UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

96-25
398538

March 29, 1996

MEMORANDUM FOR: Donald A. Cool, Director
Division of Industrial and Medical
Nuclear Safety, NMSS

FROM: John R. Madera, Chief
Nuclear Materials Licensing Branch, RIII

SUBJECT: REQUEST FOR TECHNICAL ASSISTANCE IN THE REVIEW OF THE REVISED EMERGENCY PLAN FOR ADVANCED MEDICAL SYSTEMS, INC. (AMS)

Enclosed for your review is a copy of the responses submitted by AMS in reply to our February 28, 1996 deficiency letter.

We are currently reviewing the responses and await your comments before we generate a third deficiency letter, if necessary. An expeditious review of the enclosed responses would be greatly appreciated.

Attachments: AMS' response letter dated March 21, 1996

CONTACT: Kevin Null
708-829-9854

· 041

Advanced Medical Systems, Inc.
1020 London Rd.
Cleveland, Ohio 44110
216-692-3270

96-25

March 21, 1996

398538

Mr. J. R. Madera, Chief
Nuclear Materials Licensing Section
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60523-4351

Re: Advanced Medical Systems Inc. (License No. 34-19089-01) Emergency Plan

Dear Mr. Madera:

Advanced Medical Systems, Inc. (AMS) is in receipt of your letter dated February 28, 1996 wherein comments on Revision 0 of the AMS Emergency Plan were provided. Enclosed are our responses to your comments, along with a description of our proposed follow-up actions.

Once you have approved these responses and follow-up actions, the Emergency Plan will be revised in accordance with our commitments. Revision 1 of the Plan will then be distributed to the USNRC and to those individuals on our "first responders" list. Shortly thereafter the first responders will be trained in the provisions of the Plan, and the first emergency drill will be scheduled.

AMS is operating under the conditions of its existing license until final action is taken on our revised renewal application. Consequently, these responses, and ultimately Revision 1 of the Emergency Plan reflect some discontinuity between procedures that do not exist under the provisions of the current license, and those that are proposed for the renewed license. We are hopeful that timely USNRC action on our revised renewal application will permit us to convert all procedural references in the Emergency Plan to the new Radiation Safety Procedures before Revision 1 of the Plan is ready for distribution.

If I can answer any questions or provide you with additional information, please call me at (216) 692-3270. We are looking forward to timely approval of our Emergency Plan.

Sincerely,

Robert Meschter

Robert Meschter, RSO

cc: D. Cesar
D. A. Miller, Esq. - Stavole & Miller
C. D. Berger, C.H.P. - IEM

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RESPONSE TO COMMENTS FROM
U. S. NUCLEAR REGULATORY COMMISSION

Agency Comment 1(a): It appears that the onsite emergency organization is comprised of three individuals during working hours, and the absence of one or more individuals could severely impact the licensee's capability to promptly notify offsite response organizations and coordinate the response to an emergency. The licensee is required by 10 CFR 30.32(i)(3)(vii) to plan the notification and coordination so that unavailability of some personnel will not prevent notification and coordination. The plan should describe how the licensee will compensate for the functions assigned to an absent member of the emergency organization.

AMS Response: Concur. AMS recognizes its potential staffing limitations in the event of an Alert or Site Area Emergency. However, due to the low probability of occurrence of these events, and the limited activities that are currently on-going at the London Road facility, a staffing increase is not warranted. Furthermore, Section 2 of the Emergency Plan shows that the radiological impact of accidents such as building fires, earthquakes, tornados, vandalism, floods and events at neighboring industrial facilities is relatively small and in no case requires countermeasures or recovery actions. As a result, personnel demands are likely to be small.

Action Taken: Page 4-2, lines 19 will be modified to read: ". . . dose consequences of the incident. It only one AMS staff member is available to assist the Emergency Manager, that staff member will assume both site access and site surveys responsibilities until additional staff members arrive. If no AMS staff members are available to assist the Emergency Manager, the Emergency Manager will delegate both site access and site surveys responsibilities, to the best of his abilities, to other responders until additional staff members arrive."

Page 4-2, lines 20 through 23 will be modified to read: "The Emergency Manager is responsible for contacting off-site emergency response agencies for assistance if the Plan is activated. If less than three (3) AMS staff members are available to assist, the Emergency Manager will assign the responsibility for notifications to the Vice President. In addition, an environmental . .".

Agency Comment 1(b): Section 4.2 of the plan should clearly state the order in which AMS staff members assume the role of Emergency Manager if the Radiation Safety Officer (RSO) is not available.

AMS Response: Concur.

Action Taken: After line 15 on page 4-1, the following sentence will be added: "In the absence or unavailability of the RSO, the authority for implementing the radiation protection program is delegated to the Alternate Radiation Safety Officer (ARSO)."

The sentences beginning on line 11 of page 4-2, will be changed to read: "In the absence of the RSO, the ARSO can serve as the acting Emergency Manager until the arrival of the RSO. In the absence of the RSO and the ARSO, the remaining AMS staff member can serve as the acting Emergency Manager until the arrival of the RSO or the ARSO. All AMS staff members at the facility during an . . ."

Agency Comment 1(c): It is still difficult to determine which personnel are assigned to each of the functional areas specified in Section 4.2.2 of Regulatory Guide 3.67. It would be helpful if these functional responsibilities were all specified in one place such as Figure 7.

AMS Response: Concur.

Action Taken: The position entitled "Emergency Manager" on Figure 7 will be modified to read: "Emergency Manager (Personnel evacuation and accountability; search and rescue operation, communications, personnel decontamination; record keeping). The position entitled "Vice President" will be modified to read: "Vice President (Media Contact). The position entitled "Environmental consultant" will be modified to read "Environmental Consultant (Certified Health Physicist, post event assessment, mobilization of intermediate resources). The position entitled "AMS Staff Member (Site Access and Security)" will be modified to read: "AMS Staff Member (Facility system operation, assist fire control, assist first aid, facility security and access control; facility repair and damage control). The position entitled "AMS Staff Member (Radiation Surveys and Assessments)" will be modified to read: "AMS Staff Member (Radiological survey and assessment, facility decontamination).

Agency Comment 1(d): During nonworking hours, it is unclear whether a fire or other emergency situation will be detected promptly if power lines or phone lines are down. The plan should describe how the alarm system signal is transmitted to ADT Security Systems and how ADT would detect a loss of contact with the alarm system. Any difference in the response to a loss of contact versus an alarm signal should also be described also.

AMS Response: Concur. However, because this letter and the AMS Emergency Plan are public documents, a detailed description of the alarm system has the potential to compromise its integrity.

Action Taken: Footnote 22 on page 2-6 will be modified to read: "ADT Security Systems, Inc. provides the monitored alarm system for the facility. In the event of a power failure or disruption in telephone services, ADT contacts the individuals on the AMS call-back list. In the event of a fire or intruder alarm, ADT first places a call to the fire or police department, as applicable, and then contacts the individuals on the AMS call-back list."

Agency Comment 1(e): During nonworking hours, it appears that local fire or police units could arrive before AMS staff and it is unclear whether there are adequate provisions to alert offsite response personnel to radiological hazards if no AMS personnel are there to meet them. The plan should describe arrangements with fire, police and rescue personnel regarding how they will fight fires and respond to alarms if AMS personnel are not present when they arrive at the site. The plan should also describe signs and other provisions to prevent offsite response personnel from unknowingly entering areas with elevated radiation levels.

AMS Response: In Section 7.2 of the Plan (page 7-1), AMS has committed to providing annual radiation safety training for first responders. Included in the training is instruction in emergency procedures and the agency's anticipated role in an emergency. During that training, the first responders will be instructed in how to access the facility in the absence of an AMS representative, the maps that are posted immediately inside both entrances on the east side of the building showing the restricted areas, and how to recognize the postings at the entrance to the restricted areas.

Action Taken: Page 7-1, line 17 will be modified to read: ". . . procedures, radiation protection guidelines, location of restricted areas, posting/labeling, and the agency's anticipated . . ."

Agency Comment (2): Engineers Opinion Report

AMS Response: AMS did not receive the USNRC's Inspection Report No. 030-16055/95006, dated March 12, 1996, in sufficient time to evaluate the information and prepare a response. Thus we wish to defer response to Agency Comment (2) until the report has been reviewed.

Action Taken: None at this time. However, a specific response to Agency Comment (2) will be included in the AMS response to Inspection Report No. 030-16055/95006.

Agency Comment 3(a): Section 1.1 contains a brief description of activities formerly conducted at the site, but there is no description of activities currently authorized or conducted. The plan should describe the current activities.

AMS Response: Concur.

Action Taken: Page 1-1, line 6, will be modified to include the following sentence: "These materials are possessed for the purpose of sale or transfer to an authorized third party; for storage incident to disposal, discharge and/or decommissioning; or for use as shielding for AMS and Picker teletherapy and radiography units. Source manufacturing at the London Road facility ceased in 1987."

Agency Comment 3(b): Section 1.1 and Table 1 describe the amount of licensed material possessed on September 21,1995. This inventory is subject to change and could increase up to the possession limits stated in the license. The plan should state the total quantity of radioactive material authorized by the license. Typical quantities possessed at one time may be noted also.

AMS Response: Concur.

Action Taken: Page 1-1, line 5 will be modified to read: ". . . license No. 34-19089-01, AMS is currently licensed to possess 340,000 curies of ^{60}Co in the form of solid metal or sealed sources, and up to 4,040 kilograms of depleted uranium. As of the date of this report, AMS . . ."

Agency Comment 3(c): Section 1.1 states that there are over 60,000 curies of cobalt-60 and 2200 kilograms of depleted uranium in the facility, but it is unclear where this material is typically located. Sections 1.2 through 1.2.12 only identify the location of approximately 34,000 curies of cobalt-60. The typical storage locations for the remaining material authorized by the license should be identified.

AMS Response: There are two storage containers holding a total of 20,000 curies of ^{60}Co in the form of sealed sources. The contents of these containers, which may be re-located within the restricted area from time to time, were omitted from Revision 0 of the Plan.

Action Taken: Page 1-4, line 11 will be modified to read: "that contains approximately 20,000 curies of ^{60}Co in a non-dispersible form (e.g., in sealed sources housed in shipping containers),

approximately 2,100 kilograms of depleted uranium in non-dispersible form, and approximately two (2) millicuries . . ."

Agency Comment 3(d): The plan still lacks a detailed site drawing showing the exterior features of the building and property described in Section 1.2 of Regulatory Guide 3.67. A detailed drawing of the exterior features of the site must be provided in addition to the interior floor plans. In addition to detailed information about the license's property, the drawing should show the pump house on Mandalay Avenue, the rail line that runs past the facility, and the nearest residents in each direction.

AMS Response: Concur.

Action Taken: An exterior drawing that shows the pertinent features of the site, including the pump house on Mandalay Avenue, the rail line that runs past the facility, and the nearest residents in each direction will be included as Figure 8.

Agency Comment 3(e): The terminology used to describe areas in the facility is still inconsistent. [Examples given.] consistent terminology should be used and all areas discussed in the text should be indicated on the drawings.

AMS Response: Concur.

Action Taken: Page 1-1, line 16 will be modified to read:" a Hot Cell, a High Level Waste Storage Room, and miscellaneous . . ." Page 1-1, line 18 will be modified to read: "a Clean Equipment Room, and the HEPA Equipment Room. The basement . . ." Page 1-1, line 19 will be modified to read: "contains a Source Garden, waste storage . . ."

Agency Comment 3(f): Section 1.2.3 states that there is an L-shaped shield of sand-filled vaults on two sides of the source garden in the basement, but the floor plan in Figure 2/Appendix B does not show the shield. Significant safety features such as the sand shield, the emergency generator, fire pull stations, and storage locations of emergency response kits should be shown on the floor plans. The floor plans should also identify where electrical and natural gas services enter the building.

AMS Response: The sand-filled shield located on two sides of the Source Garden is an integral part of the structure. The shield itself is no more of a special safety feature that the walls on the remaining two sides of the Source Garden. Therefore, additional detail to show the location of this shield in Figure 2 and Appendix B is not necessary. The fire pull station and the electrical control panel are clearly identified on Appendix B.

Action Taken: Page 1-3, line 17 will be modified to read: "Additional shielding for accessible areas of the basement is provided by an L-shaped sand-filled shield at the basement level."

The location of the emergency generator, the emergency response kit and the location where natural gas services enter the building will be identified on Appendix B.

Agency Comment 3(g): Section 1.3 states that Figure 5 identifies the facility and its proximity to near-by structures. It states that figure 5 shows the location of schools, hospitals and fire stations also. Figure 5 appears to be a poor quality copy of a street map and neither the licensee's building nor any structures

within 1 mile of the site are clearly identified. Figure 1 does not provide an adequate picture of the area near the site either. The plan should contain a reasonably detailed drawing of the site area as described in Section 1.3 of Regulatory Guide 3.67. The plan should also contain a U. S. Geological Survey topographic map (7.5 minute series).

AMS Response: Concur.

Action Taken: Figure 5 will be replaced with a USGS topographical map showing structures and buildings within one (1) mile of the AMS site.

Agency Comment 4(a): The discussion on page 2-2 refers to guidance issued by the ICRP. This guidance is not directly applicable to facilities in the United States. The guidance applicable to protecting the public in this country is contained in the "Manual of Protective Action Guides and Protection Actions for Nuclear Incidents" issued by the U. S. Environmental Protection Agency. The plan should refer to this guidance regarding offsite protective action recommendations.

AMS Response: Concur.

Action Taken: The paragraph that begins on line 14 of page 2-2 will be revised to read: "The U. S. Environmental Protection Agency provides guidance on when and how to institute countermeasures and recovery actions in the event of a major radiation accident (USEPA, Office of Radiation Programs, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents", October, 1991). However, countermeasures and recovery actions themselves involve some risk to the public. Consequently, to ensure that the risk avoided is much greater than the risk of the action, they have set a dose limit below which they recommend that no follow-up action whatsoever be taken. The USEPA protective action guides for early-phase countermeasures (evacuation and sheltering) ranges from 1,000 to 5,000 millirem. Therefore, for the major fire scenario at the AMS site, wherein an off-site individual might receive up to 0.3 millirem, countermeasures or recovery actions for purposes of protecting that individual are not indicated."

Agency Comment 4(b): We have a number of concerns regarding the analysis in Section 2.1.1 and Appendix C of potential doses from a fire. Appendix C states that the source term for the worst case fire was assumed to be 40.4 curies, but the basis for that number is not provided. This does not appear to be a conservative assumption because the revised AMS license application dated October 30, 1995 requests a possession limit of 50 curies for packaged waste and surface contamination, and there is no explanation why the source term should not include bulk quantities of cobalt-60 from containers ruptured by one of the accidents postulated in Chapter 2 such as a gas line explosion, train derailment, or earthquake.

AMS Response: It is clearly stated in Sections 1.2 1 through 1.2.12 of the Plan, and again on Table 1 (page 11-2) that approximately 40 curies of the current radioactive materials inventory at AMS are considered to be potentially dispersible. Therefore, this is the value that was used as input to the dose assessments.

In the October 30, 1995 license amendment application, radioactive materials possession limits in excess of the actual inventory were requested for all material forms (e.g., sealed sources, bulk metal, residual contamination, and packaged waste). Since the purpose of the dose estimates in the Emergency Plan are to arrive at a realistic evaluation of the impact of a major building fire,

AMS maintains that 40 curies of potentially-dispersible material is the appropriate source term for the calculations.

Because the bulk ^{60}Co and the sealed sources are contained in either hardened storage areas (e.g., the Hot Cell, the Source Garden, source heads or shipping containers), it is not likely that these materials would be released in the event of an explosion, train derailment, or earthquake. This explanation was given on page 2-1, lines 25 through 28, and on page 2-1, lines 1 through 5. It is highly improbable that release quantities of these materials that even approaches those contained in 10 CFR 30.72 would occur. Furthermore, the smallest physical size of these materials (1 mm x 1 mm pellets with a density of over 8 grams per milliliter) are not respirable, and the deposition velocity is not conducive to dispersion. AMS sees no justification for including the bulk quantities and sealed sources in a realistic evaluation of the radiological impacts from a major building fire.

Action Taken: None required.

Agency Comment 4(b): In addition, we disagree with the statement in footnote 40 that a 10-meter release height is a conservative assumption. A ground level release with no plume rise would maximize the off-site dose estimate.

AMS Response: AMS agrees that a ground-level release with no plume rise would definitely maximize the offsite dose estimate. However, footnote 40 on page 13-8 refers to the means by which the emission source is modeled in the event of a major building fire. In this scenario, airborne radioactive materials would exit the building through doors, windows or the existing ventilation system, which has a 10 meter above-grade stack height. In all cases, the release height is above ground level. Furthermore, thermal rise would ensure an even greater release height before the materials could disperse or diffuse through the atmosphere.

The purpose of the dose estimates in the Emergency Plan are to arrive at a realistic evaluation of the impact of a major building fire. Therefore, AMS maintains that a ground-level release is not realistic under the circumstances and that a release height of 10 meters above the ground is indeed a conservative assumption.

Action Taken: None required.

Agency Comment 4(b): We note that the CAP88-PC computer code is not intended to estimate short term doses resulting from an unplanned release during an emergency. [An alternative evaluation is provided.] A more detailed and conservative analysis using more appropriate calculational methods should be provided.

AMS Response: AMS acknowledged, in footnote 37 on page 13-7, that the CAP88-PC computer code was designed for assessing annual average exposure rates from routine releases of radioactive materials, as opposed to short-term doses from a "puff" release. However, using the assumptions shown in that footnote, the CAP88-PC code will, indeed, over-estimate the dose.

Like the CAP88-PC code, the NUREG-1140 calculation referenced in Agency Comment 4(b) is based upon a gaussian plume model. However, if the Agency representative who used the NUREG-1140 calculation for Comment 4(b) assumed a ground-level release with no plume rise

and a highly-conservative dispersion category, it is not unreasonable to see a dose estimate that exceeds the CAP88-PC estimate shown on page 13-9.

It is important to note that, in both cases, mathematical models are being used to estimate the potential impact on people. When one considers the limitations of these models in regard to such influences as terrain effects, building wake effects, stability categories, and person-specific exposure factors, the difference between 7.7 millirem from the NUREG-1140 calculation and 0.2 millirem from the CAP88-PC calculation is insignificant. Furthermore, all calculated doses are less than the 10 millirem per year dose limit promulgated by the U. S. Environmental Protection Agency in Title 40, Code of Federal Regulations, Part 61, Subpart I (National Emission Standards for Radionuclide Emissions from Facilities Licensed by the Nuclear Regulatory Commission and Federal Facilities Not Covered by Subpart H). Therefore, additional refinements to the computer model or selection of an alternative model, in light of these negligible calculational differences, is not warranted.

Action Taken: None required.

Agency Comment 4(c): Section 2.1.2 and Appendix C state that an earthquake could create a 100 millirem/hour dose rate 20 feet beyond the outside wall of the source garden. The plan should state the distance at which the dose rate would drop below 2 millirem/hour and whether that location is in an area accessible to the public. In addition, we attempted to run the Microshield code using the assumptions stated in Appendix C but we could not duplicate the results stated in the plan. The input parameters and assumptions should be described in enough detail to permit us to duplicate and evaluate the calculation.

AMS Response: Concur.

Action Taken: Page 2-3, line 11, will be modified to read: "the building, 0.1 R per hour at a distance of 20 feet from the wall of the building, and two (2) mR per hour at a distance of 140 feet away from the building at the elevation of the Source Garden. There are no off-site residents at any of these locations. However, they are accessible by members of the general public."

Appendix B . . ." Page 13-9, footnote 46 will be modified to read: "The Microshield code is distributed by Grove Engineering, Inc.. Version 4.10 was used for this assessment. The following were used as input to the code: x-coordinate = distance from receptor to outside wall of the Source Garden (e.g., x = 20 feet); y-coordinate = the mid-point of the height of the Source Garden's active area (e.g, y = 21.9 cm); z-coordinate = the mid-point of the width of the Source Garden's active area (e.g., z = 21.9 cm); the outer concrete wall of the Source Garden is 45.7 centimeters thick with a density of 3.6 grams per ml; and the density of the sources in the Source Garden is 8.8 grams per milliliter."

Agency Comment 4(d): Section 2.1.3 states that a tornado would not compromise the structural integrity of restricted areas and references the Engineers Opinion Report issued by Neff & Associates. Although this report states that portion of the building contained within the bunker-type construction would not sustain any appreciable distress, it also states "that it is scientifically certain that a tornado passing over this facility would impose significant structural damage" to other parts of the building. Restricted areas on the second floor and in the warehouse areas of the first floor could be completely demolished by a tornado releasing radioactive materials in those areas. Section 2.1.3 should provide a more accurate description

of the potential damage from a tornado, and postulate the maximum amount of radioactive material that could be in these areas as a result of routine storage, preparation for shipments, or other operations.

AMS Response: Partially concur. It is likely that a tornado passing over the facility would impose structural damage to a variety of restricted areas that are not of "hardened" construction. However, of these areas, only the HEPA Room on the second floor contains any dispersible activity of consequence (e.g., two curies). If one disregards the grossly increased dispersion of this material in a tornado, the maximum dose to the nearest off-site resident would be only a fraction of that associated with the fire scenario, wherein 40 curies could potentially be dispersed. Therefore, AMS maintains that the radiological impact of a tornado would be minimal.

Action Taken: None.

Agency Comment 5(a): Section 3.2 is still inconsistent with the notification requirements in the regulations. Pursuant to 10 CFR 30.32(i)(3)(viii), the plan must contain a clear commitment to notify appropriate offsite response organizations promptly after declaring an Alert or Site Area Emergency (SAE). The plan should not differentiate between these classifications or give the impression that the licensee can needlessly wait a full hour before notifying offsite officials of an Alert declaration. In addition, the plan must clearly state that the licensee shall notify NRC immediately after notification of local and State authorities. Simply stating that NRC will be notified within one hour is not sufficient.

AMS Response: Partially concur. Title 10, Code of Federal Regulations, Section 30.32(I)(3)(viii) states that the licensee shall "also commit to notify the NRC operations center immediately after notification of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency".

Action Taken: Page 3-3, line 17 will be modified to read: "First responders will be notified promptly (within 15 minutes) after an alert or a site area emergency has been declared. The USNRC Operations Center is notified immediately (within one hour) after notification of the first responders after an. . ."

The following bullet will be added after line 17 on page 3-2 and after line 10 on page 3-3: "Notify USNRC Operations Center".

Agency Comment 5(b): Several of the emergency action levels in Attachment 1 of Appendix D are defined in terms of potential exposure rates or actual exposures. It is unclear how the Emergency Manager will be able to identify these conditions in a timely manner. It is unacceptable to wait for survey results if it will take more than 15 minutes to get them. EALs must be defined in terms of conditions that are apparent within the first few minutes of an emergency. This is especially important during nonworking hours. If an alarm goes off and the condition cannot be verified within 15 minutes, the Emergency Manger should act conservatively by declaring an emergency and initiating notification of offsite response organizations. The EALs should be redefined.

AMS Response: Concur.

Action Taken: Attachment 1 of Appendix D will be revised in its entirety. An attachment to this letter shows the revision.

Agency Comment 5(c): The offsite response organizations listed in Attachment 1 of Appendix D to receive a notification vary depending on the event. Each of the organizations identified as a "first responder" should be notified every time an Alert or Site Area Emergency is declared. In addition, all NRC notifications should be made to the NRC Operations Center. The Operations Center coordinates event reports with regional staff.

AMS Response: Concur.

Action Taken: Attachment 1 will be revised to indicate that an Alert and an Site Area Emergency will require notification of all first responder list as well as the USNRC Operations Center. An attachment to this letter shows the revision.

Agency Comment 5(d): The plan does not establish the initial recommendations for offsite protective actions that will be included in the initial SAE notification to offsite organizations. If an accident has the potential to require road blocks or other protective actions offsite, the licensee should act conservatively and make initial recommendations to offsite officials until the scope of the accident can be verified. This would include recommendations to stop traffic on the rail line or rope off potentially contaminated areas. Protective action recommendations should be addressed in Sections 3.1.4 and 3.3., and Appendix D.

AMS Response: Concur.

Action Taken: Attachment 1 to Appendix D will be revised to include protective action recommendations to off-site responders in the event of a Site Area Emergency. An attachment to this letter shows the revision.

The following will be added after line 10 on page 3-3: "The RSO transmits recommendations for offsite protective actions and the recommended radius of protective action implementation to first responders. If the emergency is due to elevated off-site exposure rates, initial recommendations may include roadblocks, traffic/train access control, or evacuation. If the emergency is due to elevated effluent concentrations, initial recommendations may include respirator usage, roadblocks, sheltering, or evacuation. If the emergency is due to elevated exposure rates and effluent concentrations, initial recommendations may include roadblocks, traffic/train access control, respirator usage, sheltering or evacuation."

Agency Comment 5(e): Section 3.3 should specify the minimum frequency of updates to offsite response organizations after the initial notification. The response to our previous comment states that Section 8.3 was being modified to include the information, but the revision does not include this information.

AMS Response: Concur.

Action Taken: After line 10 on Page 3-4, the following sentence will be added: "To ensure the information has been received by the offsite response organization, and to continuous understanding of the status of the emergency, an update call to each first responder for an Alert or a Site Area Emergency will be placed within 90 minutes of the initial notification. Subsequent updates will be as agreed upon between AMS and the responder during the first update call."

Agency Comment 6(a): Section 4.2 states that an environmental consulting firm and a certified health physicist have been retained to assist in all matters relating to radiation safety and environmental issues. Figure 7 shown the environmental consultant as part of the AMS emergency organization and it is unclear what function either of these parties would perform during an emergency. The roles of the environmental consultant and the certified health physicist should be clarified.

AMS Response: See response to Agency Comment 1(c), above. As stated in page 4-2, line, 22, the environmental consulting firm, and the Certified Health Physicist who is a member of that firm, provides consultation to AMS, on an as-needed basis, "in all matters relating to radiation safety and environmental issues". The environmental consulting firm can, at the direction of AMS, mobilize additional resources in the form of equipment, personnel and services to support the intermediate and long-term emergency response efforts. However, neither the environmental consulting firm nor the Certified Health Physicist are listed as first responders in the event of an emergency at AMS.

Action Taken: Page 4-2, line 22 will be modified to read: "Health Physicist have been retained by AMS to assist, on an as-needed basis, in all matters relating to radiation safety and environmental issues. The firm can, at the direction of AMS, mobilize additional resources in the form of equipment, personnel and services to support the emergency response effort."

Figure 7 will be modified as described in the response to Agency Comment 1(c), above.

Agency Comment 6(b): The response to our previous comment states that letters from the hospital, fire department and police department will be included in the plan. Section 4.3 states that Appendix E contains letters of agreement from "applicable first responders" listed in Table 2 along with information on the agreed upon means of communication and notification with these agencies. Contrary to these statements, Appendix E only contains letters from the fire department and two State agencies and there is almost no information about methods of communication. Complete documentation that offsite response agencies are aware of, and have agreed to their roles as specified int the plan should be provided.

AMS Response: In order to give first responders sufficient time to comply with the AMS request for a letter of agreement to respond, and in order to meet our comment to submit Revision 0 of the Emergency Plan to the USNRC within the agreed-upon date, Appendix E of the Plan (page 13-13) contained a listing of those agencies to whom a solicitation was sent, and the notation that "Letters received to date [emphasis added] are included in this section". A copy of the solicitation letter is attached. Since that time, we have received additional letters of agreement, but their contents were not "as expected".

Action Taken: A second solicitation letter is being sent to each first responder. Included will be a form to assist them in providing the required information. A copy of the form is attached to this letter.

Agency Comment 6(c): The response to our previous comment concerning the capabilities of offsite organizations and rumor control arrangements stated that the plan would be modified to address these items. The plan does not include this information. In addition to other capabilities, Section 4.4 should specially address whether local fire or police personnel have the capability to conduct radiation surveys.

AMS Response: The local fire and police personnel do not have the capability for conducting radiation surveys. It is our position that including a list of capabilities that the agency does not have in Section 4.4 is counterproductive.

Action Taken: See response to Agency Comment 6(b).

Agency Comment 6(d): Section 4.4 fails to describe some of the organizations listed in Table 2. A description of the responsibilities and capabilities of each of these organizations should be provided.

AMS Response: Concur.

Action Taken: Section 4.4 of the Plan (page 4-3) will be modified to include the responsibilities of the USNRC Operations Center and the Ohio Emergency Management Agency.

Agency Comment 6(e): In Table 2, the organizations do not appear to be listed it the order they would be called. The NRC Operations Center should be notified immediately after appropriate local and State organizations. Table 2 and Attachments 2 and 3 of Appendix D should be revised to prevent confusion.

AMS Response: Concur.

Action Taken: Table 2 of the Plan and Attachment 3 of Appendix D will be re-ordered to match the order shown in Attachment 2 of Appendix D. Attachment 2 will be ordered as follows: City of Cleveland Fire/Police (911 call), Cleveland Emergency Medical Services, Ohio Environmental Protection Agency; Ohio Emergency Management Agency; USNRC Operations Center, and University Hospital of Cleveland.

Agency Comment 7(a): The terms used for accidents are still inconsistent. The plan should establish the terms for accidents in Chapter 2 and these terms should be used consistently throughout the rest of the plan. [Examples given.]

AMS Response: Concur.

Action Taken: Page 5-1, line 13 will be modified to read: ". . . with personnel. The incident will be characterized as a fire, natural phenomenon (e.g., earthquake, tornado or flood), vandalism, explosion (industrial facility impact or underground gas line explosion), or transportation accident. The Emergency Manager . . ."

Attachment 1 of Appendix D will be modified to include the following event types only for Alerts or Site Area Emergencies: fire, natural phenomenon, vandalism, explosion and transportation accident.

Agency Comment 7(b): We disagree with the statement in Section 5.3 that no actions can be taken to mitigate the consequences of a tornado or flood. When there is advance warning of sever weather conditions, we would expect the licensee to take reasonable steps to secure the facility and minimize releases. If a tornado warning is issued for the site area, we would expect the licensee to declare an alert and take immediate steps to secure licensed materials especially in the warehouse portions of the facility. Section 5.3 and Appendix D should address the mitigating actions that will be taken if a severe weather warning issued.

AMS Response: Partially concur. Because the majority of the AMS inventory is not readily dispersible (see page 2-i, lines 25 through 28, and on page 2-1, lines 1 through 5), there are no additional actions that can be taken to better secure the materials if advance notice of severe weather conditions is received. Procedure step 5.2.3 in Appendix D describes the actions that shall be taken in the event of a "potential compromise" to health and safety.

Action Taken: The following sentence will be added after Page 5-1, line 25: "In the event of advance warning of severe weather conditions or other natural phenomenon, all on-going operations involving the handling of radioactive materials will be terminated and the materials will be stored/secured."

Agency Comment 7(c): Section 5.4.1 states that evacuated personnel will assemble at the designated muster area, however the location of the muster area is not specified and it is not shown on any of the drawings. The location of the muster area should be identified.

AMS Response: Concur.

Action Taken: Page 5-2, line 6 will be modified to read: ". . . and assemble in the AMS parking lot (west) or the Super Cast Inc. parking lot (east), depending upon the direction of prevailing winds. The . . ."

Agency Comment 7(d): Section 5.4.1 does not describe provisions for search and rescue operations if the RSO cannot account for all personnel. This issue should be addressed.

AMS Response: Concur.

Action Taken: The following sentence will be added after line 7 on page 5-2: "The RSO will initiate search and rescue operations for individuals that are unaccounted for."

Agency Comment 7(e): Section 5.3 states that licensee staff will assist the fire department by conducting surveys during fire fighting efforts. Footnote 25 on page 5-2 states that in the event of a fire, only self-contained breathing apparatus (SCBA) should be worn, and full- or half-face respirators are not permitted. Section 6.4 states that respirators are maintained in the building and Table 3 indicates that a respirator is maintained at the pump house. Please indicate what types of respirators are maintained in the building and the pump house. SCBAs should be available in the building and the pump house to respond to a fire.

AMS Response: Footnote 25 on page 5-2 was added for information purposes only. This footnote was not intended to imply that AMS maintains SCBA's in its inventory. The Cleveland City Fire Department provides its own SCBAs.

Action Taken: Footnote 25 on page 5-2 will be deleted.

Page 6-2, line 3 will be modified to read: "clothing and a minimum of four (4) particulate respirators (full face, negative pressure).

On Table 3, page 11-4, the item listed as "Respirator" will be modified to read "Respirator (full face, negative pressure).

Agency Comment 7(f): Section 5.5 still does not address informed consent. The plan should describe how the Emergency Manager will verify that a volunteer is aware of the health risks before authorizing emergency exposures exceeding 25 rem.

AMS Response: Concur.

Action Taken: Page 5-2, line 2 will be modified to read: "dose, and only after informed consent has been given."

Page 7-1, line 17 will be modified to read: ". . . procedures, radiation protection guidelines, location of restricted areas, posting/labeling, radiation risks, informed consent for lifesaving operations, and the agency's anticipated . . ."

Agency Comment 7(g): Issuing dosimeters to firemen is not addressed in section 5.11 of Appendix D. This issue should be addressed in the implementing procedure.

AMS Response: Concur.

Action Taken: The following procedural step will be added after step 5.2.2 in Appendix D: "The RSO shall, as necessary, deploy personnel monitoring devices (pocket ionization chambers and/or thermoluminescent dosimeter badges) to emergency personnel."

Procedural step 5.11.6 will be modified to read: "Upon arrival, firemen shall be cautioned as to where radioactive materials are stored and may be issued personnel monitoring devices."

Procedural step 5.11.8 will be modified to read: "A thorough survey of firemen and their equipment shall be performed and personnel dosimeters, if issued, shall be collected prior to their departure from the controlled area."

Agency Comment 7(h): Section 5.5 states that personnel will be monitored for contamination, but there is no description of the procedure for decontaminating personnel if contamination is found. This issue should be addressed.

AMS Response: Concur.

Action Taken: Page 5-3, line 7 will be modified to read: ". . .an AMS staff member, and decontaminated, as necessary, pursuant to Radiation Safety Procedure No. RSP-009, "Contamination Control".

Agency Comment 7(l): Section 5.6 states that the Cleveland Emergency Medical Service personnel receive annual training, but it is unclear who conducts this training. In addition, there is no letter of agreement confirming that his organization has agreed to transport contaminated individuals. The training issue should be clarified and a letter of agreement should be provided.

AMS Response: Section 7.2 (page 7-1, line 15) states that annual training is provided by AMS.

Action Taken: See response to Agency Comment 6(b).

Agency Comment 7(j): Sections 5.6 and 5.7 state that the University Hospital of Cleveland is capable of diagnosing and treating radiation injuries, and has a Radiation Safety Officer who will perform surveys and control contamination. There is no letter of agreement from the hospital verifying its capabilities and confirming its agreement with these statements. A letter of agreement should be provided.

AMS Response: Concur.

Action Taken: See response to Agency Comment 6(b).

Agency Comment 8(a): Section 6.2 does not describe any communications capability at the alternative command center (the pump house). Both the primary and alternative command center should have a telephone or other means of communicating with offsite organizations.

AMS Response: Both command centers have telephone communications.

Action Taken: Page 6-1, line 8 will be modified to read: "system at the London Road facility and at the alternate Command Center (Pump House) are used for . . ."

Agency Comment 8(b): Section 6.4 states that dosimeters and survey meters are stored in the "instrument calibration room" shown in Figure 3, and that protective clothing and respirators are stored "in the locker room or storage room". There is no instrument calibration room indicated on Figure 3 and the storage location for the protective clothing is too vague. It is unclear whether these locations would be accessible during postulated accidents. Section 6.4 should use terminology that is consistent wit the labels on the drawings. It would be helpful if the command center, equipment storage locations, first aid kits, emergency generator and other features related to emergency response were specifically indicated on the drawings.

AMS Response: Concur.

Action Taken: See response to Agency Comment 3(f).

The location of the instrument calibration room and the storage location will be noted on Appendix B.

Agency Comment 8(c): Section 6.4 and Table 3 only list pocket dosimeters. While pocket dosimeters are useful for real-time dose assessments, they are not very accurate. The licensee should provide more accurate dosimeters (e.g., film badges or TLDs) that can be used to verify personnel exposures after an emergency is brought under control.

AMS Response: AMS takes exception to this comment. Pocket dosimeters, if calibrated, serviced and used as described in USNRC Regulatory Guide 8.4, "Direct and Indirect-reading Pocket Dosimeters" and ANSI N322, "Inspection and Test specifications for Direct and Indirect Reading Quartz Fiber Pocket Dosimeters", are sufficiently accurate indicators of the deep-dose equivalent incurred by the wearer. Film badges and TLD badges are not necessarily more accurate, although they can, in addition to the deep dose equivalent, provide an indication of the shallow dose equivalent and the eye dose equivalent to the wearer. The fact that they have additional capability does not render them more "accurate".

Action Taken: None required.

Agency Comment 8(d): Table 3 indicates that only one respirator and two pocket dosimeters are maintained at the pump house. This does not appear to be sufficient to equip the licensee's staff and offsite rescue personnel that may need to enter the building. The pump house should contain enough respirators and dosimeters to equip the licensee's emergency staff, and enough additional dosimeters to monitor hose crews, search and rescue teams, or other offsite rescue personnel.

AMS Response: Partially concur. Respirators worn for the purposes of limiting internal doses, must be issued and worn pursuant to the requirements contained in 10 CFR 20.1703(3). Since AMS can only ensure compliance with these requirements for AMS personnel, a single respirator at the Pump House is deemed sufficient for use by AMS personnel. Fire fighting personnel are generally equipped with their own respiratory protection (SCBA) and must meet NIOSH/MSHA specifications for their own program..

Action Taken: On Table 3, page 11-4, the Minimum Number of the item listed as "Pocket Dosimeters (0 to 1 R)" will be modified to read "6".

Agency Comment 8(e): Table 3 indicates that only one frisker and one survey meter are maintained at the pump house. We believe that at least one additional survey meter should be provided at this location for backup. The range of the survey meters should be specified also.

AMS Response: Partially concur. The operational status of the frisker and survey meter are checked quarterly as described on page 6-2, line 6. Since the devices are not used routinely between quarterly checks, the probability of failure in the event that the Command Center must be evacuated to the alternate location is considered to be small. It is not practical to equip the alternate Command Center similar to the main facility.

Action Taken: On Table 3, page 11-4, the item listed as "Survey Meter" will be modified to read "Survey Meter (0 to 1 R/hr range)". The item listed as "Frisker" will be modified to read "Frisker (0 to 500,000 cpm range)".

Agency Comment 9(a): Section 7.2 should specifically state that the risks of emergency doses will be covered in the training offsite rescue personnel so they can decide in advance what risks they would be willing to accept during lifesaving operations. Numerical estimates of health risks are provided in the EPA Manual of Protective Action Guides.

AMS Response: Concur.

Action Taken: Page 7-1, line 17 will be modified to read: ". . . procedures, radiation protection guidelines, location of restricted areas, posting/labeling, radiation risks, informed consent for lifesaving operations, and the agency's anticipated . . ."

Agency comment 9(b): Section 7.3 should state that the exercise objectives and scenario shall be provided to NRC in advance (typically 60 days) to allow NRC to review and comment on the exercise.

AMS Response: Concur.

Action Taken: The following footnote will be added to the end of the sentence on line : "The objectives of the exercise and a summary of the scenario will have been reviewed by the USNRC prior to implementation."

Agency Comment 9(c): Sections 7.4 and 7.5 should specify who is responsible for tracking findings from critiques and audits, and verifying that the findings are closed out.

AMS Response: Concur.

Action Taken: The following sentence will be added after page 7-2, line 9: "The IC will track and ensure closure of critique items." Page 7-2, line 14 will be modified to read: "The audit findings are presented at the next scheduled meeting of the IC, who are responsible for tracking and ensuring closure."

Agency Comment 9(d): Section 7.5 states that there will be periodic audits. The plan should state that there will be annual audits.

AMS Response: Concur.

Action Taken: Page 7-2, line 11 will be modified to read: "AMS participates in annual audits of all aspects of its . . ."

Agency Comment 9(e): Section 7.6 should state that the self-life of protective clothing and other degradable materials shall be tracked and changed out on a regular basis. In addition, provisions for calibration of the stack monitor and testing of the emergency generator should be described.

AMS Response: Partially concur.

Action Taken: Page 7-2, line 20 will be modified to read: "Inoperable, expired or missing equipment are repaired/replaced . . ."

The following sentence will be added after line 21 on page 7-2: "The emergency generator and other facility devices are confirmed to be operational during routine surveillance activities described in Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance".

Agency comment 10: Section 8.1 should specify that records of incidents shall be permanently retained with the licensee's decommissioning records.

AMS Response: Partially concur. ISP-37, procedure item 7, describes the provisions for maintaining records generated during an incident. AMS does not distinguish between radiation protection records and "decommissioning records". All are maintained pursuant to RSP-004, "Radiation Protection Records".

Action Taken: Page 8-1, line 7 will be modified to read: ". . . is included in ISP-37 (See Appendix D) and in Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

Agency Comment 11(a): The plan still does not have a list of effective pages that a reader can use to verify his copy is complete an up-to-date. A list of effective pages should be provided.

AMS Response: Page 7-1, lines 3 through 5 state that page changes to the Plan will not be made. If changes of significance are necessary, the Plan will be re-issued in its entirety.

Action Taken: The total number of pages in the Plan will be included in the Table of Contents.

Agency Comment 11(b): Although Figures 2,3,4 and 5, and Appendix B have cover pages that are numbered, the actual drawings are not numbered or identified as part of the emergency plan. The drawings can be removed from the plan without creating any gaps in the page numbers. Every page of the plan, including the drawings, must be identified with a page number and a revision number/date.

AMS Response: Concur.

Action Taken: Every page of the plan, including the drawings, will be identified with a page number and a revision number. In addition, the total number of pages in the Plan will be included in the Table of Contents.

ATTACHMENT
Proposed Revision to Attachment 1 of Appendix D

F = Fire; X = Explosion; IJ = Injury; P = Personnel Exposure; SP = Spill; L = Loss/Theft; T = Transportation; NP = Natural Phenomenon; O = Other

Event Type	Mechanism	Action Levels	Class	Notifications	Actions	I/E Report	Critique
Building security compromised	L, IJ, P	Indication of unauthorized entry	Unusual Event	USNRC Region III	RSO secures condition.	No	no
	L, IJ, P	Confirmation of unauthorized entry with potential for intruder exposures in excess of 100 mR	Incident	USNRC Region III City of Cleveland Police Department	Operating staff to a state of readiness; provide off-site authorities with sequence of events	yes	no
	L, IJ, P	Confirmation of theft of less than 0.5 Ci of licensed material	Incident	USNRC Region III City of Cleveland Police Department	Operating staff to a state of readiness; provide off-site authorities with sequence of events; assist in return of materials.	yes	yes
	L, IJ, P	Confirmation of theft of greater than 0.5 Ci of licensed material	Alert	First Responders USNRC Command Center	Operating staff to a state of readiness; provide off-site authorities with sequence of events	yes	yes
Loss of Electrical Power	P	Hot cell door in open position with personnel exposures of less than 250 mrad	Unusual Event	Cleveland Public Power	RSO secures condition	no	no
	F	Hot cell door in open position with personnel exposures in excess of 250 mrad	Incident	Cleveland Public Power USNRC Region III	RSO secures condition	yes	no
Minor spill	SP, IJ, T	Unexpected Airborne activity in the building <10 DAC over 24 hours	Incident	None	RSO secures condition	yes	no
	SP, P, T	Unexpected exposure rates in the building <20 mR/hr	Incident	None	RSO secures condition	yes	no
Major Spill	SP, IJ, P, T, F	Unexpected Airborne activity in the building >10 DAC over 24 hours or exposure rates in the building > 20 mR/hr	Incident	USNRC Region III	Operating staff to state of readiness	yes	no

Event Type	Mechanism	Action Levels	Class	Notifications	Actions	I/E Report	Critique
Minor Release	F,X,L, LJ, P	Projected effluents >10x expected	Incident	USNRC Region III	Operating staff to a state of readiness	yes	no
	F,X,L, LJ, P	Actual or projected site boundary exposure rates >20 mR/hr	Incident	USNRC Region III	Operating staff to a state of readiness; off-site emergency response agencies to a state of readiness; provide off-site authorities with status reports	yes	no
Major Release	F,X,L, NP, LJ, P	Potential for effluents >100x expected	Alert	First Responders USNRC Operations Center	Man response center; dispatch monitoring personnel; mobilize offsite emergency response personnel; provide public information; provide off-site authorities with status reports	yes	yes
	F,X,L, NP, LJ, P	Actual or projected effluents >100x expected	Site Area Emergency	First Responders USNRC Operations Center	Man response center; dispatch monitoring personnel; mobilize offsite emergency response personnel; recommend protective actions; provide public information; provide off-site authorities with status reports	yes	yes
	F,X,L, NP, LJ, P	Potential for boundary exposure rates >100 mrad/hr	Alert	First Responders USNRC Operations Center	Man response center; dispatch monitoring personnel; mobilize offsite emergency response personnel; provide public information; provide off-site authorities with status reports	yes	yes
	F,X,L, NP, LJ, P	Actual or projected boundary exposure rates >100 mrad/hr	Site Area Emergency	First Responders USNRC Operations Center	Man response center; dispatch monitoring personnel; mobilize offsite emergency response personnel; recommend protective actions; provide public information; provide off-site authorities with status reports	yes	yes

ATTACHMENT
Solicitation Letter Sent to First Responders

September 12, 1995

FIELD(Name)
FIELD(Address)

Dear FIELD(Salutation):

In the Emergency Plan for Advanced Medical Systems, Inc. (AMS), your organization is llsted as a first responder to certain types of emergencies at the London Road facility. Shortly you will be receiving the revised version of the Emergency Plan for this facility. The Plan will describe the type and radiological impact of potential emergencies at the facility, along with information that will be of assistance to you in the event of an emergency.

Pursuant to regulatory guidance, the plan must also contain letters of agreement with all first responders. Therefore, AMS is soliciting a letter of agreement from your agency. The letter should contain your commitment to support AMS in the event of an emergency, your instructions on how to notify and communicate with you during an emergency, and any other information or instructions that should be considered.

Please forward your letter of agreement to me at the address shown above before September 22, 1995. In the meantime, if you have any questions or if I can provide you with additional information, please call me at (216) 692-3270. Thank you in advance for your assistance.

Sincerely,

Robert Meschter, RSO

ATTACHMENT
Solicitation Form for First Responders

Agency Name	Agency Telephone
Agency Address	Agency Contact (name):
AMS should call this telephone number during normal business hours in the event of an emergency:	AMS should call this telephone number after normal business hours in the event of an emergency:
AMS should relay the following information to our agency in the event of an emergency:	

Our agency will provide the following services in the event of an emergency (check all that apply):

- ☐ Personnel
- ☐ Respiratory Protection (agency use)
- ☐ Site Security
- ☐ Protective Clothing (agency use)
- ☐ Evacuation Services (describe)
- ☐ Radiation Survey Equipment
- ☐ Respiratory Protection (use by others)
- ☐ Fire Fighting
- ☐ Protective Clothing (use by others)
- ☐ Emergency Medical Services
- ☐ Earthmoving Equipment
- ☐ Crowd Control
- ☐ Analytical Services
- ☐ Other (describe)
- ☐ Other (describe)
- ☐ Other (describe)
- ☐ Other (describe)
- ☐ Other (describe)

Describe the authority and responsibility of your agency in the event of an emergency at AMS:

Describe your interface with other agencies in the event of an emergency at AMS.

Describe your location with respect to the AMS facility at 1020 London Road, Cleveland, Ohio

If an emergency occurs at AMS, to whom should the public and the media be referred in order to obtain information about the emergency? (Provide name and telephone number).

Agency Commitment: This agency agrees to respond to an emergency at AMS.

Agency Representative (Signature)	Agency Representative (Print)
Position:	Today's Date:

AMS Commitment Advanced Medical Systems, Inc. agrees to abide by these instructions when requesting the emergency assistance of this agency.

AMS Representative (Signature)	AMS Representative (Print):
Position: Radiation Safety Officer	Today's Date:

Please return your completed form to: Robert Meschter, R. S. O., Advanced Medical Systems, Inc., 1020 London Road, Cleveland, Ohio 44110. A fully-executed copy will be returned to you, at the address shown above, shortly thereafter.

AMS material inventory per 4/8/96 quarterly update of Strategic Plan

Bulk + sealed Co-60 = 54,375 curies

Bulk = 11,750 curies

Sealed Co-60 42,625 curies

Cobalt-60 waste and miscellaneous:

EP 5000 Ci (unsealed)

Solid waste packaged in LSA boxes and drums = 28 curies

Solid waste (packaged) generated during water treatment process = 0.4 curie

Sludge in WHUT room (unpackaged) = 51 curies

Total of bulk + sealed + waste + misc. = 54,454.4 curies

Front plug inventory as of 10/1/94:

Bulk = 2342 curies
Sealed Co-60 = 1009 curies
Sealed Cs-137 = 664 curies

4015 curies

If AMS disposes of bulk and sealed Co-60, with the exception of what is in the front plug, they will be below the limit (5,000 curies) for requiring an EP.

C/42