-2	4.4	<p>The discussion of Coordination with Participating Government Agencies is insufficient. No first responders are listed, nor is there an indication where such contact information may be found. Contact information for the NRC may also properly belong here.</p>
5-1	5.1	<p>It is not clear who makes up the radiological contingency response organization. A flow chart cross-referenced to the text would help toward understanding the proposed radiological contingency response organization.</p> <p>As indicated above, reference is made to an Emergency Manager without a clear definition of who this person may be other than the Radiation Safety Officer. If their roles are co-extensive, one of the phrases should be eliminated.</p> <p>As indicated above, accidents and alerts should be able to be passed along to actual emergency responders without human intervention, insofar as emergencies may arise during off-hours, or during regular hours the personnel on site may be injured or out of communication and thus unable to personally alert the responders.</p> <p>AMS should consider an agreement with an outside contractor for back-up support in the event of a radiological release to the facility or off-site (e.g., Clean Harbors).</p>
	5.1.1	<p>"Initial" incident reporting implies that there is some follow-up reporting contemplated. At what stage is the initial incident report prepared? At what time is a follow-up report prepared?</p>

No reporting requirements are set forth. Where may these requirements be found? To whom are reports sent? To what end are the reports prepared?

For each of the subheadings under the initial incident reporting heading, action steps need to be listed.

The description of Ventilation System Incidents apparently operates on the assumption that a failure of the ventilation system "does not constitute a radiological emergency." This appears to be too optimistic. In the event, for example, of a blow-out of the HEPA filters or a fire in the ventilation system, or a combination of the two, such an emergency could indeed constitute a radiological emergency. Moreover, given the remoteness of the RSO's residence, an off-hours accident of this nature could indeed become substantial in nature. Accordingly, some automated back-up system should be in place for the reporting of incidents involving the ventilation system.

The description of reporting for Ventilation Systems Incidents also indicates that the RSO will perform the initial assessment of the incident. Again, insofar as the RSO is remote from the site, some more rapid response should be developed.

In the discussion of Major Fire or Severe Natural Phenomenon, there does not appear adequate off- hours notification to off-site responders. ADT or any other alarm monitoring organization should have direct contact with the Fire Department or other appropriate responders.

Potentially three different people could be contacts according to the sentence, "During off hours, the Emergency Manager/RSO (or his alternate) will be contacted at home."

Reference to the company contact numbers does not indicate formally who the Emergency Manager is, or how an alternate is chosen. Some contact hierarchy should be set forth, preferably in flow chart form.

Alternatively, a cellular telephone or an emergency pager should be made available to whomever is acting Radiation Safety Officer. In this way, a single emergency number could be used.

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		<p>A statement is made that "The RSO will contact other key personnel, summoning them to the site as required." What is meant by "other key personnel"? What is their level of training to respond to a major fire or severe natural phenomenon?</p> <p>In the event that both electrical power and telephone communications are cut off, what back up systems exist?</p>
5-2	5.1.2	<p>What is meant to be included in "Incidents Other Than Major Fires and Severe Natural Phenomenon"?</p> <p>The first paragraph of this Section indicates that the RSO will be the individual to assess the situation and determine what sort of response is applicable. What emergency response training does he have to make such assessments? How is it determined that assessments can wait until the RSO arrives on-site from his residence?</p> <p>The statement is made that "The action to be taken under each emergency class are outlined in Section 3.2 and detailed in the attached procedures." As discussed above, Section 3.2 is vague and incomplete as far as action steps to be taken under those emergency classes outlined therein, and, leaves out any discussion whatsoever of a situation in which the 10 CFR Part 20 release limits are exceeded.</p> <p>The reference to Section 3.2 highlights the need for more logical pagination; Section 3.2 actually begins on page 3-1.</p> <p>Reference is made to a "Director of Regulatory Affairs." Is this an AMS employee? If so, contact information should be provided for him or her.</p> <p>The discussion of telephone contacts made by the Radiation Safety Officer in the event of an emergency is said to be detailed in Section 8.3. This is not the case, inasmuch as no reference is made to the "Director of Regulatory Affairs," or the Cleveland Fire Department.</p> <p>The statement is then made that "These parties will be instructed to place a return call and repeat the information provided by the RSO to authenticate the call." This is very problematic, inasmuch as it ties up the telephone lines at each of the named emergency responders and those of AMS.</p>

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		Further, inasmuch as the title of this subparagraph is "Incidents Other Than Major Fires and Severe Natural Phenomenon," other responders should be listed for telephone contact here and in Section 8.3.
		The heading, "Major Fires and Severe Natural Phenomenon," is not co-extensive with the classes of incidents described in Section 3.3. Section 3.3 falls short of describing all foreseeable incidents for which the emergency plan should make provision.
		The statement is made that "the Emergency Manager/RSO will receive reports of these types of incidents from plant personnel or the off-site security company." What measures are in place for incident communication in the event of a failure of both electrical power and telephone service?
		As indicated above, the off-site security company should have in place procedures to directly contact emergency responders in the event of fire, burglary, etc.
		It is stated that the RSO will assure that the facility is being evacuated. Nowhere in the emergency plan was a detailed evacuation plan set forth. Primary and secondary evacuation paths should be made clear, as well as primary and secondary collection points outside.
		Criteria for declaration of a neighborhood evacuation should be prepared and an evacuation plan for the neighborhood should be detailed.
		The statement is made that "He [RSO] will instruct his personnel to assess the emergency via environmental monitoring." What equipment is available for said "environmental monitoring"? What personnel are trained in its use? Where is such equipment located? Is this equipment able to be used by emergency responders?
		The last sentence of Section 5.1.2 contemplates that the steps of receiving reports from plant personnel, and instruction to personnel to begin "environmental monitoring" will precede activation of the "emergency response team," and precede contacting offsite responders. The order of activities here should be reversed. If the order on the page was not intended to reflect the action chronology, the chronology itself should be set forth.

Page	Section	Comments
5-2	5.2	<p>Section 5.2 describes a number of activities that could fall into the category of "environmental monitoring." If that is the intention, that should be stated expressly.</p> <p>While the several steps outlined in Section 5.2 provide important information, it nonetheless appears that these activities precede contacting the emergency responders. As indicated above, this order is inappropriate.</p> <p>The categorization contemplated by Section 5.2 appears to restrict incidents to "contained spill, ventilation system failure, fire or natural phenomenon." As discussed above, the potential for several other accident types exists.</p> <p>Not all foreseeable spills would be "contained spills," such as, for example, could result from failures of the storage bladders on site. Measures to respond to uncontained spills should be developed.</p> <p>The statement is made that "For all but the most severe incident, the RSO will estimate the amount of radioactivity that has been released through inspection of process records and discussion with the operating personnel." It does not seem appropriate that process records be reviewed in an emergency situation. What is the definition of a "most severe incident"?</p> <p>Among the assessment actions, the first activity that should take place is air and dose monitoring. However, it is relegated to the third paragraph in Section 5.2.</p> <p>What is the procedure for collecting airborne particulates and filter paper? Is this activity appropriate for, e.g., a fire?</p> <p>Who is conducting the sample collection? If it is the RSO, how is this task correlated with the many other tasks for which he is made responsible?</p>
5-3	5.2	<p>The top paragraph of page 5-3 refers to personnel film badges, self-reading dosimeters and portable survey instruments. It should be made clear to all first responders that film badges are for post-accident exposure assessment, and should not be referred to during the emergency response itself for an indication of exposure; film badges need to be developed to be meaningful.</p>

Page	Section	Comments
5-3	5.3	<p>Inasmuch as the accident scenarios described in Chapter 3 are inadequate to the potential hazards posed by this facility, the corrective actions contemplated under Section 5.3 are similarly inadequate.</p> <p>The statement is made that "fires will not be of sufficient severity to cause breach of containment." What is the engineering basis for this assertion?</p> <p>The assertion is also made that "corrective action for ventilation failure is to have personnel restore proper air flow." It does not appear in the emergency plan how AMS is to respond to other than a power failure to the ventilation system. What steps should be taken in the event of a blowout of the HEPA filters, a fire in the ventilation system, or a combination of the two?</p> <p>The statement is made that "In the event of an all engulfing fire or tornado or earthquake, there are essentially no corrective actions that can be taken." This is incorrect insofar as warning and/or evacuation of all down-wind residents, contacting the Red Cross or other disaster response organization, or like activities could take place. These procedures should be developed and articulated.</p> <p>One corrective action described is the RSO surveying the affected building to locate any contamination. Inasmuch as contamination may have spread offsite, this directive should be expanded to cover the neighborhood surrounding the facility.</p> <p>In the event that there is widespread damage to the area by a tornado or earthquake, how does the RSO get to the area to provide the survey functions that are described? What backup to the RSO's presence has been arranged?</p> <p>Inasmuch as offsite contamination may be widespread, and thus beyond the decontamination capacity of the individual RSO, a decontamination subcontractor should be made an integral part of the large-scale emergency response plan for the AMS facility.</p>
5-3	5.4	<p>As to Protective Actions, a windsock or flag should be put on top of the building to indicate the direction of wind. A flag in front of the building is not sufficient, as it may not be seen from other than in front of the building.</p>

Page	Section	Comments
	5.4.1	<p>An evacuation plan for the neighborhood should be developed.</p> <p>The evacuation plan described for the facility itself where a secondary assembly point is, where the site is located, whose responsibility it is to pick-up the site, what steps are taken in the event that all personnel and equipment are not present.</p>
5-3	5.4.2	<p>The location(s) of the respiratory devices and protective equipment that are said to be located at "various areas throughout the facility" should be set forth on the facility drawings.</p> <p>The nature of the respiratory devices (dust masks, etc.) should be set forth, along with the number of each type of equipment. Protective clothing for emergencies should be set forth in large sizes, so that any emergency responder may use it.</p> <p>The statement is made that "Personnel are trained in the use of protective equipment as part of their initial radiation protection training." What personnel have received this training? From whom?</p> <p>The statement is made that "Appropriate respiratory protection is worn for corrective action during fires." Are there any factors in determining what are "appropriate respiratory protection"?</p>
5-4	5.4.3	<p>In what way are radioactive materials "secured" to prevent a spill? What equipment is on hand for spill control? What is the level of training of the RSO and other personnel for radioactive spills?</p> <p>What is meant by the term "full scale recovery operation"?</p> <p>What is the source of the loose surface contamination in Section 5.4.3? How are these to be determined? By whom? What actions are taken in the event local contamination exceeds these levels?</p>
5-4	5.5	<p>Who makes up the "members of the emergency response team"?</p> <p>Why are EPA guidelines rather than NRC guidelines used for exposure limits? 75 REMS appears to be too high for a non-radiation worker.</p>

Page	Section	Comments
5-4	5.5.1	<p>The statement is made that "Preliminary decontamination of non-life threatening injured personnel will occur prior to transport." How is preliminary decontamination conducted? By whom? Where?</p> <p>How is decontamination water collected?</p>
	5.5.2	<p>The statement is made the "Emergency Manager/RSO is the only individual who can authorize workers to receive emergency radiation doses." What if the emergency manager/RSO is injured or otherwise unavailable?</p> <p>Are offsite responders included in the term "workers"? In the event that the emergency manager/RSO is not available, does AMS contemplate that no emergency response activity shall be conducted? If not, some fall-back plan should be set forth.</p> <p>The statement is made that "During the emergency, trained workers will carry survey meters to determine dose rates in the areas in which they are working." Which trained workers are available during off hours? What is the nature of their training? How many such trained workers are available? At what point are these trained workers called on to the site? By whom?</p> <p>There is a discrepancy between the exposure levels in Section 5.5.2 and Section 5.5. Explain.</p>
5-5	5.5.3	<p>It is stated that all emergency response personnel, including firefighters, will wear self-reading dosimeters. By whom will they be provided? Who will distribute them? Who zeros them in? How many are there? Where may they be found in the event AMS personnel are not available?</p> <p>Storage of an adequate number of dosimeters at the fire department itself may simplify distribution questions.</p> <p>The statement is made that "team members will also carry radiation survey meters and pocket dosimeters." What team is referred to here?</p>
5-5	5.5.4	<p>Are the "workers" to whom the discussion of initial decontamination refers inclusive of emergency responders?</p> <p>Who performs the initial decontamination? What training have they</p>

Page	Section	Comments
		received?
		Reference is made to the "contracted hospital". To what hospital does this refer? No Letter of Agreement from any hospital was included in the plan.
		What is meant by the statement "appropriate decontamination procedures and decontaminates will be used."
		What equipment is available and what procedures are in place to contain and control the spread of waste developed in the decontamination process?
5-5	5.6	What first aid training does AMS personnel have?
		Emergency Medical Services should be included in the medical transportation section.
		What commercial ambulance service has agreed to provide the transportation services described?
5-5	5.7	The introductory sentence of this section refers to hospitals plural, but only University Hospitals is named.
		A back-up hospital remote from University Hospitals should also be contacted. In this way, should a tornado or other disaster affect the East side, a West side hospital would likely still be available.
		What is the maximum number of contaminated injury victims that the hospital can accommodate?
5-5	5.8	Reference is made again to fighting fires with dry chemicals. Since the Cleveland Fire Department does not have ready access to large quantities of such chemicals, either AMS should supply them or install runoff containment systems for the contaminated water that will be in fact used to fight the fire.
		What equipment and procedures are available for detecting and monitoring the contamination level in such runoff?
6-1	6.0	This section overall is vague on what actual equipment is available, and does not indicate how many of those pieces of equipment named are available.

Page	Section	Comments
6.1		<p>The fire pump house is described as being the control point in the event of an emergency. In the event such pump house is in a contamination plume, a back-up control point should be established with at least minimal back-up supplies.</p> <p>Who has keys to the pump house supplies? What back-up procedures are there for insuring that emergency responders do have access to the equipment inside?</p> <p>It should be clarified that the pump house is actually northwest rather than simply west of the facility.</p>
	6.2	Provision should be made for a loss of telephone and electrical service to the facility.
	6.3	Reference is made to "assessment teams". Who makes up these assessment teams? In what areas of emergency response are they trained?
	6.4	<p>Please see comments to page 4-3.</p> <p>Again, reference is made to facilities plural "with which AMS has arrangements." Letters of Agreement were not included with this proposed emergency plan.</p> <p>The bottom paragraph on page 6-1 should be amended to indicate that the pump house is northwest of the facility.</p>
6-2		<p>Is the fire pump house serviced by the alarm company to detect, e.g., vandals?</p> <p>Are there back-up devices for when, for example, the frisker and survey meter are being calibrated?</p> <p>The frisker, survey meter, flashlight and respirator are referred to in the singular. Is there only one of each of these items in the fire pump house? If not, how many are located in the pump house?</p> <p>As to the respirator, what kind is it?</p> <p>How is the air sampler powered?</p> <p>How many 100' extension cords are available? Are there only two</p>

Page	Section	Comments
		pocket dosimeters available?
		What kind and how many pieces of protective clothing are available? Are the coveralls referred to made of Tyvek or other impervious fabric? Are the sizes of in particular the coveralls extra large so that all emergency responders may fit into them? Are there both latex and outer protective gloves?
		What is meant by 20" masking tape? Duct tape would likely be more useful.
		The contamination wipes, soap and spray bottle should be supplemented with brushes and a containment pool, such as a small child's inflatable pool. What kind of soap is to be used for decontamination?
		How much rope and what kind is available?
		What signs and placards are referred to?
		Where is the nearest working pay phone? Are directions thereto included with the emergency phone numbers and quarters? How often is the operability of the pay phone checked?
		The building keys should be separately secured. Do the building keys referred to include all those required to unlock the normally locked doors referred to on page 2-5?
		Additional supplies that should be included for emergency response include shovels, garbage bags, a large plastic roll, the Kraft paper referred to elsewhere in this emergency plan, a cellular phone, sampling bottles, sand bags and booms to block spillage.
		Batteries should be checked on a monthly basis.
6-2	6.5	The items listed in 6.5 are, in many cases, listed in the plural, but listed in the singular in the list of supplies in the pump house. The necessary items should be included in the pump house.
		The schedule of equipment checks and calibration should be expressly set forth. Adequate measures should be in place to be able to speak more confidently than "equipment should, therefore, be operational at the time use."

Page	Section	Comments
7-1	7.1	Reference to the pages of the proposed emergency plan itself indicates that it is not annually updated. The ultimate responsibility for forwarding the plan and procedures to emergency responders lies with AMS rather than its RSO. This should be expressly recognized.
7-1	7.2	<p>The discussion of training is generally vague, particularly with respect to who actually provides the training and how they are qualified to provide such training. A retraining schedule should also be set forth.</p> <p>The statement "since their only responsibility during an emergency is initial reporting of an abnormal occurrence, no further training is required," is contrary to much of the previous contents of the proposed emergency plan. First aid, decontamination, emergency assessment, spill control, and general emergency response training are all contemplated within the scope of personnel activities under the Proposed Emergency Plan. Such training should be provided.</p> <p>A statement is made that "Staff with limited emergency responsibilities receive basic radiation protection training as well as limited emergency response training." Who are the "staff with limited emergency responsibilities"? Who, then, are staff with broader emergency responsibilities?</p> <p>What constitutes "basic radiation protection training"? What is involved with "limited emergency response training"?</p> <p>What training or certification does the RSO have to provide training in emergency response?</p>
7-3	7.3	<p>What is the scheduling for the in-house drills contemplated by AMS? Is there provision for both on shift and off shift drills? What is the nature of the drills (paper? communication checks? bench?)?</p> <p>In what way and by whom are these in-house drills evaluated, reported, and audited?</p> <p>The statement is made that "AMS will conduct full-scale exercises with onsite and offsite personnel. These exercises will be conducted periodically. The interval will be determined through communication with all affected personnel and agencies participating in the exercise." The NEORSD is not aware of a</p>

Page	Section	Comments
		<p>scheduled exercise? When is it scheduled? What efforts have been made to arrange such a full-scale exercise? Inasmuch as AMS has never before had a full-scale exercise, what resources are being committed to coordinating such an exercise?</p> <p>What is the schedule for overall emergency preparedness?</p> <p>The statement is made that "A full scale biannual exercise will be conducted with AMS emergency response personnel and off-site emergency response personnel." What offsite emergency response personnel does AMS expect to include in this exercise? When, exactly, is this exercise to take place? What efforts have been made to schedule the various emergency responders participation?</p> <p>What comments are being solicited from the responders?</p> <p>What is the nature of the quarterly communication checks with offsite response organizations?</p>
7-2	7.4	<p>This section appears to restrict critique of each drill and exercise conducted to AMS personnel. Critique should be solicited from all emergency responders participating in any exercise.</p> <p>By whom is the annual audit of emergency response program conducted? What standards are used in this audit process?</p> <p>Has this "annual audit" been conducted previously? Where may its results be found?</p>
7-2	7.6	<p>Quarterly checks of equipment in the pump house is not sufficient for such items as batteries, particularly in winter months.</p> <p>Response to missing equipment should be beyond mere repair or replacement. Any equipment found missing should be thoroughly investigated.</p>
7-2	7.7	<p>Any revisions and/or updates to the Proposed Emergency Plan should be transmitted to all emergency response agencies.</p>
8-1	8.1	<p>This section contemplates saving records only until such time as the present NRC license is terminated. Any such emergency records should be kept for any possible future owner/licensee of the facility. This will enable any such subsequent owner or licensee to be familiar with prior incidents.</p>

Page	Section	Comments
8-1	8.2	Records involving training and retraining, critiques of drills and exercises, maintenance records for emergency equipment, and all review and updates for the plans and procedures should be kept on hand until decommissioning of the facility. To dispose of these after five years would lose important information.
		Reference is made in section 8.2 to "annual retraining". Who conducts such retraining?
	8.3	Are any forms available for the reports referred to in this section?
		All emergency responders should be provided with any updates of the emergency plan. Acknowledgment of the receipt should not be more involved than signing a return-receipt-requested slip from the U.S. Postal Service.
	8-2	As indicated above, this Section omits contacts to the actual emergency response organizations. This section also contemplates that initial offsite reporting may be delayed up to one hour. This is too long for emergency response.
		Reporting is referenced only in terms of offsite doses. Physical forms of releases and concentrations should also be provided.
		Who is included in the "support staff referred to"?
9-1	9.0	What decontamination capabilities exist for restoring the facility?
		What steps will be taken if resumption of normal operations is impossible?
	9.1	The first paragraph of this section deals with only minor spills. What steps are taken in the event of a major spill? What steps, for example, would be taken in the event of a failure of the HEPA system creating a release to the roof during a rain event?
		Reentry should not be restricted to only saving human lives. Reentry may be justified for assessment of the scope of the emergency, containment or remediation thereof.
		EPA standards are again referred to for exposure limits. Do there exist any NRC limits in this area?

Page	Section	Comments
		Mention is made of "appropriate respiratory equipment". What is meant by this phrase? Where is such equipment available? How many of the various pieces of equipment are available?
		Does the phrase "reentry personnel" include offsite responders? If so, who will provide them with portable radiation detection equipment?
		What provisions are in place for remediation of contaminated off-site property?
		Reference is made to "other supervisors" other than the RSO. Who are these individuals? In what areas of emergency response have they been trained?
		Who makes up the "reentry teams" referred to? In what areas of hazard assessment are they trained?
9-1	9.2	Health and safety should be the first order of priority for restoration activities; maintenance and regulatory compliance should be secondary to health and safety.
		Reference is made to the "supervisor of each of these sections" as if there were separate individuals for each of the areas of regulatory compliance, maintenance, and health and safety. Is this the case? If so, please identify the relevant supervisors.
9-2		The Radiation Safety Officer should insure that enclosures, shielding, the ventilation systems and their associated alarms are not only functional but that they are functioning.
		What compromises the "RSO's staff"?
		The statement, "based on information provided to the Emergency Manager/RSO by these individuals, the Emergency Manager/RSO will declare that the plant has been safely restored," should be modified. Depending on the nature of the emergency, this determination of whether or not the plant has been safely restored should be made by a health physicist, a professional engineer, or both.
	9.3	The procedures described in section 9.2 are inadequate to insure that plant restoration should be allowed.

Page Section

Comments

Actions that can prevent the recurrence of a particular type of accident should take place prior to resumption of operations at the facility.

Conformance to the "specifications described in Chapter 2" are insufficient to insure that operations could be conducted safely. See discussion of chapter 2 above.

Appendix A

Cover Sheet

Why is there a second "Emergency Pre-Plan Operating Procedures"? What is to be done with the first set?

Contents Page

The pagination on the Contents Page (which is itself un-numbered) is incorrect.

Contact Page

The emergency contact personnel sheet should be augmented by a beeper, pager or cell phone to be circulated among the radiation safety officer and any responsible delegate.

Travel times from the RSO's and delegates' homes should be included, so that the emergency responders can have some idea of how long they may have to wait for AMS personnel to get onsite during off-hours.

Are the secondary contacts listed the "designated alternates", "staff", "RSO staff"?

What level of training do these individuals have? What level of authority do they have?

What is the nature of transfer of authority from the Radiation Safety Officer to these individuals?

In particular, in the event that the Radiation Safety Officer cannot be reached by emergency responders, do these people have the authority to make decisions in his stead?

The heading "Emergency Civil Response Agencies" does not properly apply to the University Hospital of Cleveland or to ADT Security Services. These telephone numbers should be included, however.

Page	Section	Comments
		For ADT, the AMS account number and any applicable approval codes should be in place for contacts directly from emergency responders to ADT for information purposes.
		This list should also include numbers for the telephone, natural gas and electricity utilities, as well as Conrail.
		Contact information for the Local Emergency Planning Committee, the Cuyahoga County Department of Health, the City of Cleveland Department of Health -- Division of Air Pollution Control, and the Northeast Ohio Regional Sewer District should also be included.
		The AMS emergency contacts should confirm that there is no answering machine at these numbers, so that the phones will ring until someone physically answers.

Fire/Explosion/Medical Emergency Procedures

1	1.0	Actual activities, as well as "administrative actions," should be set forth for responses to emergencies. Revisions should also be made, as discussed above, for tornados, earthquakes, floods, spills, and sabotage.
1	3.0	<p>The "designated alternative" should be named and his training should be set forth.</p> <p>Procedures should be reviewed with all emergency responders rather than merely the Fire Department and Cleveland City Police.</p> <p>An update and revision schedule should be set forth.</p> <p>What is meant by "affected personnel"?</p> <p>What training does the Radiation Safety Officer have that would enable him in turn to train others?</p> <p>Subparagraph 3 of Section 3.0 should make it clear that its restrictions on making public announcements applies only to AMS personnel. Such restrictions cannot be made on emergency responders.</p> <p>Subparagraph 3 and 4 of Section 3 refer to the "Director of Regulatory Affairs." Who is this person? As no such Director of</p>

Page	Section	Comments
		Regulatory Affairs is named in the plan, who conducts the review and update of emergency names and telephone numbers on a quarterly basis as contemplated by subparagraph 4 of Section 3.0?
		What steps have been taken to insure that delegation of duty to "designated alternates" only takes place when the said designated alternate has sufficient training to accept such responsibilities?
1	4.0	The RSO's emergency responsibility should be expanded to include information assistance to all emergency responders, rather than merely firefighters.
		First aid, rescue, and spill containment responsibilities should also be explicitly set forth. In addition, training and retraining responsibilities should be set forth.
2	5.1	The entire first paragraph of Section 5.1 should be removed as obvious.
		The locations of portable fire extinguishers and the 1½-inch hoses should be set forth on the facility drawings.
		What run-off control and containment devices are in place in the event the 1½-inch fire hoses must be used?
		What action steps are in place for failure to control a fire at the incipient stage?
		What steps are to be taken in the event that the on-site fire pull is inaccessible and telephone service has been caught off? That is, where is the nearest fire box in the neighborhood?
2	6.0	No emergency contact personnel are listed on the page numbered "1."
2	7.1	No action step follows the statement "In the event of an emergency, the following action should be taken by the person reporting such emergencies." In addition, no provision appears to be made for emergencies occurring in off-hours.
	7.3	The paragraph about fighting fires with dry chemicals is repeated once again here. As indicated above, it does not appear that AMS has sufficient dry chemicals available. Similarly, such chemicals are

Page	Section	Comments
		not available to the Cleveland Fire Department. Accordingly, either readily supply arrangements should be made on the part of AMS or containment systems for water run off and monitoring should be put in place.
3	7.3	<p>Subparagraph 2 of Section 7.3 states that dampers for the HEPA equipment room are manual. In the event that this equipment room was inaccessible due to fire or other obstruction, no action could be taken to spare the environment from a potential release. Some automatic back-up system should be put in place that will default to a closed system (or a closed loop into the facility's controlled areas).</p> <p>Subparagraph 3 of Section 7.3 is unacceptable. The Fire Department should always be called first in the event of a fire alarm.</p> <p>Subparagraph 4 refers to evacuation of the building. Back-up areas should be assigned.</p> <p>Where is the nearest pay phone in the event that telephone service at the facility is inaccessible or out of order?</p> <p>As indicated above, the alarm service should be directly wired to alert the Fire Department directly in the event of a fire.</p>
3	7.4	<p>The statement "In the event of a fire or explosion, this signal is automatically transmitted to the ADT central office and the proper response civil service group (Cleveland Fire and Police Department) is immediately notified" describes the preferred response mode. Contacts with other emergency responders should be included, however.</p> <p>A statement is also made that "ADT calls key AMS emergency response personnel." Other than the Radiation Safety Officer, who are the "key AMS emergency response personnel"?</p>
4	7.4	<p>Subparagraph 2a is unrealistic in that it contemplates the Fire Department waiting for the Radiation Safety Officer to arrive before doing anything.</p> <p>Contact information for the Cleveland City Fire Department Radiation Officer should be provided.</p>

Page	Section	Comments
		Subparagraph 2d states that at the time of an emergency the responder should "Verify the existence and location of radioactive materials." This should be done now, in complete detail, prior to any emergency arising.
		In sub-paragraph 2g, reference is made to pocket dosimeters. How many such dosimeters are available? By whom will they be issued? Who will present instructions in their use? Who will zero them out prior to use? How much time is anticipated to be consumed by such zeroing out and instruction?
		What is the basis for the statement "the maximum dose allowable to save equipment is 25 REM."
		In regard to sub-paragraph 2h, what training does the RSO or his alternate have that would enable him to determine whether a fire will cause release of high airborne activity to the environment?
		What steps are taken to curtail releases from the HEPA equipment room in the event that the room itself is inaccessible?
		Subparagraph 2i refers to a joint determination by AMS personnel and professional firemen as to how fires may be suppressed. Insofar as large scale dry chemical facilities are not available to the Cleveland Fire Department, and that water will be used to fight any major fire at the facility, what steps will be taken by AMS to contain run off?
5	2j	In what manner will firefighting personnel be monitored for contamination upon exiting the facility? By whom?
		Referring to Subparagraph 2k, in what way will conducting exit contamination surveys confirm that the facility itself has been restored to a safe condition?
		What steps will be taken in the event that the facility is not restored to a safe condition? That is, what equipment and procedures exist for remediating and/or sealing up the facility and/or evacuating the neighborhood?
5	9	This section is headed "Minor Injuries," yet Subparagraph 3 thereof contemplates victims being unable to be moved. What is meant by "minor" in this context?

Page	Section	Comments
		Subparagraph 2a refers to a frisker used to assess the contamination level of an accident victim. Where is the frisker located? How does it function? In the event that an accident victim is in a restricted area, is a frisker capable of distinguishing contamination on the person from the high level of background radiation that attends a restricted area?
		Subparagraph 3b refers to rolling out a Kraft paper path to accident victims. Where may such Kraft paper be found?
6		Sub-paragraph 3e refers to a "emergency response team." Who makes up this team?
		Subparagraph 3g refers again to using exit contamination surveys to determine whether the facility itself is safe. What steps will be taken in the event that the facility is indeed not safe?
		Subparagraph 4 refers to spreading plastic sheets in areas to be occupied by accident victims. Where are such plastic sheets found?
		Subparagraph 5 refers to "back-up AMS response personnel." Who are these people?
		At the time an ambulance is called for any accident, the ambulance service or EMS should be informed that they will be responding to a potential radiation problem so that they may secure proper equipment (protective clothing, etc.) in a timely fashion.
7	11.1	It should be explicitly recognized that the outside emergency responders are in command of an accident scene upon their arrival.
	11.2	All relevant emergency responders should be contacted before any effort is made to contact non-responders such as the Director of Regulatory Affairs.
	11.3	Who are included in "supervisory personnel"?
		In which parking lot are personnel assembled?
	11.5	The equipment alarm maintenance discussion refers only to fire detection and security alarms. What steps are taken to inspect and insure the operation of gamma alarms?

Page	Section	Comments
7	12.0	As noted previously, the incidents of broken windows, theft from vehicles at the facility, fence breaches, and acts of arson on the AMS site indicate that security procedures should be reviewed.
8	12.1	<p>Inasmuch as it does not appear that reports were made following each broken window at the facility, how large a breach must be suffered before alarms are triggered or police are contacted?</p> <p>Why have the broken windows not been repaired?</p> <p>As indicated above, in the event of alarms, the relevant emergency responder should be contacted directly by the alarm monitoring service.</p> <p>Subparagraph 8 of Section 12.1 is unrealistic, since all radioactive materials on site have yet to be inventoried.</p> <p>Subparagraph 11 of Section 12.1 should be modified to include contact to the local emergency responders in the event of the loss or theft of radioactive materials from the facility.</p> <p>Sections 13, 14, 15, and 16 do not appear to be the result of communication with the relevant hospital. These paragraphs generally do not reflect the availability of state-of-the-art facilities. They do, however, appear to attempt to make it the responsibility of the offsite hospitals to obtain specialized radiological equipment. This responsibility, if it is undertaken by the hospitals, should be expressly set forth in their Letter of Agreement.</p> <p>In addition, it contemplates a variety of recording equipment that does not appear to be available in the emergency response kit (for example the portable battery operated tape recorder, camera, and/or movie camera referred to on page 14).</p>
9	13.0	<p>Are there any NRC rules for ambulance/rescue squads?</p> <p>Is the Department of Energy reference from 1978 the most current?</p>
Attachment 1		See above for comments on the Emergency Response Kit kept in the pump house.
Appendix B		See above for comments on the Facility drawings.

Page	Section
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Page	Section	Comments
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Appendix C		
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Appendix C		The Local Emergency Planning Committee, the State Emergency Response Commission, the Emergency Medical Service, the Northeast Ohio Regional Sewer District, the Ohio EPA Emergency Response Personnel, and the Federal EPA should each be added to the distribution list of emergency agencies receiving a copy of the contingency plan.
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In addition, insofar as page 14 of the plan contemplates contacting Perry Nuclear Plant, Perry Nuclear Plant should also receive a copy.

A contact person should be included for the University Hospitals of Cleveland.

Telephone numbers should be provided for each of the contacts.