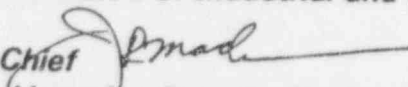


96-50 Kevin

REGIONAL TECHNICAL ASSISTANCE REQUEST FORM

Date: 7/9/96

Mail or E-Mail to: Donald A. Cool, Director
Division of Industrial and Medical Nuclear Safety, NMSS

From: John R. Madera, Chief 
Nuclear Materials Licensing Branch, Region III

Licensee: Advanced Medical Systems License No. 34-19089-01

- ☐ Control No. 01555
- ☐ Letter dated: 7/1/96
- ☐ Suggested change in licensing procedure (enclosed):

☐ Problem/Issue: The attached letter dated 7/1/96 is in response to the 6/25 telecon between AMS, Region III and NMSS. We have reviewed the letter and feel that AMS has submitted the information requested by the NRC during that telecon. However, we believe that AMS will need to submit more detail on the disposal of the material once they coordinate and/or finalize plans with Chemnuclear. We suggest that the amendment be issued with a statement in the cover letter that they must submit procedures on such things as preparation of material for shipment, special safety procedures that will be followed, use of dosimetry, etc. along with a clear distinction between the responsibilities of both Chemnuclear and AMS. This must be submitted for NRC review before initiation of the project, and may be referenced as additional information to the 7/1 letter.

The amendment will tie down the 7/1 letter which commits AMS to:

1. Only use the money for disposal of material as described in item 2 of their letter.
2. Place any money not used for the disposal project back into the LOC.
3. Submit a revised DFP by 9/1/96.

☐ Action Required: Please review and provide comments.

☐ Recommended Action (with revisions): X Approve or ☐ Reject

C183

Remarks:

Headquarters Reviewer: _____

Regional Reviewer: Kevin Null

Reviewer Code: R2

Reviewer Phone No.: (708)829-9854 *Fax No.:* (708)515-1259

Request Needed by: __/__/__ (date)

Form TAR-10

8/93

cc with attachment: C. Pederson

Advanced Medical Systems, Inc.

121 North Eagle Street • Geneva, Ohio 44041
(216)466-8005 FAX (216)466-8629

July 1, 1996

A
030-16055

Mr. Geoffrey Wright
U. S. Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

RE: Advanced Medical Systems, Inc. Application to Amend
USNRC License No. 34-19089-01

Dear Mr. Wright:

The purpose of this letter is to request an amendment to the Advanced Medical Systems, Inc. (AMS) radioactive materials license in regard to decommissioning financial assurance. Specifically, AMS wishes to modify its standby letter of credit dated January 27, 1995, to reflect a reduction from its current amount of \$1,800,000 to \$940,000.¹ The released funds will be used to finance a portion of the Building Recovery Project that was described in our June 10, 1996, proposal. The following are the specific provisions associated with this amendment request:

(1) Upon receipt of the license amendment, AMS will request Bank One to reduce the collateral used to secure the letter of credit line of credit by \$860,000 and issue a new letter of credit for \$940,000.

(2) The \$860,000 released from the collateral will be used by AMS for the sole purpose of funding transfer/disposal of the sealed sources of ⁶⁰Co, the canisters of bulk ⁶⁰Co, and the low-level radioactive waste. Task 1 and Task 2 of the June 10, 1996, proposal for the Building Recovery Project contain a description of these materials and the general approach AMS intends to follow to effect their final disposition.

(3) Any funds remaining after the fees associated with Tasks 1 and 2 of the Building Recovery Project have been paid will be returned to Bank One for the sole purpose of increasing the value of the letter of credit. At that time, AMS will request Bank One to issue a new letter of credit to reflect the increased collateral amount.

¹ Irrevocable Standby Letter of Credit No. SB300980 in the amount of \$1,800,000, issued by Bank One, Cleveland on January 27, 1995, currently serves as the AMS decommissioning funding instrument. This Letter of Credit is secured with the following: A one-year CD with Bank One (Certificate No. 088-006-0292518, matures 07/22/96, principle amount at inception was \$250,000); a 180-day CD with Bank One (Certificate No. 086-006-0292517, matures 07/16/96, balance at last maturity, \$256,595.89); a 30-day CD with Bank One (Certificate No. 086-006-292516, matures 05/17/96, balance at last maturity, \$285,171.88); and pledged assets of approximately \$1,000,000 in the form of negotiable securities and government bonds.

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REGION III

July 1, 1996

(4) By August 30, 1996, AMS will submit Revision 1 of the "Conceptual Decommissioning Plan for the London Road Facility" to reflect the abbreviated quantity of items to be decommissioned after the Building Recovery Project is complete.² Because the USNRC has not yet made a decision as to the appropriate decommissioning methodology for the London Road Facility (e.g., DECON versus SAFSTOR), all applicable technologies will be evaluated in Revision 1. Revision 1 will also contain a clear description of the preferred methodology and a detailed cost estimate for implementing that methodology.³

(5) By September 15, 1996, and in anticipation of USNRC approval of Revision 1 of the "Conceptual Decommissioning Plan for the London Road Facility", AMS will submit a revised Decommissioning Funding Plan wherein new decommissioning financial assurance instruments will be described. Within 15 days after USNRC approval of the Plan, AMS will request Bank One to issue a new letter of credit for the amount shown in Revision 1 of the "Conceptual Decommissioning Plan for the London Road Facility".

A license amendment fee, in the amount of \$680, is enclosed. If I can answer any questions or assist you in any way in expediting your review, please call me at 216/466-8005. We are asking for prompt USNRC action on this important issue.

Sincerely,



DAVID CESAR
Vice President and Treasurer

DC/cs
Enclosure

cc: R. Meschter
D. A. Miller, Esq. - Stavole & Miller
R. A. Duff - IEM
C. D. Berger - IEM

² Since the only items remaining will be the Hot Cell, the stabilized WHUT Room, the Hot Cell ventilation system, a small section of abandoned drain tiles, and the abandoned lateral connection from the building to the regional sewer system, the estimated decommissioning cost will be significantly reduced from those contained in Revision 0 of the Plan, dated October 20, 1995.

³ The cost estimated for the preferred alternative will be presented in the same format as Appendix F of USNRC Regulatory Guide 3.66, "Standard Format and Content of Financial Assurance Mechanism Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72" (June, 1990).

July 10, 1996

MEMORANDUM TO: Josephine M. Piccone, Acting Chief
Operations Branch
Division of Industrial and Medical
Nuclear Safety, NMSS

AMS

FROM: David Brooks, Acting Chief /s/ for M. Bell
Engineering and Geosciences Branch
Division of Waste Management, NMSS

SUBJECT: REVIEW OF ADVANCED MEDICAL SYSTEMS, INC. RESPONSE TO
INSPECTION REPORT NO. 030-16055/95006(DNMS)

The review and evaluation of the June 7, 1996, submittal from Advanced Medical Systems, Inc. (AMS) has been completed, and the results of that effort are provided in the enclosure. An overall assessment of the AMS building integrity issue is provided below.

To our knowledge, there has not been a definitive statement provided by AMS regarding the additional period of time over which the 1958 building structure must perform its confinement function. Consequently, the actions or inactions proposed by AMS cannot be evaluated with respect to the time function. AMS has proposed no repairs, no maintenance program, and no periodic structural integrity inspections or evaluations, but has proposed a movement monitoring program for select areas of the building on a generally 2-year frequency after the initial program startup. AMS has accepted the fact that there may be localized failures of certain building elements under this philosophy of operation but along with its structural consultant has concluded there will be no loss of confinement of stored radioactive material in the concrete core structure. We agree with this assessment for normal conditions, but we do not agree that, based on the current facts, this conclusion is valid for the indefinite future. Therefore, the Nuclear Regulatory Commission will re-evaluate the conditions and facts at 10-year intervals, unless new information becomes available to cause a change in these intervals.

With regard to events impacting the AMS site relative to the emergency plan, such as seismic events and tornados, the AMS structural consultant has provided an assessment of the vulnerabilities of the building based on some very simplified analyses. The conclusion is that a 0.1g ground motion at the site would not cause the loss of confinement of the radioactive materials stored in the concrete core. A severe tornado would likely cause heavy damage to all but the concrete core structure, and the test cell and the radiography room would be vented to the atmosphere. NRC believes these are reasonable conclusions.

If there are any questions on this review and evaluation, please contact Robert E. Shewmaker at 415-6713.

Enclosure: As stated

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Enclosure

REVIEW OF ADVANCED MEDICAL SYSTEMS, INC., RESPONSE TO
INSPECTION REPORT NO. 030-16055/95006
Dated June 7, 1996

1. The Advanced Medical Systems, Inc. (AMS) and its structural consultant have identified additional cracking in the southeast corner of the second floor slab and have an opinion as to the cause of the distress in this area. In addition, they are willing to accept a local collapse in the southeast area of the structure and conclude that if such a local collapse were to occur, it would not compromise the concrete core structure where the radioactive materials are stored. The AMS consultant made no comment regarding the need for repairs. Based on these facts, the licensee has proposed that no repairs be made.

The Nuclear Regulatory Commission believes that radioactive materials stored in the concrete core structure will be adequately confined to the concrete core structure that will remain intact after any local adjacent failures in the bearing walls. NRC believes there is a high degree of confidence that the core will remain intact for at least a period of 10 years.

2. AMS and its structural consultant have investigated the cracking of the north bay of the east wall and concluded that any associated failure with this distressed area would not result in compromising the concrete core structure that contains the radioactive materials. The consultant made no recommendation for repairs to the existing levels of observed distress unless the subject wall at the second floor level were to fail, leaving the building envelope open to the elements.

NRC believes that radioactive materials stored in the concrete core structure will be adequately confined to that intact core. NRC believes there is a high degree of confidence that the core will remain intact for at least a period of 10 years.

3. The AMS consultant found no evidence of structural degradation in the roof decking where there was evidence of corrosion on the underside. AMS has proposed no additional activity relative to the roof decking.

NRC believes the reroofing completed in 1994 should halt or severely retard the corrosion process related to the roof deck panels, and they are acceptable for use during the next 10 years.

4. During the investigation, the AMS consultant was able to determine the source of the fluids above the concrete slab of the second floor and also identified the pathway of the fluid as passing through pipe chases, not the structural concrete floor slab. It was concluded that no degradation had taken place as a result of the fluids.

NRC accepts this additional information and conclusion.

5. AMS states that its structural consultant concluded "that even with no repair or maintenance, the AMS building on London Road is capable of providing protective confinement for its licensed radioactive materials inventory for many years into the future." AMS concluded that a routine inspection program is not required but has elected to provide for a position or location survey to monitor the building movement at several critical locations in the structure. After the initial survey, a recheck will be made in 6 months and then every 2 years thereafter. The AMS radiation protection staff will perform routine inspections in order to identify unusual conditions that may warrant further study if conditions were to change between the intervals of surveys.

NRC notes that the AMS consultant stated that the need to periodically inspect and evaluate the building's ability to perform its intended functions over the utilization period was out of the scope of his review. The AMS consultant indicated that a sound maintenance program can result in the lifetimes of similar type facilities being extended 25 to 30 years; however, the elements of such a maintenance program were not provided in the report, and AMS has stated that no maintenance is necessary in order to assure protective confinement of the licensed radioactive materials inventory for many years into the future.

NRC expects that the AMS movement monitoring program will, as a minimum, address the possible additional vertical and horizontal movements associated with the southeast corner distress of the 1958 building, as well as the wall of the 1958 building above the original lobby area. NRC will observe the periodic results of the monitoring program and will re-evaluate the condition of the building structure, including the capability of the concrete core structure to continue to function at the end of a 10-year period.



Advanced Medical Systems, Inc.

1020 London Rd.
Cleveland, Ohio 44110
216-692-3270

July 10, 1996

Mr. Hubert Miller
Regional Administrator, Region III
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60523-4351

Re: Strategic Plan (USNRC License No. 34-19089-01)

Dear Mr. Miller:

On August 29, 1995, a meeting was held at the request of Advanced Medical Systems, Inc. (AMS) to discuss an action plan for addressing outstanding issues that are of mutual interest to AMS and the USNRC in a timely fashion but within the resources currently available to AMS. In that meeting, AMS agreed to submit to the USNRC a written plan for meeting its short-term, intermediate-term and long-term objectives. That plan was, in fact, submitted on October 11, 1995.

Included in the plan was a commitment to provide quarterly updates on AMS's progress toward meeting its goals. Enclosed is Revision 3 of the "Strategic Plan for the London Road Facility", which is being submitted in response to our commitment. If you have any questions or if I can provide you with additional information, please call me at (216) 692-3270. You may expect to receive Revision 4 of the plan in October of 1996.

Sincerely,

Robert Meschter, R.S.O.

cc: D. Cesar
D. A. Miller, Esq. - Stavole & Miller
C. D. Berger, C.H.P. - IEM
Assistant General Counsel for Hearings and
Enforcement, USNRC
D. A. Cool - Director, Division of Industrial and
Medical Nuclear Safety, USNRC
C. D. Pederson - Director, Division of Radiation
Safety and Safeguards, USNRC
J. Caldwell - Deputy Director, Division of
Radiation Safety and Safeguards, USNRC
M. Weber - Region III, USNRC

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STRATEGIC PLAN FOR THE LONDON ROAD FACILITY

Submitted by:

Advanced Medical Systems, Inc.

1020 London Road
Cleveland, Ohio 44110
(216) 692-3270

Report No. 94009/G-3113, Revision 3
July 10, 1996

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INTRODUCTION

Advanced Medical Systems, Inc. (AMS) manufactured and fabricated sealed sources of ^{60}Co for teletherapy and radiography machines. Under the provisions of U. S. Nuclear Regulatory Commission (USNRC) license No. 34-19089-01, and as of the date of this report, AMS possesses approximately 54,000 curies of ^{60}Co , and 2,200 kilograms of depleted uranium (nickel plated) for use as shielding material.¹ Included are approximately 40 curies of radioactive material in a potentially dispersible form. This material, which consists primarily of dry solid waste, carbon granules and ion exchange resins, is stored in sealed 55-gallon drums or B-25 (steel) boxes. The types and quantities of licensed materials currently in the possession of AMS are shown in Table 1.

As part of its license compliance efforts, AMS is faced with completing a number of tasks ranging from license renewal to significant reductions in the existing radionuclide inventory. Timely completion of these activities is critical since they will ultimately result in streamlined routine operations, recovery of needed building/facility capabilities, and reduced regulatory demands on the operating staff.

However, due to limited personnel and financial resources, it is not possible for AMS to complete all of the outstanding activities in a single campaign. Therefore, to avoid unnecessary and negative financial impacts on the company, yet ensure steady and well-managed progress toward completion, the activities were prioritized based upon an activity's ability to improve the implementability of other activities, AMS's ability to fund the activity in the near-, intermediate- and long-term, and on the cost/benefit associated with the activity's timely completion. Table 2 shows the listing of the outstanding activities, along with their priorities (e.g., high priority, intermediate priority, and lower priority).²

A number of additional activities not shown in Table 2 will run concurrent with the prioritized activities. These include audit/assessment of the radiation protection program, upgrade of standard operating procedures, improvements in housekeeping, and attempts to increase community relations.

The remainder of this report contains additional discussion on each of the outstanding activities. Included is a brief discussion of the AMS strategy for each activity, the plan of action for completing the activity, a description of the current status (as of the date of this report) and an implementation schedule, where appropriate.

¹ There is negligible radiological hazard associated with the depleted uranium inventory. Therefore, it is not addressed further in this report.

² In general, high priority items are scheduled for completion within the next year, intermediate priority items within the next one to three years, and lower priority items within the next three to five years.

2 Over the intermediate and long term, as actions are completed and as the scope/approach of
3 specific activities (subitems) become solidified, the individual action plans will be expanded and
4 specific dates will be entered in the implementation schedules. Therefore, this report will be
revised on a quarterly basis and numbered revisions will be issued.

HIGH PRIORITY ACTIONS

Complete the Remediation Report

In late 1994, the Northeast Ohio Regional Sewer District (NEORS) intentionally isolated AMS access to regional sewage treatment system. This action rendered the facility drainage system non-functional, increased the hydrostatic pressure on the foundation structure, and caused groundwater to enter the basement of the AMS facility. After AMS made timely notification to the USNRC about the deteriorating conditions at the building, AMS initiated action to drain the basement, remove the ^{60}Co from the water in the basement, remediate the foundation drainage system, isolate the residual radioactivity in the manhole and sewer line exiting the facility to the London Road Interceptor, and remediate the residual radioactivity in the London Road interceptor.³

One commitment made to the USNRC as part of the remediation project was to provide a final report that contains a description of the events that led to the site conditions, a review of the remedial actions implemented and their results, and a summary of all data acquired during the process. However, since all remedial activities are not yet complete, the final remediation report is still being compiled. Outstanding items are disposition of water in the collapsible storage tanks, disposition of contaminated solids (e.g., soils and water treatment media), implementation of the long-range surveillance plan for residual radioactivity that exists outside of the AMS building (e.g., in the abandoned footer drains and lateral connection from the building to the London Road Interceptor), disposition of water in the WHUT Room, and remediation of the London Road Interceptor.

In regard to the residual water in the WHUT Room, AMS investigated the use of a stabilizing agent known as STERGO™, solid granular, cross-linked polymer that rapidly absorbs and retains large quantities of aqueous-based liquids. It was considered because it is non-toxic, will hold from 12 to 40 times its weight in aqueous solutions, and testing indicates that its capacity to retain liquids at high dose rates and large integrated doses is good. However, on June 10, 1996 AMS forwarded to the USNRC a proposal for the Building Recovery Project. Task 3 of the proposal is to stabilize the radiological conditions in the basement and WHUT Room in order to reduce the impact of water incursion. Actions to address residual water are thus delayed pending USNRC acceptance of the proposal.

In regard to the contaminated solids from the excavation (rock, soil) that exist outside the AMS facility, a lined wooden structure was built on the south west quadrant of the property, approximately 200 feet from the building. These solids were transferred to the structure shortly thereafter. The structure and its environs have been posted pursuant to RSP-011, "Posting and Labeling", and have been included in the quarterly radiological surveillance program pursuant to RSP-008, "Instrumentation and Surveillance".

³ As of the date of this report, the NEORS has not permitted AMS access to the London Road Interceptor. AMS's ability to complete the remediation is beyond its control.

In regard to the long-range surveillance plan for residual radioactivity, AMS submitted the plan to the USNRC on September 5, 1995. After a December 14, 1995 submission of additional information, the plan was approved as modified by the USNRC on January 18, 1996. On May 16, 1996, AMS implemented the provisions of the January 24, 1996 version of the plan with one exception. On May 23 1996, AMS submitted an application to amend the Plan in order to delay until Spring of 1997 the installation of the two wells referenced in the Plan. The purpose of the delay was to permit AMS to finalize other operational decisions pertaining to water handling and to better-coordinate well installation activities. As of the date of this report, there has been no USNRC action on the May 23, 1996 license amendment request.

Once all of the actions associated with the water treatment and sewer remediation project are complete, the remediation report will be finalized and submitted to the USNRC. However, for reasons that are beyond AMS's control, remediation of the London Road Interceptor may be delayed significantly. Therefore, AMS may elect to submit the Remediation Report in advance and exclusive of this item. Table 3 shows the action plan for this task.

License Renewal Application

In early 1995, AMS submitted an application to renew its USNRC license under the provisions of timely renewal. After initial USNRC review of the application, a letter of deficiency was issued and additional information was requested. Subsequently, an in-house review of the application, in light of the short- and long-range plan of AMS, was completed. This review confirmed that the application was indeed cumbersome and permitted AMS little flexibility in achieving its intermediate- and long-term goals. Therefore, a significantly revised application was submitted on October 30, 1995.

On December 5, 1995, the USNRC asked AMS to provide copies of the Radiation Safety Procedures that were referenced in the revised application. These were transmitted to the USNRC in three (3) separate submittals dated January 3, 1996, February 13, 1996 and March 8, 1996. To date, AMS has received no additional response from the USNRC and continues to operate under the provisions of the existing license. Table 3 shows the action plan for this task.

Emergency Plan

As part of license renewal efforts, an emergency plan was submitted to the USNRC for review and comment. On June 7, 1995, after initial USNRC review of the Plan, a letter of deficiency was issued and additional information was requested. Because the magnitude of deficiencies was significant, a revised Plan was submitted on September 22, 1995. This revision was consistent with the guidance contained in USNRC Regulatory Guide 3.67 (1992), "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities".

On February 28, 1996, the USNRC mailed comments on Revision 0 of the Emergency Plan. The AMS response to those comments was forwarded on March 22, 1996, along with the AMS response to comments received from the Ohio Environmental Protection Agency, the Ohio Emergency Management Agency, the Cuyahoga Emergency Management Assistance Center, the

Ohio Department of Health, and the City of Cleveland Division of Fire were forwarded to these agencies and to the USNRC.

On March 12, 1996, AMS received the results of a special inspection directed toward the structural integrity of the London Road facility. A number of the issues raised in the inspection report are pertinent to the Emergency Plan. The AMS response to those comments was submitted to Geoffrey Wright (USNRC) on June 7, 1996. The structural issues that pertained specifically to Emergency Plan comments were addressed in a June 7, 1996 letter to John Madera (USNRC). Table 3 contains the action plan for this task.

Decommissioning Funding Plan

As part of the recent license renewal efforts, a decommissioning funding plan was submitted to the USNRC for review and comment. On August 17, 1995, after initial USNRC review of the Plan, a letter of deficiency was issued and additional information was requested. Specifically, the USNRC indicated that the January 1995 cost estimate and site characterization submitted by AMS "are no longer valid". However, the January 1995 estimate was based upon a "decontaminate and release" decommissioning option, which is not suitable for a facility like AMS where the primary radionuclide of concern has a radiological half life of only five years. Therefore, AMS prepared a Conceptual Decommissioning Plan for the facility pursuant to 10 CFR 40.46(d) that is based upon a "safe storage" decommissioning option.⁴

The Plan, which was submitted to the USNRC on October 20, 1995, describes the decommissioning objective for the facility and its basis, a description of the items to be decommissioned, the proposed decommissioning methodology, an ALARA analysis to support the proposed methodology, a cost estimate (1995 costs) for implementing the methodology, and a review schedule for ensuring the Plan's continued applicability for the duration of License No. 34-19089-01. Once approved by the USNRC, AMS intended that the Plan will be funded by the corporation and reviewed for continued applicability on a planned and periodic basis.

On March 20, 1996, the USNRC mailed comments on the Plan, along with a request for additional information. The AMS response to these comments was forwarded to John Madera (USNRC) on April 12, 1996.

On June 10, 1996 AMS forwarded to the USNRC a proposal to complete a Building Recovery Project, the result of which would be a significantly reduced inventory of radioactive materials at the London Road facility. In that proposal, AMS requested that the USNRC to release a portion of the funds AMS has committed for decommissioning in order to support commercial disposal costs. One justification for this request is that the cost of decommissioning will be less than that reflected in the October 20, 1995 Conceptual Decommissioning Plan due to the reduction in inventory and restricted areas. At the request of the USNRC, AMS submitted an application to amend its radioactive materials license reflect a reduction from the current financial assurance

⁴ Pending its concurrence with the Conceptual Decommissioning Plan, the USNRC did, in a January 8, 1996 letter to AMS, accept AMS's decommissioning financial assurance submittal based upon the January, 1995 cost estimate.

amount of \$1,800,000 to \$940,000 on June 26, 1996. As of the date of this report, there has been no USNRC action on this amendment request. Table 3 contains the action plan for this task.

Train First Responders in Emergency Plan Provisions

As part of its emergency response requirements, AMS must provide annual radiation safety training for first responders. Pursuant to the revised Emergency Plan, this training must include a review of items of mutual interest, instruction in emergency procedures, radiation protection guidelines, and the responder's anticipated role in an emergency. During the training session, the emergency response team activation scheme, notification procedures, and overall response coordination process will be reviewed.

Within 60 days after USNRC approval of the revised Emergency Plan, a training session for first responders will be scheduled. After training is complete, agency attendance will be documented and letters of agreement will be updated, as necessary. The training sessions will be scheduled annually thereafter. Table 3 contains the action plan for this task.

Stage Emergency Exercise and Perform Critique

As part of its emergency response requirements, and in order to maintain emergency preparedness, AMS must conduct an emergency exercise on a planned and periodic basis. Within 60 days after all first responders have received initial training in the provisions of the AMS Emergency Plan, the emergency exercise will be scheduled and staged.

Pursuant to the revised Emergency Plan, the exercise will include one or more of the accident scenarios postulated for the facility, and will involve off-site agencies that have provided letter agreements for support services (e.g., first responders). The scenario will not be known in advance by exercise participants, and a non-participating observer will provide an evaluation of the effort, along with recommendations for improvement.

The critique of the exercise will be used as a basis for modifying the Emergency Plan or for supplementing the training of off-site agencies. Deficiencies identified during critiques will be corrected and closure will be documented. As necessary, changes to the Emergency Plan, based upon the findings of the critique, will be implemented. Table 3 contains the action plan for this task.

INTERMEDIATE PRIORITY ACTIONS

Recover Hot Cell Capabilities

In order to decontaminate, leak test, package and ship sealed sources of ^{60}Co from the AMS facility, a functional hot cell is needed. Currently, the Hot Cell contains significant residual removable radioactivity. Consequently, cross-contamination of items that enter the Hot Cell is a concern. Therefore, AMS intended to recover sufficient Hot Cell capabilities to support inventory reduction efforts.

Shortly after issue of the initial version of this Strategic Plan, the Hot Cell capabilities that were needed to facilitate inventory reduction were evaluated. From this evaluation, it was determined that improved lighting and construction of a source transfer mechanism were the only items necessary to support initial inventory reduction. These items were implemented, a successful "trial run" of the system occurred on December 19, 1995, and the system became fully operational on December 27, 1995.

Return NPI Sources

There are currently 34 sealed sources in the AMS inventory that belong to Neutron Products Inc. (NPI). As part of on-going operations, AMS purchases sources from NPI for delivery to a customer. When the shipping cask is sent to NPI, one of the sources in the AMS permanent inventory is enclosed, thereby reducing the inventory.

AMS has attempted, without success, to escalate the return of all of the remaining sources now that Hot Cell capability has been recovered. Since NPI will accept only one returned source for each source shipped, the rate of reduction in the NPI inventory will significantly slower than expected. Nonetheless, AMS is proceeding with this task at the highest possible rate. As sources leave the London Road facility, the inventory log is debited. Table 3 contains the action plan for this task.

Identify a Market for Remaining Sources and Bulk Material

There are approximately 54,000 curies of sealed ^{60}Co sources and bulk ^{60}Co metal in the AMS inventory. AMS has attempted to identify a domestic or foreign market for this material. On March 20, 1996, AMS prepared and distributed a description of the type, form and curie content of the sources to a variety of agencies, including source distribution firms, government agencies, and non-domestic agencies. Included with the description was a form soliciting the level of interest of each recipient. Although a number of potential users were identified, their needs are for sources with significantly greater activity than is present in the AMS inventory. Therefore, AMS has not met with success in transferring the inventory to other users.

After many conversations and levels of negotiation, it was determined that the relatively small volume but high activity of the sealed source inventory could provide a cost-mitigating factor for conventional disposal. This fact placed conventional disposal of the sources into the realm of financial possibility if AMS is permitted to "tap" funds that are currently held by the USNRC for

decommissioning funding. Therefore, on June 10, 1996 AMS forwarded to the USNRC a proposal for the Building Recovery Project, which included a brief description of the AMS facility and its planned operations, the reason why AMS wishes to implement the Building Recovery Project, a description of the Project's 12-point scope of work, a proposed project schedule, and the proposed mechanism whereby the project will be funded. Task 1 in the proposal is to dispose of all accessible sealed ^{60}Co sources and all canisters of bulk ^{60}Co at a commercial low level waste burial ground.

On July 8, 1996, AMS submitted an application to amend its USNRC license to permit commercial disposal of the sources and canisters. As of the date of this report, there has been no USNRC action on this amendment request. Table 3 contains the action plan for this task.

LOWER PRIORITY ACTIONS

Remove Plug in the Hot Cell

An estimated 4,000 curies of ^{60}Co in the form of sealed sources are located in a storage well in the Hot Cell. Because the well plug has become lodged in the well, these sources cannot be removed and included in the inventory reduction efforts. Therefore, AMS intends to dislodge the plug.

A methodology for dislodging the plug has been determined, and a contract for services has been let. Once the decision is made to proceed and the work plan and Radiation Work Permit have been completed, equipment and personnel will be staged, "dry runs" will be completed, and the plug will be removed. Table 3 contains the action plan for this task.

Decontaminate the Hot Cell

After the plug removal project is complete, significant residual radioactivity will likely exist within the Hot Cell. In order to ensure its continued usefulness, AMS intends to decontaminate the Hot Cell to levels necessary to support planned future operations.

The first step in the process will be determination of the methodology for Hot Cell decontamination. Once complete, the work plan will be prepared, outside services, if necessary, will be contracted, and the project will begin. Table 3 shows the action plan for this task.

Complete/Confirm the Physical Inventory and Transfer/Ship Remaining Sources

After removal of the plug, AMS will be able to confirm the physical inventory of licensable radioactive material present at the London Road facility. (AMS is obliged, by License Condition 14, to complete a physical inventory of all sources in its custody. In light of the low priority associated with this task and the activities that are scheduled to be performed for the Building Recovery Project, AMS intends to submit an application to amend Provision 14(c) of License No. 34-19089-01 requesting an exemption from performing a physical inventory of the sources in the stuck plug until the plug is removed. Included in the application will be an accounting of the sealed source status for the year prior to the application, a summary of surveillance information confirming that "unaccounted for" sources do not exist at the facility, and a commitment to complete the physical inventory once the stuck plug is removed. Table 3 contains the action plan for this task.

Disposition of Solid Waste at the Facility

As shown in Table 1, there are about 3,000 cubic feet of solid waste at the AMS facility. These materials are stored either within the AMS facility, or in a secured storage location within the fenced portion of the property.

On June 10, 1996 AMS forwarded to the USNRC a proposal for the Building Recovery Project. Task 2 of the proposal is to dispose of all dry solid waste currently stored in the facility basement and in the high-level waste storage through a commercial low-level waste broker. On July 8, 1996, AMS submitted an application to amend its USNRC license to permit this operation to

proceed pursuant to modified operating procedures. As of the date of this report, there has been no USNRC action on this amendment request. Table 3 contains the action plan for this task.

Disposition of Treated Water in Collapsible Storage Tanks

As part of the 1995 sewer remediation project, approximately 100,000 gallons of water was treated by the methodology of sub-micron filtration and reverse osmosis in order to reduce its radionuclide content to below drinking water standards. There are approximately 40 microcuries of ^{60}Co in the water, which is currently stored in collapsible storage tanks at the London Road facility. The solubility of the residual radioactivity was confirmed using American Public Health Association's Method 7110 "Gross Alpha and Gross Beta Radioactivity (Total, Suspended, and Dissolved)" from Standard Methods for Examination of Water and Wastewater.

AMS requested and received permission from the U. S. Environmental Protection Agency (USEPA) and the USNRC to evaporate this water. However, due to delays and difficulties in implementing the treatment process that were beyond AMS's control, more than four times the original amount of water had to be treated to reduce its concentration of radioactive cobalt at a cost that went well-beyond the original projection. In light of the magnitude of these unbudgeted expenses, the evaporation option became significantly more costly. Therefore, AMS is pursuing other options for disposing of the water.

Since the treated water meets the USEPA's criteria for man-made radionuclides in drinking water pursuant to 40 CFR 141, and since it contains no other hazardous substances, its presence at the AMS facility poses no radiological risk. Therefore, there is no urgency to ensure its final disposition. Nonetheless, AMS will pursue a direct discharge option until such time as it becomes patently unattainable. At that time, the evaporation option will be re-visited in light of available financial resources. Table 3 contains the action plan for this task.

ON-GOING ACTIONS

Audit/Assessment of Radiation Protection Program

In light of changing operational issues, pending licensing activity, and the desire to "streamline" compliance efforts, AMS intends to perform a series of audits of its radiation protection program in order to compare AMS's performance to that required and/or recommended by existing license/permit provisions, U. S. Nuclear Regulatory Commission regulations, and standard industry practices (e.g., USNRC Regulatory Guides, ANSI, ASME and ASTM Standards, ICRP Publications, NCRP Publications). The audits will be performed by AMS personnel and consultants to AMS. They will involve initial review of applicable operating procedures, quality assurance procedures, and other pertinent documentation related to a particular performance issue.⁵ The initial document review is performed in order to identify possible areas of failure or liability, and to derive an efficient schedule for on-site assessments. While on site, AMS compliance with existing procedures will be determined and areas of inefficiency or poor function, as compared to industry standards and practices, will be identified.

On June 27, 1996, AMS prepared Radiation Safety Procedure No. RSP-020, "Quality Assurance Audits". Once this procedure is approved by the Radiation Safety Committee and after License No. 34-19089-01 has been renewed, the audit schedule will be set and incorporated into the computerized tracking program. While the results of the audits are intended to be used for demonstrating compliance and/or to guide future program modifications or improvements, any findings of significant regulatory non-compliance or conditions of imminent hazard will be immediately reported to and addressed by the RSO. Immediately after renewal of License No. 34-19089-01, the Radiation Safety Committee will set the audit schedule.

Upgrade of Standard Operating Procedures

In response to audit findings, and in light of changing operational demands and licensing activities, the current collection of standard operating procedures (ISPs) were reviewed for continued applicability. Wherever possible, multiple procedures that address a single topic were combined, and out-dated procedures were revised. Consistency between procedures was confirmed and compliance with the requirements of the AMS Radiation Protection Program Plan was assured. Since October 10, 1995, the following new/revised procedures have been developed and approved by the Radiation Safety Committee, and submitted to the USNRC for review:

- RSP-001, Radiation Protection Program Plan

⁵ The following programmatic issues will be audited on a planned and periodic basis: Organization and Administration; Facilities and Equipment; Training in Radiation Protection; Radiation Exposure Control; ALARA Program; Contamination Control; Instrumentation and Surveillance; Posting and Labeling; Receipt and Control of Radioactive Material; Packaging and Transportation of Radioactive Materials; Control of Radioactive Waste; Radiation Protection Records; Documentation; Emergency Response and Notifications; and Quality Assurance in Radiological Protection.

- RSP-002, Definitions
- RSP-003, Control of Radiation Safety Procedures
- RSP-004, Radiation Protection Records
- RSP-005, ALARA Program
- RSP-006, Training and Qualifications of Radiation Protection Personnel
- RSP-007, Training in Radiation Protection
- RSP-008, Instrumentation and Surveillance
- RSP-009, Contamination Control
- RSP-010, Exposure Control
- RSP-011, Radiological Areas and Posting
- RSP-012, Control of Work
- RSP-013, Control of Radioactive Waste
- RSP-014, Receipt, Handling, and Identification of Radioactive Materials
- RSP-015, Packaging and Transportation of Radioactive Materials
- RSP-016, Emergency Response and Notifications
- RSP-017, Stop Work Authority
- RSP-018, Operation of the Gamma Spectrometer
- RSP-019, Assessment of Radioactivity in Water Samples

Immediately after renewal of License No. 34-19089-01, these procedures will be implemented in their entirety.

Housekeeping Improvements

Currently, there are only three permanent employees at the London Road facility. Therefore, only a small fraction of the available space is used for routine operations, office areas and storage. However, AMS has instituted improvements in housekeeping in the useable areas of the facility.

On May 15, 1996, AMS instituted an aggressive program of waste consolidation, equipment decontamination, and facility surveys as part of the Building Recovery Project. In fact, Task 6 of the Project is to free-release (for unrestricted use) the London Road building, with the exception of the WHUT Room, the Hot Cell, the ventilation system, and an ancillary work area. This work is proceeding on an escalated schedule so that all waste generated can be disposed of under Task 2 of the Project.

Community Relations

In the past, issues or activities at AMS that required state, federal and local approvals were hampered due to lack of knowledge of AMS operations and/or an understanding of the fundamental principles of radiation and radioactivity on the part of decision-makers. In an effort to streamline future decision-making, AMS has mounted a community relations program to acquaint various officials and members of the print and broadcast media with the AMS function, its capabilities, and its short-, intermediate-, and long-range plans. This has been accomplished, on an as-needed basis, through briefings, tours, and development/publication of hand-out materials and brochures.

Reconnection of Sewer System to London Road Interceptor

Currently, the London Road facility does not have a direct connection to the regional sewer system. There are no sanitary discharges from the building, the roof drains discharge onto the ground surface, and all groundwater is pumped from a manhole on the property into storage tanks. Once a tank is full, the water is sampled and discharged. Since December 22, 1995, over 140,000 61,000 gallons of water have been collected, analyzed, and found to be free of insoluble ⁶⁰Co.⁶ However, a series of extenuating circumstances have increased the urgency in reconnecting all drainage paths to the London Road Interceptor.

AMS is barred, by court order, from freely releasing the ground/surface water that collects in the remediated foundation drainage system. Therefore, on July 1, 1996, AMS renewed its March 1, 1995 and March 20, 1995 applications to amend its USNRC license to permit free-release of foundation drainage since USNRC authorization to free-release the water is a necessary part of a permanent legal solution. As of the date of this report, there has been no USNRC action on the July 1, 1996 license amendment request. However, once USNRC and legal authority to freely discharge the storm/ground water that collects in the foundation drainage system of the London Road building has been received, AMS will operate a temporary automatic pumping system to remove water that accumulates in the new manhole. This water will be discharged to a storm sewer catch basin on the west side of the building's west parking lot. AMS will then pursue the legal authority to re-institute a permanent (gravity-fed) discharge system.

⁶ Cobalt-60 was identified in two 3,000-gallon batch tanks and one 25,000 gallon frac tank. However, the source of this contamination was the tanks themselves, which were used as process tanks for the water treatment project. The residual ⁶⁰Co that remained in the batch tanks when they were first filled with water from the remediated underdrain system was removed by filtration. Sampling of subsequent batches of water held in these tanks has been negative for the presence of ⁶⁰Co. Remedial action for the frac tank is delayed pending resolution of a non-radiological issue.

TABLES

Table 1 - Cobalt-60 Inventory as of July 3, 1996

Item	Form	Material Description	Estimated Activity (Ci)
Licensed Material	Solid	Bulk Metal and Sealed Sources	53337
Packaged waste	Solid	Materials contained in high-level waste storage, LSA boxes and drums in the basement of the facility.	28
Packaged waste	Solid	Solid waste generated during the water treatment project.	0.4
Unpackaged waste	Solid/sludge	Materials contained in WHUT Room	51
Surface radioactivity	Solid	Uncharacterized surface activity in the restricted areas of the facility	1
TOTALS			53417

Table 2 - Action Plan Summary⁷

High Priority Activity	Intermediate Priority Activity	Lower Priority Activity
Submit the Remediation Report for the water treatment and sewer remediation project	Recover the capabilities of the Hot Cell.	Remove the plug in the Hot Cell and extract the remaining sources
Finalize site emergency plan.	Reduce the inventory of sealed sources and bulk cobalt.	Decontaminate the Hot Cell.
Submit conceptual decommissioning plan		Complete the physical inventory of sources.
Finalize decommissioning funding plan.		Ship out remaining sources
Finalize license renewal activities.		Dispose of solid waste
Implement training requirements of the approved site emergency plan (e.g., train first responders and perform emergency exercise and critique)		Pursue disposition of treated water that currently exists in the collapsible storage tanks.

⁷ Shaded areas denote closure:

Table 3 - Action Plan for Each Task⁸

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Complete Remediation Report	Determine remedial alternative for the WHUT Room	8/29/95	10/3/95	Closed. Solidification has been identified as the preferred alternative.
	Determine storage methodology for contaminated solids	8/29/95	10/3/95	Closed. Construction of an above-ground storage container has been identified as the preferred alternative.
	Stabilize liquids that currently exist in the WHUT Room	10/3/95	3/1/96	To be addressed as part of the Building Recovery Project.
	Implement storage option for contaminated solids	10/3/95	4/30/96	Closed.
	Finalize and submit remediation report	8/1/95	TBD	Pending resolution of AMS/NEORSO litigation
	Begin direct discharge of ground and surface water from the AMS foundation drainage system.	1/15/96	TBD	Pending resolution of AMS/NEORSO litigation and reconnection of sewer system
License Renewal Application	Submit revised application	9/11/95	10/31/95	Closed. Application mailed to USNRC on 10/31/95
	Begin operations under provisions of renewed license.	1/1/96	TBD	Pending USNRC action on renewal application
Emergency Plan	Submit revised Emergency Plan to the USNRC	8/15/95	9/30/95	Closed. Plan mailed to USNRC and first responders on 9/26/95.
	Submit response to USNRC and agency comments on Revision 0 of Emergency Plan.	2/28/96	3/28/96	Closed. Comments mailed to USNRC and first responders on 3/22/96.
	Submit response to USNRC inspection report on structural integrity of the building	3/12/96	4/12/96	Closed. Response mailed to USNRC on 6/7/96.
	Begin operations under provisions of approved plan.	1/1/96	TBD	Pending USNRC approval of Emergency Plan.

⁸ As actions are completed and as the scope/approach of specific activities (subitems) become solidified, the individual action plans will be expanded and specific dates will be entered in the implementation schedules. Changes will be noted in future revisions of this Plan. Shaded entries denote closure.

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Decommissioning Funding Plan	Submit Conceptual Decommissioning Plan	9/8/95	10/23/95	Closed. Plan mailed to USNRC on 10/20/95.
	Submit response to USNRC comments on Conceptual Decommissioning Plan.	3/20/96	4/20/96	Closed. Response mailed to USNRC on 4/12/96
	Submit Revision 1 of Conceptual Decommissioning Plan	7/1/96	8/30/96	Open
	Submit Decommissioning Funding Plan	9/1/96	9/15/96	Open
	Scheduled review of Conceptual Decommissioning Plan and Decommissioning Funding Plan for continued applicability	TBD	One (1) year after USNRC approval	Pending USNRC approval of Decommissioning Funding Plan
Recover Hot Cell Capabilities	Determine Hot Cell requirements for inventory reduction.	8/29/95	10/27/95	Closed.
	Specify Hot Cell recovery actions	11/1/95	12/1/95	Closed
	Implement recovery actions	12/1/95	1/1/95	Closed
Return NPI Sources	Evaluate residual radioactivity on NPI Sources	9/11/95	9/15/95	Closed.
	Determine decontamination methodology	9/25/95	11/24/95	Closed.
	Perform "trial run" of decontamination methodology.	11/1/95	12/20/95	Closed
	Decontaminate and leak test sources	12/20/95	1/1/97	Ongoing
	Package and ship sources	12/20/95	1/1/97	Ongoing
Identify a Market for Remaining Bulk Cobalt	Identify domestic market possibilities	8/1/95	12/31/96	Closed.
	Identify foreign market possibilities	11/1/95	12/31/96	Closed.
	Prepare and mail solicitation letters to market possibilities.	2/15/96	4/1/96	Closed Letters mailed on 3/22/96
	Determine and implement permitting requirements	12/31/96	6/1/97	Closed. No longer applicable
	Complete contracts with purchasers	TBD	TBD	Closed. No longer applicable
	Package and ship sources	TBD	TBD	Closed. No longer applicable

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Transfer Sealed Sources and Bulk Cobalt to Authorized Recipient	Submit license amendment to release decommissioning funds to fund transfer cost.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 6/26/96.
	Submit license amendment to permit source shipment pursuant to applicable Radiation Safety Procedures and vendor instructions.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 7/5/96
	Execute contract with waste broker	6/1/96	7/15/96	Open
	Package and stage the sources.	TBD	TBD	Unscheduled
	Prepare necessary permits and licenses	TBD	TBD	Unscheduled
	Ship Waste	TBD	TBD	Unscheduled
Train First Responders in Emergency Plan Provisions	Receive USNRC approval of the Emergency Plan	10/20/95	TBD	Pending response from USNRC
	Schedule initial first responder training session	10 days after USNRC approval	TBD	Unscheduled pending USNRC approval of the Emergency Plan
	Complete training and documentation	60 days after USNRC approval	TBD	Unscheduled
	Obtain updated letters of agreement, as necessary	TBD	TBD	Unscheduled
	Schedule refresher training	TBD	TBD	Unscheduled
Implement an Emergency Exercise and Critique	Schedule emergency exercise	60 days after completion of training	TBD	Unscheduled pending completion of first-responder training
	Prepare scenario	TBD	TBD	Partially complete
	Contract outside observer	TBD	TBD	List of qualified personnel prepared.
	Initiate emergency exercise	TBD	TBD	Unscheduled
	Generate critique report	TBD	TBD	Unscheduled
	Modify Emergency Plan in light of critique findings	TBD	TBD	Unscheduled

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Remove Plug in Hot Cell	Determine methodology for plug removal	7/1/95	8/1/95	Closed
	Generate specifications plan for plug removal	7/1/95	8/1/95	Closed
	Issue Request for Quotation for plug removal	7/1/95	8/1/95	Closed
	Review bids and issue contract for services	7/1/95	8/1/95	Closed
	Prepare work plan and Radiation Work Permit	TBD	TBD	Unscheduled
	Mobilize personnel and equipment	TBD	TBD	Unscheduled
	Train personnel in provisions of work plan	TBD	TBD	Unscheduled
	Perform dress rehearsals	TBD	TBD	Unscheduled
	Remove plug	TBD	TBD	Unscheduled
Decontaminate the Hot Cell	Specify Hot Cell decontamination methodology and clean-up criteria	TBD	TBD	Unscheduled pending plug removal
	Generate work plan for decontamination activities	TBD	TBD	Unscheduled
	Contract decontamination services, as necessary	TBD	TBD	Unscheduled
	Mobilize equipment and personnel	TBD	TBD	Unscheduled
	Complete decontamination	TBD	TBD	Unscheduled
	Request amendment to License Condition 14 to postpone the physical inventory requirement pending plug removal.	5/1/98	6/30/98	Open pending action by USNRC on October, 1995 license renewal application
Complete/Confirm Inventory and Transfer/Ship Remaining Sources	Confirm physical inventory of remaining sealed sources	TBD	TBD	Unscheduled pending final decontamination of Hot Cell
	Evaluate residual radioactivity on remaining sources	TBD	TBD	Unscheduled
	Decontaminate and leak test sources	TBD	TBD	Unscheduled
	Obtain shipping cask	TBD	TBD	Unscheduled
	Package and ship sources	TBD	TBD	Unscheduled

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Stabilize WHUT Room and Free-Release Basement	Secure engineering design for WHUT Room stabilization.	6/15/96	7/15/96	Open
	Contract stabilization services.	6/15/96	8/15/96	Open
	Contract decontamination services	6/15/96	7/15/96	Complete
	Decontaminate basement using HEPA-filtered scabbling	1/1/97	3/1/97	Open
	Stabilize WHUT Room using engineer-specified stabilizing agents and hydrological seals	1/1/97	3/1/97	Open
	Perform final status survey on basement	3/1/97	4/1/97	Open
Disposition of Solid Waste at the Facility	Evaluate disposition options in light of Conceptual Decommissioning Plan	10/1/95	TBD	Complete
	Select the preferred option based upon an ALARA analysis.	TBD	TBD	Complete
	Submit license amendment to release decommissioning funds to fund disposal cost.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 6/26/96.
	Submit license amendment to permit waste shipment pursuant to applicable Radiation Safety Procedures.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 7/5/96
	Execute contract with waste broker	6/1/96	12/1/96	Open
	Characterize the materials.	6/1/96	12/5/96	Open
	Prepare necessary permits and licenses	11/1/96	12/5/96	Open
	Ship Waste	12/5/96	2/1/97	Open
Disposition of Treated Water in Collapsible Storage Tanks	Identify disposition options.	8/1/95	TBD	Open
	Prepare necessary permits and licenses	TBD	TBD	Unscheduled
	Implement preferred disposition option.	TBD	TBD	Unscheduled



Advanced Medical Systems, Inc.

1020 London Rd.
Cleveland, Ohio 44110
216-692-3270

July 10, 1996

Mr. Hubert Miller
Regional Administrator, Region III
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60523-4351

Re: Strategic Plan (USNRC License No. 34-19089-01)

Dear Mr. Miller:

On August 29, 1995, a meeting was held at the request of Advanced Medical Systems, Inc. (AMS) to discuss an action plan for addressing outstanding issues that are of mutual interest to AMS and the USNRC in a timely fashion but within the resources currently available to AMS. In that meeting, AMS agreed to submit to the USNRC a written plan for meeting its short-term, intermediate-term and long-term objectives. That plan was, in fact, submitted on October 11, 1995.

Included in the plan was a commitment to provide quarterly updates on AMS's progress toward meeting its goals. Enclosed is Revision 3 of the "Strategic Plan for the London Road Facility", which is being submitted in response to our commitment. If you have any questions or if I can provide you with additional information, please call me at (216) 692-3270. You may expect to receive Revision 4 of the plan in October of 1996.

Sincerely,

Robert Meschter, R.S.O.

cc: D. Cesar
D. A. Miller, Esq. - Stavole & Miller
C. D. Berger, C.H.P. - IEM
Assistant General Counsel for Hearings and
Enforcement, USNRC
D. A. Cool - Director, Division of Industrial and
Medical Nuclear Safety, USNRC
C. D. Pederson - Director, Division of Radiation
Safety and Safeguards, USNRC
J. Caldwell - Deputy Director, Division of
Radiation Safety and Safeguards, USNRC
M. Weber - Region III, USNRC

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REGION III

JUL 18 1996

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STRATEGIC PLAN FOR THE LONDON ROAD FACILITY

Submitted by:

Advanced Medical Systems, Inc.

1020 London Road
Cleveland, Ohio 44110
(216) 692-3270

Report No. 94009/G-3113, Revision 3
July 10, 1996

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INTRODUCTION

Advanced Medical Systems, Inc. (AMS) manufactured and fabricated sealed sources of ^{60}Co for teletherapy and radiography machines. Under the provisions of U. S. Nuclear Regulatory Commission (USNRC) license No. 34-19089-01, and as of the date of this report, AMS possesses approximately 54,000 curies of ^{60}Co , and 2,200 kilograms of depleted uranium (nickel plated) for use as shielding material.¹ Included are approximately 40 curies of radioactive material in a potentially dispersible form. This material, which consists primarily of dry solid waste, carbon granules and ion exchange resins, is stored in sealed 55-gallon drums or B-25 (steel) boxes. The types and quantities of licensed materials currently in the possession of AMS are shown in Table 1.

As part of its license compliance efforts, AMS is faced with completing a number of tasks ranging from license renewal to significant reductions in the existing radionuclide inventory. Timely completion of these activities is critical since they will ultimately result in streamlined routine operations, recovery of needed building/facility capabilities, and reduced regulatory demands on the operating staff.

However, due to limited personnel and financial resources, it is not possible for AMS to complete all of the outstanding activities in a single campaign. Therefore, to avoid unnecessary and negative financial impacts on the company, yet ensure steady and well-managed progress toward completion, the activities were prioritized based upon an activity's ability to improve the implementability of other activities, AMS's ability to fund the activity in the near-, intermediate- and long-term, and on the cost/benefit associated with the activity's timely completion. Table 2 shows the listing of the outstanding activities, along with their priorities (e.g., high priority, intermediate priority, and lower priority).²

A number of additional activities not shown in Table 2 will run concurrent with the prioritized activities. These include audit/assessment of the radiation protection program, upgrade of standard operating procedures, improvements in housekeeping, and attempts to increase community relations.

The remainder of this report contains additional discussion on each of the outstanding activities. Included is a brief discussion of the AMS strategy for each activity, the plan of action for completing the activity, a description of the current status (as of the date of this report) and an implementation schedule, where appropriate.

¹ There is negligible radiological hazard associated with the depleted uranium inventory. Therefore, it is not addressed further in this report.

² In general, high priority items are scheduled for completion within the next year, intermediate priority items within the next one to three years, and lower priority items within the next three to five years.

Over the intermediate and long term, as actions are completed and as the scope/approach of specific activities (subitems) become solidified, the individual action plans will be expanded and specific dates will be entered in the implementation schedules. Therefore, this report will be revised on a quarterly basis and numbered revisions will be issued.

HIGH PRIORITY ACTIONS

Complete the Remediation Report

In late 1994, the Northeast Ohio Regional Sewer District (NEORS) intentionally isolated AMS access to regional sewage treatment system. This action rendered the facility drainage system non-functional, increased the hydrostatic pressure on the foundation structure, and caused groundwater to enter the basement of the AMS facility. After AMS made timely notification to the USNRC about the deteriorating conditions at the building, AMS initiated action to drain the basement, remove the ^{60}Co from the water in the basement, remediate the foundation drainage system, isolate the residual radioactivity in the manhole and sewer line exiting the facility to the London Road Interceptor, and remediate the residual radioactivity in the London Road interceptor.³

One commitment made to the USNRC as part of the remediation project was to provide a final report that contains a description of the events that led to the site conditions, a review of the remedial actions implemented and their results, and a summary of all data acquired during the process. However, since all remedial activities are not yet complete, the final remediation report is still being compiled. Outstanding items are disposition of water in the collapsible storage tanks, disposition of contaminated solids (e.g., soils and water treatment media), implementation of the long-range surveillance plan for residual radioactivity that exists outside of the AMS building (e.g., in the abandoned footer drains and lateral connection from the building to the London Road Interceptor), disposition of water in the WHUT Room, and remediation of the London Road Interceptor.

In regard to the residual water in the WHUT Room, AMS investigated the use of a stabilizing agent known as STERGO™, solid granular, cross-linked polymer that rapidly absorbs and retains large quantities of aqueous-based liquids. It was considered because it is non-toxic, will hold from 12 to 40 times its weight in aqueous solutions, and testing indicates that its capacity to retain liquids at high dose rates and large integrated doses is good. However, on June 10, 1996 AMS forwarded to the USNRC a proposal for the Building Recovery Project. Task 3 of the proposal is to stabilize the radiological conditions in the basement and WHUT Room in order to reduce the impact of water incursion. Actions to address residual water are thus delayed pending USNRC acceptance of the proposal.

In regard to the contaminated solids from the excavation (rock, soil) that exist outside the AMS facility, a lined wooden structure was built on the south west quadrant of the property, approximately 200 feet from the building. These solids were transferred to the structure shortly thereafter. The structure and its environs have been posted pursuant to RSP-011, "Posting and Labeling", and have been included in the quarterly radiological surveillance program pursuant to RSP-008, "Instrumentation and Surveillance".

³ As of the date of this report, the NEORS has not permitted AMS access to the London Road Interceptor. AMS's ability to complete the remediation is beyond its control.

In regard to the long-range surveillance plan for residual radioactivity, AMS submitted the plan to the USNRC on September 5, 1995. After a December 14, 1995 submission of additional information, the plan was approved as modified by the USNRC on January 18, 1996. On May 16, 1996, AMS implemented the provisions of the January 24, 1996 version of the plan with one exception. On May 23 1996, AMS submitted an application to amend the Plan in order to delay until Spring of 1997 the installation of the two wells referenced in the Plan. The purpose of the delay was to permit AMS to finalize other operational decisions pertaining to water handling and to better-coordinate well installation activities. As of the date of this report, there has been no USNRC action on the May 23, 1996 license amendment request.

Once all of the actions associated with the water treatment and sewer remediation project are complete, the remediation report will be finalized and submitted to the USNRC. However, for reasons that are beyond AMS's control, remediation of the London Road Interceptor may be delayed significantly. Therefore, AMS may elect to submit the Remediation Report in advance and exclusive of this item. Table 3 shows the action plan for this task.

License Renewal Application

In early 1995, AMS submitted an application to renew its USNRC license under the provisions of timely renewal. After initial USNRC review of the application, a letter of deficiency was issued and additional information was requested. Subsequently, an in-house review of the application, in light of the short- and long-range plan of AMS, was completed. This review confirmed that the application was indeed cumbersome and permitted AMS little flexibility in achieving its intermediate- and long-term goals. Therefore, a significantly revised application was submitted on October 30, 1995.

On December 5, 1995, the USNRC asked AMS to provide copies of the Radiation Safety Procedures that were referenced in the revised application. These were transmitted to the USNRC in three (3) separate submittals dated January 3, 1996, February 13, 1996 and March 8, 1996. To date, AMS has received no additional response from the USNRC and continues to operate under the provisions of the existing license. Table 3 shows the action plan for this task.

Emergency Plan

As part of license renewal efforts, an emergency plan was submitted to the USNRC for review and comment. On June 7, 1995, after initial USNRC review of the Plan, a letter of deficiency was issued and additional information was requested. Because the magnitude of deficiencies was significant, a revised Plan was submitted on September 22, 1995. This revision was consistent with the guidance contained in USNRC Regulatory Guide 3.67 (1992), "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities".

On February 28, 1996, the USNRC mailed comments on Revision 0 of the Emergency Plan. The AMS response to those comments was forwarded on March 22, 1996, along with the AMS response to comments received from the Ohio Environmental Protection Agency, the Ohio Emergency Management Agency, the Cuyahoga Emergency Management Assistance Center, the

Ohio Department of Health, and the City of Cleveland Division of Fire were forwarded to these agencies and to the USNRC.

On March 12, 1996, AMS received the results of a special inspection directed toward the structural integrity of the London Road facility. A number of the issues raised in the inspection report are pertinent to the Emergency Plan. The AMS response to those comments was submitted to Geoffrey Wright (USNRC) on June 7, 1996. The structural issues that pertained specifically to Emergency Plan comments were addressed in a June 7, 1996 letter to John Madera (USNRC). Table 3 contains the action plan for this task.

Decommissioning Funding Plan

As part of the recent license renewal efforts, a decommissioning funding plan was submitted to the USNRC for review and comment. On August 17, 1995, after initial USNRC review of the Plan, a letter of deficiency was issued and additional information was requested. Specifically, the USNRC indicated that the January 1995 cost estimate and site characterization submitted by AMS "are no longer valid". However, the January 1995 estimate was based upon a "decontaminate and release" decommissioning option, which is not suitable for a facility like AMS where the primary radionuclide of concern has a radiological half life of only five years. Therefore, AMS prepared a Conceptual Decommissioning Plan for the facility pursuant to 10 CFR 40.46(d) that is based upon a "safe storage" decommissioning option.⁴

The Plan, which was submitted to the USNRC on October 20, 1995, describes the decommissioning objective for the facility and its basis, a description of the items to be decommissioned, the proposed decommissioning methodology, an ALARA analysis to support the proposed methodology, a cost estimate (1995 costs) for implementing the methodology, and a review schedule for ensuring the Plan's continued applicability for the duration of License No. 34-19089-01. Once approved by the USNRC, AMS intended that the Plan will be funded by the corporation and reviewed for continued applicability on a planned and periodic basis.

On March 20, 1996, the USNRC mailed comments on the Plan, along with a request for additional information. The AMS response to these comments was forwarded to John Madera (USNRC) on April 12, 1996.

On June 10, 1996 AMS forwarded to the USNRC a proposal to complete a Building Recovery Project, the result of which would be a significantly reduced inventory of radioactive materials at the London Road facility. In that proposal, AMS requested that the USNRC to release a portion of the funds AMS has committed for decommissioning in order to support commercial disposal costs. One justification for this request is that the cost of decommissioning will be less than that reflected in the October 20, 1995 Conceptual Decommissioning Plan due to the reduction in inventory and restricted areas. At the request of the USNRC, AMS submitted an application to amend its radioactive materials license reflect a reduction from the current financial assurance

⁴ Pending its concurrence with the Conceptual Decommissioning Plan, the USNRC did, in a January 8, 1996 letter to AMS, accept AMS's decommissioning financial assurance submittal based upon the January, 1995 cost estimate.

amount of \$1,800,000 to \$940,000 on June 26, 1996. As of the date of this report, there has been no USNRC action on this amendment request. Table 3 contains the action plan for this task.

Train First Responders in Emergency Plan Provisions

As part of its emergency response requirements, AMS must provide annual radiation safety training for first responders. Pursuant to the revised Emergency Plan, this training must include a review of items of mutual interest, instruction in emergency procedures, radiation protection guidelines, and the responder's anticipated role in an emergency. During the training session, the emergency response team activation scheme, notification procedures, and overall response coordination process will be reviewed.

Within 60 days after USNRC approval of the revised Emergency Plan, a training session for first responders will be scheduled. After training is complete, agency attendance will be documented and letters of agreement will be updated, as necessary. The training sessions will be scheduled annually thereafter. Table 3 contains the action plan for this task.

Stage Emergency Exercise and Perform Critique

As part of its emergency response requirements, and in order to maintain emergency preparedness, AMS must conduct an emergency exercise on a planned and periodic basis. Within 60 days after all first responders have received initial training in the provisions of the AMS Emergency Plan, the emergency exercise will be scheduled and staged.

Pursuant to the revised Emergency Plan, the exercise will include one or more of the accident scenarios postulated for the facility, and will involve off-site agencies that have provided letter agreements for support services (e.g., first responders). The scenario will not be known in advance by exercise participants, and a non-participating observer will provide an evaluation of the effort, along with recommendations for improvement.

The critique of the exercise will be used as a basis for modifying the Emergency Plan or for supplementing the training of off-site agencies. Deficiencies identified during critiques will be corrected and closure will be documented. As necessary, changes to the Emergency Plan, based upon the findings of the critique, will be implemented. Table 3 contains the action plan for this task.

INTERMEDIATE PRIORITY ACTIONS

Recover Hot Cell Capabilities

In order to decontaminate, leak test, package and ship sealed sources of ^{60}Co from the AMS facility, a functional hot cell is needed. Currently, the Hot Cell contains significant residual removable radioactivity. Consequently, cross-contamination of items that enter the Hot Cell is a concern. Therefore, AMS intended to recover sufficient Hot Cell capabilities to support inventory reduction efforts.

Shortly after issue of the initial version of this Strategic Plan, the Hot Cell capabilities that were needed to facilitate inventory reduction were evaluated. From this evaluation, it was determined that improved lighting and construction of a source transfer mechanism were the only items necessary to support initial inventory reduction. These items were implemented, a successful "trial run" of the system occurred on December 19, 1995, and the system became fully operational on December 27, 1995.

Return NPI Sources

There are currently 34 sealed sources in the AMS inventory that belong to Neutron Products Inc. (NPI). As part of on-going operations, AMS purchases sources from NPI for delivery to a customer. When the shipping cask is sent to NPI, one of the sources in the AMS permanent inventory is enclosed, thereby reducing the inventory.

AMS has attempted, without success, to escalate the return of all of the remaining sources now that Hot Cell capability has been recovered. Since NPI will accept only one returned source for each source shipped, the rate of reduction in the NPI inventory will significantly slower than expected. Nonetheless, AMS is proceeding with this task at the highest possible rate. As sources leave the London Road facility, the inventory log is debited. Table 3 contains the action plan for this task.

Identify a Market for Remaining Sources and Bulk Material

There are approximately 54,000 curies of sealed ^{60}Co sources and bulk ^{60}Co metal in the AMS inventory. AMS has attempted to identify a domestic or foreign market for this material. On March 20, 1996, AMS prepared and distributed a description of the type, form and curie content of the sources to a variety of agencies, including source distribution firms, government agencies, and non-domestic agencies. Included with the description was a form soliciting the level of interest of each recipient. Although a number of potential users were identified, their needs are for sources with significantly greater activity than is present in the AMS inventory. Therefore, AMS has not met with success in transferring the inventory to other users.

After many conversations and levels of negotiation, it was determined that the relatively small volume but high activity of the sealed source inventory could provide a cost-mitigating factor for conventional disposal. This fact placed conventional disposal of the sources into the realm of financial possibility if AMS is permitted to "tap" funds that are currently held by the USNRC for

decommissioning funding. Therefore, on June 10, 1996 AMS forwarded to the USNRC a proposal for the Building Recovery Project, which included a brief description of the AMS facility and its planned operations, the reason why AMS wishes to implement the Building Recovery Project, a description of the Project's 12-point scope of work, a proposed project schedule, and the proposed mechanism whereby the project will be funded. Task 1 in the proposal is to dispose of all accessible sealed ^{60}Co sources and all canisters of bulk ^{60}Co at a commercial low level waste burial ground.

On July 8, 1996, AMS submitted an application to amend its USNRC license to permit commercial disposal of the sources and canisters. As of the date of this report, there has been no USNRC action on this amendment request. Table 3 contains the action plan for this task.

LOWER PRIORITY ACTIONS

Remove Plug in the Hot Cell

An estimated 4,000 curies of ^{60}Co in the form of sealed sources are located in a storage well in the Hot Cell. Because the well plug has become lodged in the well, these sources cannot be removed and included in the inventory reduction efforts. Therefore, AMS intends to dislodge the plug.

A methodology for dislodging the plug has been determined, and a contract for services has been let. Once the decision is made to proceed and the work plan and Radiation Work Permit have been completed, equipment and personnel will be staged, "dry runs" will be completed, and the plug will be removed. Table 3 contains the action plan for this task.

Decontaminate the Hot Cell

After the plug removal project is complete, significant residual radioactivity will likely exist within the Hot Cell. In order to ensure its continued usefulness, AMS intends to decontaminate the Hot Cell to levels necessary to support planned future operations.

The first step in the process will be determination of the methodology for Hot Cell decontamination. Once complete, the work plan will be prepared, outside services, if necessary, will be contracted, and the project will begin. Table 3 shows the action plan for this task.

Complete/Confirm the Physical Inventory and Transfer/Ship Remaining Sources

After removal of the plug, AMS will be able to confirm the physical inventory of licensable radioactive material present at the London Road facility. (AMS is obliged, by License Condition 14, to complete a physical inventory of all sources in its custody. In light of the low priority associated with this task and the activities that are scheduled to be performed for the Building Recovery Project, AMS intends to submit an application to amend Provision 14(c) of License No. 34-19089-01 requesting an exemption from performing a physical inventory of the sources in the stuck plug until the plug is removed. Included in the application will be an accounting of the sealed source status for the year prior to the application, a summary of surveillance information confirming that "unaccounted for" sources do not exist at the facility, and a commitment to complete the physical inventory once the stuck plug is removed. Table 3 contains the action plan for this task.

Disposition of Solid Waste at the Facility

As shown in Table 1, there are about 3,000 cubic feet of solid waste at the AMS facility. These materials are stored either within the AMS facility, or in a secured storage location within the fenced portion of the property.

On June 10, 1996 AMS forwarded to the USNRC a proposal for the Building Recovery Project. Task 2 of the proposal is to dispose of all dry solid waste currently stored in the facility basement and in the high-level waste storage through a commercial low-level waste broker. On July 8, 1996, AMS submitted an application to amend its USNRC license to permit this operation to

proceed pursuant to modified operating procedures. As of the date of this report, there has been no USNRC action on this amendment request. Table 3 contains the action plan for this task.

Disposition of Treated Water in Collapsible Storage Tanks

As part of the 1995 sewer remediation project, approximately 100,000 gallons of water was treated by the methodology of sub-micron filtration and reverse osmosis in order to reduce its radionuclide content to below drinking water standards. There are approximately 40 microcuries of ^{60}Co in the water, which is currently stored in collapsible storage tanks at the London Road facility. The solubility of the residual radioactivity was confirmed using American Public Health Association's Method 7110 "Gross Alpha and Gross Beta Radioactivity (Total, Suspended, and Dissolved)" from Standard Methods for Examination of Water and Wastewater.

AMS requested and received permission from the U. S. Environmental Protection Agency (USEPA) and the USNRC to evaporate this water. However, due to delays and difficulties in implementing the treatment process that were beyond AMS's control, more than four times the original amount of water had to be treated to reduce its concentration of radioactive cobalt at a cost that went well-beyond the original projection. In light of the magnitude of these unbudgeted expenses, the evaporation option became significantly more costly. Therefore, AMS is pursuing other options for disposing of the water.

Since the treated water meets the USEPA's criteria for man-made radionuclides in drinking water pursuant to 40 CFR 141, and since it contains no other hazardous substances, its presence at the AMS facility poses no radiological risk. Therefore, there is no urgency to ensure its final disposition. Nonetheless, AMS will pursue a direct discharge option until such time as it becomes patently unattainable. At that time, the evaporation option will be re-visited in light of available financial resources. Table 3 contains the action plan for this task.

ON-GOING ACTIONS

Audit/Assessment of Radiation Protection Program

In light of changing operational issues, pending licensing activity, and the desire to "streamline" compliance efforts, AMS intends to perform a series of audits of its radiation protection program in order to compare AMS's performance to that required and/or recommended by existing license/permit provisions, U. S. Nuclear Regulatory Commission regulations, and standard industry practices (e.g., USNRC Regulatory Guides, ANSI, ASME and ASTM Standards, ICRP Publications, NCRP Publications). The audits will be performed by AMS personnel and consultants to AMS. They will involve initial review of applicable operating procedures, quality assurance procedures, and other pertinent documentation related to a particular performance issue.⁵ The initial document review is performed in order to identify possible areas of failure or liability, and to derive an efficient schedule for on-site assessments. While on site, AMS compliance with existing procedures will be determined and areas of inefficiency or poor function, as compared to industry standards and practices, will be identified.

On June 27, 1996, AMS prepared Radiation Safety Procedure No. RSP-020, "Quality Assurance Audits". Once this procedure is approved by the Radiation Safety Committee and after License No. 34-19089-01 has been renewed, the audit schedule will be set and incorporated into the computerized tracking program. While the results of the audits are intended to be used for demonstrating compliance and/or to guide future program modifications or improvements, any findings of significant regulatory non-compliance or conditions of imminent hazard will be immediately reported to and addressed by the RSO. Immediately after renewal of License No. 34-19089-01, the Radiation Safety Committee will set the audit schedule.

Upgrade of Standard Operating Procedures

In response to audit findings, and in light of changing operational demands and licensing activities, the current collection of standard operating procedures (ISPs) were reviewed for continued applicability. Wherever possible, multiple procedures that address a single topic were combined, and out-dated procedures were revised. Consistency between procedures was confirmed and compliance with the requirements of the AMS Radiation Protection Program Plan was assured. Since October 10, 1995, the following new/revised procedures have been developed and approved by the Radiation Safety Committee, and submitted to the USNRC for review:

- RSP-001, Radiation Protection Program Plan

⁵ The following programmatic issues will be audited on a planned and periodic basis: Organization and Administration; Facilities and Equipment; Training in Radiation Protection; Radiation Exposure Control; ALARA Program; Contamination Control; Instrumentation and Surveillance; Posting and Labeling; Receipt and Control of Radioactive Material; Packaging and Transportation of Radioactive Materials; Control of Radioactive Waste; Radiation Protection Records; Documentation; Emergency Response and Notifications; and Quality Assurance in Radiological Protection.

- RSP-002, Definitions
- RSP-003, Control of Radiation Safety Procedures
- RSP-004, Radiation Protection Records
- RSP-005, ALARA Program
- RSP-006, Training and Qualifications of Radiation Protection Personnel
- RSP-007, Training in Radiation Protection
- RSP-008, Instrumentation and Surveillance
- RSP-009, Contamination Control
- RSP-010, Exposure Control
- RSP-011, Radiological Areas and Posting
- RSP-012, Control of Work
- RSP-013, Control of Radioactive Waste
- RSP-014, Receipt, Handling, and Identification of Radioactive Materials
- RSP-015, Packaging and Transportation of Radioactive Materials
- RSP-016, Emergency Response and Notifications
- RSP-017, Stop Work Authority
- RSP-018, Operation of the Gamma Spectrometer
- RSP-019, Assessment of Radioactivity in Water Samples

Immediately after renewal of License No. 34-19089-01, these procedures will be implemented in their entirety.

Housekeeping Improvements

Currently, there are only three permanent employees at the London Road facility. Therefore, only a small fraction of the available space is used for routine operations, office areas and storage. However, AMS has instituted improvements in housekeeping in the useable areas of the facility.

On May 15, 1996, AMS instituted an aggressive program of waste consolidation, equipment decontamination, and facility surveys as part of the Building Recovery Project. In fact, Task 6 of the Project is to free-release (for unrestricted use) the London Road building, with the exception of the WHUT Room, the Hot Cell, the ventilation system, and an ancillary work area. This work is proceeding on an escalated schedule so that all waste generated can be disposed of under Task 2 of the Project.

Community Relations

In the past, issues or activities at AMS that required state, federal and local approvals were hampered due to lack of knowledge of AMS operations and/or an understanding of the fundamental principles of radiation and radioactivity on the part of decision-makers. In an effort to streamline future decision-making, AMS has mounted a community relations program to acquaint various officials and members of the print and broadcast media with the AMS function, its capabilities, and its short-, intermediate-, and long-range plans. This has been accomplished, on an as-needed basis, through briefings, tours, and development/publication of hand-out materials and brochures.

Reconnection of Sewer System to London Road Interceptor

Currently, the London Road facility does not have a direct connection to the regional sewer system. There are no sanitary discharges from the building, the roof drains discharge onto the ground surface, and all groundwater is pumped from a manhole on the property into storage tanks. Once a tank is full, the water is sampled and discharged. Since December 22, 1995, over 140,000 61,000 gallons of water have been collected, analyzed, and found to be free of insoluble ⁶⁰Co.⁶ However, a series of extenuating circumstances have increased the urgency in reconnecting all drainage paths to the London Road Interceptor.

AMS is barred, by court order, from freely releasing the ground/surface water that collects in the remediated foundation drainage system. Therefore, on July 1, 1996, AMS renewed its March 1, 1995 and March 20, 1995 applications to amend its USNRC license to permit free-release of foundation drainage since USNRC authorization to free-release the water is a necessary part of a permanent legal solution. As of the date of this report, there has been no USNRC action on the July 1, 1996 license amendment request. However, once USNRC and legal authority to freely discharge the storm/ground water that collects in the foundation drainage system of the London Road building has been received, AMS will operate a temporary automatic pumping system to remove water that accumulates in the new manhole. This water will be discharged to a storm sewer catch basin on the west side of the building's west parking lot. AMS will then pursue the legal authority to re-institute a permanent (gravity-fed) discharge system.

⁶ Cobalt-60 was identified in two 3,000-gallon batch tanks and one 25,000 gallon frac tank. However, the source of this contamination was the tanks themselves, which were used as process tanks for the water treatment project. The residual ⁶⁰Co that remained in the batch tanks when they were first filled with water from the remediated underdrain system was removed by filtration. Sampling of subsequent batches of water held in these tanks has been negative for the presence of ⁶⁰Co. Remedial action for the frac tank is delayed pending resolution of a non-radiological issue.

TABLES

Table 1 - Cobalt-60 Inventory as of July 3, 1996

Item	Form	Material Description	Estimated Activity (Ci)
Licensed Material	Solid	Bulk Metal and Sealed Sources	53337
Packaged waste	Solid	Materials contained in high-level waste storage, LSA boxes and drums in the basement of the facility.	28
Packaged waste	Solid	Solid waste generated during the water treatment project.	0.4
Unpackaged waste	Solid/sludge	Materials contained in WHUT Room	51
Surface radioactivity	Solid	Uncharacterized surface activity in the restricted areas of the facility	1
TOTALS			53417

Table 2 - Action Plan Summary⁷

High Priority Activity	Intermediate Priority Activity	Lower Priority Activity
Submit the Remediation Report for the water treatment and sewer remediation project	Recover the capabilities of the Hot Cell.	Remove the plug in the Hot Cell and extract the remaining sources
Finalize site emergency plan.	Reduce the inventory of sealed sources and bulk cobalt.	Decontaminate the Hot Cell.
Submit conceptual decommissioning plan		Complete the physical inventory of sources.
Finalize decommissioning funding plan.		Ship out remaining sources
Finalize license renewal activities.		Dispose of solid waste
Implement training requirements of the approved site emergency plan (e.g., train first responders and perform emergency exercise and critique)		Pursue disposition of treated water that currently exists in the collapsible storage tanks.

⁷ Shaded areas denote closure.

Table 3 - Action Plan for Each Task⁸

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Complete Remediation Report	Determine remedial alternative for the WHUT Room	8/29/95	10/3/95	Closed. Solidification has been identified as the preferred alternative.
	Determine storage methodology for contaminated solids	8/29/95	10/3/95	Closed. Construction of an above-ground storage container has been identified as the preferred alternative.
	Stabilize liquids that currently exist in the WHUT Room	10/3/95	3/1/96	To be addressed as part of the Building Recovery Project.
	Implement storage option for contaminated solids	10/3/95	4/30/96	Closed.
	Finalize and submit remediation report	8/1/95	TBD	Pending resolution of AMS/NEORSR litigation
	Begin direct discharge of ground and surface water from the AMS foundation drainage system.	1/15/96	TBD	Pending resolution of AMS/NEORSR litigation and reconnection of sewer system
License Renewal Application	Submit revised application	9/11/95	10/31/95	Closed. Application mailed to USNRC on 10/31/95
	Begin operations under provisions of renewed license.	1/1/96	TBD	Pending USNRC action on renewal application
Emergency Plan	Submit revised Emergency Plan to the USNRC	8/15/95	9/30/95	Closed. Plan mailed to USNRC and first responders on 9/26/95.
	Submit response to USNRC and agency comments on Revision 0 of Emergency Plan.	2/28/96	3/28/96	Closed. Comments mailed to USNRC and first responders on 3/22/96
	Submit response to USNRC inspection report on structural integrity of the building	3/12/96	4/12/96	Closed. Response mailed to USNRC on 6/7/96.
	Begin operations under provisions of approved plan.	1/1/96	TBD	Pending USNRC approval of Emergency Plan.

⁸ As actions are completed and as the scope/approach of specific activities (subitems) become solidified, the individual action plans will be expanded and specific dates will be entered in the implementation schedules. Changes will be noted in future revisions of this Plan. Shaded entries denote closure.

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Decommissioning Funding Plan	Submit Conceptual Decommissioning Plan	9/8/95	10/23/95	Closed. Plan mailed to USNRC on 10/20/95.
	Submit response to USNRC comments on Conceptual Decommissioning Plan.	3/20/96	4/20/96	Closed. Response mailed to USNRC on 4/12/96
	Submit Revision 1 of Conceptual Decommissioning Plan	7/1/96	8/30/96	Open
	Submit Decommissioning Funding Plan	9/1/96	9/15/96	Open
	Scheduled review of Conceptual Decommissioning Plan and Decommissioning Funding Plan for continued applicability	TBD	One (1) year after USNRC approval	Pending USNRC approval of Decommissioning Funding Plan
Recover Hot Cell Capabilities	Determine Hot Cell requirements for inventory reduction.	8/29/95	10/27/95	Closed.
	Specify Hot Cell recovery actions	11/1/95	12/1/95	Closed
	Implement recovery actions	12/1/95	1/1/97	Closed
Return NPI Sources	Evaluate residual radioactivity on NPI Sources	9/11/95	9/15/95	Closed.
	Determine decontamination methodology	9/25/95	11/24/95	Closed.
	Perform "trial run" of decontamination methodology.	11/1/95	12/20/95	Closed
	Decontaminate and leak test sources.	12/20/95	1/1/97	Ongoing
	Package and ship sources	12/20/95	1/1/97	Ongoing
Identify a Market for Remaining Bulk Cobalt	Identify domestic market possibilities	8/1/95	12/31/96	Closed.
	Identify foreign market possibilities	11/1/95	12/31/96	Closed.
	Prepare and mail solicitation letters to market possibilities.	2/15/96	4/1/96	Closed Letters mailed on 3/22/96
	Determine and implement permitting requirements	12/31/96	6/1/97	Closed. No longer applicable
	Complete contracts with purchasers	TBD	TBD	Closed. No longer applicable
	Package and ship sources	TBD	TBD	Closed. No longer applicable

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Transfer Sealed Sources and Bulk Cobalt to Authorized Recipient	Submit license amendment to release decommissioning funds to fund transfer cost.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 6/26/96.
	Submit license amendment to permit source shipment pursuant to applicable Radiation Safety Procedures and vendor instructions.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 7/5/96.
	Execute contract with waste broker	6/1/96	7/15/96	Open
	Package and stage the sources.	TBD	TBD	Unscheduled
	Prepare necessary permits and licenses	TBD	TBD	Unscheduled
	Ship Waste	TBD	TBD	Unscheduled
Train First Responders in Emergency Plan Provisions	Receive USNRC approval of the Emergency Plan	10/20/95	TBD	Pending response from USNRC
	Schedule initial first responder training session	10 days after USNRC approval	TBD	Unscheduled pending USNRC approval of the Emergency Plan
	Complete training and documentation	60 days after USNRC approval	TBD	Unscheduled
	Obtain updated letters of agreement, as necessary	TBD	TBD	Unscheduled
	Schedule refresher training	TBD	TBD	Unscheduled
Implement an Emergency Exercise and Critique	Schedule emergency exercise	60 days after completion of training	TBD	Unscheduled pending completion of first-responder training
	Prepare scenario	TBD	TBD	Partially complete
	Contract outside observer	TBD	TBD	List of qualified personnel prepared
	Initiate emergency exercise	TBD	TBD	Unscheduled
	Generate critique report	TBD	TBD	Unscheduled
	Modify Emergency Plan in light of critique findings	TBD	TBD	Unscheduled

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Remove Plug in Hot Cell	Determine methodology for plug removal	7/1/95	8/1/95	Closed
	Generate specifications plan for plug removal	7/1/95	8/1/95	Closed
	Issue Request for Quotation for plug removal	7/1/95	8/1/95	Closed
	Review bids and issue contract for services	7/1/95	8/1/95	Closed
	Prepare work plan and Radiation Work Permit	TBD	TBD	Unscheduled
	Mobilize personnel and equipment	TBD	TBD	Unscheduled
	Train personnel in provisions of work plan	TBD	TBD	Unscheduled
	Perform dress rehearsals	TBD	TBD	Unscheduled
	Remove plug	TBD	TBD	Unscheduled
Decontaminate the Hot Cell	Specify Hot Cell decontamination methodology and clean-up criteria	TBD	TBD	Unscheduled pending plug removal
	Generate work plan for decontamination activities	TBD	TBD	Unscheduled
	Contract decontamination services, as necessary	TBD	TBD	Unscheduled
	Mobilize equipment and personnel	TBD	TBD	Unscheduled
	Complete decontamination	TBD	TBD	Unscheduled
	Request amendment to License Condition 14 to postpone the physical inventory requirement pending plug removal.	5/1/98	6/30/98	Open pending action by USNRC on October, 1995 license renewal application
Complete/Confirm Inventory and Transfer/Ship Remaining Sources	Confirm physical inventory of remaining sealed sources	TBD	TBD	Unscheduled pending final decontamination of Hot Cell
	Evaluate residual radioactivity on remaining sources	TBD	TBD	Unscheduled
	Decontaminate and leak test sources	TBD	TBD	Unscheduled
	Obtain shipping cask	TBD	TBD	Unscheduled
	Package and ship sources	TBD	TBD	Unscheduled

Primary Action Item	Sub-Item	Scheduled Start Date	Scheduled End Date	Current Status
Stabilize WHUT Room and Free-Release Basement	Secure engineering design for WHUT Room stabilization.	6/15/96	7/15/96	Open
	Contract stabilization services.	6/15/96	8/15/96	Open
	Contract decontamination services	6/15/96	7/15/96	Complete
	Decontaminate basement using HEPA-filtered scabbling	1/1/97	3/1/97	Open
	Stabilize WHUT Room using engineer-specified stabilizing agents and hydrological seals	1/1/97	3/1/97	Open
	Perform final status survey on basement	3/1/97	4/1/97	Open
Disposition of Solid Waste at the Facility	Evaluate disposition options in light of Conceptual Decommissioning Plan	10/1/95	TBD	Complete
	Select the preferred option based upon an ALARA analysis.	TBD	TBD	Complete
	Submit license amendment to release decommissioning funds to fund disposal cost.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 6/26/96.
	Submit license amendment to permit waste shipment pursuant to applicable Partiation Safety Procedures.	6/1/96	7/5/96	Complete. Amendment application mailed to USNRC on 7/5/96
	Execute contract with waste broker	6/1/96	12/1/96	Open
	Characterize the materials.	6/1/96	12/5/96	Open
	Prepare necessary permits and licenses	11/1/96	12/5/96	Open
	Ship Waste	12/5/96	2/1/97	Open
Disposition of Treated Water in Collapsible Storage Tanks	Identify disposition options.	8/1/95	TBD	Open
	Prepare necessary permits and licenses	TBD	TBD	Unscheduled
	Implement preferred disposition option.	TBD	TBD	Unscheduled