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DECISION ANALYSIS REPORT FOR U.S. ARMY MATERIALS TECHNOLOGY LABORATORY RESEARCH REACTOR

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DECISION ANALYSIS REPORT
FOR
U.S. ARMY MATERIALS TECHNOLOGY LABORATORY
RESEARCH REACTOR

November 1990

Prepared by
EG&G Idaho, Inc.
Idaho National Engineering Laboratory
As Part of Work for Others Project No. 88845

Prepared for the
United States Army Toxic and Hazardous Materials Agency
Base Closure Division
Aberdeen Proving Ground, Maryland 21010
and for the U.S. Department of Energy
Idaho Operations Office
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SUMMARY

This decision analysis report describes the methodology used and the factors considered in choosing the best decommissioning alternative for the U.S. Army Materials Technology Laboratory (AMTL) Research Reactor located in Watertown, Massachusetts. The reactor facility consists of the reactor containment building, an underground waste retention tank and associated piping, and a small amount of piping remaining in Building 97, which from the reactor vessel to liquid-waste treatment tanks that were removed from Building 97.

The two alternative decommissioning modes that are considered in this report are partial dismantlement and total dismantlement.

The alternatives of mothballing (safe storage) and in-place entombment are not addressed in this report due to the projected closure of the AMTL in 1995 and the requirement by the Nuclear Regulatory Commission for immediate decommissioning and release of the site for unrestricted use. Neither of these alternatives would allow the reactor site to be released for unrestricted use due to the radioactively contaminated reactor vessel and associated components.

The alternatives were considered and compared based on estimated costs, facility and material reuse, surveillance and maintenance costs, volume of waste generated, hazards to decontamination and decommissioning workers, short-term impact on AMTL personnel and operations, and long-term impact on the public.

EG&G Idaho, Inc., recommends that the reactor be decommissioned by Alternative 2, total dismantlement.

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1. OBJECTIVES

The objectives of this decision analysis are to develop decommissioning alternatives for the disposition of the research reactor facility located at the U.S. Army Materials Technology Laboratory (AMTL) in Watertown, Massachusetts; to evaluate the alternatives; and to recommend a decommissioning alternative to the United States Army Toxic and Hazardous Materials Agency (USATHAMA).

The objective of the decommissioning effort is to place this facility or site in a condition such that it can be unconditionally released for reuse. The U.S. Army has stated its intent to inactivate the entire AMTL by 1995 and excess the property to other parties for unrestricted use.

The decommissioning of this facility will be coordinated by USATHAMA and approved by the Nuclear Regulatory Commission (NRC).

2. BACKGROUND INFORMATION

The first nuclear research reactor designed to meet the needs of the research programs on materials for the U.S. Army Ordnance Corps was constructed at Watertown, Massachusetts (see Figure 1), during the late 1950s and 1960. The reactor was dedicated on May 17, 1960, to the memory of the late Dr. Horace Hardy Lester, who won national recognition as a pioneer in the field of industrial radiography. Figure 2 is a general site map of the AMTL, including Building 100, the AMTL nuclear reactor containment facility.

Initial criticality of the nuclear reactor was achieved on June 15, 1960, at a power level of 1 MW.[1] Various solid-state physics research programs and experiments were conducted at the 1 MW power level through June 1966 by the Army Materials and Mechanics Research Center (AMMRC, now AMTL). The reactor was also used by the U.S. Army Picatinny Arsenal, the Detroit and Frankford Arsenals, and the Natick and Electronics Research and Development Laboratories.[1,2,3,4,5,6] A number of local institutions (Boston College, Worcester Polytechnic Institute, University of New Hampshire, and the Massachusetts Institute of Technology) also made use of the AMTL reactor for diffraction measurements and irradiations.

The reactor's license was amended in June 1966 to allow the power level to be increased to 2 MW to provide higher neutron fluxes for experiments.[4] The reactor's license was uprated again in 1969 from 2 MW to 5 MW, providing higher power levels for new experiments.[6]

In December 1969, the Department of the Army decided to shut down the operation of the AMTL reactor and to place the facility in a standby condition in 1970. On March 27, 1970, the reactor operations were shut down and the reactor was placed in a standby mode.[6] A deactivation report was submitted to the Division of Reactor Licensing and to the Army Reactor Systems Health and Safety Review Committee in December 1970.[7]

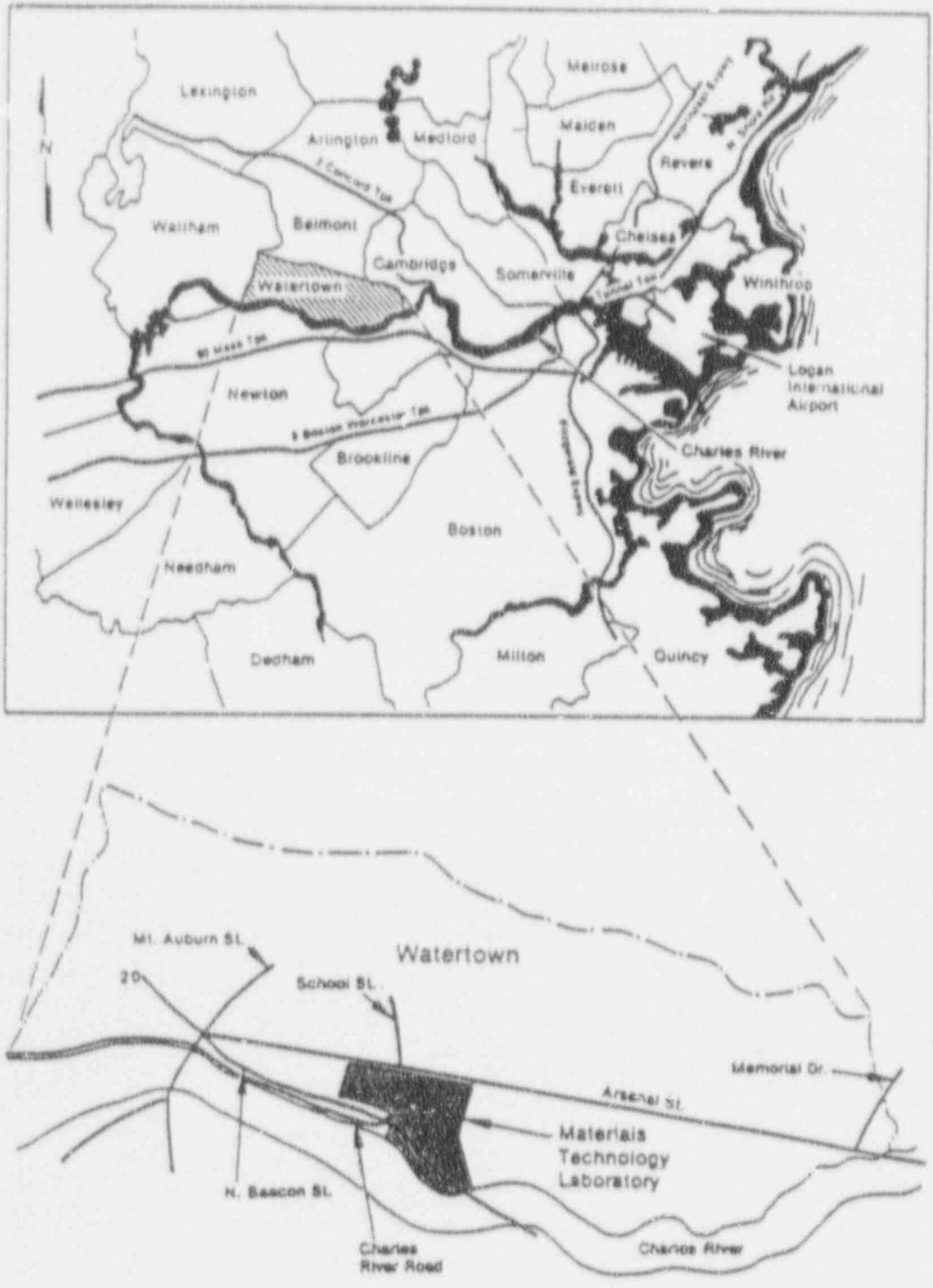

Figure 1. Location of Army Materials Technology Laboratory in Watertown, Massachusetts.

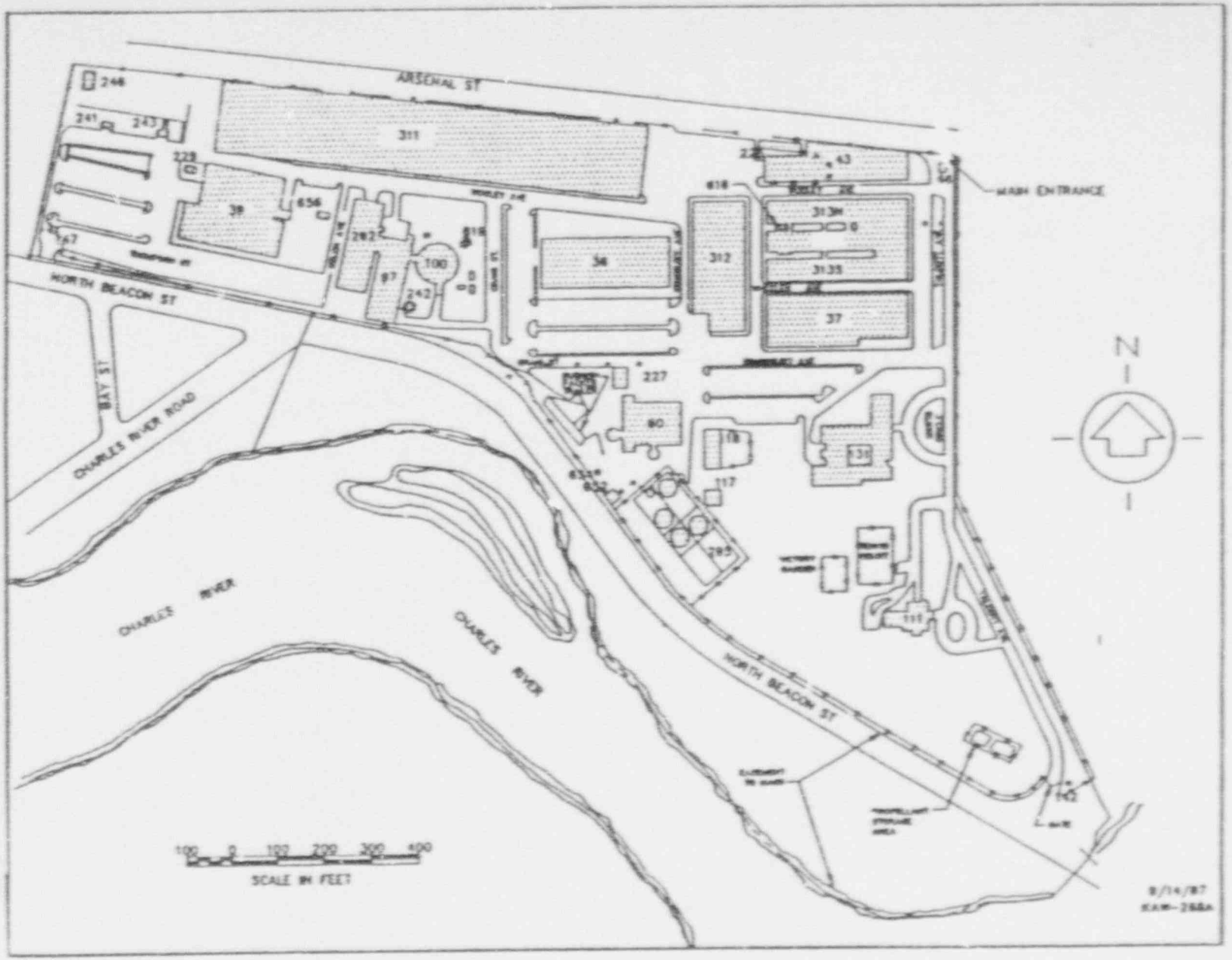

Figure 2. Army Materials Technology Laboratory general site map.

Radioactive materials were removed from the reactor building and disposed of as follows:

- The fuel elements containing special nuclear material were removed and returned to the U.S. Atomic Energy Commission.
- The irradiated and unirradiated fuel elements and materials were disposed of under contract with National Lead Company.
- The beryllium oxide (BeO) reflector elements, shim-safety rods, armatures, and stainless-steel pieces from the guide tubes were disposed of as high-activity radioactive waste.
- The fission chambers containing U-235 were transported to another reactor facility and reported under SNM-244.
- The ionization chambers were disposed of as low-level radioactive waste.
- The radioactive sources used for calibration and check of survey meters were transferred to the Army Radiation and Occupational Safety Branch.

The water from the primary and secondary coolant systems, secondary coolant sump, main reactor pool, fuel storage tank (in basement), and Cistern 242 was drained and disposed of.[7] Indications are that the water was monitored for radioactivity and discharged according to standard procedure, which was to either discharge to the sanitary sewer, if found to be below regulatory standards, or to dilute to achieve acceptable release criteria before discharging.

The following liquid-waste system equipment was removed and disposed of from Building 97:

- Three each 3,000-gal decontamination storage tanks
- Disposable ion exchange system
- Pool fill, make-up, and laboratory demineralizer system
- Pumps, valves, and piping associated with the above systems.

The reactor stack, exhaust fan, absolute filter, and the secondary coolant towers were removed and disposed of at a later date.

Only low levels of radioactivity and contamination were found during the characterization surveys made in September 1989 on the reactor vessel and remaining reactor components. Analyses of sediment and soil samples taken from around the reactor facility and Cistern 242 in March 1990 did not detect any gamma-emitting nuclides above regulatory concern. Chemical analyses of these samples also did not detect any hazardous materials or substances above Environmental Protection Agency (EPA) regulatory limits.[8]

The following figures are included to provide an overview of the reactor site: Figure 3 provides a present-day view of Building 100, Figure 4 provides a present-day view of Cistern 242, Figure 5 is cross-sectional view of the reactor containment shell, Figure 6 shows the reactor containment-shell floor plans, and Figure 7 shows a model of the reactor.

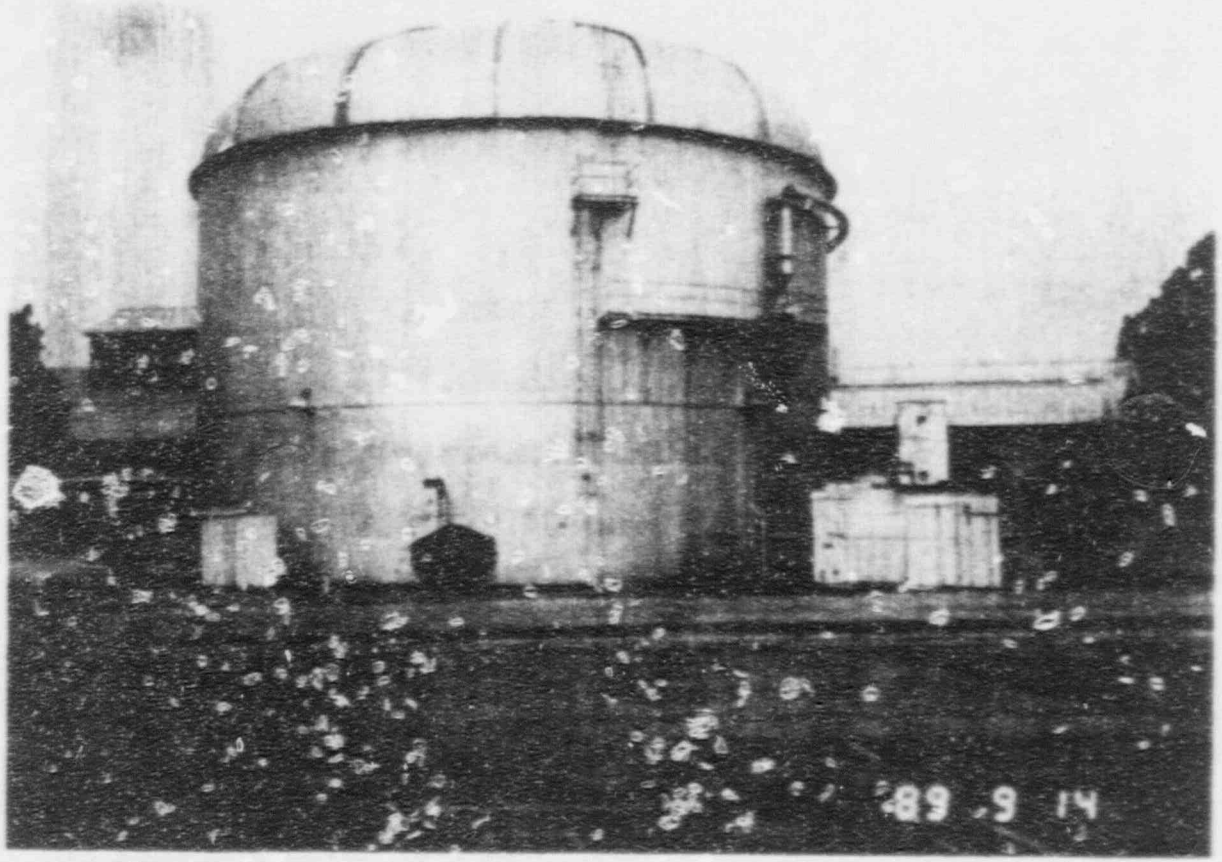

Figure 3. View of Building 100, looking west. Building 97 is in the background.

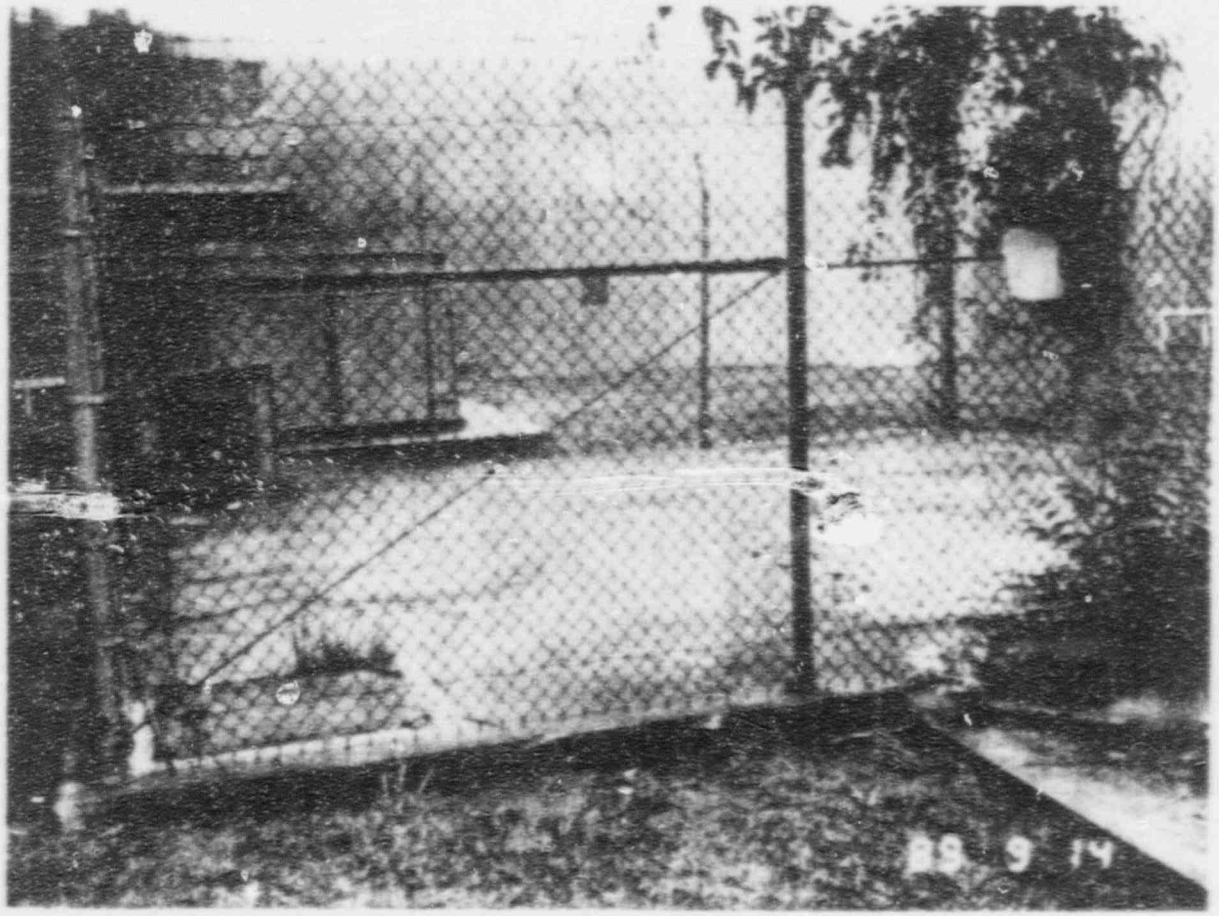

Figure 4. View of Cistern 242, looking north. Building 100 is in background.

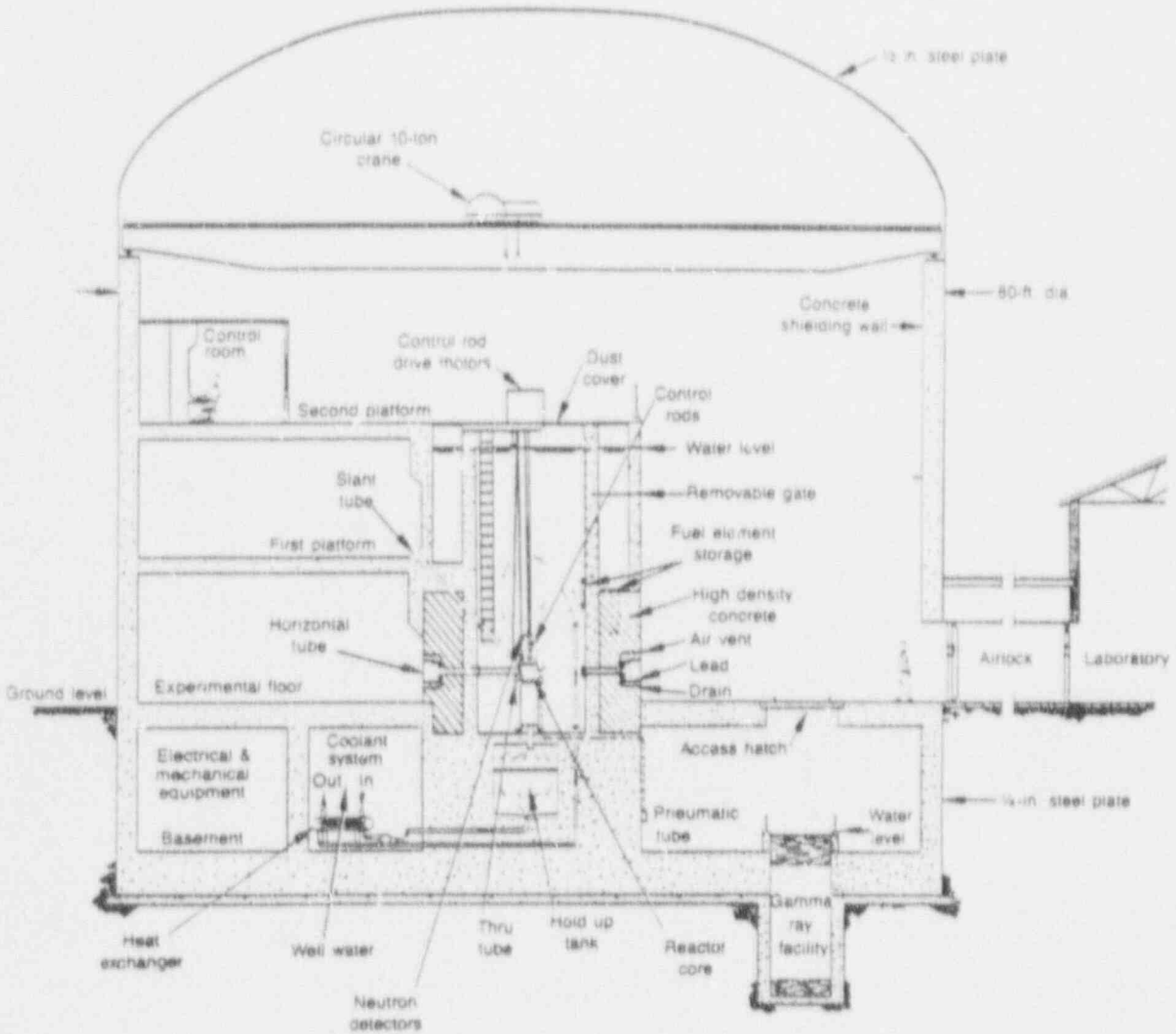

Figure 5. Reactor containment-shell cross-sectional view.

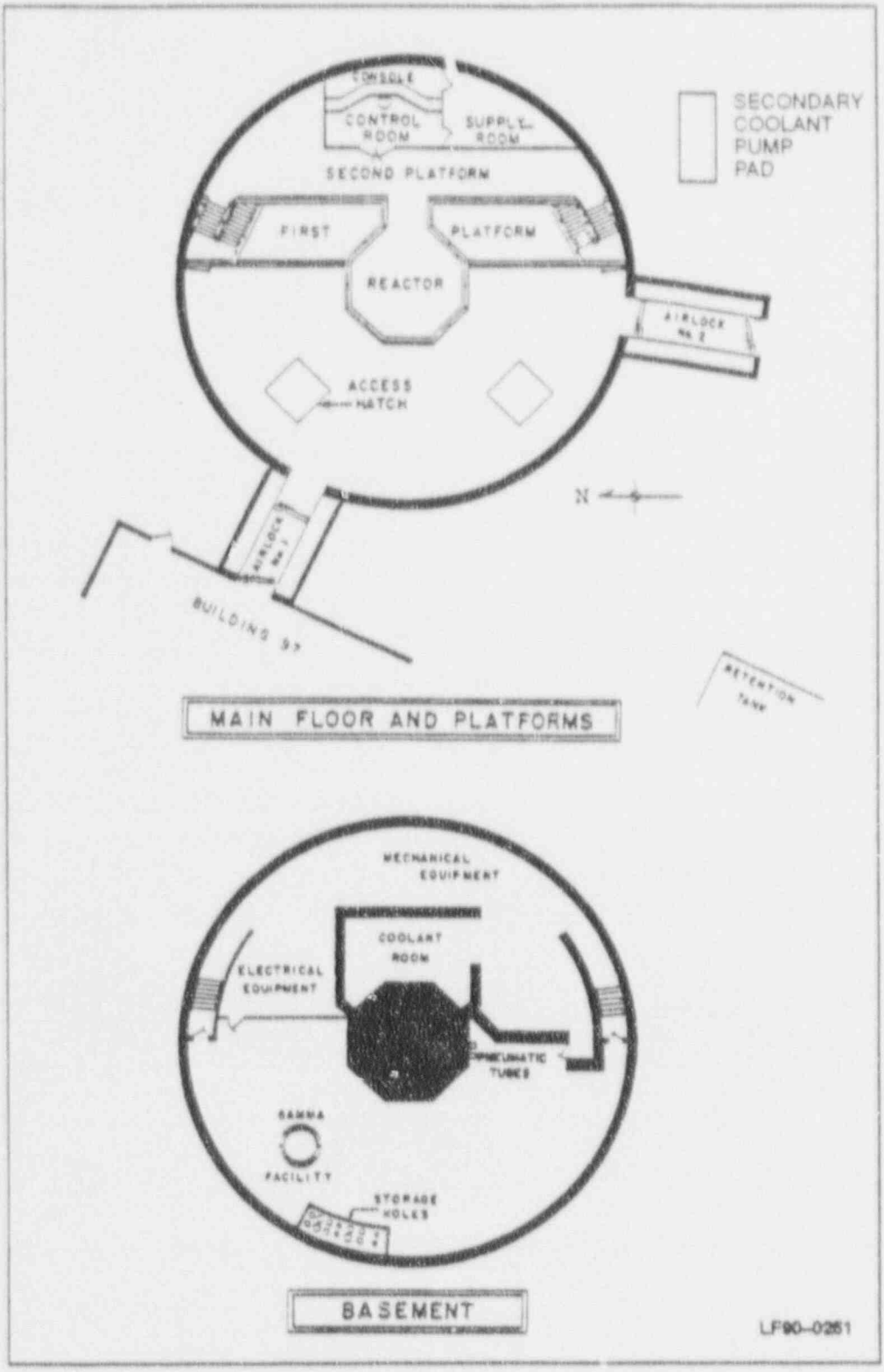

Figure 6. Reactor containment-shell floor plans.

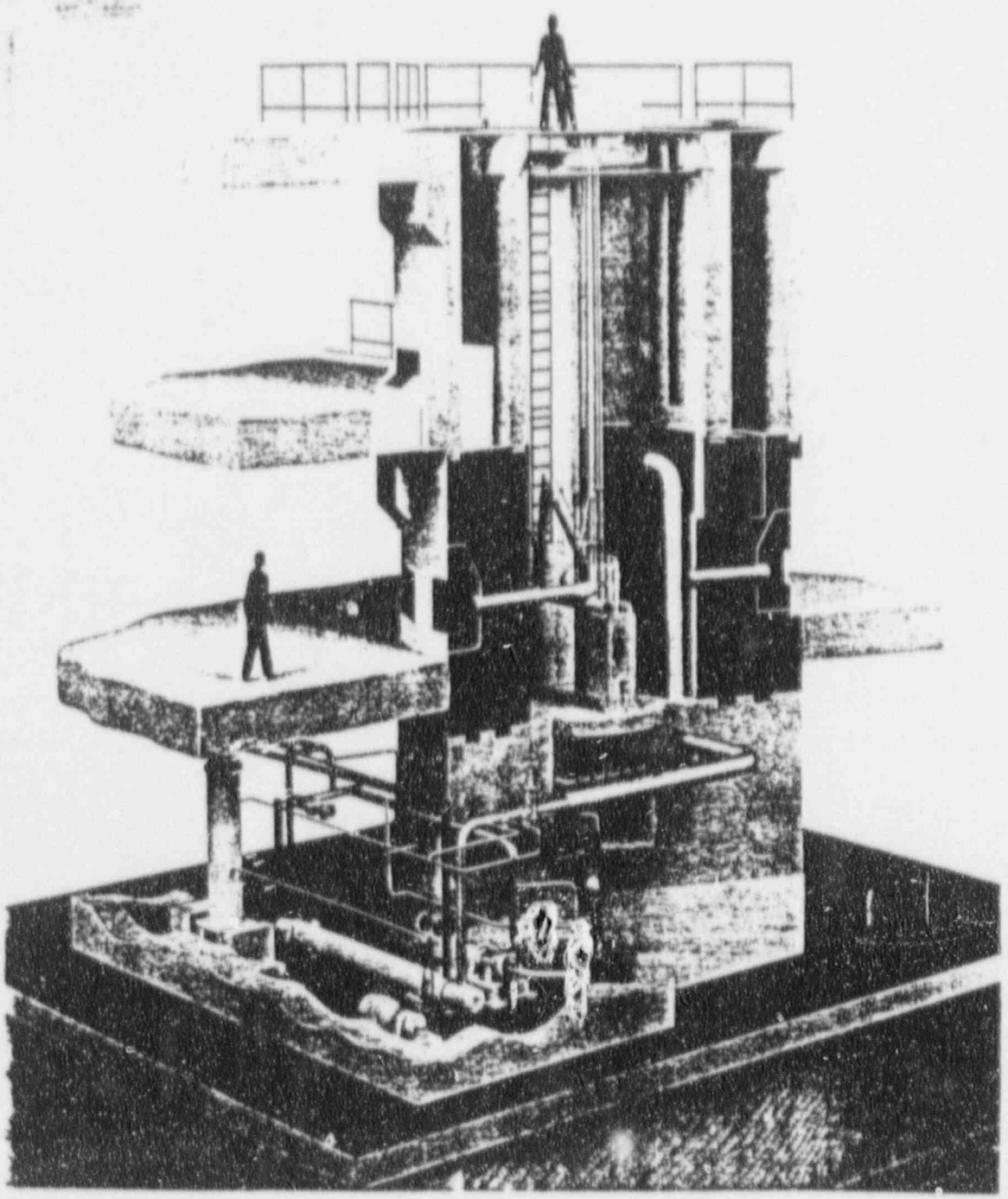

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Figure 7. Army Materials Technology Laboratory Research Reactor model.

3. ALTERNATIVE DECOMMISSIONING MODES

The two alternative decommissioning modes that are considered for the AMTL reactor are explained below.

1. Partial Dismantlement. This alternative consists of removing the following items: Cistern 242 and related piping, the remaining liquid-waste handling piping from/to Building 97, and the three secondary-coolant pumps, sump, and concrete pad located southeast of Building 100. The following equipment and structures would also be removed from within the containment building: the first and second platforms (including the control room and equipment and the associated electrical and heating, ventilating, and air conditioning equipment), the entire reactor vessel, and all reactor support systems (piping, heat exchangers, demineralizers, etc.). In addition the floor drain system, the fuel storage tubes, and the gamma-ray facility located in the reactor basement would be decontaminated and backfilled as required. The steel containment shell, concrete liner with polar crane, basement, operating floor (with a cover over the space left by removal of reactor vessel), and the airlock between Buildings 97 and 100 would be left intact for reuse.

2. Total Dismantlement. This alternative includes all the work described in Alternative 1 plus the total dismantlement and disposal of Building 100, the reactor containment shell, as clean waste. The electrical sub-station transformers, their pad, and the cathodic protection system would also be removed. The building site would be backfilled and landscaped to match the surrounding area.

The alternatives of mothballing (safe storage) and in-place entombment are not addressed in this report due to the projected closure of the AMTL by 1995. Neither of these alternatives would allow the reactor to be released for unrestricted use due to the radioactively contaminated reactor vessel and associated components. Immediate decommissioning of the reactor, with termination of the license and release of the facility or site for unrestricted use, is required by the NRC in

10 CFR 50.82. Safe storage and in-place entombment are interim measures and not decommissioning as defined by 10 CFR 50.2.

A "phased-in" option or alternative was considered but not included as a separate alternative in this Decision Analysis Report. The phased-in alternative is partial dismantlement followed by an extensive facility characterization and another decision process to determine whether or not to perform total dismantlement. Total dismantlement would possibly follow the decision process. The following are some disadvantages to the phased-in alternative:

- The characterization to be performed following partial dismantlement would include coring the basement floor to sample and analyze the soil beneath the floor. The characterization would be necessary to reasonably assure that no contamination exists below the basement floor. To achieve a high level of confidence that no contamination exists below the floor, many corings/borings would be required, and this would cost a significant amount of money because the concrete floor is 4 ft thick. The characterization cost could be estimated after a characterization plan is prepared and approved.

- Following the extensive characterization, a decision process would be required. This would delay the completion of the project and add to the project cost.

- If contamination above releasable limits is found in the basement floor or in the soil beneath the reactor, total dismantlement would be required and the time and money spent on the extensive characterization and second decision process would have been wasted.

- If contamination discovered during the characterization is below releasable levels, the reactor containment "shell" with holes in the basement floor would have low reuse potential without restoration of the building. A possibility also exists that the NRC may not approve this option.

4. ACILITIES AND MATERIALS REUSE

The reactor control-room equipment and miscellaneous spare parts for the control-room equipment could be donated to an operator of a small training reactor such as the Massachusetts Institute of Technology.

If Alternative 1, partial dismantlement, is selected, the operating floor and basement of the reactor containment building could be used for continuing radiography experiments. The overhead polar crane would be available to support activities requiring lifting in the building such as transferring items to and from the basement. Building 100 could also be used for storage or office space.

If Alternative 2, total dismantlement, is selected, the steel outer shell and roof could be salvaged and sold as scrap metal. The overhead polar crane and bridge could be salvaged and sold as scrap metal or utilized in a similar facility.

Prior to decommissioning the reactor by either partial or total dismantlement, artifacts with historical significance will be preserved. Examples of such artifacts will be specified in the Decommissioning Plan and include the model of the AMTL reactor, the brass plaque over the airlock in Building 97, photographs of construction and operations, and operating logbooks. These artifacts would be placed in an appropriate location at the AMTL. The AMTL is to be designated a historical district.

5. ESTIMATED COST AND SCHEDULE OF EACH ALTERNATIVE

The cost estimates in this report are based on available information and Idaho National Engineering Laboratory (INEL) experience in decommissioning nuclear facilities. The estimates are for comparing the two considered alternatives. The actual cost for decommissioning the AMTL reactor will depend on the bid price of the selected contractor and on other factors.

There are four cost-estimate variations for each of the two considered alternative decommissioning modes. The eight variations are briefly explained below. Details are give in Appendix A. Table 1 summarizes cost estimates and durations for the variations.

- Partial dismantlement, variation 1-A, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Partial dismantlement, variation 1-B, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

- Partial dismantlement, variation 1-C, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Partial dismantlement, variation 1-D, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

Table 1. Summary of cost estimates and durations for the variations of the two decommissioning alternatives

Decommissioning Variation	Estimated Cost	Estimated Duration (weeks)[a]
Partial Dismantlement 1-A	$3.4 million	26
Partial Dismantlement 1-B	$4.5 million	26
Partial Dismantlement 1-C	$3.9 million	26
Partial Dismantlement 1-D	$5.5 million	26
Total Dismantlement 2-A	$4.2 million	41
Total Dismantlement 2-B	$5.3 million	41
Total Dismantlement 2-C	$4.7 million	41
Total Dismantlement 2-D	$6.3 million	41

a. Estimated duration covers only the decommissioning operations. It does not include planning, steps leading to the awarding of contract, and preparation of post-decommissioning documents.

- Total dismantlement, variation 2-A, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Total dismantlement, variation 2-B, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

- Total dismantlement, variation 2-C, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Total dismantlement, variation 2-D, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

The State penalty surcharge on low-level radioactive waste is levied by Public Law (PL) 99-240 on waste generation in Massachusetts because Massachusetts is a non-member state out of compliance with PL 99-240. The penalty surcharge is currently $40 per cubic foot and will increase to $120 per cubic foot after January 1, 1992. After January 1, 1993, the waste cannot be shipped from Massachusetts.

Two different waste void volumes (10% and 60%) are included in the cost-estimate variations. A void volume of 10% is ideal, but a void volume of 60% is included to show a worst-case situation of waste packaging. Actual void volume will depend on the efforts of the decommissioning contractor to minimize void volume and reduce disposal costs.

The radioactive-waste disposal costs are very dependent on the State penalty surcharge ($40 per cubic foot or $120 per cubic foot) and on the actual void volume. However, it is important to note that the estimated

cost to dispose of the radioactive waste is the same for either alternative.

The time required to perform the decommissioning operations for each alternative is also shown in Table 1. Not included in each duration in the table, however, are preparation of the Request for Proposal, review of proposals, award of the decommissioning contract, mobilization of the decommissioning contractor, and preparation of post-decommissioning documentation.

Basis for the cost estimates and assumptions that affect the cost estimates are summarized below:

- Costs for each unit, labor, and rental were derived from INEL historical costs, vendor pricing, and sound engineering judgments.
- Labor rates for the Boston, Massachusetts, area were extracted from the April, 1990, issue of the Richardson Construction Cost Trend Reporter. A rate of $25 per hour was selected as an average wage rate of all crafts.
- EG&G activities are based on EG&G labor rates.
- Other costs such as those for health physics (HP) technicians, certified industrial hygiene (CIH) personnel, and space rental are based on estimated manpower and labor rates.
- Transportation and calculations for radioactive-waste disposal were derived from Chem-Nuclear/Barnwell disposal site criteria. This facility is about 1200 mi from the AMTL site.
- Cold-waste disposal was based on an assumption that the cold dump site is available within a 25-mi radius of the AMTL site.
- Page 8 of 10 of each cost-estimate variation explains the disposal of the steel shell and other cold metals and equipment.
- The assumption was made that all radioactive-waste containers and casks would be leased, filled, transported, emptied, and returned to the leasing company.
- Escalation was applied to each portion of the estimate based on the activity midpoint. The escalation percentages were applied

using the guidelines established by the DOE-HQ Independent Cost Estimating Staff. Escalation sheets are included with each cost-estimate variation.

- Contingency was added at a rate of 15% to the construction portion of the estimate and 10% to the support portion of the estimate. It is felt that this is a reasonable contingency.

- Costs were added for the removal of the secondary coolant sump and its associated piping. It is assumed that it is not contaminated.

- Costs were added for the design and manufacture of some small tools that could be required to disassemble the AMTL. The costs were based on INEL experience and engineering judgment.

- The labor hours have been modified to reflect current schedules.

- The concrete reactor pool is assumed to be 50% radioactive waste due to activation and/or contamination.

- The waste holdup tank beneath the reactor is assumed to be empty but contaminated. The disposal costs for the waste holdup tank are included in the reactor base biological shield, etc.

- The estimates assume that radioactive waste will be removed prior to January 1, 1993. After January 1, 1993, no waste can be shipped from Massachusetts.

6. VOLUMES OF WASTE TO BE GENERATED BY EACH ALTERNATIVE

The estimated volumes of contaminated and clean waste to be generated for Alternatives 1 and 2 are presented in Table 2. The estimated volumes for contaminated concrete in Table 2 do not include void volumes. However, the cost-estimate variations in Appendix A include two void volumes added to the estimated, unpackaged waste volumes shown in Table 2. The void volumes reflected in the cost estimates are 10% and 60%. Actual void volume will depend on efforts by the decommissioning contractor to minimize void volume and reduce waste-disposal costs. All the contaminated waste is classified as low-level beta-gamma and would be transported to Barnwell, South Carolina, for disposal. Chem-Nuclear would provide the technical direction for packaging and arrange transportation of the contaminated waste to the disposal site.

The criteria for releasing components and material for unrestricted use are in NRC Regulatory Guide 1.86. Uncontaminated waste must meet the criteria in Regulatory Guide 1.86 before it is disposed of in a landfill. The waste volume estimates in Table 2 are based on current knowledge of the AMTL reactor facility and previous decommissioning experience. If, during decommissioning, however, surprises are encountered, the estimates might have to be revised.

The estimated volumes of waste do not include any mixed waste because--based on the operating history of the AMTL reactor, information discovered through file searches, and facility characterization--mixed waste is not expected during decommissioning of the reactor. If mixed waste is generated, however, the Army would have to store it because it cannot be disposed of now.

Uncontaminated waste from decommissioning projects is disposed of in landfills all across the United States. The uncontaminated waste, however, must be certified by the decommissioning contractor as meeting releasable levels as defined in NRC Regulatory Guide 1.86. For this project, the certification will be based on very intensive radiation surveys and analyses to be described in the Decommissioning Plan and implementing procedures.

Table 2. Volumes of waste to be generated by each alternative

Alternative	Stainless Steel (ft^3)	Steel (ft^3)	Other[a] Metal (ft^3)	Concrete (ft^3)	Other[b] (ft^3)	Total (ft^3)
Contaminated Waste						
1. Partial dismantlement	130	200	150	6,750	0	7,230
2. Total dismantlement	130	200	150	6,750	0	7,230
Uncontaminated Waste						
1. Partial dismantlement	0	1,500	0	6,800	6,000	14,300
2. Total dismantlement	0	3,000	0	78,000	15,000	96,000

a. "Other metal" category includes components from inside the reactor vessel (e.g., beryllium oxide reflector elements). According to information from EG&G personnel familiar with hazardous-waste regulations, beryllium oxide is not currently RCRA regulated and therefore would not be mixed waste.

b. "Other" category includes galvanized sheet metal, motor control panels, control room equipment, metal piping, and substation transformers.

7. HAZARDS TO D&D WORKERS

Table 3 presents the estimated radiation exposures and industrial hazards during decommissioning for each alternative. The estimated radiation dose for each alternative listed in Table 3 is based on expected radiation fields (see Reference 8) for each task, the estimated duration of each task, and the estimated crew size. Alternatives 1 and 2 would provide the same potential radiation exposure hazard to D&D workers since these alternatives both involve removing the radioactively contaminated reactor vessel and associated components. Insignificant exposure would be expected during dismantlement of the reactor building in Alternative 2. The actual radiation fields and contamination levels would be determined prior to any decommissioning activities to ensure as-low-as-reasonably-achievable (ALARA) exposure control. During decommissioning, radiation fields and airborne contamination will be measured continuously to determine the actual radiation hazard for each task performed. The D&D workers will be required to wear personnel protective equipment, dosimetry badges, supplied-air respirators, or self-contained breathing apparatus as specified by health physics personnel during dismantling activities of the contaminated areas. In addition, engineering controls will be used to ensure ALARA exposure control to radiation fields.

Industrial hazards expected during the D&D work include those associated with working at heights, use of cutting torches, and operation of equipment (loaders, trucks, cranes, forklifts, etc.) to perform demolition and excavation activities. These hazards would be encountered in both of the alternatives.

Table 3. Hazards to D&D workers

Alternatives	Estimated Radiation Dose[a] (man-rem above background)	Risk of Industrial Hazards
1. Partial dismantlement	8.6	Moderate now, high eventually[b]
2. Total dismantlement	8.6	High now, none eventually

a. Totals are estimated conservatively and represent maximum exposures unless unanticipated radiation fields are encountered. However, under no circumstances will actual individual exposure to radiation exceed maximum limits specified by applicable regulations.

b. Total dismantlement would eventually be required.

8. SHORT-TERM IMPACT ON AMTL PERSONNEL AND OPERATIONS

If Alternative 1 is selected, and if radiography experiments are still being conducted in Building 100, the experiments would be disrupted for at least 26 weeks and permanently if the reactor building were not acceptable following partial dismantlement. The equipment being used for the experiments would have to be removed from the reactor containment facility to allow dismantlement of the reactor vessel and the associated radioactively contaminated components. Some disruption of work being performed in Building 97 would also be expected due to the noise that would be generated during the decommissioning activities. Alternative 1 would be completed in an estimated 26 weeks.

Alternative 2 would have the greatest impact on AMTL personnel if Building 100 was still being utilized for radiography experiments, as all work being conducted inside the reactor building would be terminated prior to the start of the total dismantlement of the building. As with Alternative 1, some disruption of work in Building 97 would be expected due to the noise generated by the dismantling of Building 100. Alternative 2 would be completed in an estimated 41 weeks.

Table 4 provides a summary of the short-term impact of the two alternatives on AMTL personnel and operations.

Table 4. Short-term impact on AMTL personnel and operations

Alternative	Short-Term Impact
1. Partial dismantlement	26-week disruption of radiography experiments (if still being conducted) Outside contractor on site for 26 weeks Low-level waste shipments (8600 ft^3) to Barnwell, S.C.
2. Total dismantlement	Termination of use of Building 100 Outside contractor on site for 41 weeks Low-level waste shipments (8600 ft^3) to Barnwell, S.C.

9. LONG-TERM IMPACT ON THE PUBLIC

Alternative 1 involves removing all the radioactive contaminants from Buildings 27 and 100 that originated from the operation of the reactor. Cistern 242 would be decontaminated, as required, and excavated, and the area would be backfilled. Radiation levels would be at background at the completion of the decommissioning activities if decommissioning efforts were successful. This would be verified by a characterization of the facility. Building 100 would be released for unrestricted use if the release were obtained from the NRC. If the reactor building were released for unrestricted use, but undetected contamination remained in the facility, there could be a long-term safety impact on the public. Undetected contamination could remain in regions of the building not accessible by conventional characterization techniques. One possible region is beneath the basement floor if partial dismantlement is the selected alternative.

Alternative 2 involves performing the same decommissioning activities as Alternative 1 but also the total dismantlement of Building 100. The building site would be backfilled and landscaped to match the surrounding area. A characterization survey would be performed to verify that the site met criteria for unrestricted release. There would be less chance of a long-term safety impact on the public with this alternative than with the other alternative.

10. ADVANTAGES AND DISADVANTAGES OF EACH ALTERNATIVE

The advantages and disadvantages of each alternative are summarized in Table 5.

Table 5. Advantages and disadvantages of each alternative

Alternative	Advantages	Disadvantages
1. Partial dismantlement	Reuse of reactor building. Lower volume of clean waste to be disposed of at landfill. Less time of disruption to AMTL personnel during D&D activities. Less costly alternative.	Lower probability of obtaining NRC release for unrestricted use. Potential for long-term impact on the public if reactor building is released with undetected radioactivity. Total-dismantlement activities would be more costly in the future. Public may not believe cleanup of radioactive contaminants is complete unless the reactor containment is dismantled.
2. Total dismantlement	Building site could be returned to original condi- for unrestricted use. No future remedial actions required. Higher probability of obtaining NRC release for unrestricted use. Very low probability of long-term impacts to the public due to release of the site with undetected radioactivity.	More costly alternative. Higher volume of clean waste. Longer time required for contractor to perform D&D activities.

11. COST-BENEFITS SUMMARY

A cost-benefits comparison for each alternative is presented in Table 6.

Partial dismantlement would most likely meet the decommissioning objectives of obtaining release of the facility for unrestricted use. There would, however, be two risks associated with this alternative. One risk is that unknown areas of contamination may be present that could cause significantly higher decommissioning costs and/or failure to obtain unrestricted release without total dismantlement. The other risk is that undetected, sequestered contamination may remain in the building even after the facility is released by the NRC.

Total dismantlement would meet decommissioning objectives with a very high probability of obtaining release of the site and a very low probability of long-term impacts on the public from residual, undetected radioactivity.

Table 6. Cost-benefits summary

Alternative	Cost Range[a]	Benefits
1. Partial dismantlement	$3.4 million to $5.5 million	Short-term continued use of Building 100 for radiography experiments, storage or office space. Removal of the radioactively contaminated reactor components, which reduces potential exposure to AMTL personnel and the public. Sale of facility as part of base closure.
2. Total dismantlement	$4.2 million to $6.3 million	Removal of the radioactively contaminated reactor components, which reduces potential exposure to AMTL personnel and the public. Release of the reactor site for unrestricted use. Higher probability of obtaining NRC release. Low probability of long-term impact on the public. Sale of site as part of base closure.

a. Cost-estimate variations and assumptions are explained in Section 5.

12. RECOMMENDATIONS

EG&G Idaho, Inc., recommends that the AMTL reactor be decommissioned by total dismantlement. Total dismantlement would produce a very high probability of obtaining unrestricted release from the NRC because only the soil (site) would require release. This recommendation is based on no adverse environmental impacts being identified in the National Environmental Policy Act (NEPA) document currently being prepared.

Partial dismantlement, on the other hand, would require release of the building and the site. Much more potential exists for increased costs and/or unreleasable levels of residual radioactivity in the building than in the soil following decommissioning. Failure to obtain release following partial dismantlement would require additional decontamination and, possibly, total dismantlement anyway.

In addition, total dismantlement would greatly reduce any potential for long-term impacts on the public from undetected, sequestered radioactivity following release by the NRC. Regardless of the extent of facility characterization following partial dismantlement, there is potential for sequestered residual radioactive contamination. Examples of this could be low-level contamination (especially alpha) imbedded in cracks in the basement floor, beneath the basement floor, or in other regions where radiation shielding prevents detection of radioactivity. Of course, a very extensive and expensive post-decommissioning characterization performed after partial dismantlement would minimize the risk of leaving sequestered, undetected contamination. There is a greater chance that such residual radioactivity would remain in the reactor building (left standing by partial dismantlement) than in the soil.

13. REFERENCES

1. Army Materials and Mechanics Research Center (AMMRC), Operations Report of the U.S. Army Materials Research Agency Nuclear Reactor Facility, June 15, 1960, to December 31, 1964.

2. AMMRC, Operations Report of the U.S. Army Materials Research Agency Nuclear Reactor Facility, (License R-65, USAEC Docket 50-47), Report No. 2, January 1, 1965, to December 31, 1965.

3. AMMRC, Operations Report of the U.S. Army Materials Research Agency Nuclear Reactor Facility, (License R-65, USAEC Docket 50-47), Report No. 3, January 1, 1966, to December 31, 1966.

4. AMMRC, Operations Report of the U.S. Army Materials Research Agency Nuclear Reactor Facility, (License R-65, USAEC Docket 50-47), Report No. 4, January 1, 1967, to December 31, 1967.

5. AMMRC, Operations Report of the U.S. Army Materials Research Agency Nuclear Reactor Facility, (License R-65, USAEC Docket 50-47), Report No. 5, January 1, 1968, to December 31, 1968.

6. AMMRC, Operations Report of the U.S. Army Materials Research Agency Nuclear Reactor Facility, (License R-65, USAEC Docket 50-47), Report No. 6, January 1, 1969, to March 27, 1970.

7. AMMRC, Deactivation Report of the Army Materials Research Reactor, December 8, 1970.

8. EG&G Idaho, Inc., Characterization Report for U.S. Army Material Technology Laboratory Research Reactor, EGG-WM-8978, Rev. 0, 1990.

14. DRAWING LIST

Drawing Number	Drawing Title
35-64-04-S3	Architectural Schedules, Doors & Misc. Details
35-64-04-S4	Architectural Basement Floor Plan & Stairs Nos. 1 & 2 Sections and Details
35-64-04-S5	Architectural Operating Floor Plan & Stairs Nos. 3 & 4 Sections & Details
35-64-04-S6	Architectural First Platform Plan & Stairs Nos. 5 & 6 Sections & Details
35-64-04-S7	Architectural Second Platform, Control & Supply Room Plans, Sections & Details
35-64-04-S8	Architectural Storage Area - Bldg. 97 Plan, Sections & Details
35-64-04-S9	Structural First Platform Slab Framing Plan & Details
35-64-04-S10	Structural Second Platform Slab Framing Plan & Details
35-64-04-S11	Structural Cross-Section "A-11"
35-64-04-S12	Structural Cross-Section "B-12"
35-64-04-S13	Structural Bottom Steel Plate, Supports & Mud Mat Plans & Details
35-64-04-S14	Structural Steel Shell, Roof & Wall Plan, Elevation & Details
35-64-04-S15	Structural Circular Concrete Wall, Elevation & Details
35-64-04-S16	Structural Basement Slab Plan & Details
35-64-04-S17	Structural Concrete Mat Reinforcement
35-64-04-S18	Structural Operating Floor Slab Framing Plan & Details
35-64-04-S19	Structural Misc. Sections & Details
35-64-04-S20	Structural Retention Basin & Foundation for Airlocks No. i.e., No. 2

14. DRAWING LIST (cont.)

Drawing Number	Drawing Title
35-64-04-S21	Outside Underground Service Piping
35-64-04-S22	Heating Ventilating & Air Conditioning Process & Service Piping Basement Plan
35-64-04-S23	Heating Ventilating & Air Conditioning Process & Service Piping Main Operating Floor Plan
35-64-04-S24	Heating Ventilating & Air Conditioning Process & Service Piping First Platform Plan
35-64-04-S25	Heating Ventilating & Air Conditioning Process & Service Piping Second Platform Plan
35-64-04-S26	Heating Ventilating & Air Conditioning Process & Service Piping Section Thru Containment Shell
35-64-04-S27	Heating Ventilating & Air Conditioning Schematic Diagrams
35-64-04-S28	Coolant System Process Piping Schematic Diagrams
35-64-04-S29	Liquid Waste Decontamination Process Piping Schematic Diagram & Details
35-64-04-S30	Process & Service Piping Arrangement & Details - Bldg. 97
35-64-04-S31	Liquid Waste Decontamination Process Piping Equipment Arrangement & Details
35-64-04-S32	440 MCC & 120/208V PC Layout & Details Substation One-Line Diagrams, Misc. Schematic Wiring Diagrams
35-64-04-S33	One-Line Diagrams 440V MCC & 120/208V PC Network Wiring Diagrams
35-64-04-S34	Grounding & Cathodic Protection Plans & Details
35-64-04-S35	Electrical Layouts Basement Plans & Details
35-64-04-S36	Electrical Layouts Operating Floor Bldg. 97 Area Plans
35-64-04-S37	Electrical Layouts First Platform Plans Power Equipment Tabulation

14. DRAWING LIST (cont.)

Drawing Number	Drawing Title
35-64-04-S38	Electrical Layout Second Platform & Substation Plans Underground Duct Sections & Pit
35-64-04-S39	Conduit Sections "A" & "B"
35-64-04-S40	Lighting & Cable Trays Basements Plan
35-64-04-S41	Lighting & Cable Trays Operating Floor Plan
35-64-04-S42	Lighting First Platform Plan
35-64-04-S43	Lighting Second Platform Plan
35-64-04-S44	Communication PA & Fire Alarm Riser Diagrams
35-64-04-S45	Communications PA & Fire Alarm Plans
ELa	Field Erection of Airlocks
1a	Airlock No. 1

APPENDIX A

COST ESTIMATES FOR DECOMMISSIONING THE AMTL REACTOR

SUMMARY

These estimates are based on the best information available at the time. Vendors were contacted, historical information from the INEL was retrieved and studied, and the engineers assembling the Decision Analysis Report were contacted almost daily.

The estimates are based on disposal of a reactor facility in Boston, Massachusetts. There are four cost-estimate variations for each of the two considered alternative decommissioning modes. The eight variations are briefly explained below.

- Partial dismantlement, variation 1-A, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Partial dismantlement, variation 1-B, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

- Partial dismantlement, variation 1-C, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Partial dismantlement, variation 1-D, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

- Total dismantlement, variation 2-A, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Total dismantlement, variation 2-B, would involve a void volume of 10% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

- Total dismantlement, variation 2-C, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste prior to January 1, 1992. For this variation a State penalty surcharge was added of $40 per cubic foot of radioactive waste.

- Tota dismantlement, variation 2-D, would involve a void volume of 60% in the packaged radioactive waste. This variation would dispose of the radioactive waste after January 1, 1992, but before January 1, 1993. For this variation a State penalty surcharge was added of $120 per cubic foot of radioactive waste.

ESTIMATING METHODOLOGY FOR THE COST ESTIMATES

- Costs for each unit, labor, and rental were derived from INEL historical costs, vendor pricing, and sound engineering judgments.

- Labor rates for the Boston, Massachusetts, area were extracted from the April, 1990, issue of the Richardson Construction Cost Trend Reporter. A rate of $25 per hour was selected as an average wage rate of all crafts.

- EG&G activities are based on EG&G labor ra.

- Other costs such as those for HP technicians, CIH personnel, and space rental are based on estimated manpower and labor rates.

- Transportation and calculations for radioactive-waste disposal were derived from Chem-Nuclear/Barnwell disposal site criteria. This facility is about 1200 mi from the AMTL site.

- Cold-waste disposal was based on an assumption that the cold dump site is available within a 25-mi radius of the AMTL site.

- Page 8 of 10 of each cost-estimate variation explains the disposal of the steel shell and other cold metals and equipment.

- The assumption was made that all radioactive-waste containers and casks would be leased, filled, transported, emptied, and returned to the leasing company.

- Escalation was applied to each portion of the estimate based on the activity midpoint. The escalation percentages were applied using the guidelines established by the DOE-HQ Independent Cost Estimating Staff. Escalation sheets are included with each cost-estimate variation.

- Contingency was added at a rate of 15% to the construction portion of the estimate and 10% to the support portion of the estimate. It is felt that this is a reasonable contingency.

MODIFICATIONS TO THESE ESTIMATES AND CLARIFICATIONS

- Costs were added for the removal of the secondary coolant sump and its associated piping. It is assumed that it is not contaminated.
- Costs were added for the design and manufacture of some small tools that could be required to disassemble the AMTL. The costs were based on INEL experience and engineering judgment.
- The labor hours have been modified to reflect current schedules.
- The concrete reactor pool is assumed to be 50% radioactive waste due to activation and/or contamination.
- The waste holdup tank beneath the reactor is assumed to be empty but contaminated. The disposal costs for the waste holdup tank are included in the reactor base biological shield, etc.
- The estimates assume that radioactive waste will be removed prior to January 1, 1993. After January 1, 1993, no waste can be shipped from Massachusetts.

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING File No.: M-164 Date: 10/10/90

Project : USTHAMA/AMTL SITE, OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Prepared By : A. R. Millward Checked/Approved By:

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	1% of construction)		21,000
Title I & II Design Of Special Tools	20,000	1,000		
Title III Inspection				
Construction Costs Subtotal				2,517,000
Direct/Indirect Costs			2,517,000	
8000 Contractor Demo Labor	215,000	10,000		
8000 Contractor Demo Mat'l	89,000	4,000		
8000 Contractor Disposal	901,000	41,000		
8000 Contractor Support	888,000	40,000		
Indirect Costs	315,000	14,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				492,000
Project Management	479,000	13,000		
Project Support	NA			
Subtotal				3,030,000
Contingency	13% of Subtotal			400,000
Escalation (included in above totals)		123,000		
	Total Estimated Cost			3,430,000

Comments: THIS ESTIMATE IS ESCALATED TO A MIDPOINT OF CONSTRUCTION OF SEPTEMBER 1991

EG&G Idaho, Inc. DETAILED COST ESTIMATE SHEET

Project or Description: USIHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A
Location: BOSTON MA.
Requester: D. L. SMITH
Remove Contaminated Reactor Components and Leave Containment Intact

Type of Est. PLANNING
SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

File No. M-164
Date : 10/10/90
Page : 1 of 10
Prep. By : DLS/WLM/ARM
Chk'd/Appr'd By :

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
Summary Of Subcontractor Costs For Option #1											
	Contractor-Demo. mhrs/rate, From Page # 6					8,596	25	214,900			$214,900
	Boston Area PT&I										$75,215
	Overhead @ 15%										$43,517
	Profit @ 10%										$33,365
	Sub-Total, Rounded to Nearest $1,000										$367,000
	Demo. Material & Other Costs, From Page # 6								5,197	83,650	$88,650
	Overhead @ 15%										$13,298
	Profit @ 10%										$10,195
	Sub-Total, Rounded to Nearest $1,000										$112,000
	Subcontractor Disposal, From Page # 6										$900,700
	Overhead @ 10%										$90,070
	Profit @ 5%										$49,539
	Sub-Total, Rounded to Nearest $1,000										$1,040,000
	Subcontractor Support Costs, From Page # 9, Including Overhead And Profit, Rounded to Nearest $1,000										$888,000
	Total for Option #1 (Demo/Disposal), Rounded to Nearest $1,000										$2,407,000

Project or Description: USIHAMA/AMTL SITE

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 2 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Remove Conteminated Reactor Components and Leave Reactor Containment Intact

Equip/Mat., etc.

Acct. No.	Description	E,V,I P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Option 1 -										
	Mobilization/Demolition										
	(Allow for 10-12 man composite crew)					200	25	5,000			$5,000
	Remove Ground Level Airlock Structure										
	(#2) per S.O.W. Remove Built-up Roof					32	25	800		150	$950
	Remove 12" brick wall and Concrete Floor										
	Structure		Approx.53 cy			80	25	2,000		200	$2,200
	Rmove Doors/Piping/Misc. and Store					60	25	1,500		200	$1,700
	Flame cut outside Metal Skin on Dome										
	(Approx. 1/2" th.) to 12' x 14' pc.										
	for access opening 52 LF.					40	25	1,000		200	$1,200
	Saw cut concrete shield (2 ft th.) to										
	12' wide x 14' high opening 52 LF.					160	25	4,000		1000	$5,000
	DEMOLITION - OPTION 1										
	Remove Control Rod Assy and Core Grid,										
	Beam Tubes, etc.					100	25	2,500		1000	$3,500
	Store X-TER Components Allow					40	25	1,000		500	$1,500
	Remove S.S. Liner					80	25	2,000		1000	$3,000
	Remove all Associated External Piping					200	25	5,000		500	$5,500
	Page Two Subtotal					992		$24,800		$4,750	$29,550

Project or Description USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Type of Est. PLANNING File No. M-164

Date : 10/10/90
Page : 3 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Heat Exchanger Tanks/										
	Demineralizers/Pumps, Valves and Store					200	25	5,000		300	$5,300
	Remove all Instrumentation/Control										
	Mechanisms/Electrical from Control Room										
	on 2nd floor and Transport to Storage					100	25	2,500		300	$2,800
	Remove second balcony floor (Ref.										
	Dwg. #35-64-04) Remove Duct/Wiring										
	Panels/HandRails/Partitions/Plumbing/										
	Lighting, etc. Store or Dispose per S.O.					240	25	6,000			$6,000
	Demo./Remov. 2nd floor Platform-Saw cut,										
	Break Concrete (6") etc., approx. 500 SF										
	Allow for approx. 20 CY					100	25	2,500			$2,500
	Remove Floor Support Beams					48	25	1,200			$1,200
	Remove 1st Floor Platform (Ref. Dwg.										
	35-64-04 Sheet 9) Remove Stairways and H					32	25	800			$800
	Remove concrete slab		Approx. 35 CY			160	25	4,000			$4,000
	Remove structural support beams & dispos		ALLOW			80	25	2,000			$2,000
	Remove Elect. conduit and wire etc.					80	25	2,000			$2,000
	Page Three Subtotal					1040		$26,000		$600	$26,600

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Type of Est. PLANNING File No. M-164 Date : 10/10/90 Page : 4 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Reactor Containment										
	Outer Shield (Concrete)		40 CY	200 CY		320	25	8,000			$8,000
	Inner Shield (Concrete)		70 CY	300 CY		840	25	21,000	Contaminated		$21,000
	High Density Shielding										
	(Mostly grout and rock)		130 CY	300 CY		1,560	25	39,000	Contaminated		$39,000
	Remove Reactor Concrete Base (in basement)		147 CY	300 CY		1,764	25	44,100	Allow .50 Cont.		$44,100
	(This estimate based on 10 man comp. crew)										
	Allow for Equip. Decontamination					800	25	20,000		5000	$25,000
	Remove Electrical, HVAC, Piping, Pumps-										
	all other reactor associated equip.		ALLOW			200	25	5,000			$5,000
	Remove contaminated Piping, (from										
	Resctor to Bldg. 97) w/20 Ft. UG		100 Ft.			80	25	2,000		2000	$4,000
	Remove Cistern 242 and Piping										
	Remove fence and misc from Cistern		ALLOW			32	25	800			$800
	Remove Piping (underground)		ALLOW			40	25	1,000		200	$1,200
	Remove Retention Tank					160	25	4,000		4200	$8,200
	Backfill w/pit run and compact					40	25	1,000	800	800	$2,600
	Metal Covers - Reactor floor cover										
	approx. 22 Dia. 1/4" C.S.B.P.					40	25	1,000	2,000		$3,000
	Page Four Subtotal					5876		$146,900	$2,800	$12,200	$161,900

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Type of Est. PLANNING File No. M-164

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l Cost	Other Cost	Total Cost
	Metal Covers (Continued)										
	(Reactor) Metal Floor Cover Supports		ALLOW			40	25	1,000	1,000		$2,000
	Sump Covers					24	25	600	200		$800
	Remove the Secondary Coolant Pumps, store etc.		ALLOW			32	25	800		200	$1,000
	Remove Concrete Pads					32	25	800		400	$1,200
	General Clean-up					200	25	5,000		500	$5,500
	REMOVE SECONDARY COOLANT PUMP SUMP										
	AND ASSOCIATED PIPING, ASSUME NON										
	CONTAMINATED, 10,000 GAL. WITHIN 50 FOOT										
	OF BUILDING		ALLOW		200	200	25	5,000			$5,000
	Heavy Equipment Lease, 3 mo.									24000	$24,000
	Cranes $8000/mo. for 3 months									3600	$3,600
	Loader/Backhoe, 3 mo @ $1,200/mo.									2400	$2,400
	Fork Lifts, 3 mo. @ $800/mo.									35000	$35,000
	Trucks-Dump/Low Boy etc.		ALLOW								
	SPECIAL TOOLS		ALLOW		1000	160	160	25	4,000	1,000	$5,000
	Page Five Subtotal					688		$17,200	$2,200	$66,100	$85,500

Project or Description: USTHAMA/AMTL SITE

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 6 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Summary Sheet for Demolition And Disposal

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION I										
(DEMO)	Page 2					992	25	24,800		4,750	29,550
(DEMO)	Page 3					1,040	25	26,000		600	26,600
(DEMO)	Page 4					5,876	25	146,900	2,800	12,200	161,900
(DEMO)	Page 5					688	25	17,200	2,200	66,100	85,500
	Subtotal for Partial Demo					8,596	25	$214,900	$5,000	$83,650	$303,550
	DISPOSE OF CLEAN AND RADWASTE										
(WASTE)	Page 7 Dispose of Cold Waste Locally										$12,000
(WASTE)	Page 7 Ship Low Level to SC										$88,000
(WASTE)	Page 8 Ship Low Level to SC										$256,700
(WASTE)	Page 8 RAD Waste Disposal in SC										$224,000
(WASTE)	STATE PENALTY SURCHARGE		8000 CF	40					320,000		$320,000
	Sub-Total for Disposal										$900,700

Project or Description: US.THAMA/AMTL — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 7 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

(Dispose Locally)

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Clean, non-contaminated waste disposal (concrete)										
	Air Lock Structure/Floor		40 CY								
	New Door - Cut concrete		20 CY								
	Second Floor Platform Concrete		20 CY								
	First floor Platform Concrete		35 CY								
	Remove Retention Tank, Approx.		62 CY								
	Remove Outer Reactor Biological Shield		40 CY								
	Estimated Total		217 CY						USE 450 TON		
	Other Non-Contaminated Misc.								20 TON		
	Disposal, Nearby, Allow for 25 Mi. to										
	Waste Site $2.50 per mi. Truck and Driver $75 RT. Use 50 trips @ 10 tons per trip 50 trips @ $75 = $3,750									Use	$5,000
	Fees etc. $15 per ton @ Waste Site. Use 470 tons @ $15 = $7,050									Use	$7,050
	Estimated Cost to dispose of AMTL Research Reactor Non Contaminated Waste										$12,000
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask 8-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total										$88,000

Project or Description USATHAMA/AMTL

Type of Est. PLANNING File No. M-164

Date : 10/10/90

Page : 8 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

Acct. No.	Description	E,V,I P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Contaminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level)								
	Use B-25 Shipping Con. 7425CF/92CF PER CONTAINER = 81 CONTAINERS X $700 Ea Cask Lease (CONTAINS 10% VOID VOLUME)									56,700	$56,700
	20 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									200,000	$200,000
	Subtotal									$256,700	$256,700
	(RADWASTE) OPTION 1										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in B-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		80	800						64000	$64,000
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask B-120A - (Higher Activity Level)										
	Casks B-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COST)										$100,000
	Total										$224,000

The outer steel shell, polar crane, support structures, imbedded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for [illegible]

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in sal returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT. SHEET)

Pag. 9

Project or Description USATHAMA/AMTL

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

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OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-A

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60 HR'S)		6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	12 MTHS	350					4,200		4,200
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	22000					22,000		22,000
	CIH PERSONNEL	E	155 DAYS	800					124,000		124,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	4,650 SETS	25					116,250		116,250
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	24 MTH	750					18,000		18,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		8 MEN		480	3,840	45	172,800			172,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										888,080

Project or Description: USATHAMA/AMTL
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-P

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 10 of 10

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	Total										479,400
											USE $479,000

ESCALATION SHEET

Date : 10/10 /90
Project
or Description : USTHAMA/AMTL SITE, OP. #1 PART. DISMANTLEMENT/VAR. 1-A Page : 1 of 1
Location : INEL Prepare'd By : A. R. Millward
Requested By : D. L. Smith Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	9	3.5									4.64%
Title III													
Labor	3	1.1	9	3.4									4.54%
Mat'l & Subcontracts	3	1.0	9	3.3									4.33%
Equipment													
Indirects	3	1.1	9	3.4									4.54%
PM	3	1.1	4	1.6									2.66%
CM													
FE													
Equipment		4.0		4.4		5.1		5.3		5.4		5.4	
Material		4.0		4.4		5.1		5.3		5.4		5.4	
Labor		4.2		4.6		5.6		5.8		6.0		5.9	
Indirects		4.2		4.6		5.6		5.8		6.0		5.9	
I, II		4.3		4.7		5.7		5.8		6.0		5.9	
III		4.3		4.7		5.7		5.8		6.0		5.9	
PM-CM-FE		4.3		4.7		5.7		5.8		6.0		5.9	
Composite		4.2		4.6		5.5		5.7		5.8		5.7	

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Ertimate : PLANNING File No.: M-164 Date: 10/10/90

Project : USTHAMA/AMTL SITE, OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Prepared By : A. R. Millward Checked/Approved By:

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	1% of construction)		22,000
Title I & II Design Of Special Tools	20,000	2,000		
Title III Inspection				
Construction Costs Subtotal				3,466,000
Direct/Indirect Costs			3,466,000	
8000 Contractor Demo Labor	215,000	22,000		
8000 Contractor Demo Mat'l	89,000	9,000		
8000 Contractor Disposal	1,541,000	156,000		
8000 Contractor Support	888,000	90,000		
Indirect Costs	414,000	42,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				517,000
Project Management	479,000	38,000		
Project Support	NA			
Subtotal				4,005,000
Contingency	13% of Subtotal			505,000
Escalation (included in above totals)		359,000		
	Total Estimated Cost			4,510,000

Comments: THIS ESTIMATE IS ESCALATED TO A MIDPOINT OF CONSTRUCTION OF SEPTEMBER 1992

EG&G Idaho, Inc. DETAILED COST ESTIMATE SHEET

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-6 — Page: 1 of 10

Location: BOSTON MA. — SOURCE OF ESTIMATE: (E) Eng. Est., (V) Vendor, (P) Pur. Order, (H) Handbook Ref. — Prep. By: DLS/GRM/AWM

Requester: D. L. SMITH — Chk'd/Appr'd By:

Remove Contaminated Reactor Components and Leave Containment Intact

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
Summary Of Subcontractor Costs For Option #1											
	Contractor Demo. mhrs/rate, From Page # 6					8,596	25	214,900			$214,900
	Boston Area PT&I										$75,215
	Overhead @ 15%										$43,517
	Profit @ 10%										$33,363
	Sub-Total, Rounded to Nearest $1,000										$367,000
	Demo. Material & Other Costs, From Page # 6								5,000	83,650	$88,650
	Overhead @ 15%										$13,298
	Profit @ 10%										$10,195
	Sub-Total, Rounded to Nearest $1,000										$112,000
	Subcontractor Disposal, From Page # 6										$1,540,700
	Overhead @ 10%										$154,070
	Profit @ 5%										$84,739
	Sub-Total, Rounded to Nearest $1,000										$1,780,000
	Subcontractor Support Costs, From Page # 9, Including Overhead And Profit, Rounded to Nearest $1,000										$888,000
	Total for Option #1 (Demo/Disposal), Rounded To Nearest $1,000										$3,147,000

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Page 2

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE Type of Est. PLANNING File No. M-164 Page : 2 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-6

Remove Contaminated Reactor Components and Leave Reactor Containment Intact

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Equip/Mat., etc. Mat'l. Cost	Other Cost	Total Cost
	Option 1 -										
	Mobilization/Demolition										
	(Allow for 10-12 man composite crew)					200	25	5,000			$5,600
	Remove Ground Level Airlock Structure										
	(#2) per S.O.W. Remove Built-up Roof					32	25	800		150	$950
	Remove 12" brick wall and Concrete floor										
	Structure		Aprox.50 cy			80	25	2,000		200	$2,200
	Remove Doors/Piping/Misc. and Store					60	25	1,500		200	$1,700
	Flame cut outside Metal Skin on Dome										
	(Approx. 1/2" th.) to 12' x 14' pc.										
	for access opening 52 LF					40	25	1,000		200	$1,200
	Saw cut concrete shield (2 ft th.) to										
	12' wide x 14' high opening 52 LF.					160	25	4,000		1000	$5,000
	DEMOLITION - OPTION 1										
	Remove Control Rod Assy and Core Grid,										
	Beam Tubes, etc.					100	25	2,500		1000	$3,500
	Store X-TER Components Allow					40	25	1,000		500	$1,500
	Remove S.S. Liner					80	25	2,000		1000	$3,000
	Remove all Associated External Piping (D					200	25	5,000		500	$5,500
	Page Two Subtotal					992		$24,800		$4,750	$29,550

Project or Description: USIHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 3 of 10

Acct. No.	Description	E,V, P,%	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Heat Exchanger Tanks/										
	Demineralizers,Pumps, Valves and Store					200	25	5,000		300	$5,300
	Remove all Instrumentation/Control										
	Mechanisms/Electrical from Control Room										
	on 2nd floor and Transport to Storage					100	25	2,500		300	$2,800
	Remove second balcony floor (Ref.										
	Dwg. #35-64-04) Remove Duct/Wiring										
	Panels/HandRails/Partitions/Plumbing/										
	Lighting, etc. Store or Dispose per S.D.					240	25	6,000			$6,000
	Demo./Remove 2nd floor Platform-Saw cut,										
	Break Concrete (6") etc., approx. 500 SF										
	Allow for approx. 20 CY					100	25	2,500			$2,500
	Remove Floor Support Beams					48	25	1,200			$1,200
	Remove 1st Floor Platform (Ref. Dwg.										
	35-64-04 Sheet 9) Remove Stairways and R					32	25	800			$800
	Remove concrete slab		Approx. 35 CY			160	25	4,000			$4,000
	Remove structural support beams & dispos		ALLOW			80	25	2,000			$2,000
	Remove Elect. conduit and wire etc.					80	25	2,000			$2,000
	Page Three Subtotal					1040		$26,000		$600	$26,600

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 4 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Reactor Containment										
	Outer Shield (Concrate)		40 CY	200 CY		320	25	8,000			$8,000
	Inner Shield (Concrete)		70 CY	300 CY		840	25	21,000	Contaminated		$21,000
	High Density Shielding										
	(Mostly grout and rock)		130 CY	300 CY		1,560	25	39,000	Contaminated		$39,000
	Remove Reactor Concrete Base (in basement)		147 CY	300 CY		1,764	25	44,100	Allow .50 Cont.		$44,100
	(This estimate based on 10 man comp. crew)										
	Allow for Equip. Decontamination					800	25	20,000		5000	$25,000
	Remove Electrical, HVAC, Piping, Pumps										
	all other reactor associated equip.		ALLOW			200	25	5,500			$5,000
	Remove contaminated Piping, (from										
	Reactor to Bldg. 97) w/20 Ft. UG		100 Ft.			80	25	2,000		2000	$4,000
	Remove Cistern 242 and Piping										
	Remove fence and misc from Cistern		ALLOW			32	25	800			$800
	Remove Piping (underground)		ALLOW			40	25	1,000		200	$1,200
	Remove Retention Tank					160	25	4,000		4200	$8,200
	Backfill w/pit run and compact					40	25	1,000	800	800	$2,600
	Metal Covers - Reactor floor cover										
	approx. 22 Dia. 1/4" C.S.B.P.					40	25	1,000	2,000		$3,000
	Page Four Subtotal					5876		$146,900	$2,800	$12,200	$161,900

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Type of Est. PLANNING File No. M-164

Date : 10/10/90
Page : 5 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Metal Covers (Continued)										
	(Reactor) Metal Floor Cover Supports		ALLOW			40	25	1,000	1,000		$2,000
	Sump Covers					24	25	600	200		$800
	Remove the Secondary Coolant Pumps, store etc.		ALLOW			32	25	800		200	$1,000
	Remove Concrete Pads					32	25	800		400	$1,200
	General Clean-up					200	25	5,000		500	$5,500
	REMOVE SECONDARY COOLANT PUMP SUMP										
	AND ASSOCIATED PIPING, ASSUME NON-										
	CONTAMINATED, 10,000 GAL. WITHIN 50 FOOT										
	OF BUILDING		ALLOW		200	200	25	5,000			$5,000
	Heavy Equipment Lease, 3 mo.										
	Cranes $8000/mo. for 3 months									24000	$24,000
	Loader/Backhoe, 3 mo @ $1,200/mo.									3600	$3,600
	Fork Lifts, 3 mo. @ $600/mo.									2400	$2,400
	Trucks-Dump/Low Boy etc.		ALLOW							35000	$35,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Five Subtotal					688		$17,200	$2,200	$66,100	$85,500

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 6 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Summary Sheet for Demolition And Disposal

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION 1										
(DEMO)	Page 2					992	25	24,800		4,750	29,550
(DEMO)	Page 3					1,040	25	26,000		600	26,600
(DEMO)	Page 4					5,876	25	146,900	2,800	12,200	161,900
(DEMO)	Page 5					688	25	17,200	2,200	66,100	85,500
	Subtotal for Partial Demo					8,596	25	$214,900	$5,000	$83,650	$303,550
	DISPOSE OF CLEAN AND RAD-WASTE										
(WASTE)	Page 7 Dispose of Cold Waste Locally										$12,000
(WASTE)	Page 7 Ship Low Level to SC										$88,000
(WASTE)	Page 8 Ship Low Level to SC										$256,700
(WASTE)	Page 8 RAD Waste Disposal in SC										$224,000
(WASTE)	STATE PENALTY SURCHARGE		8000 CF	120					960,000		$960,000
	Sub-Total for Disposal										$1,540,700

Project or Description: USATHAMA/AMTL — Type of Est.: PLANNING — File No.: M-364 — Date: 10/16/89 — Page: 7 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

(Dispose Locally)

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labr Rat.	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Clear, non contaminated waste disposal (concrete)										
	Air Lock Structure/Floor		40 CY								
	New Door - Cut concrete		20 CY								
	Second Floor Platform Concrete		20 CY								
	First floor Platform Concrete		35 CY								
	Remove Retention Tank, Approx.		62 CY								
	Remove Outer Reactor Biological Shield		40 CY								
	Estimated Total		217 CY						USE 450 TON		
	Other Non-Contaminated Misc.								20 TON		
	Disposal, Nearby, Allow for 25 Mi. to										
	Waste Site $2.50 per mi. Truck and Driver $75 Hr. Use 50 trips @ 10 tons per trip 50 Trips @ $75 = $3,750									Use	$5,000
	Fees etc. $15 per ton @ Waste Site. Use 470 tons @ $15 = $7,050									Use	$7,000
	Estimated Cost to dispose of AMTL Research Reactor Non Contaminated Waste										$12,000
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask B-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total										$88,000

Project or Description USATHAMA/AMTL

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Type of Est. PLANNING File No. M-164

Date : 10/10/90

Page : 8 of 10

Acct. No.	Description	E,V, P,W	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Contaiminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level)								
	Use B-25 Shipping Con. 7425CF/92CF PER CONTAINER = 81 CONTAINERS X $700 Ea Cask Lease (CONTAINS 10% VOID VOLUME)									56,700	$56,700
	20 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									200,000	$200,000
	Subtotal									$256,700	$256,700
	(RADWASTE) OPTION I										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in B-25 Shipping Casks (4 per load x cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		80	800						64000	$64,000
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask B-120A - (Higher Activity Level)										
	Casks B-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COST)										$100,000
	Total										$224,000

The outer steel shell, polar crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal.

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in sales returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

Project or Description: USATHAKA/AMTL
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Type of Est.: PLANNING File No.: M-164

Date: 10/10/90
Page: 9 of 10

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60)	E	6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAP (RENTAL)	E	12 MTHS	350					4,200		4,200
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	22000					22,000		22,000
	CIH PERSONNEL	E	155 DAYS	800					124,000		124,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	4,650 SETS	25					116,250		116,250
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	24 MTH	750					18,000		18,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		8 MEN		480	3,840	45	172,800			172,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										880,380
											USE 880,000

Project or Description: USATHAMA/AMTL
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-B

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 10 of 10

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRIPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARY SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY, QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	Total										479,400
											USE $ 479,400

ESCALATION SHEET

Date : 10/10 /90
Project
or Description : USTHAMA/AMTL SITE, OP. #1 PART. DISMANTLEMENT/VAR. 1-B Page : 1 of 1
Location : INEL Prepare'd By : A. R. Millward
Requested By : D. L. Smith Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		//////////
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	12	4.7	9	4.3							10.35%
Title III													
Labor	3	1.1	12	4.6	9	4.2							10.14%
Mat'l & Subcontracts	3	1.0	12	4.4	9	3.8							9.48%
Equipment													
Indirects	3	1.1	12	4.6	9	4.2							10.14%
PM	3	1.1	12	4.7	4	1.9							7.84%
CM													
FE													
Equipment		4.0		4.4		5.1		5.3		5.4		5.4	
Material		4.0		4.4		5.1		5.3		5.4		5.4	
Labor		4.2		4.6		5.6		5.8		6.0		5.9	
Indirects		4.2		4.6		5.6		5.8		6.0		5.9	
I, II		4.3		4.7		5.7		5.8		6.0		5.9	
III		4.3		4.7		5.7		5.8		6.0		5.9	
PM-CM-FE		4.3		4.7		5.7		5.8		6.0		5.9	
Composite		4.2		4.6		5.5		5.7		5.8		5.7	

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING File No.: M-164 Date: 10/10/92

Project : USTHAMA/AMTL SITE, OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Prepared By : A. R. Ward Checked/Approved By:

	Unescalated	Escalation	Totals:
Engineering, Design and Inspection	(1% of construction)		21,000
Title I & II Design Of Special Tools	20,000	1,000	
Title III Inspection			
Construction Costs Subtotal			2,968,000
Direct/Indirect Costs		968,000	
8000 Contractor Demo Labor	215,000	10,000	
8000 Contractor Demo Mat'l	89,000	4,000	
8000 Contractor Disposal	1,274,000	58,000	
8000 Contractor Support	888,000	40,000	
Indirect Costs	373,000	17,000	
Construction Management			
Field Engr and Const Mgmt	NA		
Const Mgmt Reserve	NA		
Government Furnished Material			
Purchased By CM	NA		
Purchased By	NA		
Procurement Fee	NA		
Project Administration Costs			492,000
Project Management	479,000	13,000	
Project Support	NA		
Subtotal			3,481,000
Contingency	13% of Subtotal		439,000
Escalation (included in above totals)		143,000	
	Total Estimated Cost		3,920,000

Comments: THIS ESTIMATE IS ESCALATED TO SEPTEMBER OF 1991

EG&G Idaho, Inc.

DETAILED COST ESTIMATE SHEET

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Type of Est.: PLANNING

File No.: M-164

Date: 10/16/90

Page: 1 of 15

Prep. By: DLS/WLM/ARM

Chk'd/Appr'd By:

Location: BOSTON MA.

Requester: D. L. SMITH

SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

Remove Contaminated Reactor Components and Leave Containment Intact

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
Summary Of Subcontractor Costs For Option #1											
	Contractor Demo. mhrs/rate, From Page # 6					8,596	25	214,900			$214,900
	Boston Area PT&I										$75,215
	Overhead @ 15%										$43,547
	Profit @ 10%										$33,363
	Sub-Total, Rounded to Nearest $1,000										$367,000
	Demo. Material & Other Costs, From Page # 6								5,000	83,650	$88,650
	Overhead @ 15%										$13,298
	Profit @ 10%										$10,195
	Sub-Total, Rounded to Nearest $1,000										$112,000
	Subcontractor Disposal, From Page # 6										$1,273,500
	Overhead @ 10%										$127,350
	Profit @ 5%										$70,043
	Sub-Total, Rounded to Nearest $1,000										$1,471,000
	Subcontractor Support Costs, From Page # 9, Including Overhead And Profit, Rounded to Nearest $1,000										$888,000
	Total for Option #1 (Demo/Disposal), Rounded To Nearest $1,000										$2,838,000

Project or Description USTHAMA/AMTL SITE Type of Est. PLANNING File No. M-164 Date : 10/10/90 Page : 2 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Remove Contaminated Reactor Components and Leave Reactor Containment Intact Equip/Mat., etc.

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Option 1 -										
	Mobilization/Demolition										
	(Allow for 10-12 man composite crew)					200	25	5,000			$5,000
	Remove Ground Level Airlock Structure										
	(EC) per S.O.W. Remove Built-up Roof					32	25	800		150	$950
	Remove 12" brick wall and Concrete Floor										
	Structure		Approx.50 cy			80	75	2,000		200	$2,200
	Remove Doors/Piping/Misc. and Store					60		1,500		200	$1,700
	Flame cut outside Metal Skin on Dome										
	(Approx. 1/2" th.) to 12' x 14' pc.										
	for access opening 52 LF.					40	25	1,000		200	$1,200
	Saw cut concrete shield (2 ft th.) to										
	12' wide x 14' high opening 52 LF.					160	25	4,000		1000	$5,000
	DEMOLITION - OPTION 1										
	Remove Control Rod Assy and Core Grid,										
	Beam Tubes, etc.					100	25	2,500		1000	$3,500
	Store X-TER Components Allow					40	25	1,000		500	$1,500
	Remove S.S. Liner					80	25	2,000		1000	$3,000
	Remove all Associated External Piping (D)					200	25	5,000		500	$5,500
	Page Two Subtotal					992		$24,800		$4,750	$29,550

Project nr
Description USTHANA/AMTL SITE — Type of Est. PLANNING — File No. M-164 — Date : 10/10/99 — Page : 3 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Heat Exchanger Tanks/										
	Demineralizers/Pumps, Valves and Store					200	25	5,000		300	$5,300
	Remove all Instrumentation/Control										
	Mechanisms/Electrical from Control Room										
	on 2nd floor and Transport to Storage					100	25	2,500		300	$2,800
	Remove second balcony floor (Ref.										
	Dwg. #35-64-04) Remove Duct/Wiring										
	Panels/Hand Rails/Partitions/Plumbing/										
	Lighting, etc. Store or Dispose per S.O.					240	25	6,000			$6,000
	Demo./Remove 2nd floor Platform-Saw cut,										
	Break Concrete (6") etc., approx. 500 SF										
	Allow for approx. 20 CY					100	25	2,500			$2,500
	Remove Floor Support Beams					48	25	1,200			$1,200
	Remove 1st Floor Platform (Ref. Dwg.										
	35-64-04 Sheet #1) Remove Windows and H					32	25	800			$800
	Remove concrete slab		Approx. 35 CY			160	25	4,000			$4,000
	Remove structural supports & dispos		ALLOW			80	25	2,000			$2,000
	Remove Elect. conduit and wire etc.					80	25	2,000			$2,000
	Page Three Subtotal					1040		$26,000		$600	$26,600

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Reactor Containment										
	Outer Shield (Concrete)		40 CY	200 CY		320	25	8,000			$8,000
	Inner Shield (Concrete)		70 CY	300 CY		840	25	21,000	Contaminated		$21,000
	High Density Shielding										
	(Mostly grout and rock)		130 CY	300 CY		1,560	25	39,000	Contaminated		$39,000
	Remove Reactor Concrete Base (in basement)		147 CY	300 CY		1,764	25	44,100	Allow .50 Cont.		$44,100
	(This estimate based on 10 man comp. crew)										
	Allow for Equip. Decontamination					800	25	20,000		5000	$25,000
	Remove Electrical, HVAC, Piping, Pumps-										
	all other reactor associated equip.		ALLOW			200	25	5,000			$5,000
	Remove contaminated Piping, (from										
	Reactor to Bldg. 97) w/20 Ft. UG		100 Ft.			80	25	2,000		2000	$4,000
	Remove Cistern 242 and Piping										
	Remove fence and misc from Cistern		ALLOW			32	25	800			$800
	Remove Piping (underground)		ALLOW			40	25	1,000		200	$1,200
	Remove Retention Tank					160	25	4,000		4200	$8,200
	Backfill w/pit run and compact					40	25	1,000	800	800	$2,600
	Metal Covers - Reactor floor cover										
	approx. 22 Dia. 1/4" C.S.B.P.					40	25	1,000	2,000		$3,000
	Page Four Subtotal					5876		$146,900	$2,800	$12,200	$161,900

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Project or Description: USTAWA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Type of Est.: PLANNING File No.: M-164

Date: 10/10/90
Page: 5 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Metal Covers (Continued)										
	(Reactor) Metal Floor Cover Supports		ALLOW			40	25	1,000	1,000		$2,000
	Sump Covers					24	25	600	200		$800
	Remove the Secondary Coolant Pumps, store etc.		ALLOW			32	25	800		200	$1,000
	Remove Concrete Pads					32	25	800		400	$1,200
	General Clean-up					200	25	5,000		500	$5,500
	REMOVE SECONDARY COOLANT PUMP SUMP										
	AND ASSOCIATED PIPING, ASSUME NON-										
	CONTAMINATED, 10,000 GAL. WITHIN 50 FOOT										
	OF BUILDING		ALLOW		200	200	25	5,000			$5,000
	Heavy Equipment Lease, 3 mo.										
	Cranes $8000/mo. for 3 months									24000	$24,000
	Loader/Backhoe, 3 mo @ $1,200/mo.									3600	$3,600
	Fork Lifts, 3 mo. @ $800/mo.									2400	$2,400
	Trucks-Dump/Low Boy etc.		ALLOW							35000	$35,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Five Subtotal					688		$17,200	$2,200	$66,100	$85,500

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-264 — Date: 10/10/90 — Page: 6 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Summary Sheet For Demolition And Disposal

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION 1										
(DEMO)	Page 2					992	25	24,800		4,750	29,550
(DEMO)	Page 3					1,040	25	26,000		600	26,600
(DEMO)	Page 4					5,876	25	146,900	2,800	12,200	161,900
(DEMO)	Page 5					688	25	17,200	2,200	66,100	85,500
	Subtotal for Partial Demo					8,596	25	$214,900	$5,000	$83,650	$303,550
	DISPOSE OF CLEAN AND RADWASTE										
(WASTE)	Page 7 Dispose of Cold Waste Locally										$12,000
(WASTE)	Page 7 Ship Low Level to SC										$98,000
(WASTE)	Page 8 Ship Low Level to SC										$424,700
(WASTE)	Page 8 RAD Waste Disposal in SC										$268,800
(WASTE)	STATE PENALTY SURCHARGE		12000 CF	40					480,000		$480,000
	Sub-Total for Disposal										$1,277,5

Project or Description: USATHAMA/AMTL

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 7 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

(Dispose Locally)

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Clean, non contaminated waste disposal (concrete)										
	Air Lock Structure/Floor		40 CY								
	New Door - Cut concrete		20 CY								
	Second Floor Platform Concrete		20 CY								
	First floor Platform Concrete		35 CY								
	Remove Retention Tank, Approx.		62 CY								
	Remove Outer Reactor Biological Shield		40 CY								
	Estimated Total		217 CY						USE 450 TON		
	Other Non-Contaminated Misc.								20 TON		
	Disposal, Nearby, Allow for 25 Mi. to										
	Waste Site $2.50 per mi. Truck and Driver $75 Rt. Use 50 trips @ 10 tons per trip 50 Trips @ $75 = $3,750									Use	$5,000
	Fees etc. $15 per ton @ Waste Site. Use 470 tons @ $15 = $7,050									Use	$7,000
	Estimated Cost to dispose of AMTL Research Reactor Non Contaminated Waste										$12,000
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask 8-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total										$100,000

Project or Description: USAIRAMA/AMTL — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 8 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Acct. No.	Description	E,V, P,R	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Containminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level) (ADD 50% MORE FOR INCREASE VOID VOLUME = 11,138 CF)								
	Use B-25 Shipping Con. 11,138CF/92CF PER CONTAINER = 121 CONTAINERS X $700 Ea Cask Lease (ALSC CONTAINS ORIGINAL 10% VOID VOLUME)									84,700	$84,700
	34 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									340,000	$340,000
	Subtotal									$424,700	$424,700
	(RADWASTE) OPTION I										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in B-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		136	800						108800	$108,800
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask B-12GA - (Higher Activity Level)										
	Casks B-12GA - Curies 7 Allow for (4) containers at $25,000 Ea (INCLUDES										$100,000
	Total										$268,800

The outer steel shell, polar crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in sales returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

Project or Description USATHAMA/AMTL

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Type of Est. PLANNING File No. M-164

Date : 10/10/90

Page : 9 of 10

ACCT. NO.	DESCRIPTION	E,V, P,R	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60	E	6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	12 MTHS	350					4,200		4,200
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	22000					22,000		22,000
	CIH PERSONNEL	E	155 DAYS	800					124,000		124,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	4,650 SETS	25					116,250		116,250
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	24 MTH	750					18,000		18,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		8 MEN		480	3,840	45	172,800			172,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										888,080
											USE 890,000

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT. SHEET)

Project or Description: USATHAMA/AMTL
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-C

Type of Est.: PLANNING Site No.: M-164 Date: 10/10/90 Page: 10 of 10

ACCT. NO.	DESCRIPTION	E,V, P,M	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,040
	Total										479,400
											* USE $479,000

ESCALATION SHEET

Project
or Description : USTHAMA/AMTL SITE, OP. #1 PART. DISMANTLEMENT/VAR. 1-C
Location : INEL
Requested By : D. L. Smith

Date : 10/10 /90
Page : 1 of 1
Prepare'd By : A. R. Millward
Chk'd/appr'd By :

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	9	3.5									4.64%
Title III	3	1.1	9	3.5									4.64%
Labor	3	1.1	9	3.4									4.54%
Mat'l & Subcontracts	3	1.0	9	3.3									4.33%
Equipment													
Indirects	3	1.1	9	3.4									4.54%
PM	3	1.1	4	1.6									2.66%
CM													
FE													

Equipment	4.0	4.4	5.1	5.3	5.4	5.4
Material	4.0	[illegible]	5.1	5.3	5.4	5.4
Labor	4.2	[illegible]	5.6	5.8	6.0	5.9
Indirects	4.2	[illegible]	5.6	5.8	6.0	5.9
I, II	4.3	4.7	5.7	5.8	6.0	5.9
III	4.3	4.7	5.7	5.8	6.0	5.9
PM-CM-FE	4.3	4.7	5.7	5.8	6.0	5.9
Composite	4.2	4.6	5.5	5.7	5.8	5.7

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING File No.: M-164 Date: 10/10/90

Project : USTHAMA/AMTL SITE, OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Prepared By : A. R. Millward Checked/Approved By:

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	0% of construction)		21,000
Title I & II Design Of Special Tools	20,000	1,000		
Title III Inspection				
Construction Costs Subtotal				4,348,000
Direct/Indirect Costs			4,348,000	
8000 Contractor Demo Labor	215,000	22,000		
8000 Contractor Demo Mat'l	89,000	9,000		
8000 Contractor Dispusal	2,234,000	226,000		
8000 Contractor Support	888,000	90,000		
Indirect Costs	522,000	53,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				505,000
Project Management	479,000	26,000		
Project Support	NA			
Subtotal				4,874,000
Contingency	13% of Subtotal			626,000
Escalation (included in above totals)		427,000		
	Total Estimated Cost			5,500,000

Comments: THIS ESTIMATE IS ESCALATED TO A MIDPOINT OF CONSTRUCTION OF SEPTEMBER 1992

EG&G Idaho, Inc. DETAILED COST ESTIMATE SHEET

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Type of Est.: PLANNING
File No.: M-164
Date: 10/10/90
Page: 1 of 10

Location: BOSTON MA.

SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

Prep. By: DLS/WLM/ARM
Chk'd/Appr'd By:

Requester: D. L. SMITH

Remove Contaminated Reactor Components and Leave Containment Intact

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
Summary Of Subcontractor Costs For Option #1											
	Contractor-Demo. mhrs/rate, From Page # 6					8,596	25	214,900			$214,900
	Boston Area PT&I										$75,215
	Overhead @ 15%										$43,517
	Profit @ 10%										$33 363
	Sub-Total, Rounded to Nearest $1,000										$367,000
	Demo. Material & Other Costs, From Page # 6								5,000	83,650	$98,650
	Overhead @ 15%										$13,298
	Profit @ 10%										$10,195
	Sub-Total, Rounded to Nearest $1,000										$112,000
	Subcontractor Disposal, From Page # 6										$2,233,500
	Overhead @ 10%										$223,350
	Profit @ 5%										$122,843
	Sub-Total, Rounded to Nearest $1,000										$2,580,000
	Subcontractor Support Costs, From Page # 9, Including Overhead And Profit, Rounded to Nearest $1,000										$888,000
	Total for Option #1 (Demo/Disposal), Rounded to Nearest $1,000										$3,947,000

Project or Description: USIHAMA/AMTL SITE

Type of Est: PLANNING

File No. M-164

Date : 10/10/90

Page : 2 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Remove Contaminated Reactor Components and Leave Reactor Containment Intact

Equip/Mat., etc.

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Option I -										
	Mobilization/Demolition										
	(Allow for 10-12 man composite crew)					200	25	5,000			$5,000
	Remove Ground Level Airlock Structure										
	(#2) per S.O.W. Remove Built-up Roof					32	25	800		150	$950
	Remove 12" brick wall and Concrete Floor										
	Structure		Approx.50 cy			80	25	2,000		200	$2,200
	Remove Doors/Piping/Misc. and Store					60	25	1,500		200	$1,700
	Flame cut outside Metal Skin on Dome										
	(Approx. 1/2" th.) to 12' x 14' pc.										
	for access opening 52 LF.					40	25	1,000		200	$1,200
	Saw cut concrete shield (2 ft th.) to										
	12' wide x 14' high opening 52 LF.					160	25	4,000		1000	$5,000
	DEMOLITION - OPTION I										
	Remove Control Rod Assy and Core Grid,										
	Beam Tubes, etc.					100	25	2,500		1000	$3,500
	Store X-TER Components Allow					40	25	1,000		500	$1,500
	Remove S.S. Liner					80	25	2,000		1000	$3,000
	Remove all Associated External Piping (D)					200	25	5,000		500	$5,500
	Page Two Subtotal					992		$24,800		$4,750	$29,550

Project or Description: USTHAMA/AMIL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Type of Est.: PLANNING File No.: M-164

Date: 10/10/90
Page: 3 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Heat Exchanger Tanks/										
	Demineralizers/Pumps, Valves and Store					200	25	5,000		300	$5,300
	Remove all Instrumentation/Control										
	Mechanisms/Electrical from Control Room										
	on 2nd floor and Transport to Storage					100	25	2,500		300	$2,800
	Remove second balcony floor (Ref.										
	Dwg. #35-64-04) Remove Duct/Wiring										
	Panels/Handrails/Partitions/Plumbing/										
	Lighting, etc. Store or Dispose per S.O.					240	25	6,000			$6,000
	Demo./Remove 2nd floor Platform-Saw cut,										
	Break Concrete (6") etc., approx. 500 SF										
	Allow for approx. 20 CY					100	25	2,500			$2,500
	Remove Floor Support Beams					48	25	1,200			$1,200
	Remove 1st Floor Platform (Ref. Dwg.										
	35-64-04 Sheet 9) Remove Stairways and H					32	25	800			$800
	Remove concrete slab		Approx. 35 CY			160	25	4,000			$4,000
	Remove structural support beams & dispos		ALLOW			80	25	2,000			$2,000
	Remove Elect. conduit and wire etc.					80	25	2,000			$2,000
	Page three Subtotal					1040		$26,000		$600	$26,600

Project or Description USTHAMA/AMTL SITE

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Type of Est. PLANNING File No. M-164

Date : 10/10/90

Page : 4 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove Reactor Containment										
	Outer Shield (Concrete)		40 CY	200 CY		320	25	8,000			$8,000
	Inner Shield (Concrete)		70 CY	300 CY		840	25	21,000	Contaminated		$21,000
	High Density Shielding										
	(Mostly grout and rock)		130 CY	300 CY		1,560	25	39,000	Contaminated		$39,000
	Remove Reactor Concrete Base (in basement)		147 CY	300 CY		1,764	25	[illegible]	Allow .50 Cont.		$44,100
	(This estimate based on 10 man comp. crew)										
	Allow for Equip. Decontamination					800	25	20,000		5000	$25,000
	Remove Electrical, HVAC, Piping, Pumps-										
	all other reactor associated equip.		ALLOW			200	25	5,000			$5,000
	Remove contaminated Piping, (from										
	Reactor to Bldg. 97) w/20 ft. UG		100 Ft.			80	25	2,000		2000	$4,000
	Remove Cistern 242 and Piping										
	Remove fence and misc from Cistern		ALLOW			32	25	[illegible]			$800
	Remove Piping (underground)		ALLOW			40	25	[illegible]		200	$1,200
	Remove Retention Tank					160	25	4,000		4200	$8,200
	Backfill w/pit run and compact					40	25	1,000	800	800	$2,600
	Metal Covers - Reactor floor cover										
	approx. 22 Dia. 1/4" C.S.E.P.					40	25	[illegible]	2,000		$3,0[illegible]
	Page Four Subtotal					5876		$146,900	$2,800	$12,200	$161,900

Project or Description: USTHAMA/AMTL SITE
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Type of Est. PLANNING File No. M-164

Date : 10/10/90
Page : 5 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Metal Covers (Continued)										
	(Reactor) Metal Floor Cover Supports		ALLOW			40	25	1,000	1,000		$2,000
	Sump Covers					24	25	600	200		$800
	Remove the Secondary Coolant Pumps, store etc.		ALLOW			32	25	800		200	$1,000
	Remove Concrete Pads					32	25	800		400	$1,200
	General Clean-up					200	25	5,000		500	$5,500
	REMOVE SECONDARY COOLANT PUMP SUMP										
	AND ASSOCIATED PIPING, ASSUME NON-										
	CONTAMINATED, 10,000 GAL. WITHIN 50 FOOT										
	OF BUILDING		ALLOW		200	200	25	5,000			$5,000
	Heavy Equipment lease, 3 mo.										
	Cranes $8000/mo. for 3 months									24000	$24,000
	Loader/Backhoe, 3 mo @ $1,200/mo									3600	$3,600
	Fork Lifts, 3 mo. @ $800/mo.									2400	$2,400
	Trucks-Dump/Low Boy etc.		ALLOW							35000	$35,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Five Subtotal					688		$17,200	$2,200	$66,100	$85,500

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Page 6

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Page : 6 of 10

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Summary Sheet for Demolition And Disposal

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION 1					992	25	24,800		4,750	29,550
(DEMO)	Page 2					1,040	25	26,000		600	26,600
(DEMO)	Page 3					5,876	25	146,900	2,800	12,200	161,900
(DEMO)	Page 4					688	25	17,200	2,200	66,100	85,500
(DEMO)	Page 5					8,596	25	$214,900	$5,000	$83,650	$303,550
	Subtotal for Partial Demo										
	DISPOSE OF CLEAN AND RADWASTE										$12,000
(WASTE)	Page 7 Dispos of Cold Waste Locally										$3,000
(WASTE)	Page 7 Ship Low Level to SC										$424,700
(WASTE)	Page 8 Ship Low Level to SC										$268,800
(WASTE)	Page 8 RAD Waste Disposal in SC								1,440,000		$1,440,000
(WASTE)	STATE PENALTY SURCHARGE		12000 CF	120							$2,233,500
	Sub-Total for Disposal										

Project or Description: USATHAMA/AMTL

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

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OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

(Dispose Locally)

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Clean, non contaminated waste disposal (concrete)										
	Air Lock Structure/Floor		40 CY								
	New Door - Cut concrete		20 CY								
	Second Floor Platform Concrete		20 CY								
	First floor Platform Concrete		35 CY								
	Remove Retention Tank, Approx.		62 CY								
	Remove Outer Reactor Biological Shield		40 CY								
	Estimated Total		217 CY						USE 450 TON		
	Other Non-Contaminated Misc.								20 TON		
	Disposal, Nearby, Allow for 25 Mi. to										
	Waste Site $2.50 per mi. Truck and Driver $75 Rt. Use 50 trips @ 10 tons per trip 50 Trips @ $75 = $3,750									Use	$5,000
	Fees etc. $15 per ton @ Waste Site. Use 470 tons @ $15 = $7,050									Use	$7,000
	Estimated Cost to dispose of AMTL Research Reactor Non Contaminated Waste										$12,000
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask B-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total										$88,000

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Containiminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level) (ADD 50% MORE FOR INCREASE VOID VOLUME = 11,138 CF)								
	Use 8-25 Shipping Con. 11,179CF/92CF PER CONTAINER = 121 CONTAINERS X $700 Ea Cask Lease (ALSO CONTAINS ORIGINAL 10% VOID VOLUME)									84,700	$84,700
	34 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									340,000	$340,000
	Subtotal									$424,700	$424,700
	(RADWASTE) OPTION 1										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in 8-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		136	800						108800	$108,800
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask 8-120A - (Higher Activity Level)										
	Casks 8-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COST)										$100,000
	Total										$268,800

The outer steel shell, polar crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal.

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in sales returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

Project or Description USATHAMA/AMTL

OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Type of Est. PLANNING

File No. K-164

Date : 10/10/90

Page : 9 of 10

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60	E	6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	12 MTHS	350					4,200		4,200
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	22000					22,000		22,000
	CIH PERSONNEL	E	155 DAYS	800					124,000		124,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	4,650 SETS	25					116,250		116,250
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	24 MTH	750					18,000		18,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		8 MEN		480	3,840	45	172,800			172,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										888,080
											USE 880,000

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT. SHEET)

Project or Description: USATHAMA/AMTL
OPTION #1 PARTIAL DISMANTLEMENT/VARIATION 1-D

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	Total										479,400
											USE $479,000

ESCALATION SHEET

Project
or Description : USTHAMA/AMTL SITE, OP. #1 PART. DISMANTLEMENT/VAR. 1-D
Location : INEL
Requested By : D. L. Smith

Date : 10/10 /90
Page : 1 of 1
Prepare'd By : A. R. Millward
Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		//////////
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yr %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	12	4.7	2	1.0							6.83%
Title III													
Labor	3	1.1	12	4.6	9	4.2							10.14%
Mat'l & Subcontracts	3	1.0	12	4.4	9	3.8							9.48%
Equipment													
Indirects	3	1.1	12	4.6	9	4.2							10.14%
PM	3	1.1	11	4.3									5.43%
CM													
FE													
Equipment		4.0		4.4		5.1		5.3		5.4		5.4	
Material		4.0		4.4		5.1		5.3		5.4		5.4	
Labor		4.2		4.6		5.6		5.8		6.0		5.9	
Indirects		4.2		4.6		5.6		5.8		6.0		5.9	
I. II		4.3		4.7		5.7		5.8		6.0		5.9	
III		4.3		4.7		5.7		5.6		6.0		5.9	
PM-CM-FE		4.3		4.7		5.7		5.8		6.0		5.9	
Composite		4.2		4.6		5.5		5.7		5.8		5.7	

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING File No.: M-164 Date: 10/10/90

Project : USTHAMA/AMTL SITE OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Prepared By : A. R. Millward Checked/Approved By:

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	1% of construction)		21,000
Title I & II Design	NA			
Of Special Tools	20,000	1,000		
Title III Inspection	NA			
Construction Costs Subtotal				3,163,000
Direct/Indirect Costs			3,163,000	
8000 Contractor Demo Labor	422,000	19,000		
8000 Contractor Demo Mat'l	157,000	7,000		
8000 Contractor Disposal	1,011,000	46,000		
8000 Contractor Support	937,000	43,000		
Indirect Costs	498,000	23,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				492,000
Project Management	479,000	13,000		
Project Support	NA			
Subtotal				3,676,000
Contingency	13% of Subtotal			494,000
Escalation (included in above totals)		152,000		
	Total Estimated Cost			4,170,000

Comments: THIS ESTIMATE IS ESCALATED TO A MIDPOINT OF CONSTRUCTION OF SEPTEMBER 1991

EG&G Idaho, Inc.

DETAILED COST ESTIMATE SHEET

Project or Description: USTHAMA/AMTL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Location: Boston, Massachusetts

Requester: D. L. Smith

Total Reactor Building Dismantlement

Type of Est. PLANNING

SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

File No. M-164

Date : 10/10/90

Page : 1 of *0

Prep. By : DLS/WLM/ARM

Chk'd/Appr'd By :

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Summary Option #2										
	Contractor-Demo. mhrs/rate, From Page # 6					16,880	25	422,000			$422,000
	Boston Area PT&I										$147,700
	Overhead @ 15%										$85,455
	Profit @ 10%										$65,516
	Sub-Total, Rounded to nearest $1,000										$721,000
	Demo. Material & Other Costs, From Page # 6								6,800	149,700	$156,500
	Overhead @ 15%										$23,475
	Profit @ 10%										$17,998
	Sub-Total, Rounded to nearest $1,000										$198,000
	Subcontractor Disposal, From Page # 6										$1,011,200
	Overhead @ 10%										$162,131
	Profit @ 5%										$55,667
	Sub-Total, Rounded to nearest $1,000										$1,169,000
	Subcontractor Support Costs From Page # 9, Including Overhead And Profit, Rounde to nearest $1,000										$937,000
	Total for Option #2 (Demo/Disposal) Rounded to nearest $1,000										$3,825,000

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Page 2

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE Type of Est. PLANNING File No. M-164 Page : 2 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Equip/Mat., etc. Other Cost	Total Cost
	Option II										
	Mobilization/Demobilization					200	25	5,000			$5,000
	Remove Ground Level Air-lock Structures					248	25	6,200			$6,200
	Provide access opening on Ground										
	level per Option #1					100	25	2,500			$2,500
	Remove control rod assembly/core grid/										
	beam tubes/all reactor components -										
	place in storage and ship					140	25	3,500			$3,500
	Remove S.S. reactor liner					80	25	2,000		2000	$3,000
	Remove all reactor associated external piping					200	25	5,000		500	$5,500
	Remove heat exchanger tanks/demineralizers/pumps/valves					200	25	5,000		300	$5,300
	Remove all instrumentation control mechanisms/										
	electrical equipment etc. from control room on 2nd floor					100	25	2,500		300	$2,800
	Page Two Subtotal					1,268	25	$31,700		$2,100	$33,800

E&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove electrical/HVAC/Piping/Pumps/any other Equipment					200	25	5,000			$5,000
	Remove contaminated piping (from										
	reactor to Building 97 w/20 Ft. UG)		100 FT			80	25	2,000			$2,000
	Remove fence/cistern/piping (Per Option 1)					232	25	5,800			$5,800
	Back Fill and compact					40	25	1,000	800	800	$2,600
	Remove secondary coolant pumps, pads etc.					48	25	1,200			$1,200
	(2nd Balcony Floor Ref. Dwg. #35-64-04)										
	Remove duct/wiring/panels/hand rails/partitions/plumbing/lighting, etc.										
	Store or dispose per SOW					240	25	6,000			$6,000
	Demo/remove 2nd floor platform per Option 1					100	25	2,500			$2,500
	Remove 1st floor platform Ref. Dwg. 35-64-04 Sh. 9 per Option 1					352	25	8,800			$8,800
	REMOVE SECONDARY COOLANT PUMP SUMP		ALLOW		200	200	25	5,000			$5,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Three Subtotal					1,652	25	$41,300	$1,800	$800	$43,900

Project or Description USTHAMA/ANTL SITE

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

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OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove reactor containment										
	Outer Shield Concrete		40 CY 200 CY			320	25	8,000			$8,000
	Inner Shield Concrete		70 CY 300 CY			840	25	21,000			$21,000
	Remove High Density Shield (Per Option 1)		130 CY 300 CY			1,560	25	39,000			$39,000
	Remove Reactor Concrete Basc (Per Option 1)		147 CY			1,764	25	44,100		50%	$44,100
	(In basement)										
	Allow for Equip. decon.					800	25	20,000		5000	$25,000
	Remove all electrical, HVAC piping, Pumps etc.					300	25	7,500			$7,500
	Remove remaining utilities inside/										
	outside elect., plumbing/HVAC etc.					300	25	7,500			$7,500
	Remove containment roof shell, flange										
	cut into sections for salvage					320	25	8,000		1000	$9,000
	Remove polar crane (completely) dismantle/salvage					240	25	6,000			$6,000
	Remove girter rail/power supply etc.					100	25	2,500			$2,500
	Page Four Subtotal					6,544	25	$163,600		$6,000	$169,600

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Project or Description: USTHAMA/AMTL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A
Total Reactor Building Dismantlement

Type of Est. PLANNING File No. M-164 Date : 10/10/90 Page : 5 of 10

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove 1/2" skin, C.S. 80'D X 50'H and										
	salvage - 480,000 lb		12,000 FT	.05/lb.		960	25	24,000		5000	$29,000
	Remove concrete operating floor										
	approx. 1-1/2" Th. 80' Dia.		275 CY			800	25	20,000		7500	$27,500
	Remove concrete circumferential wall (2 Ft. Th)		1000 CY			2,000	25	50,000		5000	$55,000
	Remove basement floor and mud mat -										
	Basement floor		700 CY	100		2,800	25	70,000		10000	$80,000
	1/4" Steel Plate		4800 SF	0.5		96	25	2,400			$2,460
	Mud Mat. concrete		150 CY	80		480	25	12,000			$12,000
	Remove cathodic protection system					80	25	2,000			$2,000
	Backfill/compaction of (reactor) hole fill		1000 CY	10		200	25	5,000	5,000	5000	$15,000
	Heavy Equipment Lease - Cranes									46800	$46,800
	Loaders/Backhoes			(Based on 20 man crew for 4.5 months to complete demolition - Option II)						5400	$5,400
	Fork Lifts									3600	$3,600
	Trucks									52500	$52,500
	Page Five Subtotal					7,416	25	$185,400	$5,000	$140,800	$331,200

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 6 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Total Reactor Building Dismantlement Summary Sheet For Demolition And Disposal

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION II										
(DEMO)	Page 2					1,268	25	31,700		2,100	33,800
(DEMO)	Page 3					1,652	25	41,300	1,800	800	43,900
(DEMO)	Page 4					6,544	25	163,600		6,000	169,600
(DEMO)	Page 5					7,416	25	185,400	5,000	140,800	331,200
	Subtotal for Complete Demo					16,880	25	$422,000	$6,800	$149,700	$578,500
	Dispose of Clean and Rad Waste										
(WASTE)	Page 7, Dispose of Cold Waste Locally										$122,500
(WASTE)	Page 7, Ship Low Level to SC										$88,000
(WASTE)	Page 8, Ship Low Level to SC										$256,700
(WASTE)	Page 8, Radwaste Disposal										$224,000
(WASTE)	STATE PENALTY SURCHARGE		8000 CF	40					320,000		$320,000
	Subtotal for Disposal										$1,011,200

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 7 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Total Reactor Building Dismantlement (Dispose Locally)

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Haul Clean Waste to local Dump Site	Use	5000 TON								
	25 mi. to Site, $2.50 per mi. = 50 mi. RT (For Option II)										
	Use 10 Ton Load per RT.		500 Trips X $75 RT							37500	$37,500
	Waste Site Fees Etc.										
	Allow $15 Per Ton		5000 TON							75000	$75,000
	For Other Clean Waste Disposal, Allow										
	for Transportation, Fees, etc.									10000	$10,000
	Total										$122,500
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask 8-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total							$28,000			$88,000

Project or Description: USATHAMA/AMTL

Type of Est.: PLANNING

File No.: R-164

Date: 10/10/90

Page: 8 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Wt. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Containaminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level)								
	Use B-25 Shipping Con. 7425CF/92CF PER CONTAINER = 81 CONTAINERS X $700 Ea Cask Lease (CONTAINS 10% VOID VOLUME)									56,700	$56,700
	20 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									200,000	$200,000
	Subtotal									$256,700	$256,700
	(RADWASTE) OPTION #2										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in B-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		80	800						64000	$64,000
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask B-120A - (Higher Activity Level)										
	Casks B-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COST)										$100,000
	Total										$224,000

The outer steel shell, polar crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in sales returns from $.01 to $.05 per lb.

Operable equipment approx. 40 cents per lb.

Project or Description: USATHAMA/AMTL
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 9 of 10

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60 HR'S)		6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	14 MTHS	350					4,900		4,900
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	30000					30,000		30,000
	CIH PERSONNEL	E	230 DAYS	800					184,000		184,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	7,800 SETS	25					195,000		195,000
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	36 MTH	750					27,000		27,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		3 MEN		480	1,440	45	64,800			64,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										936,530

Project or Description: USATHAMA/AMTL
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-A

Type of Est. PLANNING File No. M-164

Date : 10/10/90
Page : 10 of 10

ACCT. NO.	DESCRIPTION	E,V, P,M	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	Total										479,400
											USE 479,000

ESCALATION SHEET

Project
or Description : USTHAMA/AMTL SITE, OP. #2 TOTAL DISMANTLEMENT/VAR. 2-A
Location : INEL
Requested By : D. L. Smith

Date : 10/.) /90
Page : 1 of 1
Prepare'd By : A. R. Mil'ward
Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		//////////
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	9	3.5									4.64%
Title III													
Labor	3	1.1	[illegible]	3.4									4.54%
Mat'l & Subcontracts	[illegible]	1.0	9	3.3									4.33%
Equipment													
Indirects	3	1.1	9	3.4									4.54%
PM	3	1.1	4	1.6									2.66%
CM													
FE													
Equipment		4.0		4.4		5.1		5.3		5.4		5.4	
Material		4.0		4.4		5.1		5.3		5.4		5.4	
Labor		4.2		4.6		5.6		5.8		6.0		5.9	
Indirects		4.2		4.6		5.6		5.8		6.0		5.9	
I. II		4.3		4.7		5.7		5.8		6.0		5.9	
III		4.3		4.7		5.7		5.8		6.0		5.9	
PM-CM-FE		4.3		4.7		5.7		5.8		6.0		5.9	
Composite		4.2		4.6		5.5		5.7		5.8		5.7	

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING | File No.: M-164 | Date: 10/10/90

Project : USTHAMA/AMTL SITE, OPTION #2 TOT' DISMANTLEMENT/VARIATION 2-B

Prepared By : A. R. Millward | Checked/Approved By:

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	1% of construction)		22,000
Title I & II Design Of Special Tools	NA			
	20,000	2,000		
Title III Inspection	NA			
Construction Costs Subtotal				4,147,000
Direct/Indirect Costs			4,147,000	
8000 Contractor Demo Labor	422,000	43,000		
8000 Contractor Demo Mat'l	157,000	16,000		
8000 Contractor Disposal	1,651,000	167,000		
8000 Contractor Support	937,000	95,000		
Indirect Costs	598,000	61,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				517,000
Project Management	479,000	38,000		
Project Support	NA			
Subtotal				4,686,000
Contingency	13% of Subtotal			614,000
Escalation (included in above totals)		422,000		
	Total Estimated Cost			5,300,000

Comments: THIS ESTIMATE IS ESCALATED TO A MIDPOINT OF CONSTRUCTION OF SEPTEMBER 1992

EG&G Idaho, Inc. DETAILED COST ESTIMATE SHEET

Project or Description: USTHAMA/AMTL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 1 of 10

Location: Boston, Massachusetts

Requester: D. L. Smith

Total Reactor Building Dismantlement

SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

Prep. By: DLS/WLM/ARM

Ck'd/Appr'd By:

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Summary Option #2										
	Contractor-Demo. mhrs/rate, From Page # 6					16,880	25	422,000			$422,000
	Boston Area PI&I										$147,700
	Overhead @ 15%										$85,455
	Profit @ 10%										$65,516
	Sub Total, Rounded to nearest $1,000										$721,000
	Demo. Material & Other Costs, From Page # 6								6,800	149,700	$156,500
	Overhead @ 15%										$23,475
	Profit @ 10%										$17,998
	Sub-Total, Rounded to nearest $1,000										$198,000
	Subcontractor Disposal, From Page # 6										$1,651,200
	Overhead @ 10%										$166,771
	Profit @ 5%										$90,899
	Sub-Total, Rounded to nearest $1,000										$1,909,000
	Subcontractor Support Costs from Page # 9, Including Overhead And Profit, Rounde to nearest $1,000										$937,000
	Total for Option #2 (Demo/Disposal) Rounded to nearest $1,000										$3,765,000

Project or Description USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Page : 2 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATIO 2 b

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Equip/Mat., etc. Mat'l. Cost	Other Cost	Total Cost
	Option II										
	Mobilization/Demobilization					200	25	5,000			$5,000
	Remove Ground Level Air-lock Structures					248	25	6,200			$6,200
	Provide access opening on Ground										
	Level per Option #1					100	25	2,500			$2,500
	Remove control rod assembly/core grid/										
	beam tubes/all reactor components -										
	place in storage and ship					140	25	3,500			$3,500
	Remove S.S. reactor liner					80	25	2,000		1000	$3,000
	Remove all reactor associated external piping					200	25	5,000		500	$5,500
	Remove heat exchanger tanks/demineralizers/pumps/valves					200	25	5,000		300	$5,300
	Remove all instrumentation control mechanisms/										
	electrical equipment etc. from control room on 2nd floor					100	25	2,500		300	$2,800
	Page Two Subtotal					1,268	25	$31,700		$2,100	$33,800

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT SHEET)

Page 3

Project or Description: USITHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Date : 10 '90

Page : 3 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lb. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove electrical/HVAC/Piping/Pumps/any other Equipment					200	25	5,000			$5,000
	Remove contaminated piping (from										
	reactor to Building 97 w/20 Ft. UG)		100 FT			80	25	2,000			$2,000
	Remove fence/cistern/piping (Per Option ' /					232	25	5,800			$5,800
	Back Fill and compact					40	25	1,000	800	800	$2,600
	Remove secondary coolant pumps, pads etc.					48	25	1,200			$1,200
	(2nd Balcony Floor Ref. Dwg. #35-64-04)										
	Remove duct/wiring/panels/hand rails/partitions/plumbing/lighting, etc.										
	Store or dispose per SOW					240	25	6,000			$6,000
	Demo/remove 2nd floor platform per Option					100	25	2,500			$2,500
	Remove 1st floor platform Ref. Dwg. 35-64-04 Sh. 9 per Option					352	25	8,800			$8,800
	REMOVE SECONDARY COOLANT PUMP SUMP		ALLOW		200	200	25	5,000			$5,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Three Subtotal					1,652	25	$41,300	$1,800	$800	$43,900

Project or Description USHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Page : 4 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove reactor containment										
	Outer Shield Concrete		40 CY 200 CY			320	25	8,000			$8,000
	Inner Shield Concrete		70 CY 300 CY			840	25	21,000			$21,000
	Remove High Density Shield (Per Option 1)		130 CY 500 CY			1,560	25	39,000			$39,000
	Remove Reactor Concrete Base (Per Option 1)		147 CY			1,764	25	44,100		50%	$44,100
	(In basement)										
	Allow for Equip. decon.					800	25	20,000		5000	$25,000
	Remove all electrical, HVAC piping, Pumps etc.					363	25	7,500			$7,500
	Remove remaining utilities inside/										
	outside elect., plumbing/HVAC etc.					300	25	7,500			$7,500
	Remove containment roof shell, flame										
	cut into sections for salvage					320	25	8,000		1000	$9,000
	Remove polar crane (completely) dismantle/salvage					240	25	6,000			$6,000
	Remove girter rail/power supply etc.					100	25	2,500			$2,500
	Page Four Subtotal					6,544	25	$163,600		$6,000	$169,600

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Date : 10/10/90

Project or Description: USTHAMA/AMC SITE

Type of Est. PLANNING File No. M-164

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove 1/2" skin, C.S. 80'D X 50'H and					960	25	24,000		5000	$29,000
	salvage - 480,000 lb		12,000 FT	.05/lb.							
	Remove concrete operating floor					800	25	20,000		7500	$27,500
	approx. 1-1/2" th. 80' Dia.		275 CY								
	Remove concrete circumferential wall (2 Ft. th)		1000 CY			2,000	25	50,000		5000	$55,000
	Remove basement floor and mud mat -										
	Basement floor		700 CY	100		2,800	25	70,000		10000	$80,000
	1/4" Steel Plate		4800 SF	0.5		96	25	2,400			$2,400
	Mud Mat. concrete		150 CY	80		480	25	12,000			$12,000
	Remove cathodic protection system					80	25	2,000			$2,000
	Backfill/compaction of (reactor) hole fill		1000 CY	10		200	25	5,000	5,000	5000	$15,000
	Heavy Equipment Lease - Cranes									46800	$46,800
	Loaders/Backhoes			(Based on 20 man crew for 4.5 months to complete demolition - Option II)						5400	$5,400
	Fork Lifts									3600	$3,600
	Trucks									52500	$52,500
	Page Five Subtotal					7,416	25	$185,400	$5,000	$140,800	$331,200

Project or Description USTRAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Page : 6 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Total Reactor Building Dismantlement Summary Sheet For Demolition And Disposal

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat. Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION II										
(DEMO)	Page 2					1,268	25	31,700		2,100	33,800
(DEMO)	Page 3					1,652	25	41,300	1,800	800	43,900
(DEMO)	Page 4					6,544	25	163,600		6,000	169,600
(DEMO)	Page 5					7,416	25	185,400	5,000	140,800	331,200
	Subtotal for Complete Demo					16,880	25	$422,000	$6,800	$149,700	$578,500
	Dispose of Clean and Rad Waste										
(WASTE)	Page 7, Dispose of Cold Waste Locally										$122,500
(WASTE)	Page 7, Ship Low Level to SC										$88,000
(WASTE)	Page 7, Ship Low Level to SC										$256,700
(WASTE)	Page 8, Radwaste Disposal										$224,000
(WASTE)	STATE PENALTY SURCHARGE		8000 CF	120					960,000		$960,300
	Subtotal for Disposal										$1,651,200

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 7 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-6

Total Reactor Building Dismantlement (Dispose Locally)

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Haul Clean Waste to local Dump Site	Use	5000 TON								
	25 mi. to Site, $2.50 per mi. = 50 mi. RT (For Option II)										
	Use 10 Ton Load per RT.		500 Trips x $75 RT							37500	$37,500
	Waste Site Fees Etc.										
	Allow $15 Per Ton		5000 TON							75000	$75,000
	For Other Clean Waste Disposal, Allow										
	for Transportation, Fees, etc.									10000	$10,000
	Total										$122,500
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask B-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total							$28,000			$88,000

Project or Description USATHAMA/AMTL

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Page : 8 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Acct. No.	Description	E,V, P,W	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Contaminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level)								
	Use B-25 Shipping Con. 7425CF/92CF PER CONTAINER = 81 CONTAINERS X $700 Ea Cask Lease (CONTAINS 10% VOID VOLUME)									56,700	$56,700
	20 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									200,000	$200,000
	Subtotal									$256,700	$256,700
	(RADWASTE) OPTION #2										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in B-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		80	800						64000	$64,000
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask B-120A - (Higher Activity Level)										
	Casks B-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COST)										$100,000
	Total										$224,000

The outer steel shell, polar crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal.

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in scrap returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

Project or Description: USATHAMA/AMTL
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Type of Est. PLANNING File No. M-164

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60 HR'S)		6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	14 MTHS	350					4,900		4,900
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	30000					30,000		30,000
	CIH PERSONNEL	E	230 DAYS	800					184,000		184,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	7,800 SETS	25					195,000		195,000
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	36 MTH	750					27,000		27,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		3 MEN		480	1,440	45	64,800			64,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										936,530

Project or Description: USATHAMA/AMTL
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-B

Type of Est.: PLANNING
File No.: M-164
Date: 10/10/90
Page: 10 of 10

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	Total										479,400
											USE $479,000

ESCALATION SHEET

Project
or Description : USTHAMA/AMTL SITE, OP. #2 TOTAL DISMANTLEMENT/VAR. 2-B
Location : INEL
Requested By : D. L. Smith

Date : 10/10 /90
Page : 1 of 1
Prepare'd By : A. R. Millward
Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		//////////
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	12	4.7	9	4.3							10.35%
Title III													
Labor	3	1.1	12	4.6	9	4.2							10.14%
Mat'l & Subcontracts	3	1.0	12	4.4	9	3.8							9.48%
Equipment													
Indirects	3	1.1	12	4.6	9	4.2							10.14%
PM	3	1.1	12	4.7	4	1.9							7.84%
CM													
FE													
Equipment		4.0		4.4		5.1		5.3		5.4		5.4	
Material		4.0		4.4		5.1		5.3		5.4		5.4	
Labor		4.2		4.6		5.6		5.8		6.0		5.9	
Indirects		4.2		4.6		5.6		5.8		6.0		5.9	
I. II		4.3		4.7		5.7		5.8		6.0		5.9	
III		4.3		4.7		5.7		5.8		6.0		5.9	
PM-CM-FE		4.3		4.7		5.7		5.8		6.0		5.9	
Composite		4.2		4.6		5.5		5.7		5.8		5.7	

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING File No.: M-164 Date: 10/10/90

Project : USTHAMA/AMTL SITE, OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Prepared By : A. R. Millward Checked/Approved By: [illegible]

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	1% of construction)		21,000
Title I & II Design	NA			
Of Special Tools	20,000	1,000		
Title III Inspection	NA			
Construction Costs Subtotal				3,613,000
Direct/Indirect Costs			3,613,000	
8000 Contractor Demo Labor	422,000	19,000		
8000 Contractor Demo Mat'l	157,000	7,000		
8000 Contractor Disposal	1,384,000	63,000		
8000 Contractor Support	937,000	43,000		
Indirect Costs	556,000	25,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				492,000
Project Management	479,000	13,000		
Project Support	NA			
Subtotal				4,126,000
Contingency	13% of Subtotal			554,000
Escalation (included in above totals)		171,000		
	Total Estimated Cost			4,680,000

Comments: THIS ESTIMATE IS ESCALATED TO SEPTEMBER 1991

EG&G Idaho, Inc.

DETAILED COST ESTIMATE SHEET

Project or Description: USIHAMA/AMIL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Location: Boston, Massachusetts

Requester: D. L. Smith

Total Reactor Building Dismantlement

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Page : 1 of 10

Prep. By : DLS/WLM/ARM

Chk'd/Appr'd By :

SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Summary Option #2										
	Contractor-Demo. mhrs/rate, From Page # 6					16,880	25	422,000			$422,000
	Boston Area PT&I										$147,700
	Overhead @ 15%										$85,455
	Profit @ 10%										$65,536
	Sub-Total, Rounded to nearest $1,000										$721,000
	Demo. Material & Other Costs, From Page # 6								6,800	149,700	$156,500
	Overhead @ 15%										$23,475
	Profit @ 10%										$17,998
	Sub-Total, Rounded to nearest $1,000										$198,000
	Subcontractor Disposal, From Page # 6										$1,384,000
	Overhead @ 10%										$139,284
	Profit @ 5%										$76,189
	Sub-Total, Rounded to nearest $1,000										$1,600,000
	Subcontractor Support Costs From Page # 9, Including Overhead And Profit, Rounde to nearest $1,000										$937,000
	Total for Option #2 (Demo/Disposal) Rounded to nearest $1,000										$3,456,000

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Page 2

Date : 10/10/90

Project or Description: USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Page : 2 of 12

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement

Equip/Mat., etc.

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Option II										
	Mobilization/Demobilization					200	25	5,000			$5,000
	Remove Ground Level Air-lock Structures					248	25	6,200			$6,200
	Provide access opening on Ground										
	Level per Option #1					100	25	2,500			$2,500
	Remove control rod assembly/core grid/										
	beam tubes/all reactor components -										
	place in storage and ship					140	25	3,500			$3,500
	Remove S.S. reactor liner					80	25	2,000		1000	$3,000
	Remove all reactor associated external piping					200	25	5,000		500	$5,500
	Remove heat exchanger tanks/demineralizers/pumps/valves					200	25	5,000		300	$5,300
	Remove all instrumentation control mechanisms/										
	electrical equipment etc. from control room on 2nd floor					100	25	2,500		300	$2,800
	Page Two Subtotal					1,268	25	$31,700		$2,100	$33,800

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Date : 10/10/90

Project or Description USTHAMA/AMIL SITE

Type of Est. PLANNING File No. M-164

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove electrical/HVAC/Piping/Pumps/any other Equipment					200	25	5,000			$5,000
	Remove contaminated piping (from		100 FT			80	25	2,000			$2,000
	reactor to Building 97 w/20 Ft. UG)					232	25	5,800			$5,800
	Remove fence/cistern/piping (Per Option 1)					40	25	1,000	800	800	$2,600
	Back Fill and compact					48	25	1,200			$1,200
	Remove secondary coolant pumps, pads etc.										
	(2nd Balcony Floor Ref. Dwg. #35-64-04)										
	Remove duct/wiring/panels/hand rails/partitions/plumbing/lighting, etc.					240	25	6,000			$6,000
	Store or dispose per SOW					100	25	2,500			$2,500
	Demo/remove 2nd floor platform per Option 1					352	25	8,800			$8,800
	Remove 1st floor platform Ref. Dwg. 35-64-04 Sh. 9 per Option 1										
	REMOVE SECONDARY COOLANT PUMP SUMP		ALLOW		200	200	25	5,000			$5,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Three Subtotal					1,652	25	$41,300	$1,800	$800	$43,900

Project or Description USIHAMA/ANTL SITE

Type of Est. PLANNING

File No. M-164

Date : 10/10/90

Page : 4 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove reactor containment										
	Outer Shield Concrete		40 CY 200 CY			320	25	8,000			$8,000
	Inner Shield Concrete		70 CY 300 CY			840	25	21,000			$21,000
	Remove High Density Shield (Per Option 1)		130 CY 200 CY			1,560	25	39,000			$39,000
	Remove Reactor Concrete Base (Per Option 1)		147 CY			1,764	25	44,100		50%	$44,100
	(In basement)										
	Allow for Equip. decon.					800	25	20,000		5000	$25,000
	Remove all electrical, HVAC piping, Pumps etc.					300	25	7,500			$7,500
	Remove remaining utilities inside/										
	outside elect., plumbing/HVAC etc.					300	25	7,500			$7,500
	Remove containment roof shell, frame										
	cut into sections for salvage					320	25	8,000		1000	$9,000
	Remove polar crane (completely) dismantle/salvage					240	25	6,000			$6,000
	Remove girter rail/power supply etc.					100	25	2,500			$2,500
	Page Four Subtotal					6,544	25	$163,600		$6,000	$169,600

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Page 5

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Page : 5 of 20

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove 1/2" skin, C.S. 80'D x 50'H and					960	25	24,000		5000	$29,000
	salvage - 480,000 lb		12,000 FT	.05/lb.							
	Remove concrete operating floor					800	25	20,000		7500	$27,500
	approx. 1-1/2" Th. 80' Dia.		275 CY								
	Remove concrete circumferential wall (2 Ft. Th)		1000 CY			2,900	25	50,000		5000	$55,000
	Remove basement floor and mud mat -									10000	$80,000
	Basement floor		700 CY	100		2,800	25	70,000			$2,400
	1/4" Steel Plate		4800 SF	0.5		96	25	2,400			$12,000
	Mud Mat. concrete		150 CY	80		480	25	12,000			
	Remove cathodic protection system					80	25	2,000			$2,000
	Backfill/compaction of (reactor) hole fill		1000 CY	10		200	25	5,000	5,000	5000	$15,000
	Heavy Equipment Lease - Cranes									46800	$46,800
	Loaders/Backhoes			(Based on 20 man crew for 4.5 months to complete demolition - Option III)						5400	$5,400
	Fork Lifts									3600	$3,600
	Trucks									52500	$52,500
	Page Five Subtotal					7,416	25	$185,400	$5,000	$140,800	$331,200

ELGG Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Page 6 Date : 10/17/90

Project or Description USIHAMA/AMTL SITE Type of Est. PLANNING File #C. M-164 Page : 6 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement Summary Sheet For Demolition And Disposal

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION II					1,268	25	31,700		2,100	33,800
(DEMO)	Page 2					1,652	25	41,300	1,800	800	43,900
(DEMO)	Page 3					6,544	25	163,600		6,000	169,600
(DEMO)	Page 4					7,416	25	185,400	5,000	140,800	331,200
(DEMO)	Page 5					16,880	25	$422,000	$6,800	$149,700	$578,500
	Subtotal for Complete Demo										
	Dispose of Clean and Rad Waste										$122,500
(WASTE)	Page 7, Dispose of Cold Waste Locally										$88,000
(WASTE)	Page 7, Ship Low Level to SC										$424,700
(WASTE)	Page 8, Ship Low Level to SC										$268,800
(WASTE)	Page 8, Radwaste Disposal								480,000		$480,000
(WASTE)	STATE PENALTY SURCHARGE		12000 CF	40							$1,384,000
	Subtotal for Disposal										

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT. SHEET)

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-184 — Date: 10/10/90 — Page: 7 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement (Dispose Locally)

Acct. No.	Description	E,V, P,R	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Haul Clean Waste to local Dump Site	Use	5000 TON								
	25 mi. to Site, $2.50 per mi. = 50 mi. RT (For Option II)										
	Use 10 Ton Load per RT.		500 trips x $75 RT							37500	$37,500
	Waste Site Fees Etc.										
	Allow $15 Per Ton		5000 TON							75000	$75,000
	For Other Clean Waste Disposal, Allow										
	for Transportation, Fees, etc.									10000	$10,000
	Total										$122,500
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask 8-120A) lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total							$28,000			$88,000

Project or Description: USATHAMA/AMTL
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Type of Est.: PLANNING

File No.: M-144

Date: 10/10/90

Page: 8 of 10

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l Cost	Other Cost	Total Cost
	Contaiminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level) (ADD 50% MORE FOR INCREASE VOID VOLUME = 11,138 CF)								
	Use B-25 Shipping Con. 11,138CF/92CF PER CONTAINER = 121 CONTAINERS x $700 Ea Cask Lease ... 50 CONTAINS ORIGINAL 15% VOID VOLUME)									84,700	$84,700
	34 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									340,000	$340,000
	Subtotal									$424,700	$424,700
	(RADWASTE) OPTION #2										
	Radwaste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in B-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		136	800						108800	$108,800
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Ship ... sk 8-120A - (Higher Activity Level)										
	Casks 8-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES										$100,000
	Total										$268,800

The outer steel shell, polar crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will very in sales returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT. SHEET)

Page: 9

Project or Description: USAIHAMA/AMTL — Type of Est.: PLANNING — File No.: R-164 — Date: 10/10/90 — Page: 9 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement SHIP TO BARNWELL, SOUTH CAROLINA

ACCT. NO.	DESCRIPTION	E,V,P,S	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60)	E	6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	14 MTHS	350					4,900		4,900
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	30000					30,000		30,000
	CIH PERSONNEL	E	230 DAYS	800					184,000		184,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	7,800 SETS	25					195,000		195,000
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	PIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	36 MTH	750					27,000		27,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		3 MEN		480	1,440	45	64,800			64,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										936,530

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT. SHEET)

Page 10

Date : 10/10/90

Project or Description USATHAMA/AMTL Type of Est. PLANNING File No. K-164 Page : 10 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-C

Total Reactor Building Dismantlement SHIP TO BARNWELL, SOUTH CAROLINA

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,500	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	Total										479,400
											USE $479,000

ESCALATION SHEET

Project
or Description : USTHAMA/AMIL SITE, OP. #2 TOTAL DISMANTLEMENT/VAR. 2-C
location : INEL
Requested By : D. L. Smith

Date : 10/30 /90
Page : 1 of 1
Prepared By : A. R. Millward
Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	%
Title I, II	3	1.1	9	3.5									4.64%
Title III													
Labor	3	1.1	9	3.4									4.54%
Mat'l & Subcontracts	3	1.0	9	3.3									4.33%
Equipment													
Indirects	3	1.1	9	3.4									4.54%
PM	3	1.1	4	1.6									2.66%
CM													
FE													
Equipment		4.0		4.4	5.1		5.3		5.4		5.4		
Material		4.0		4.4	5.1		5.3		5.4		5.4		
Labor		4.2		4.6	5.6		5.8		6.0		5.9		
Indirects		4.2		4.6	5.6		5.8		6.0		5.9		
I. II		4.3		4.7	5.7		5.8		6.0		5.9		
III		4.3		4.7	5.7		5.8		6.0		5.9		
PM-CM-FE		4.3		4.7	5.7		5.8		6.0		5.9		
Composite		4.2		4.6	5.5		5.7		5.8		5.7		

COST ESTIMATE SUMMARY

EG&G Idaho, Inc.

Type of Estimate : PLANNING | File No.: M-164 | Date: 10/10/90

Project : USTHAMA/AMTL SITE, OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Prepared By : A. R. Millward | Checked/Approved By:

	Unescalated	Escalation		Totals:
Engineering, Design and Inspection	(	0% of construction)		22,000
Title I & II Design	NA			
Of Special Tools	20,000	2,000		
Title III Inspection	NA			
Construction Costs Subtotal				5,030,000
Direct/Indirect Costs			5,030,000	
8000 Contractor Demo Labor	422,000	47,000		
8000 Contractor Demo Mat'l	157,000	18,000		
8000 Contractor Disposal	2,344,000	238,000		
8000 Contractor Support	937,000	95,000		
Indirect Costs	706,000	72,000		
Construction Management				
Field Engr and Const Mgmt	NA			
Const Mgmt Reserve	NA			
Government Furnished Material				
Purchased By CM	NA			
Purchased By	NA			
Procurement Fee	NA			
Project Administration Costs				517,000
Project Management	479,000	38,000		
Project Support	NA			
Subtotal				5,569,000
Contingency	13% of Subtotal			731,000
Escalation (included in above totals)		504,000		
	Total Estimated Cost			6,300,000

Comments: THIS ESTIMATE IS ESCALATED TO A MIDPOINT OF CONSTRUCTION OF SEPTEMBER 1992

EG&G Idaho, Inc.

DETAILED COST ESTIMATE SHEET

Project or Description: USTHAMA/AMTL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Location: Boston, Massachusetts

Requester: D. L. Smith

Type of Est.: PLANNING

SOURCE OF ESTIMATE
(E) Eng. Est.
(V) Vendor
(P) Pur. Order
(H) Handbook Ref.

File No.: M-164

Date: 10/10/90

Page: 1 of 10

Prep. By: DLS/WLM/ARM

Chk'd/Appr'd By:

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Summary Option #2										
	Contractor-Demo. mhrs/rate, From Page # 6					16,880	25	422,000			$422,000
	Boston Area PT&I										$147,700
	Overhead @ 15%										$85,455
	Profit @ 10%										$65,536
	Sub-Total, Rounded to nearest $1,000										$721,000
	Demo. Material & Other Costs, From Page # 6								6,800	149,700	$156,500
	Overhead @ 15%										$23,475
	Profit @ 10%										$17,998
	Sub-Total, Rounded to nearest $1,000										$198,000
	Subcontractor Disposal, From Page # 6										$2,344,000
	Overhead @ 10%										$236,744
	Profit @ 5%										$129,037
	Sub-Total, Rounded to nearest $1,000										$2,710,000
	Subcontractor Support Costs From Page # 9, Including Overhead And Profit, Rounde to nearest $1,000										$957,000
	Total for Option #2 (Demo/Disposal) Rounded to nearest $1,000										$4,566,000

EG&G Idaho, Inc. DETAILED COST ESTIMATE (CONT.SHEET)

Project or Description: USTHAMA/AMTL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D
Total Reactor Building Dismantlement

Type of Est. PLANNING File No. M-164

Date : 10/10/90
Page : 2 of 10

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Equip/Mat., etc. Other Cost	Total Cost
	Option II										
	Mobilization/Demobilization					200	25	5,000			$5,
	Remove Ground Level Air-lock Structures					248	25	6,200			$6,200
	Provide access opening on Ground										
	Level per Option #1					100	25	2,500			$2,500
	Remove control rod assembly/core grid/										
	beam tubes/all reactor components -										
	place in storage and ship					140	25	3,500			$3,500
	Remove S.S. reactor liner					80	25	2,000		1000	$3,000
	Remove all reactor associated external piping					200	25	5,000		500	$5,500
	Remove heat exchanger tanks/demineralizers/pumps/valves					200	25	5,000		500	$5,500
	Remove all instrumentation control mechanisms/										
	electrical equipment etc. from control room on 2nd floor					100	25	2,500		300	$2,800
	Page Two Subtotal					1,268	25	31,700		$2,100	$33,800

Project or Description: USIHAMA/AMTL SITE
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D
Total Reactor Building Dismantlement

Type of Est. PLANNING File No. M-164

Date : 10/10/90
Page : 3 of 12

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove electrical/HVAC/Piping/Pumps/any other Equipment					200	25	5,000			$5,000
	Remove contaminated piping (from										
	reactor to Building 97 w/20 Ft. UG)		100 FT			80	25	2,000			$2,000
	Remove fence/cistern/piping (Per Option 1)					232	25	5,800			$5,800
	Back Fill and compact					40	25	1,000	800	800	$2,600
	Remove secondary coolant pumps, pads etc.					48	25	1,200			$1,200
	(2nd Balcony Floor Ref. Dwg. #35-64-04)										
	Remove duct/wiring/panels/hand rails/partitions/plumbing/lighting, etc.										
	Store or dispose per SOW					240	25	6,000			$6,000
	Demo/remove 2nd floor platform per Option 1					100	25	2,500			$2,500
	Remove 1st floor platform Ref. Dwg. 35-64-04 Sh. 9 per Option 1					352	25	8,800			$8,800
	REMOVE SECONDARY COOLANT PUMP SUMP		ALLOW		200	200	25	5,000			$5,000
	SPECIAL TOOLS		ALLOW	1000	160	160	25	4,000	1,000		$5,000
	Page Three Subtotal					1,652	25	$41,300	$1,800	$800	$43,900

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Date : 10/10/90

Project or Description: USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M 104

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, r,m	Mat'l Unit	Mat'l Ut. Cost	Unit Leb. Hrs.	Total Leb. Hrs.	Labor Rate	Labor Cost	Mat'L. Cost	Other Cost	Total Cost
	Remove reactor containment										
	Outer Shield Concrete		40 CY 200 CY			320	25	8,000			$8,000
	Inner Shield Concrete		70 CY 300 CY			840	25	21,000			$21,000
	Remove High Density Shield (Per Option I)		130 CY 300 CY			1,560	25	39,000			$39,000
	Remove Reactor Concrete Base (Per Option I)		147 CY			1,764	25	44,100		50%	$44,100
	(In basement)										
	Allow for Equip. decon.					800	25	20,000		5000	$25,000
	Remove all electrical, HVAC piping, Pumps etc.					300	25	7,500			$7,500
	Remove remaining utilities inside/										
	outside elect., plumbing/HVAC etc.					300	25	7,500			$7,500
	Remove containment roof shell, flame										
	cut into sections for salvage					320	25	8,000		1000	$9,000
	Remove polar crane (completely) dismantle/salvage					240	25	6,000			$6,000
	Remove girder rail/power supply etc.					100	25	2,500			$2,500
	Page Four Subtotal					6,544	25	$163,600		$6,000	$169,600

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Page 5

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

Page : 5 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Total Reactor Building Dismantlement

Acct. No.	Description	E,V, P,H	Mat'l Uni	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Remove 1/2" skin, C.S. 80'D X 50'H and										
	salvage - 480,000 lb		17,000 FT	.05/lb.		960	25	24,000		5000	$29,000
	Remove concrete operating floor										
	approx. 1-1/2" Th. 80' Dia.		275 CY			800	25	20,000		7500	$27,500
	Remove concrete circ[illegible] ential wall (2 Ft. Th)		1000 CY			2,000	25	50,000		5000	$55,000
	Remove basement floor and mud mat -										
	Basement floor		700 CY	100		2,800	25	70,000		10000	$80,000
	1/4" Steel Plate		4800 SF	0.5		96	25	2,400			$2,400
	Mud Mat. concrete		150 CY	80		480	25	12,000			$12,000
	Remove cathodic protection system					80	25	2,000			$2,000
	Backfill/compaction of (reactor) hole fill		1000 CY	10		200	25	5,000	5,000	5000	$15,000
	Heavy Equipment Lease - Cranes									46800	$46,800
	Loaders/Backhoes			(Based on 20 man crew for 4.5 months to complete demolition - Option II)						5400	$5,400
	Fork Lifts									3600	$3,600
	Trucks									52500	$52,500
	Page Five Subtotal					7,416	25	$185,400	$5,000	$140,900	$331,200

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT.SHEET)

Date : 10/10/90

Project or Description USTHAMA/AMTL SITE

Type of Est. PLANNING

File No. M-164

OPTION #2 TOTA. DISMANTLEMENT/VARIATION 2-D

Total Reactor Building Dismantlement Summary Sheet For Demolition And Disposal

Acct. No.	Description	E,V. P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	OPTION II										
(DEMO)	Page 2					1,268	25	31,700		2,100	33,800
(DEMO)	Page 3					1,652	25	41,300	1,800	800	43,900
(DEMO)	Page 4					6,544	25	163,600		6,000	169,600
(DEMO)	Page 5					7,416	25	185,400	5,000	140,800	331,200
	Subtotal for Complete Demo					16,880	25	$422,000	$6,800	$149,700	$578,500
	Dispose of Clean and Rad Waste										$122,500
(WASTE)	Page 7, Dispose of Cold Waste Locally										$88,000
(WASTE)	Page 7, Ship Low Level to SC										$474,700
(WASTE)	Page 8, Ship Low Level to SC										$268,800
(WASTE)	Page 8, Radwaste Disposal								1,440,000		$1,440,000
(WASTE)	STATE PEDALTY SURCHARGE		1/000 CF	120							$2,344,000
	Subtotal for Disposal										

Project or Description: USTHAMA/AMTL SITE — Type of Est.: PLANNING — File No.: M-164 — Date: 10/10/90 — Page: 7 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Total Reactor Building Dismantlement (Dispose Locally)

Acct. No.	Description	E,V, P,H	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	Mat'l. Cost	Other Cost	Total Cost
	Haul Clean Waste to local Dump Site	Use	5000 TON								
	25 mi. to Site, $2.50 per mi. = 50 mi. RT (For Option II)										
	Use 10 Ton Load per RT.		500 Trips X $75 RT							37500	$37,500
	Waste Site Fees Etc.										
	Allow $15 Per Ton		5000 TON							75000	$75,000
	For Other Clean Waste Disposal, Allow										
	for Transportation, Fees, etc.									10000	$10,000
	Total										$122,500
	Estimate for Low Level Activity to be										
	Shielded for Transportation - to Barnwell, SC.										
	Allow cost for casks and shipping										
	(Cask B-120A) Lease (4) $15,000 Ea 2 wks. lease, Round Trip										$60,000
	Packing/Handling active material @ MTL					800	35	28,000			$28,000
	Total							$28,000			$88,000

Project or Description: USAIHAWA/AMTL
OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Type of Est.: PLANNING

File No.: M-164

Date: 10/10/90

Page: 5 of 10

Acct. No.	Description	E,V, P,M	Mat'l Unit	Mat'l Ut. Cost	Unit Lab. Hrs.	Total Lab. Hrs.	Labor Rate	Labor Cost	[illegible]	Other Cost	Total Cost
	Containiminated Concrete -										
	Reactor Containment		70 CY								
	High Density Shielding		130 CY								
	Reactor Base Biological Shield, etc.										
	Allow (50%)		75 CY								
	Total		275 CY								
	Approximate Cubic Feet		7425 (Low Level) (ADD 50% MORE FOR INCREASE VOID VOLUME = 11,138 CF)								
	Use 8-25 Shipping Con. 11,138CF/92CF PER CONTAINER = 121 CONTAINERS X $700 Ea Cask Lease (ALSO CONTAINS ORIGINAL 10% VOID VOLUME)									84,700	$84,700
	34 round trips @ 10,000 per trip (INCLUDES 1200 MILES OF TRANSPORTATION AND DISPOSAL COSTS)									340,000	$340,000
	Subtotal									$424,700	$424,700
	(RADWASTE) OPTION #2										
	Radweste Disposal at Barnwell Site in SC										
	Allow for Approx. 20 loads in 8-25 Shipping Casks (4 per load w/cont. Concrete)										
	Surcharge per cont. Wt. 5,000 to 10,000 lbs.		136	800						10880u	$108,800
	w/approx. 0-5 curie per shipment		20	3000						60000	$60,000
	Shipping cask 8-120A - (Higher Activity Level)										
	Casks 8-120A - Curies ? Allow for (4) containers at $25,000 Ea (INCLUDES										$100,000
	Total										$268,800

The outer steel shell, pular crane, support structures, imbeded steel plate, misc. pipe, equip and other non-contaminated materials are not in this estimate for disposal.

These items may be a credit to disposal costs in the bldg. dismantlement. Most metal salvage will vary in sales returns from $.01 to $.05 per lb.

Operable equipment approx. 10 cents per lb.

EG&G Idaho, Inc.

DETAILED COST ESTIMATE (CONT. SHEET)

Date : 10/16/90

Project or Description USATHAMA/AMTL

Type of Est. PLANNING

File No. M-164

OPTION #2 TOTAL DISMANTLEMENT/WARRATAGE

Total Reactor Building Dismantlement SHIP TO BARNWELL, SOUTH CAROLINA

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	SUBCONTRACTOR COSTS										
	HP TECHNICIANS (PRE/POST REACTOR DEMO)	E	3 MEN		320	960	45	43,200			43,200
	HP TECHNICIANS (REACTOR DEMO 18 M/W @ 60)	E	6 MEN		1,084	6,504	45	292,680			292,680
	LAB TECHNICIAN	E	1 MAN		1,400	1,400	45	63,000			63,000
	FIELD LAB (RENTAL)	E	14 MTHS	350					4,900		4,900
	FIELD LAB INSTRUMENT RENTAL	E	1 LOT	30000					30,000		30,000
	CIH PERSONNEL	E	230 DAYS	800					184,000		184,000
	PERSONNEL PROTECTION CLOTHING & EQUIP	E	7,800 SETS	25					195,000		195,000
	PRE EMPLOYMENT EXAMINATION	E	45 EA	100					4,500		4,500
	BIO ASSAYS	E	90 EA	65					5,850		5,850
	OFFICE/LUNCH ROOM/SHOWERS	E	36 MTH	750					27,000		27,000
	POST-DECON CHAR & FINAL SURVEY										
	HP TECHNICIANS (8 M/W @ 60 HR'S)		3 MEN		480	1,440	45	64,800			64,800
	LAB TECHNICIAN	E	1 MAN		480	480	45	21,600			21,600
											936,530
	SUBTOTAL SUBCONTRACTOR SUPPORT EFFORT										

Project or Description: USATHAMA - ALL | Type of Est.: PLANNING | File No.: M-164 | Date: 10/10/90 | Page: 10 of 10

OPTION #2 TOTAL DISMANTLEMENT/VARIATION 2-D

Total Reactor Building Dismantlement SHIP TO BARNWELL, SOUTH CAROLINA

ACCT. NO.	DESCRIPTION	E,V, P,H	MAT'L UNIT	MAT'L UT. COST	UNIT LAB. HRS	TOTAL LAB. HRS.	LABOR RATE	LABOR COST	MAT'L COST	OTHER COST	TOTAL COST
	EG&G ACTIVITY COST ESTIMATE										
	STATEMENT OF WORK	E				1,530	65	97,500			97,500
	TRAVEL	E	10 TRPS	2500					25,000		25,000
	REPRODUCTION	E	1 LOT	10000					10,000		10,000
	PROPOSAL EVALUATION	E	1 LOT			360	65	23,400			23,400
	PROJECT MANAGER	E	1 EA			1,700	75	127,500			127,500
	SECRETARY	E	1 EA			1,700	35	59,500			59,500
	PHOTOS	E	200 EA	20					4,000		4,000
	POST-DECON CHAR & FINAL SURVEY	E	1 LOT			800	75	60,000			60,000
	FINAL REPORT/PROJ FILE DOCUMENTATION	E	1 LOT			100	75	7,500			7,500
	MANAGEMENT OVERVIEW	E	1 LOT			200	85	17,000			17,000
	FINANCIAL SERVICES	E	1 LOT			300	50	15,000			15,000
	SECRETARIAL SUPPORT (UP TO CONSTR)	E	1 LOT			200	35	7,000			7,000
	SAFETY/QUALITY/RAD SUPPORT UP TO										
	CONSTRUCTION	E	1 LOT			400	65	26,000			26,000
	total										479,400
											USE $479,000

ESCALATION SHEET

Date : 10/10 /90
Project or Description : USTHAMA/AMTL SITE, OP. #2 TOTAL DISMANTLEMENT/VAR. 2-b Page : 1 of 1
Location : INEL Prepare'd By : A. R. Millward
Requested By : D. L. Smith Chk'd/appr'd By : _____

Fiscal Years :	FY90		FY91		FY92		FY93		FY94		FY95		//////////
Calendar Years	CY90 JFMAMJJASOND		CY91 JFMAMJJASOND		CY92 JFMAMJJASOND		CY93 JFMAMJJASOND		CY94 JFMAMJJASOND		CY95 JFMAMJJASOND		TOTAL COM-POUNDED %
Escalated Months & Yearly Percentage	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	Months	Yrs %	
Title I, II	3	1.1	12	4.7	9	4.3							10.35%
Title III													
Labor	3	1.1	12	4.6	9	4.2							10.14%
Mat'l & Subcontracts	3	1.0	12	4.4	9	3.8							9.48%
Equipment													
Indirects	3	1.1	12	4.6	9	4.2							10.14%
PM	3	1.1	12	4.7	4	1.9							7.84% 1
CM													
FE													
Equipment		4.0		4.4		5.1		5.3		5.4		5.4	
Material		4.0		4.4		5.1		5.3		5.4		5.4	
Labor		4.2		4.6		5.6		5.8		6.0		5.9	
Indirects		4.2		4.6		5.6		5.8		6.0		5.9	
I. II		4.3		4.7		5.7		5.8		6.0		5.9	
III		4.3		4.7		5.7		5.8		6.0		5.9	
PM-CM-FE		4.3		4.7		5.7		5.8		6.0		5.9	
Composite		4.2		4.6		5.5		5.7		5.8		5.7	